ALOKA

ULTRASOUND DIAGNOSTIC INSTRUMENT

prosound α6

Instruction Manual

Measurement (volume 2/2)

> ⚠ Note
> Instruction manuals consist of this manual, Safety Instruction and How to Use.
> Before using this instrument, please read Safety Instruction.

ALOKA CO., LTD.

CE 0123

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Introduction

This is an instruction manual for model Prosound α6, an ultrasound diagnostic instrument.

Before using this instrument, please read Safety Instruction. Especially be sure to read Chapter 1. "Safety Precautions".

Keep this manual securely for future reference.

This instrument and the manuals use the following symbols for safety use. Do understand the meaning before reading the text of this manual.

⚠ Danger	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ Warning	Indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury.
⚠ Caution	Indicates a potentially hazardous situation which, if not avoided, may result in injury or property damage.
⚠ Note	Indicates a request concerning an item that must be observed in order to prevent damage or deterioration of the instrument and also to ensure effective use.

Contents of cautions shows the following graphics.

⚠	This mark means the noted action is "alerted".
⃠	This mark means the noted action is "prohibited".
❗	This mark means the noted action is required.

Classification of Prosound α6

- Protection against electric shock: Class I medical electrical equipment
- Applied parts:Type BF applied parts
- Protection against defibrillator emissions: Not compatible with defibrillator-proof applied parts
- Protection against harmful ingress of water or particulate matter: Ordinary protection (IPX0)
- Level of safety for use in air and flammable anesthetic gas, or in oxygen/nitrous oxide and flammable anesthetic gas:
  This instrument is not suitable for use in air and flammable anesthetic gas, or in oxygen/nitrous oxide and flammable anesthetic gas.
- Operation mode: Continuous operation

CONTENTS

This book consists of two separate volumes.
These two volumes have the same table of contents and the index respectively.

1. Measurement Functions

2. Cardiac Measurement

3. Vascular Measurement

4. Abdominal measurement

5. Obstetrical Measurement

6. Gynecological Measurement

7. Urological Measurement

8. eTRACKING Measurement

4. ABDOMINAL MEASUREMENT

4-1. Preface

The description concerning the Abdominal measurement functions is divided into the following six sub-sections.

This section describes the procedure for carrying out abdominal measurements, based on the assumption that products are on the factory default.

Descriptions of the basic operations of the measurement functions and each measurement method (mark type = Caliper, Trace, etc.) are given in the Section 1. ゞMEASUREMENT FUNCTIONSモ

This section consists of 50 pages.

4-2. Abdominal Measurement Functional Outline

4-2-1. Abdominal Measurement Functional List

Abdominal measurements use studies consisting of various combinations of the measurement menu, report display, and so on, depending which part is being examined and the purpose of the examination.

[Remark]
On the factory default, it contains Basic Study.

The abdominal measurement is divided as shown in the figure below for each mode.

: Items that are displayed on the factory default.

4-2-1-1. B mode

Measurement function	Measurement menu	Display items	Remark
Gallbladder measurement	Gallbladder	GB-L GB-W	Measured at one cross-section.
	GB Wall-T	GB Wall-T	
CBD measurement	CBD	CBD	Measured at one cross-section.
Liver measurement	Liver (Left Lobe) Liver (Right Lobe)	L1 L2	Measurement of left lobe and right lobe.
Pancreas measurement	Pancreas	Head Body Tail	Measured at multiple cross-sections.
	P-Duct	P-Duct	Measured at one cross-section.
Renal measurement	Renal Volume (Right, Left)	Vol. Rnl-L Rnl-W Rnl-AP	Measured at two cross-sections.
Spleen measurement	Spleen	a b SI	SI: Spleen Index(axb)
Space-occupying lesion measurement	SOL1 SOL2	d1 d2 d3 Area Volume	Measured at two cross-sections.
Blood vessel diameter measurement	Aorta Diam	Aorta Diam	Measured at one cross-section.
	PV Diam	PV Diam	
% stenosis measurement	%STENO Diam %STENO Area	Vessel Resid %STENO	Diagnosis for the rate of stenosis.

4-2-1-2. D mode

Measurement function	Measurement menu	Display items				Remark
Artery measurement	A-Ao, CA, CHA, SA, SMA, IMA, CIA, HA, Prandial SMA, Artery1, Artery2, Artery3 *Artery1— 3: It is possible to freely define and use a name according to the particular purpose and application.	PI	RI	S/D	PSV	Diagnosis for the rate of stenosis CIA: Consists of Right/ Left Prandial SMA: Consists of Pre/Pst
		EDV	MnV	ACC	AccT	
Renal Artery measurement	Renal-A	PI	RI,	S/D	PSV	Diagnosis of degree of stenosis Consists of Right/Left
		EDV	MnV	ACC	AccT	
		FlowT	AccT/FT			
Portal vein measurement	Main PV Rt.PV Lt.PV	pV				For portal vein blood flow.
Shunt blood vessel measurement	Pre Shunt PV Prox Shunt Mid Shunt Distal Shunt	pV				For shunt blood flow measurement.

4-2-1-3. B mode, D mode

Measurement function	Measurement menu	Display items				Remark
Flow quantity measurement	F.Volume (Abdom)(MnV)	MnV	pV	VTI	AccT	For steady state blood flow.
		ACC	FV	CSD	CSA	
	F.Volume (Abdom)(VTI)	MnV	pV	VTI	AccT	For arterial blood flow.
		ACC	FV(beat)	FV(min)	CSD	
		CSA	HR			

4-2-2. Items of Particular Note

For blood flow velocity measurement:
When recording an arterial flow Doppler waveform (pulse method), if the Doppler incident angle exceeds 60× the measurement error becomes large.
The measured values of the blood flow values obtained using this equipment are the absolute values displayed on the observation monitor. They are controlled as positive and negative values for the purpose of calculating the arithmetic index.
If the display of each measured value in a report is set to “Average” in a preset, the positive and negative values are added together and displayed as a mean value. Consequently, when performing multiple measurements of blood flow on the blood flow waveform drawn using the color Doppler method as a guide, use identical recording conditions (forward and reverse flow directions) for all of the blood flow waveforms in order to correctly display each of the arithmetic values arranged in the report.

4-3. Measurement operation procedure

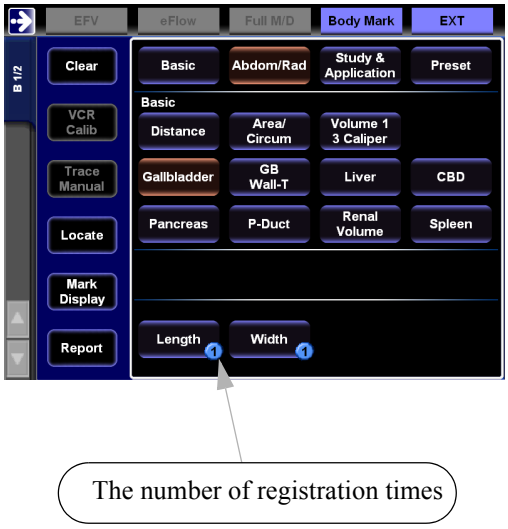
Abdominal measurement has the following study.

Basic Study

When multiple Studies are set by the preset function, it can be possible to switch the Study & Application by the touch panel.

<Displaying marks of registered reports >

When the registration of the report is made after a measurement is made for each item, the number of registration times is displayed on the touch panel.



[Remark]
The display examples of the measurement results, in this chapter, are displayed with a vertical display layout.

4-3-1. B mode

4-3-1-1. Gallbladder measurement

This is the measurement of the length and width of the vertical cross-section of the gallbladder.

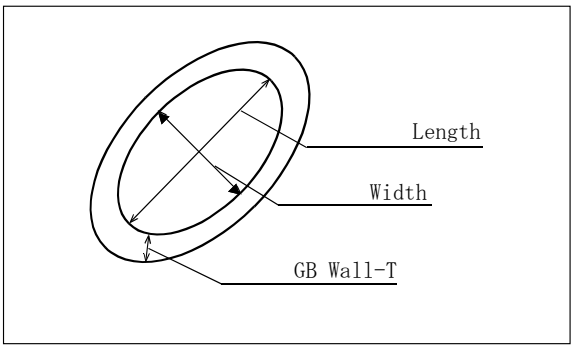
<Operation method>

(1) Record a slice image of the gall bladder in the B mode.

(2) Select the Gallbladder on the touch panel.
→ The + mark is displayed, so measure the Length.

(3) Press the + switch.
→ Measure the Width.

(4) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.



<Example of Gallbladder results display>

```
Gallbladder
GB-L:    .    cm   ← Length of the gallbladder
GB-W:    .    cm   ← Width of the gallbladder
```

4-3-1-2. GB Wall-T measurement

This is the measurement of the thickness of the gallbladder wall.

<Operation method>

(1) Record a slice image of the gallbladder in the B mode.

(2) Select the GB Wall-T on the touch panel.
→ The + mark is displayed, so measure the GB wall thickness.

(3) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of GB Wall-T results display>

```
GB-Wall-T:
        .    cm   ← Thickness of gallbladder wall
```

4-3-1-3. CBD measurement

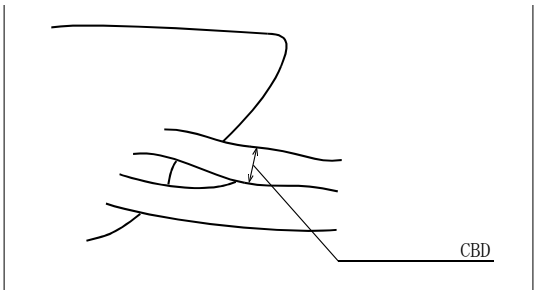
This is the measurement of the diameter of the common bile duct.

<Operation method>

(1) Record a slice image of the common bile duct in the B mode.

(2) Select the CBD on the touch panel.
→ A + mark appears, so measure the diameter of the common bile duct.

(3) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.



<Example of CBD results display>

```
CBD:
      .    cm
```

← Common Bile Duct
← Diameter of the common bile duct

4-3-1-4. Liver measurement

This is the measurement of the left and right lobes of the liver.
The method of measurement for both the left and right lobes is the same.

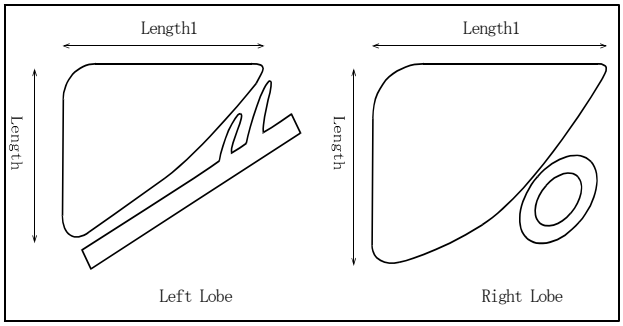
<Operation method>

(1) Record a slice image of the right (or left) lobe in the B mode.

(2) Select Right or Left of Liver on the touch panel.
→ The + mark is displayed, so measure the Length1.

(3) Press the + switch.
→ Measure the Length2.

(4) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.



<Example of Liver results display>

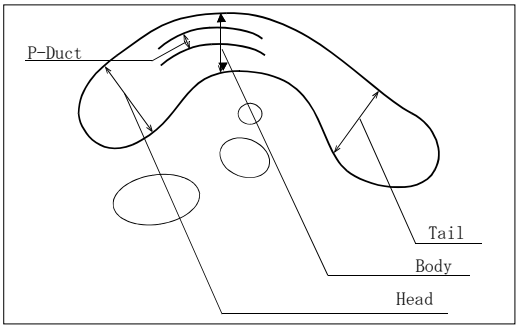
```
Liver (Right)    Liver (Left)
L1:    .    cm    L1:    .    cm
L2:    .    cm    L2:    .    cm
```

← Length 1 of the right or left lobe of the liver
← Length 2 of the right or left lobe of the liver

4-3-1-5. Pancreas measurement

This is the measurement of the head, body and tail of the pancreas from its cross-section.

<Operation method>



(1) Record a slice image showing the head of the pancreas.

(2) Select the Pancreas on the touch panel, and then select Head.
→ The + mark is displayed, so measure the Head.

(3) Record a slice image showing the body of the pancreas, and then press the + switch.
→ Measure the Body.

(4) Record a slice image showing the tail of the pancreas, and then press the + switch.
→ Measure the Tail.

(5) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of Pancreas results display>

```
Pancreas
Head:    .    cm   ← Diameter of head of pancreas
Body:    .    cm   ← Diameter of body of pancreas
Tail:    .    cm   ← Diameter of tail of pancreas
```

4-3-1-6. P-Duct measurement

This is the measurement of the diameter of the pancreatic duct.

<Operation method>

(1) Record a slice image of the pancreas showing the pancreatic duct in the B mode.

(2) Select the P-Duct on the touch panel.
→ The + mark is displayed, so measure the pancreatic duct.

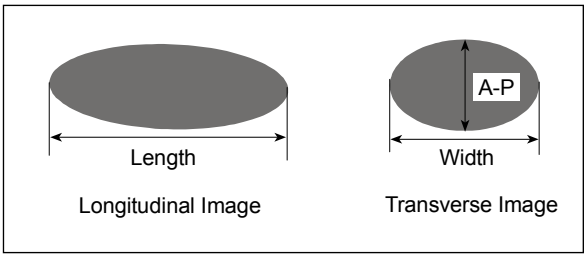
(3) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of P-Duct results display>

```
P-Duct:
         .    cm   ← Diameter of pancreatic duct
```

4-3-1-7. Renal Volume measurement

Approximate each of the left and right renal volume to an ellipsoid, measure the major and minor axes of the transverse image (Width, A-P) and the length of the major axis of the longitudinal image (Length), and calculate the volume of each renal.



[Remark]
Measure these three axes in such a way that they intersect each other.
The switching between the Right and Left can be made with the touch panel.
The operation procedure for both kinds of measurement is the same.

<Operation method>

The case of the Right of the Renal Volume is explained.

(1) Display the longitudinal and transverse images of the right kidney in the 2B mode.

(2) Select the Right of the Renal Volume on the touch panel.
→ The + mark is displayed, so measure the Length using the longitudinal image.

(3) Press the + switch.
→ Measure the Width using the transverse image.

(4) Press the + switch.
→ Measure the A-P using the transverse image.
Volume (Rt.Renal Vol.) is computed.

(5) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

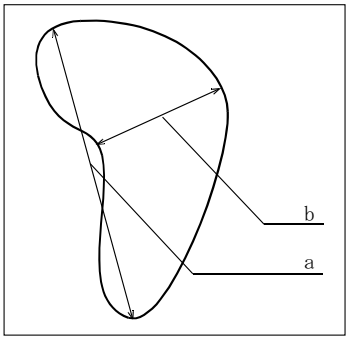
<Example of Renal Volume results display>

`Rt.Renal Vol`	Right Renal Volume
`Vol.  :  .  cc`	Volume of Renal
`Rnl-L :  .  cm`	Lengthof Renal
`Rnl-W :  .  cm`	Width of Renal
`Rnl-AP:  .  cm`	Anterior-posterior of Renal

4-3-1-8. Spleen measurement

This measurement is for obtaining the spleen index (SI = axb) from the major diameter (a) and the thickness (b) of the spleen.

<Operation method>



(1) Record a slice image of the spleen in the B mode.

(2) Select the Spleen on the touch panel.
→ A + mark appears, so measure the major diameter a.

(3) Press the + switch.
→ Measure the thickness b.

(4) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of Spleen results display>

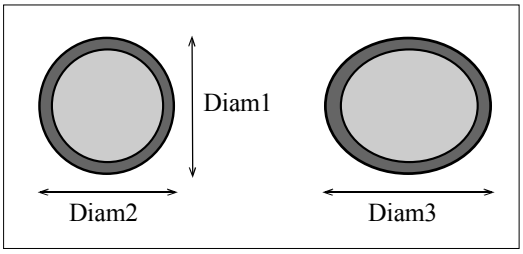
```
Spleen
a :    .    cm
b :    .    cm
SI:    .    cm²
```

← Major diameter of spleen
← Thickness of spleen
← Spleen Index (=axb)

4-3-1-9. SOL (Space Occupying Lesions) measurement

This is the measurement of the length of the three axes of a space-occupying lesion, such as a tumor, for calculating the volume of the lesion using an elliptical approximation.
The same operation is used for both SOL1 and SOL2.

<Operation method>



(1) Record a slice image showing the SOL in the 2B mode.

(2) Select the SOL1 on the touch panel.
→ A + mark appears, so measure the first axis.

(3) Press the + switch.
→ Measure the second axis.

(4) Press the + switch.
→ Measure the third axis.

(5) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of SOL results display>

```
SOL1
Vol.:     .    cm3   ← Volume
Area:     .    cm2   ← Area
d1  :     .    cm    ← Diameter of first axis
d2  :     .    cm    ← Diameter of second axis
d3  :     .    cm    ← Diameter of third axis
```

4-3-1-10. Blood vessel diameter measurement

This is the measurement of the diameter of the aorta and the portal vein. The method of measurement used for both the aorta and the portal vein is the same.

<Operation method>

(1) Record a slice image of the aorta (or the portal vein) in the B mode.

(2) Select the Aorta Diam or PV Diam on the touch panel.
→ A + mark appears, so measure the diameter of the aorta (or the portal vein).

(3) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of Aorta Diam results display>

```
Aorta Diam:
          .    cm
```
← Diameter of aorta

<Example of PV Diam results display>

```
PV Diam:
          .    cm
```
← Diameter of portal vein

4-3-1-11. Rate of %Stenosis measurement

One of the following two methods can be used to evaluate the % stenosis.

1) Evaluation by calculation from the diameter (% STENO-Diam)
2) Evaluation by calculation from the cross-sectional area (% STENO-Area)

1) % STENO-Diameter measurement

Measure the % stenosis of a blood vessel by measuring the blood vessel lumen diameter using a transverse image

<Operation method>

The following description is based on the case of % STENO Diam.

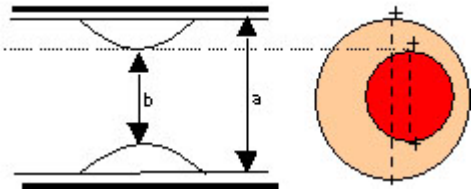
[Remark]
You can perform this measurement using the Study for the arterial system.

(1) Display the transverse image of the short axis that intersects the location of the stenosis at right angles to it.

(2) Select the% STENO Diam on the touch panel.
→ Measure the intrinsic internal diameter a of the blood vessel (Vessel).

(3) Press the + switch.
→ Using the same operation as (2), measure the residual lumen diameter b (Residual) of the stenosis.

(4) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.



% STENO= (a - b) / a × 100 (a > b)

a: Vessel lumen
b: Residual

<Example of % STENO-Diameter results display>

```
STENO-Diam
Vessl:   .   mm
Resid:   .   mm
%STENO:  .  %
```

The diameter of the lumen of the original blood vessel (Vessel)
The diameter of the lumen of the stenosis part of the blood vessel (Residual)
Rate of the stenosis

2) % STENO-Area measurement

Measure the % stenosis of a blood vessel by measuring the cross-sectional area of the blood vessel using a transverse image.

<Operation method>

The following description is based on the case of % STENO Area.

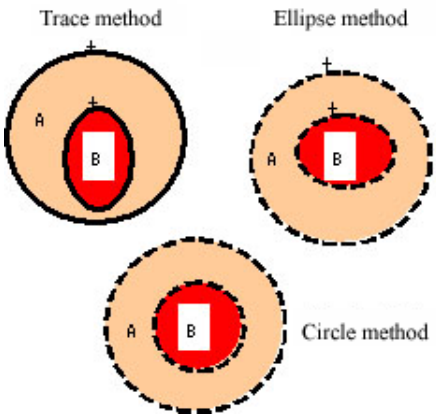
[Remark]
You can perform this measurement using the Study for the arterial system.

(1) Display the transverse image of the short axis that intersects the location of the stenosis at right angles to it.

(2) Select the % STENO Area on the touch panel.
→ Trace the intrinsic internal diameter A of the blood vessel (Vessel) using the Ellipse method.

(3) Press the + switch.
→ Trace the residual lumen diameter B (Residual) of the stenosis using the Trace method.

(4) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.



% STENO= (a - b) / a × 100 (a > b)

a: Vessel lumen
b: Residual

[Remark]
Vessel measurement is set to the Ellipse method, and Residual measurement to the Trace method, by means of a preset.
You can change the preset to other methods (Trace, Circle).
For the method of using each method, refer to Section 1-7-4-2. ?Method of performing a measurement using Ellipse?, Section 1-7-4-3. ?The measurement procedure of the Circle mark method? and Section 1-7-4-4. ?The measurement procedure of the B-Trace method?.

<Example of % STENO-Area results display>

STENO-Area		
Vessl:	**. cm²**	The area of the lumen of the original blood vessel (Vessel)
Resid:	**. cm²**	The area of the lumen of the stenosis part of the blood vessel (Residual)
%STENO:	**. %**	Rate of the stenosis

4-3-2. D mode

4-3-2-1. Measurements of abdominal region arterial blood flow

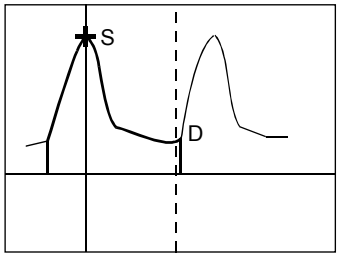
With tracing or pointing the Doppler waveforms (pulse method) of arterial blood flows in the abdominal region, it is demanded of the blood flow measurement data (PSV, EDV, and S/D of bloodstream).
As measurement menu, A-Ao, CA, CHA, SA, SMA, IMA, CIA, Renal-A, HA and Prandinal SMA are arranged.
In the CIA, HA and Renal-A, these can be switched for performing the Right/Left switching on the touch panel.
Also, Prandinal SMA enables you to perform the changeover from before eating to after eating by using Pre/Post on the touch panel.
For each blood flow measurement, there are two measurement procedures (Trace or Caliper) available and they are selected with the touch panel.

[Remark]
For the calculation of PI and RI, a systolic maximum blood flow rate (PSV) and an end-diastolic blood flow rate (EDV)are used.
In addition, as for the index, there is a report that an end-diastolic minimum blood flow rate is used.
An end-diastolic blood flow rate and an end-diastolic minimum blood flow rate are not necessarily correlation with each other. Therefore, when these measurements are carried out, move the time phase of EDV to the end-diastolic or the minimum blood flow velocity point with manual operation.
The PI and RI are calculated with the blood flow rates at these points.

1) Operation using doppler trace

<Operation method>

The following procedure applies to the CA Dop. Trace method.



(1) Display the blood flow Doppler waveform of a celiac artery.

(2) Select the CA, and select the Flow Trace on the touch panel.
→ The line cursor (vertical line) is displayed. (The + mark is displayed in the case of the Manual Trace method.)

(3) Using the Dop Trace method, trace the blood flow Doppler waveform.
→ PI, RI, S/D, etc. are calculated, and line cursors accompanied by the letters “S” and “D” are displayed.

[Remark]
Adjust the line cursors accompanied by the letters “S” and “D” using the ENTER switch and the trackball.
“S”: Peak Systolic Velocity point “D”: End Diastolic Velocity point

[Remark]
The method of using the Dop Trace method differs depending upon whether Auto Trace or Manual Trace is used.
For the operation method, refer to Section 1-7-4-5. ?The measurement procedure of the Dop-Trace method?.

(4) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of CA results display>

CA	Celiac Artery
PI :	Pulsatility Index
RI :	Resistance Index
S/D: .	Systolic/Diastolic velocity Ratio
PSV: . cm/s	Peak systolic velocity
EDV: . cm/s	End diastolic velocity
MnV: . cm/s	Mean Velocity

2) Operation using points

<Operation method>

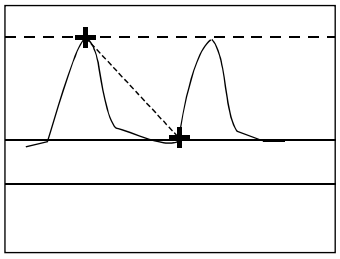
The following description is based on CA Dop. Caliper.

(1) Display the blood flow Doppler waveform of a celiac artery.

(2) Select the CA, and select the Caliper on the touch panel.
→ The + line cursor is displayed, then move the + mark to the peak systolic velocity (PSV) point.

(3) Press the ENTER switch.
→ Move the + mark to the end diastolic velocity (EDV) point.

(4) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.



<Example of CA results display>

CA	Celiac Artery
RI :	Resistance Index
S/D: .	Systolic/Diastolic velocity Ratio
PSV: . cm/s	Peak systolic velocity
EDV: . cm/s	End diastolic velocity

[Remark]
Other measurements are executed in the same way as in the case of CA Dop. Caliper.

4-3-2-2. Measurement of the portal vein and shunt blood flow

Here, the maximum values of the portal vein blood flow and the shunt blood flow are obtained by tracing or point-specifying the Doppler waveform (pulse method).
The measurement menus provided are Main PV, Rt.PV and Lt.PV for the portal vein blood flow, and Pre Shunt PV, Prox Shunt, Mid Shunt and Distal Shunt for shunt blood flow.
Two methods of measurement (Trace and Caliper) are provided for each blood flow measurement. The desired method can be selected using the touch panel.

1) Operation using doppler trace

<Operation method>

The Dop. Trace method of Main PV measurement is as follows.

(1) Record the blood flow Doppler waveform of the main portal vein.

(2) Select Main PV, and select the Flow Trace on the touch panel.
→ A line cursor (vertical line) appears. (In the case of the Manual Trace method, a + mark appears).

(3) Using the Dop Trace method, trace the blood flow Doppler waveform.
→ pV appears, and a line cursor not accompanied by "+" is drawn.

[Remark]
You can adjust pV using rotary encoder 4.
In the Dop Trace method, the operation method of Auto Trace differs from that of Manual Trace.
For the operation method, refer to Section 1-7-4-5. ✗THE MEASUREMENT PROCEDURE OF THE DOP-TRACE METHOD✗

(4) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of Main PV results display>

```
Main PV
pV:      .   cm/s
```

→ Peak Velocity

2) Operation using points

<Operation method>

The Main PV measurement is as follows.

(1) Record the blood flow Doppler waveform of the main portal vein.

(2) Select the Main PV, and select the Caliper on the touch panel.
→ A + line mark appears, so move the + mark to the maximum blood flow velocity (pV) point.

(3) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

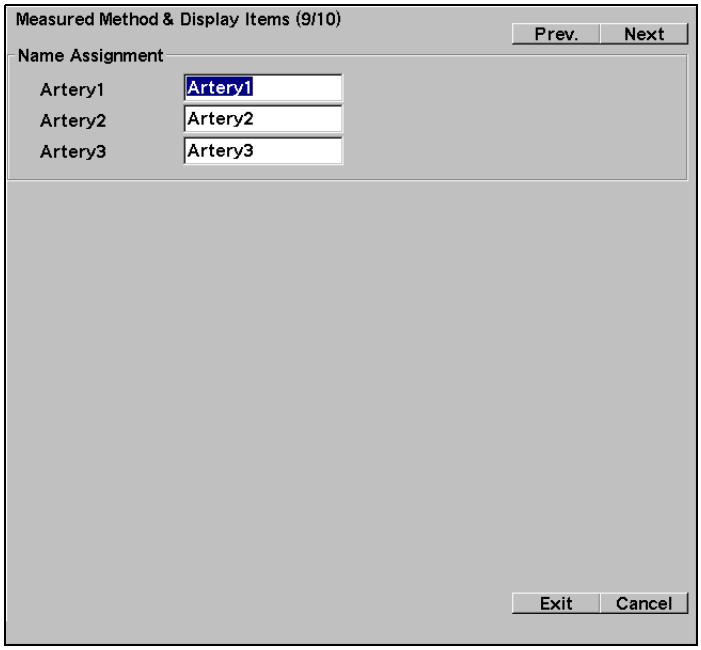
<Example of Main PV results display>

```
Main PV
pV:       .    cm/s
```

→ Peak Velocity

4-3-2-3. Artery1(-3) measurement

Registrations (and a title is made newly) for an arterial blood flow measurement except for a built-in artery can be made up to 3 with a preset.
The operation procedure for each blood flow measurement conducted here is the same procedure as for Section 4-3-2-1. ?Measurements of abdominal region arterial blood flow?.



<Example of Artery1 results display>

Artery1	Artery1
PI :	Pulsatility Index
RI :	Resistance Index
S/D: .	Systolic/Diastolic velocity Ratio
PSV: . cm/s	Peak systolic velocity
EDV: . cm/s	End diastolic velocity
MnV: . cm/s	Mean Velocity

4-3-2-4. Flow volume

You can calculate the flow volume of blood flowing at a constant velocity or of blood flowing in a peripheral vessel, for example.
There are two methods of calculating the flow volume, a method that uses MeanV (mean flow velocity), and a method that uses VTI (velocity time integration).
When you select Flow Volume(Abdom), the MeanV switch and VTI switch appear on the screen.
You can set which of these functions to be activated first by using a preset.

1) Using Flow Volume (MeanV)

You can calculate the blood flow volume from the mean flow velocity obtained using the Dop Trace method and also the cross-sectional area of the flow path obtained using the Caliper (Trace, Ellipse or Circle) method.

[Remark]
You can set a coefficient (COEF) using a preset. (Refer to Section 1-10-4-1. ?Measured Method & Display items?.)
The factory default setting is COEF = 1.00.

For reference: When calculating flow volume using an animal or a phantom, the coefficient (COEF) is between about 0.5 and 0.7. There are reports to the effect that the coefficient is 0.57 in the case of blood flowing through the portal vein, and 0.655 in the case of blood flowing through the radial artery.

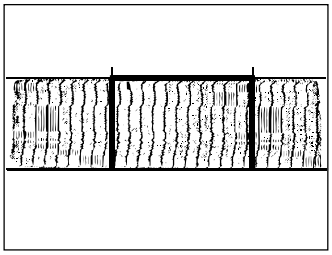
<Operation method>

Display the B/D mode image.

(1) Press the MEASUREMENT switch or the + switch, and select MeanV of Flow Volume(Abdom).
→ The + mark is displayed on the cursor (vertical). (+ mark in the case of the Manual Trace method)

(2) Move the line cursor, and press the ENTER switch.
→ The line cursor separates into two at a point 1 sec away.

(3) Press the ENTER switch.
→ The Auto Trace function operates, and the mean flow velocity (MnV) is computed.



[Remark]
A trace line is automatically drawn, so adjust the detection level of the trace line using rotary encoder 4.
If you cannot perform an adjustment satisfactorily using rotary encoder 4, press the CANCEL (Auto Trace cancel) switch or the Trace Manual switch to switch to the Manual mode.
For details of the Manual Trace operation, refer to Section 1-7-4-5. ?The measurement procedure of the Dop-Trace method?.

(4) Press the + switch.

→ The + mark is displayed on the B mode image.

(5) Measure the flow path diameter (CSD) using the Caliper method.

→ The flow path cross-sectional area (CSA) and the flow volume are computed. (The flow path cross-sectional area is computed on the assumption that it is circular in shape.)

[Remark]
In some cases, the flow path cross-sectional area is obtained directly using the Trace, Ellipse or Circle method. You can set these functions using the present function. (Refer to Section 4-5-2. ?PRESET list?.)
The factory default setting is the Caliper method.

[Remark]
Regarding the accuracy of the outflow path diameter measurement, the outflow path cross-sectional area is proportional to the square of the outflow path diameter. Consequently, when measuring the outflow path diameter, higher accuracy can be obtained by performing a measurement on an enlarged (ZOOM switch) image.

<Example of Flow Volume results display>

Flow Volume(MnV)	
MnV : . cm/s	Mean velocity
CSA : . cm²	Cross-sectional area
CSD : . cm	Cross-sectional diameter
FV : . ml/m	Flow Volume
COEF: 1.00	Coefficient

2) Using Flow Volume (VTI)

You can calculate the blood flow rate from the velocity time- integrated (VTI) value for one heartbeat obtained using the Dop Trace method, the flow path cross-sectional area (CSA) obtained using the Caliper (Trace, Ellipse, Circle) method, and the blood flow volume from the heart rate.

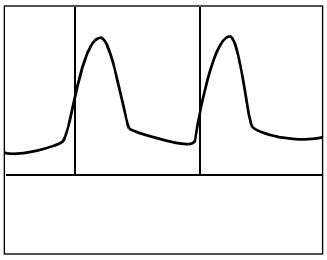
<Operation method>

Display the B/D mode image

(1) Press the MEASUREMENT switch or the + switch. Select the Flow Volume(Abdom) and then select VTI.

→ The + mark is displayed on the cursor (vertical). (+ mark in the case of the Manual Trace method)

(2) Using the trackball, move the line cursor (vertical line) to the 1-heartbeat measurement starting point, and press the ENTER switch.



(3) Using the trackball and ENTER switch, set the trace section, then press the ENTER switch once again.

→ The Auto Trace function operates, and it obtains the Velocity time integral and Heart Rate.

[Remark]
A trace line is automatically drawn, so adjust the detection level of the trace line using rotary encoder 4.
If you cannot perform an adjustment satisfactorily using rotary encoder 4, press the CANCEL (Auto Trace cancel) switch or the Trace Manual switch to switch to the Manual mode.
For details of the Manual Trace operation, refer to Section 1-7-4-5. ?The measurement procedure of the Dop-Trace method?.

[Remark]
HR is automatically calculated using the starting point and ending point times on the trace line. The line cursor for the HR is displayed on the starting and ending points of the trace line. Then measure heart rate of one beat by using the trackball and ENTER switch.

(4) Press the + switch.

→ The + mark for the flow path diameter (CSD) is displayed on the B mode image

(5) Measure the flow path diameter (CSD) using the Caliper method.

→ The flow path cross-sectional area (CSA) and the flow volume are computed. (The flow path cross-sectional area is computed on the assumption that it is circular in shape.)

[Remark]
In some cases, the flow path cross-sectional area is obtained by directly using the Trace, Ellipse or Circle method.
You can set these functions using the present function. (Refer to Section 4-5-2. ?PRESET list?.)
The factory default setting is the Caliper method.

[Remark]
Regarding the accuracy of the outflow path diameter measurement, the outflow path cross-sectional area is proportional to the square of the outflow path diameter. Consequently, when measuring the outflow path diameter, higher accuracy can be obtained by performing a measurement on an enlarged (ZOOM switch) image.

<Example of Flow Volume(VTI) results display>

F.Volume(VTI)				
VTI	:	.	cm	Velocity time integral
HR	:	.	BPM	Heart Rate
CSA	:	.	cm^2	Cross-sectional area
CSD	:	.	cm	Cross-sectional diameter
FV	:	.	ml/b	Blood flow corresponding to for one beat
FV	:	.	ml/m	Blood flow corresponding to for one minute

4-4. Report function

A report arranges and displays each index value and measurement value for abdominal measurement related patient information.
A report displays only the results of measurement. You can register up to six measurement values in a report.

[Remark]
You can set the number of values to be registered using the Report Display of Preset.

[Remark]
Be sure to enter the patient information (Patient ID, Name, etc.) using the ID screen.

4-4-1. Basic Operation of a Report

4-4-1-1. Displaying a Report

In order to display a report, press Report on the touch panel.

4-4-1-2. Ending a Report

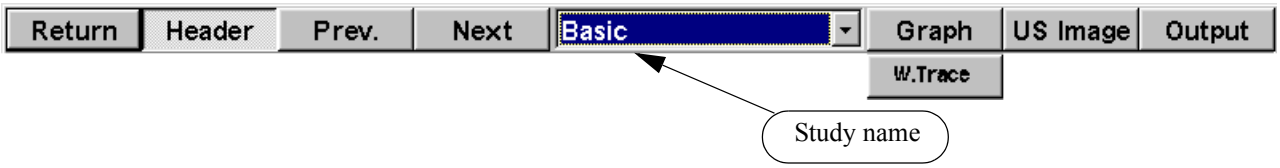
The following two patterns are used to end a report.

(1) Press Report on the operation panel.

(2) Select Return on the Report screen.

4-4-1-3. Function buttons on a Report

The following buttons are displayed on the top section of the Report screen.

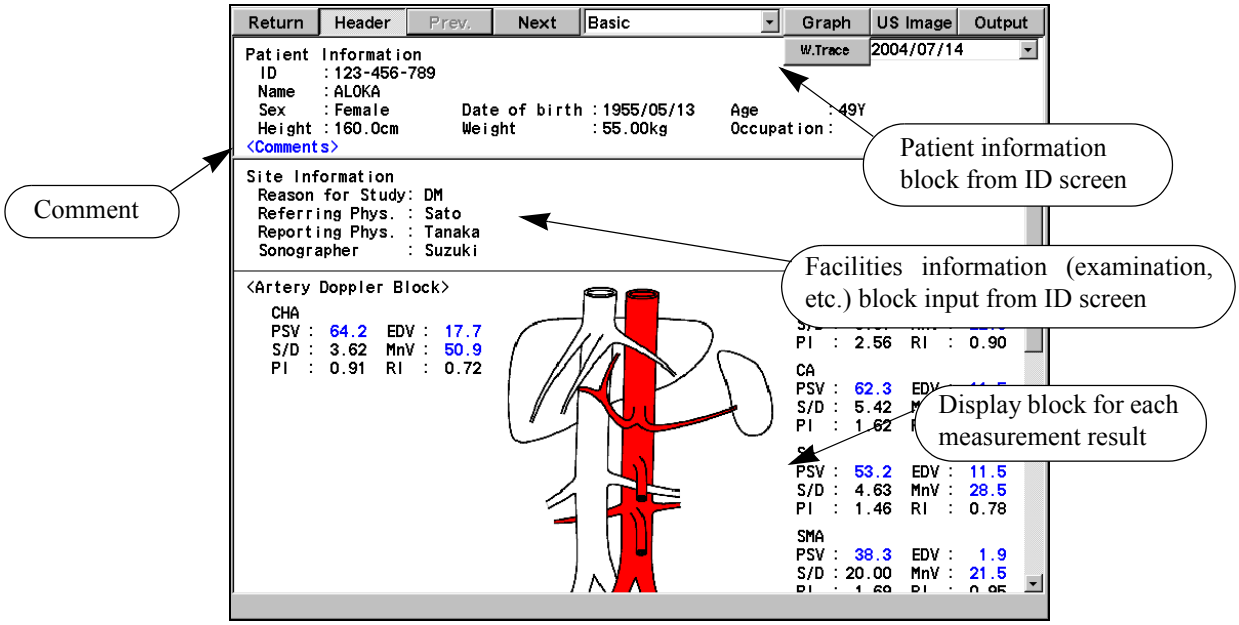


Return	Closes the report.
Header	Switches the header block (patient data display) between Long Form and Short Form.
Prev., Next	Advances or returns the page in block units.
Study name	Switch the study of the displayed report.
Graph	Displays the transition of the operation index (Area, Volume) of SOL measurement from the past to the present, in the form of a graph.
W.Trace	This function displays a Doppler trace line when each blood flow measurement value is obtained, and also displays the parts of the waveform pattern in front of and after the stenosis as a line.
US Image	Displays an ultrasound image in the report.
Output	Outputs report data to a personal computer, Media, printer or saver.

4-4-2. Report Block

A report block is the unit used to display data (each set of abdominal measurement data).

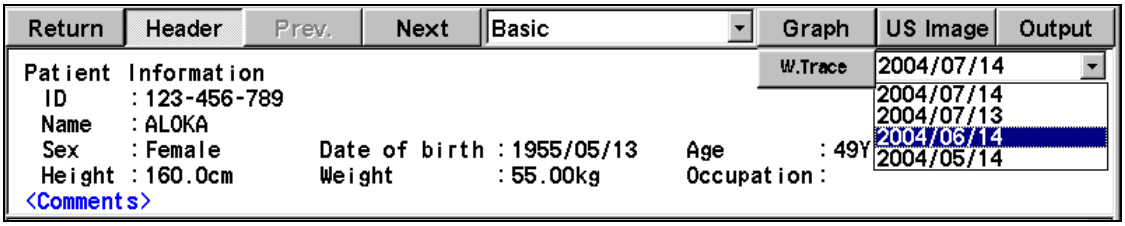
It arranges pertinent ultrasound information such as the Header (patient information) block, Site information (facilities information) block, and Abdominal dop block.



4-4-2-1. Function for displaying the past reports.

It can display past reports that are requested on exam. dates.
It is not possible to Edit (revision / deletion) the past measurement records.

(1) Move the arrow to the ▼ of the combo box identifying the exam. date, and press the ENTER switch.
→ The exam. date of the past is displayed.



(2) Select the exam. date desired for display, and press the ENTER switch.
→ The report of the requested exam. date is displayed.

4-4-2-2. Comment input function

You can enter comments concerning an ultrasound examination as the results of an ultrasound examination.

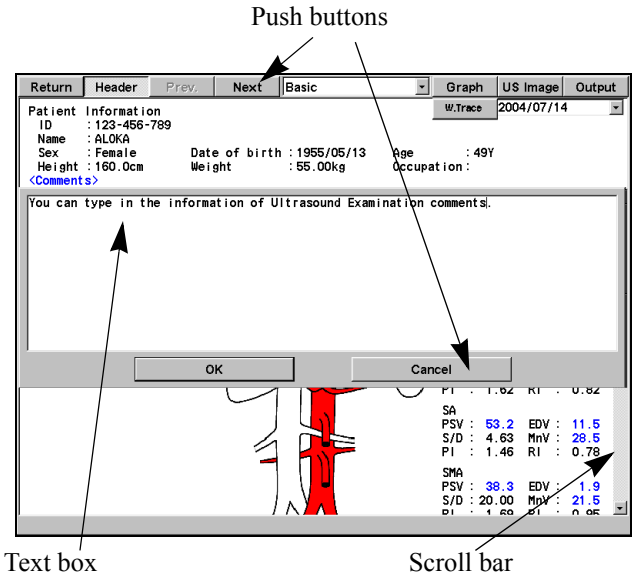
(1) Move the arrow to <Comments>, and press the ENTER switch.

→ A text box for entering a comment is displayed.

(2) Enter a comment from the keyboard.

(3) Select OK.

[Remark]
If you select Cancel, the entered contents are canceled.



4-4-2-3. Edit (edits the data) function

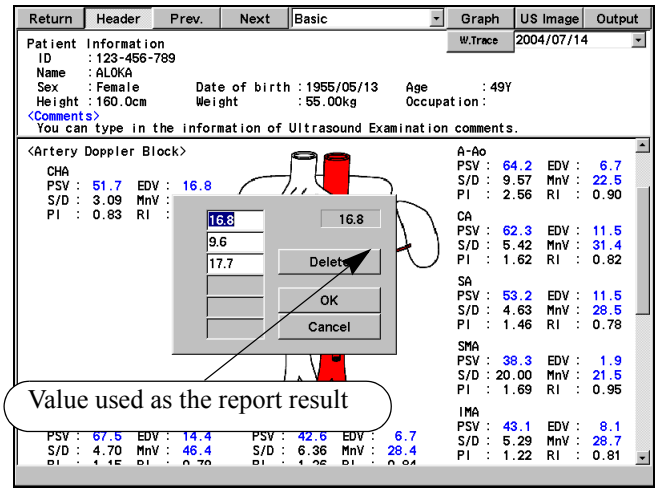
You can delete or modify the measurement results in a report.

[Remark]
You can only edit values displayed in yellow.

<Operation method>

(1) Move the arrow to the measurement value, and press the ENTER switch.

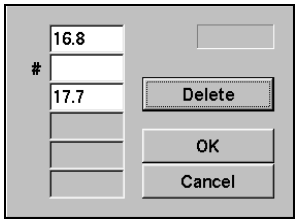
→ The Edit dialog box is displayed.
All of the measured values are displayed.



(2) Delete :

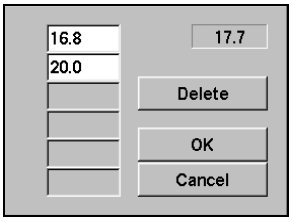
Select the measurement value to be deleted, and press Delete.

→ The specified measurement value is deleted, then select OK.



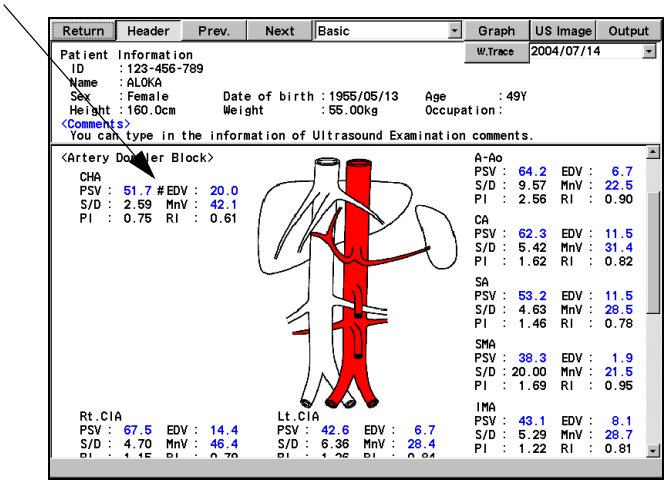
(3) Modify :

Select the measurement value to be modified, enter the new value from the keyboard, then select OK.



→ Displaying a modified measurement value:

The mark "#" is attached to the beginning of a measurement item that was modified by entering a numerical value.



[Remark]

Like PI and RI measurement, there are two items of blood flow velocity data (PSV and EDV) within the period between two heartbeats that are mutually related. Perform an editing operation so as to maintain the mutual time phase relationship.

(4) Change to a different measurement value:

You can change a measurement value displayed on a report to a different measurement value.

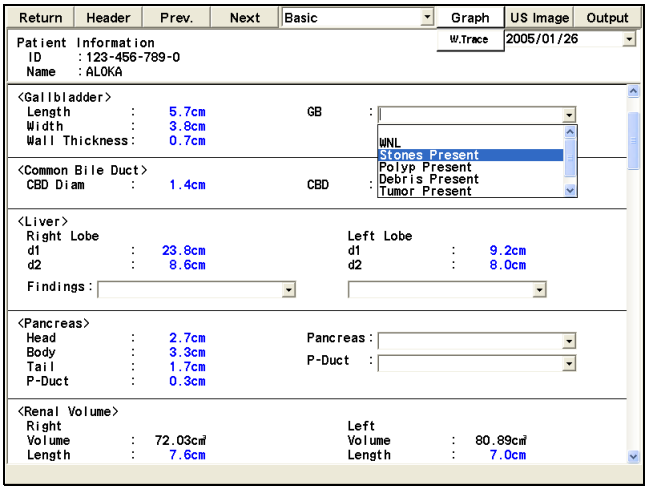
→ The displayed color of the selected part changes, so press OK.

[Remark]

When the setting is "the latest measurement (the last measured one) value is displayed on the screen of the report," it can be changed to another measurement value. Because it is averaged for all measured values when they are set on the mean value, there is no difference even if any measured value is selected
(Refer to Report Data of Section:4-5-2.PRESET list.)

4-4-2-4. Findings function

The Findings function is a function for inputting and setting remarks concerning ultrasound images of organs. Select a list of comments from the pull-down menu, or enter text from the keyboard.



<Operation method>

The following two methods are available for setting.

- Specifying a comment from the pull-down menu

(1) Move the arrow to ▼ of the specified text box, and press the ENTER switch.
→ A list of image comments is displayed.

(2) Using the trackball, select the specified comment, and press the ENTER switch.
→ The specified comment is transferred to the text box.

- Directly entering (registering) a comment

(1) Move the arrow into the text box, and press the ENTER switch.

(2) Enter a comment from the keyboard.
→ The entered information is user-defined and registered in the abovementioned list.

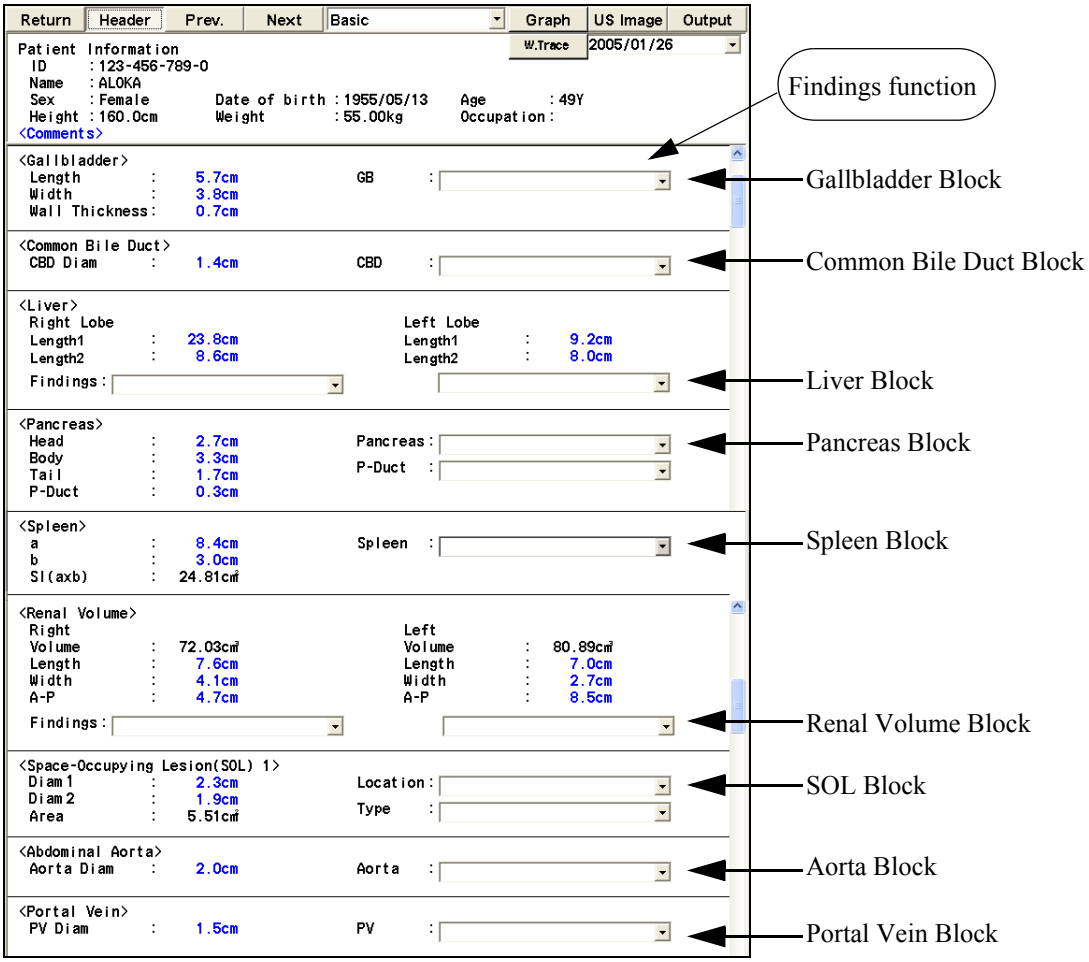
- Deleting a comment from the image comment list

(1) Using the trackball, select a comment, and press Delete switch.
→ The specified comment is deleted from the list.

4-4-3. Description of Various Data Displayed in a Report

4-4-3-1. Basic Study Report

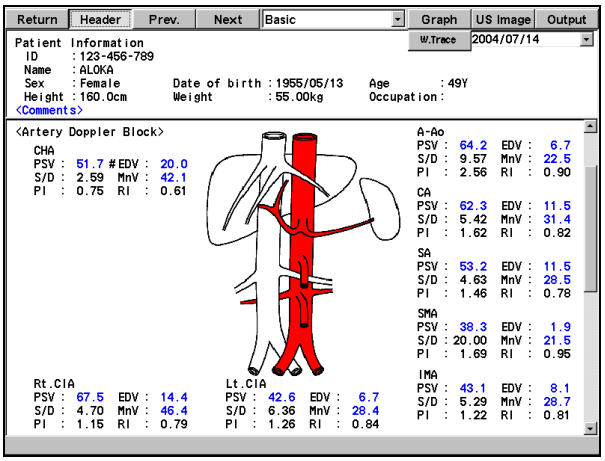
B mode abdominal region measurement report



[Remark]
You can enter or set an ultrasound comment for each organ as the Findings function, in each block of the B mode.

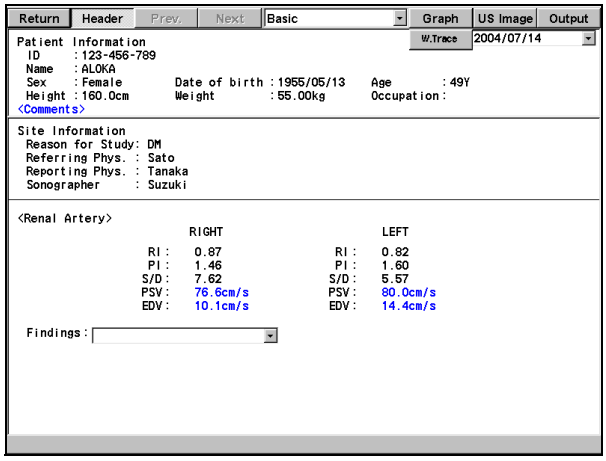
D mode abdominal region measurement report

Artery Doppler Block



Measurement results of Abdominal region arterial blood flow

Renal Artery Block

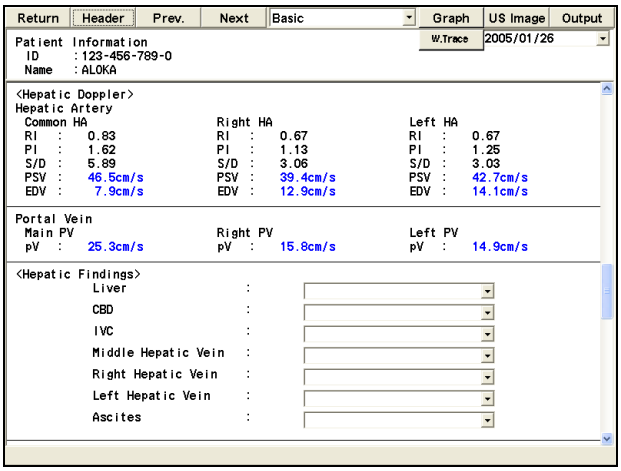


Measurement results of Renal arterial blood flow

[Remark]
In Renal Artery Block, it can be input and set the nephric ultrasound findings as a Findings function.
It can be selected from the finding list on a pull down menu or can be input letters with the keyboard.

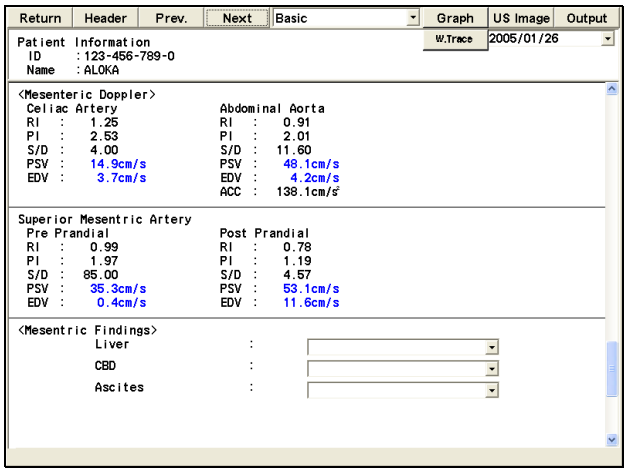
Hepatic Doppler Block

Measurement results and findings report of Hepatic arterial blood flow



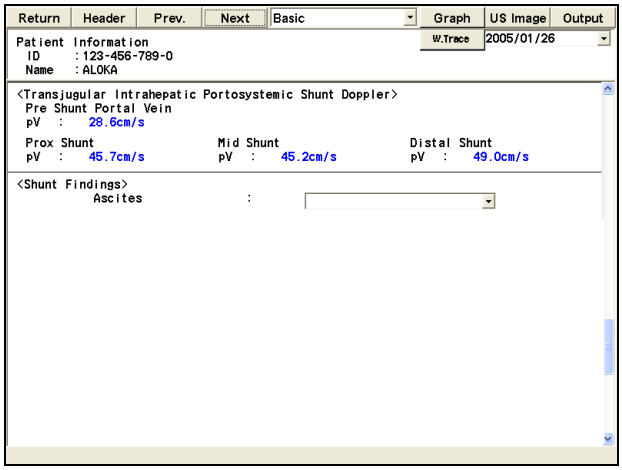
Mesenteric Doppler Block

Measurement results and findings report of Mesenteric arterial blood flow



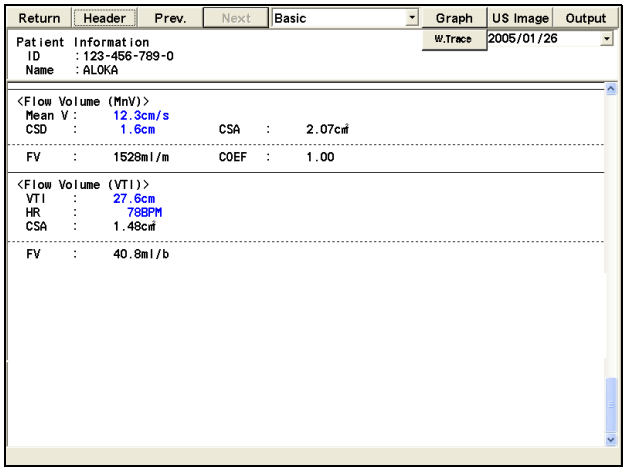
Shunt Doppler Block

Measurement results and findings report of Shunt blood flow

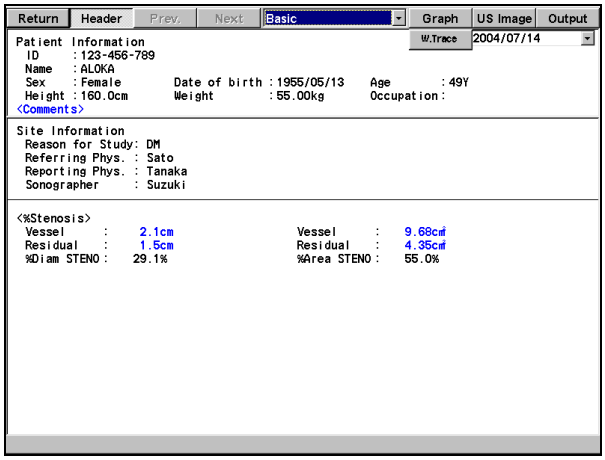


Flow Volume Block

Measurement results and findings report of Flow Volume



%Stenosis Block



Stenosis rate measurement results

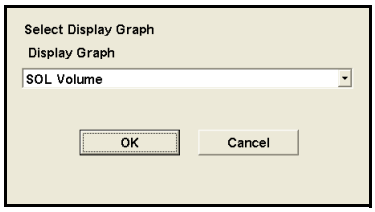
4-4-4. Graph

The function displays the transition of the area and the volume calculated from SOL measurement, in the form of a graph.

<Operation method>

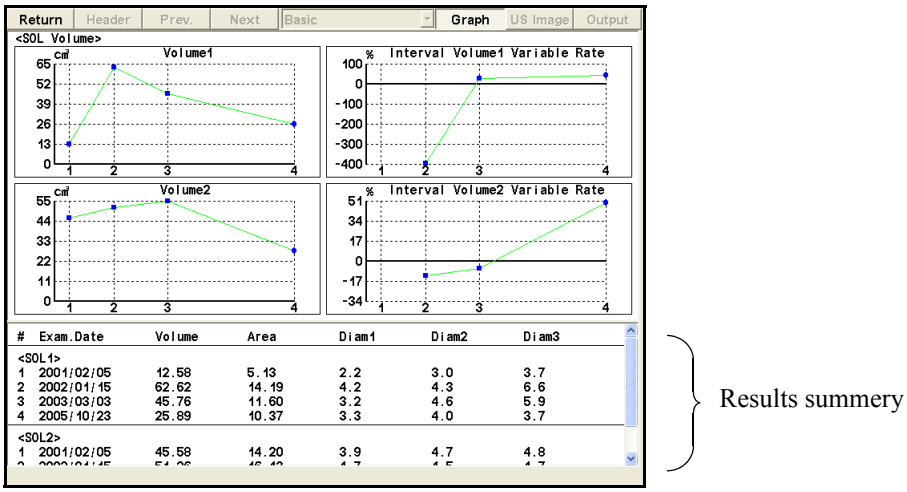
(1) Move the arrow to the Graph on the report, and press the ENTER switch.

→ The Graph menu is displayed.



(2) Select SOL Area or SOL Volume, then select OK.

→ A graph is displayed as shown below.



(3) To erase the graph and return to the initial status, select Graph again.

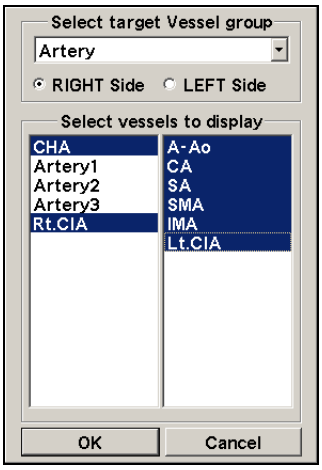
4-4-5. W. Trace

This function displays a Doppler trace line when each blood flow measurement value is obtained, and also displays the parts of the waveform pattern in front of and after the stenosis as a line.
This function is corresponding to the abdominal region artery report

[Remark]
This function operates only when the Dop. Trace method is used for a measurement.

<Operation method>

(1) Select the W. Trace on the Report window.



(2) Select the blood vessel block to be displayed, from the pull-down menu.
→ A list of names of displayable blood vessels is displayed.

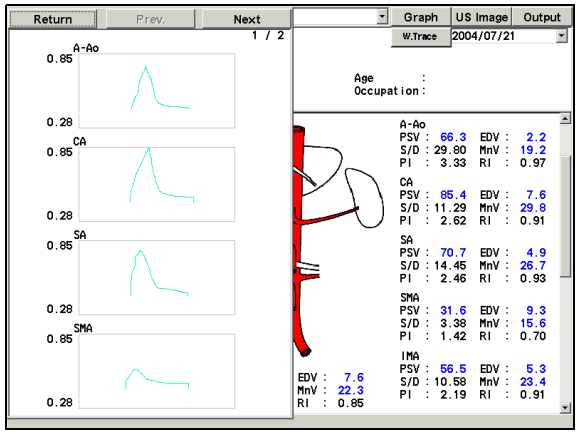
[Remark]
You can select a blood vessel block from Artery, Renal-A, Hepatic Doppler, Shunt Doppler and Mesenteric Doppler.

[Remark]
When a waveform pattern of blood flow displayed at the right side of report is displayed, select the RIGHT Side, and select the LEFT Side for the left side one.

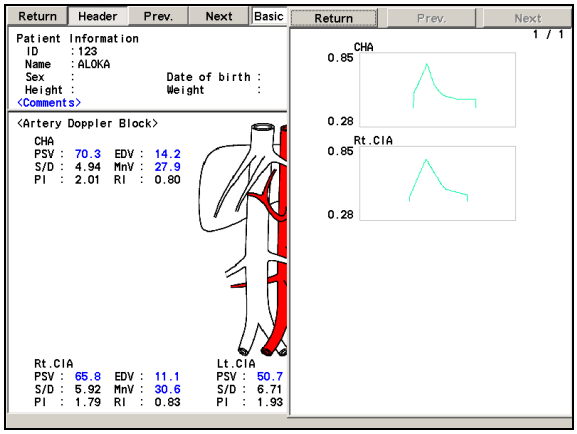
(3) Select OK.
→ The measurement value for the left (right) side and also the right (left) blood flow waveform pattern is displayed, as shown below.

When the Wave Trace function is used

Right Side



Left Side

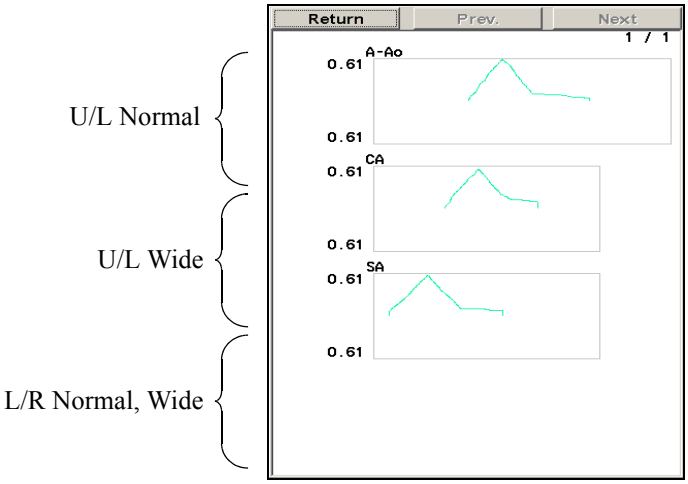


(4) When you select Return on the Wave Trace window.

→ Return to the screen od report.

[Remark]
The width of the Wave Trace window is determined by the B/D Format (left and right, and upper and lower B/D, Dop Wide, Normal). Carry out an examination under the same Format conditions.

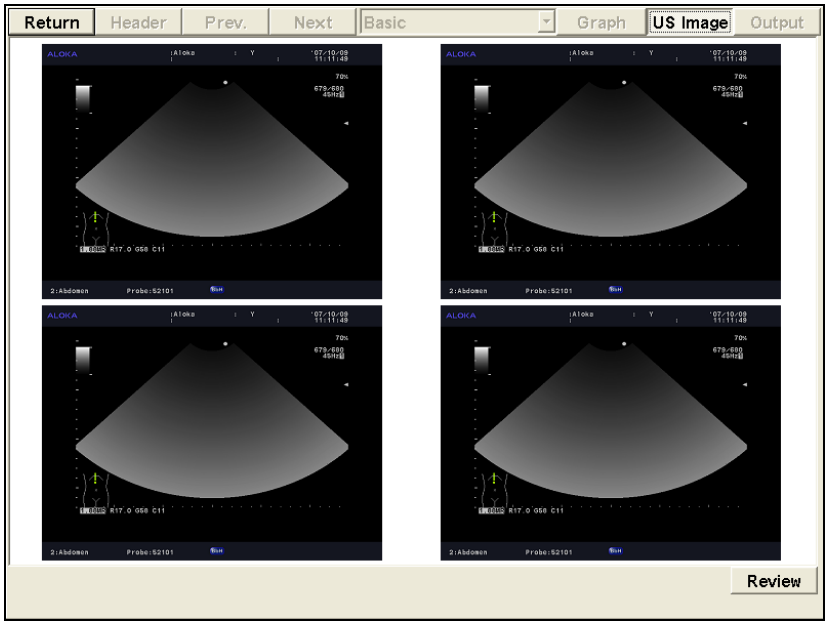
B/D Format



4-4-6. Function that Attaches an Ultrasound Image to a Report

This function automatically displays the current ultrasound image acquired by the examiner in the US Image block of the report.
Also, by using the Review function at the bottom of the Report screen, it is possible to display all of the images stored in the connected medium(f.e. HDD and external media such as USB memory) as thumbnail images. You can also select one of these images, and display it in the report.

When you select US Image on the report screen, the US Image block (ultrasound image page) is displayed.
To return to a normal report, select US Image once again.



4-4-6-1. Images that can be attached to a report

Images that can be attached to a report are the various ultrasound images of the same patient that are stored in the connected medium (f.e. HDD and external media such as USB memory) at the storage destination.

4-4-6-2. Limit for holding attached images

Attached images are held until the New Patient function is executed.

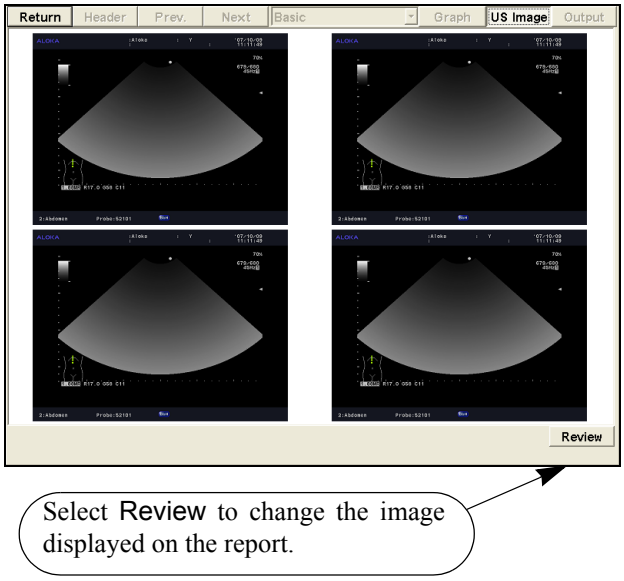
4-4-6-3. Method of attaching images

1) Auto Paste function

The number of images set using the Preset function is automatically selected from the latest images stored in the connected medium (f.e. HDD and external media such as USB memory) and displayed on the US Image block.

[Remark]
The number of displayed images and the display format can be set only by the Preset function.
The factory default settings are Display Pasted US Image Form on the Screen: 2 × 2, and the Number of US Images to be Automatically Displayed is 4.

The figure at right shows examples of factory default settings.



Regarding the display sequence, the images are automatically pasted from the latest recorded image, from top left to bottom right.

[Remark]
You can set the format of an image displayed on the Report screen to 1 × 1, 2 × 2, 3 × 2 or 3 × 3.

2) Manual Paste function

<Operation method>

This function enables you to change the automatically attached image to another image, or to add an image.

(1) Select Review at bottom right of the US Image block screen.

→ All of images of a patient concerned that are stored in the connected medium (f.e. HDD and external media such as USB memory) are displayed as thumbnail images.

(2) Move the arrow to the image that you wish to display, and press the ENTER switch.

→ The selected image is displayed with a blue border.

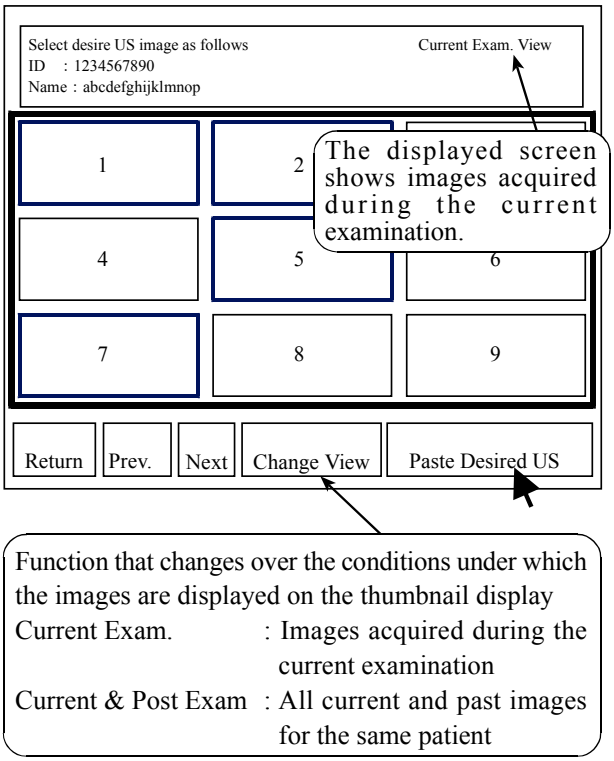


Fig. Thumbnail display

[Remark]
If you wish to select a number of images, repeat step (2). Pressing the ENTER switch on the selected image erases the blue border.

(3) Move the arrow to Paste Desired US, and press the ENTER switch.

→ The selected image is displayed in the US Image block.

[Remark]
Regarding the "Change View" function
By selecting Change View at the bottom of the thumbnail display, you can also display past images for the same patient as thumbnail display.

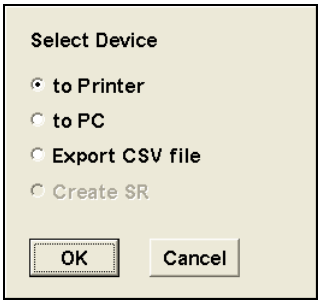
[Remark]
Each time you select Change View, the display conditions switch over between "current image only" and "current and past images". The particular set of conditions displayed are indicated at top right of the thumbnail screen.

4-4-7. Printing Function

This function outputs the entire report data to a dedicated local printer via a USB interface.
The printed data is a text data, graphical data or ultrasound image.

4-4-7-1. Operation sequence

(1) Select Output.
→ A select device dialog box is displayed.

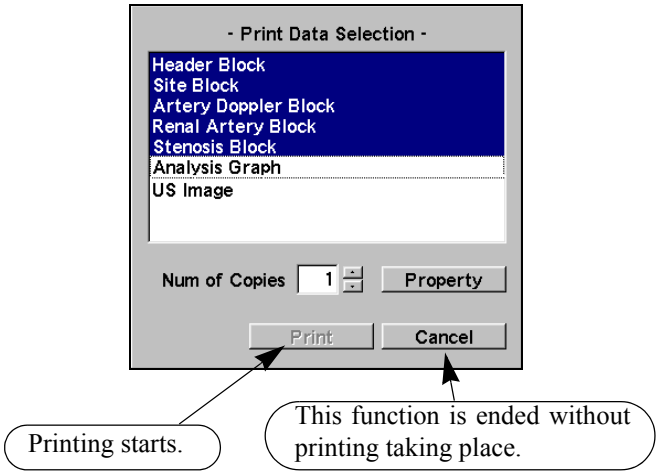


(2) Select to Printer, and press OK.
→ The Print Data Selection dialog box is displayed.

(3) Select the block that you wish to print.
→ The selected block name is highlighted in blue.

[Remark]
To cancel the selection, re-select the same block.

(4) Enter the number of copies, and select Print.
→ Printing starts, and the dialog box closes.



4-4-7-2. Property function

This function enables you to make the minimum necessary detailed settings for a local printer and a B/W digital printer.

(1) Printer name : Select the model of the printer to be used.

(2) Paper sizes : Set the size of the paper to be used. (US letter, A4 alternative selection)
The function does not operate when a digital black and white printer is selected.

(3) Title Inform : Enter the Report Title information
You can enter up to 80 characters. The print position is always Center.

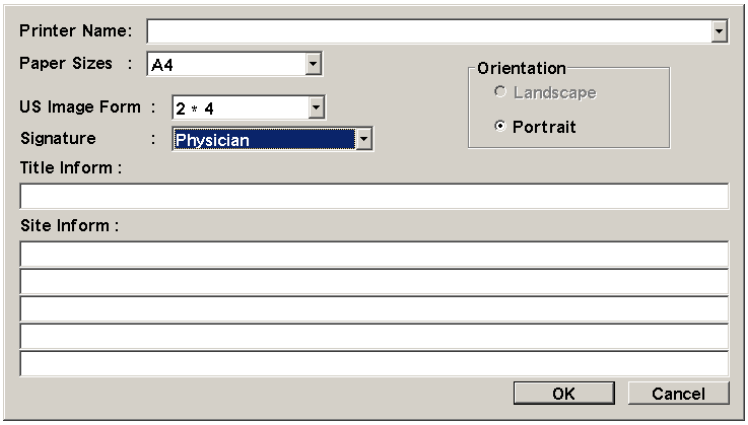
(4) Site Inform : Enter the facilities information (department, address, telephone No., FAX No., etc.).
You can enter up to 80 characters × 5 lines. The print position is always Center.

(5) Orientation : Set the orientation of the paper.
At present, the orientation is set to Portrait (vertical direction printing) only.

(6) US Image Form : When printing the US Image block, you can change the printing format to 1 × 2, 1 × 3, 2 × 2 or 2 × 4.
The function does not operate when a digital black and white printer is selected.

(7) Signature : Selects if the Signature field is set as Physician only, both Physician and Sonographer, or no field is displayed (None).

[Remark]
These settings are held subsequently so long as they are not renewed.



4-4-8. Output to a Personal Computer

This function outputs the entire report to a personal computer using an RS-232C interface.

4-4-8-1. Operation procedure

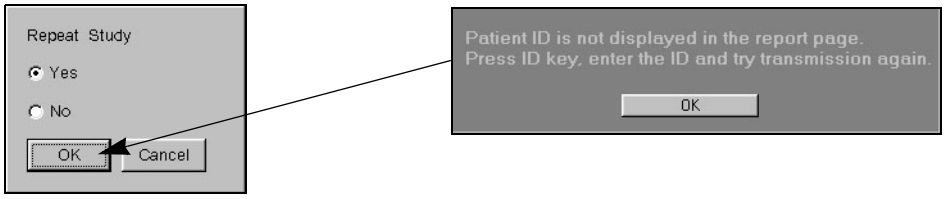
(1) Select Output.

→ The “Select device” dialog box is displayed.

(2) Select to PC.

→ The “Repeat study” dialog box is displayed.

[Remark]
If an ID is not input, a message to that effect will be displayed.
Press the ID key on the front panel.



(3) If you wish to repeat a study, select Yes and press OK.

→ Communication starts.

[Remark]
If you select Cancel, the system returns to the status that existed prior to the execution of this function.

[Remark]
The patient data and all of the data registered in the report (excluding the ultrasound image data) is output data to a personal computer.

4-4-9. Output to a CSV file

This function outputs the values registered in the report (measured values and calculated values) and the comment data to the connected medium(f.e. external media such as USB memory) as a CSV file.

4-4-9-1. Operation procedure

(1) Select Output.
→ The “Select device” dialog box is displayed.

(2) Select the Export CSV File.
→ The media selection dialog box appears.

[Remark]
The filename is automatically attached by means of [ID- Date Application], but can be changed by entering the desired name from the keyboard.

(3) Select the medium, enter the filename, and then press OK.
→ The data is written to the selected medium.

[Remark]
If you select Cancel, the equipment will return to the condition that existed prior to the execution of this function.

[Remark]
When you open the CSV file, the patient information, numerical values and comments appear in that sequence.

4-5. Preset function

4-5-1. Preset Settings

The abdominal measurement preset consists of the following three functions.

(1) Create Measurement Tools= Settings related to the measurement procedure, mark size, and report display

(2) Study Assignment = Sets the menu, transfer list, report display configuration, and so on, for each study

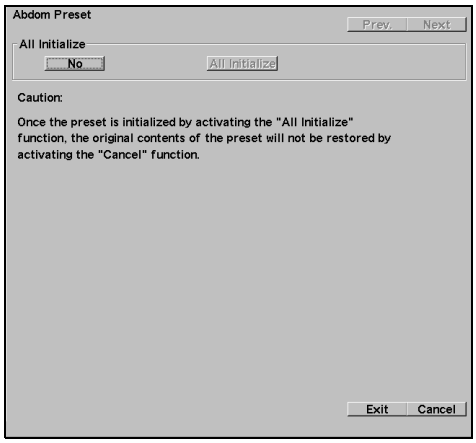
(3) SW Assignment = Settings for assigning various measurement functions to switches for shortcut operations

The preset functions related to abdominal measurements and their configuration are shown below.

Abdom Preset					
	Create Measurement Tools				Setting of the items that are common to Abdominal measurement and Basic measurements.
		Basic Measurement			Refer to Section 1-10. ✗PRESET FUNCTION∓
		Application Measurement			Settings of method used for Abdominal measurement, Mark Style and result display.
			Measurement Method & Display Items		Selection and setting of each Abdominal measurement method, Mark Style and result display items.
				B.Mode	B mode measurement settings.
				M.Mode	M mode measurement settings.
				D.Mode	D mode measurement settings.
				F.Mode	Flow mode measurement settings.
			Caliper Mark Control		Settings of the measurement mark size and dot line. Substituted by Basic measurement preset.
			Unit Selection		Setting of the display unit for performing Abdominal measurement. Substituted by Basic measurement preset.
			Caliper Auto Off		Setting of the measurement mark for canceling a freeze condition, and also the automatic result erasure function.
			Report Data		Selection of the method of displaying measurement values on the report (mean value or not).
			Display Form		Setting of Abdominal measurement result display style.
				Mark Display	Setting for displaying a caliper mark.
			User's Calculation		Function is for making the registration of calculation formulas voluntarily by user.
				Reserved Word	Function is for making the registration name(Reserved Word) voluntarily by user.
	Study Assignment				Settings of measurement menu registration, report display configuration and transfer list, for each Ultrasonic Examination Study.
		Defined study name			Basic
		Menu Assignment			Function that enables a measurement menu to be created and edited.
		Combined Report Display			Function that enables the configuration of a report to be edited.
		Other			Function that enables a selection of whether or not to display a measurement operation guide message.
	SW Assignment				Setting of registration of the direct execution switches.
		+ Mark Key Assignment			Function that assigns the measurements to be executed when the + switch is pressed.
		Hot Key Assignment			Function that assigns the measurement function that operates when a specific alphabet key is pressed.
		Measure SW Assignment			Function that assigns the measurement function that operates when the User switch is pressed.
		Control Menu Assignment			Assigning the control menu on the touch panel.

4-5-2. PRESET list

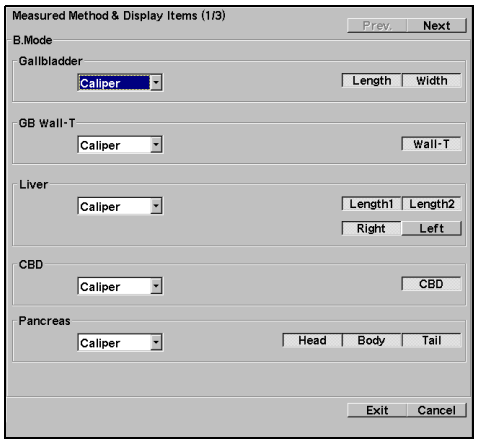
- Abdominal Preset
  Returns the registered contents to their default settings



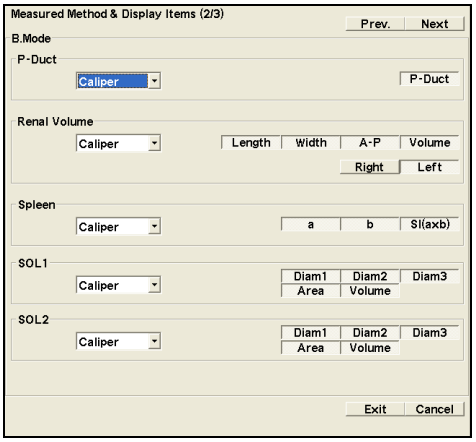
- Create Measurement Tools
  Basic Measurement

Refer to Section1.

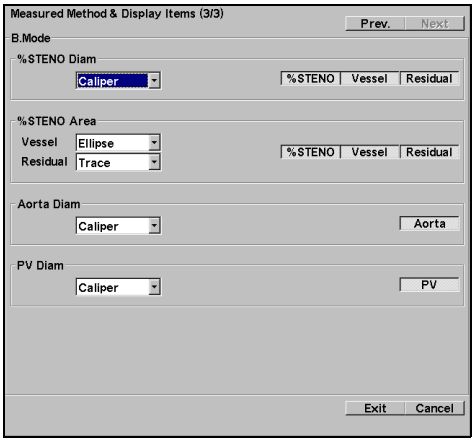
- Measured Method & Display Items (1/3)
  B mode measurement settings 1



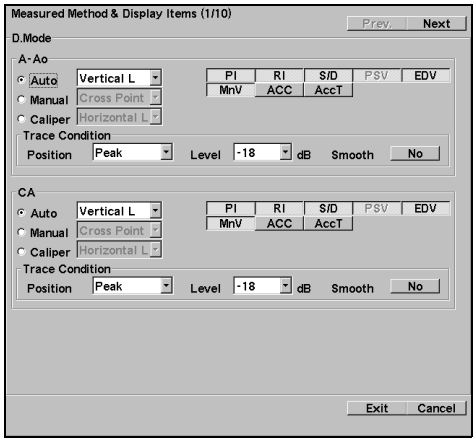
- Measured Method & Display Items (2/3)
  B mode measurement settings 2



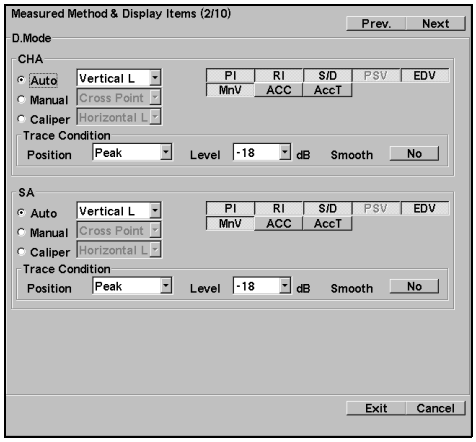
- Measured Method & Display Items (3/3)
  B mode% STENO measurement settings



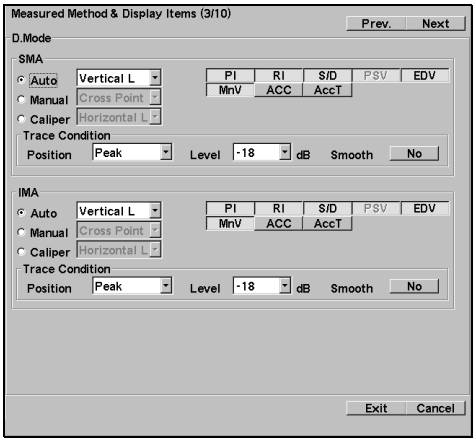
- Measured Method & Display Items (1/10)
  D mode measurement settings 1



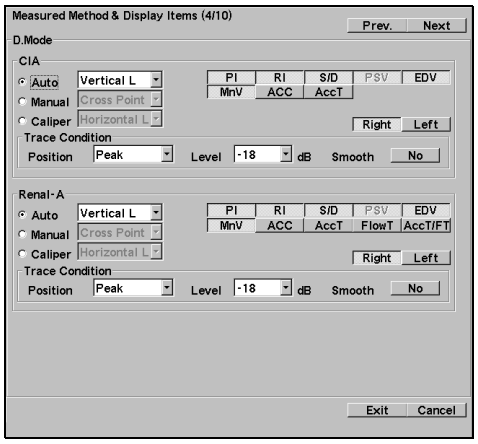
- Measured Method & Display Items (2/10)
  D mode measurement settings 2



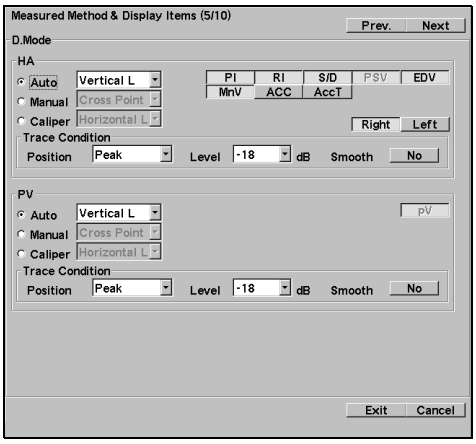
- Measured Method & Display Items (3/10)
  D mode measurement settings 3



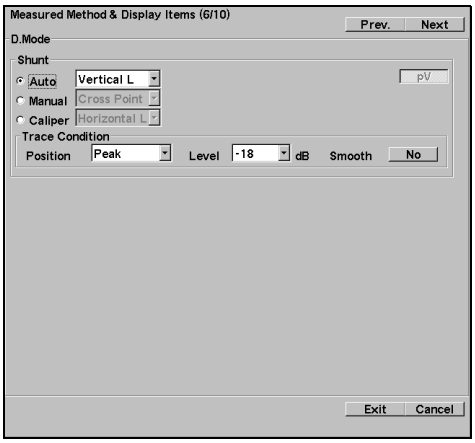
- Measured Method & Display Items (4/10)
  D mode measurement settings 4



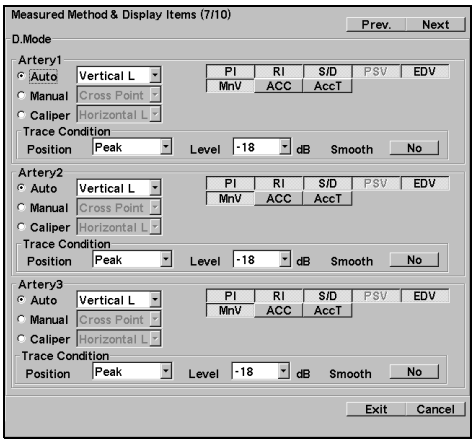
- Measured Method & Display Items (5/10)
  D mode measurement settings 5



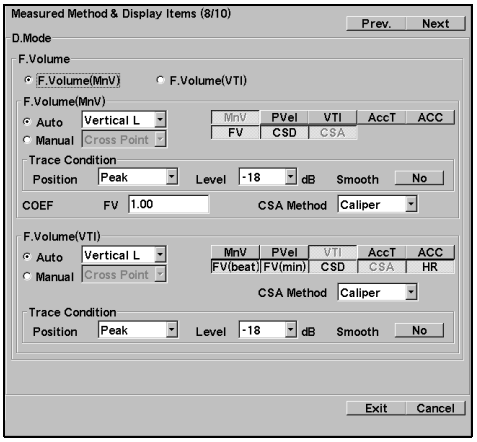
- Measured Method & Display Items (6/10)
  D mode measurement settings 6



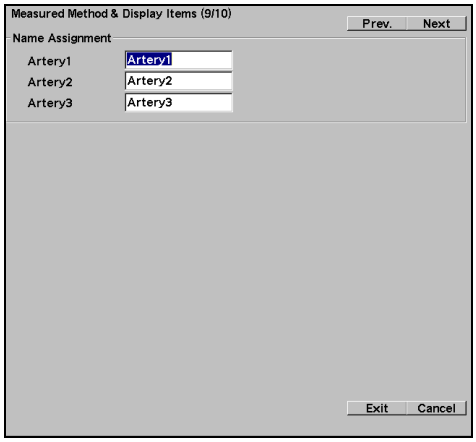
- Measured Method & Display Items (7/10)
  D mode measurement settings 7



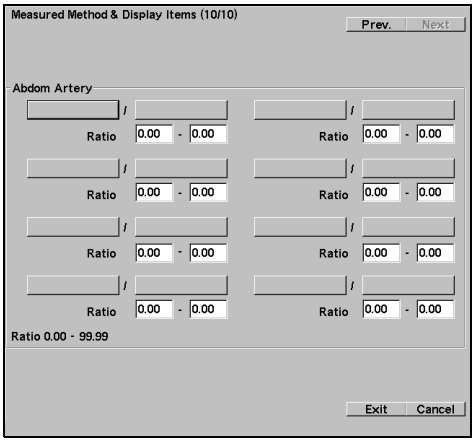
- Measured Method & Display Items (8/10)
  D mode measurement settings 8



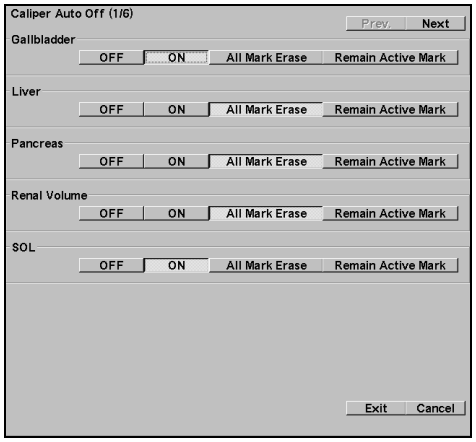
- Measured Method & Display Items (9/10)
  D mode measurement settings 9



- Measured Method & Display Items (10/10)
  D mode measurement settings 10

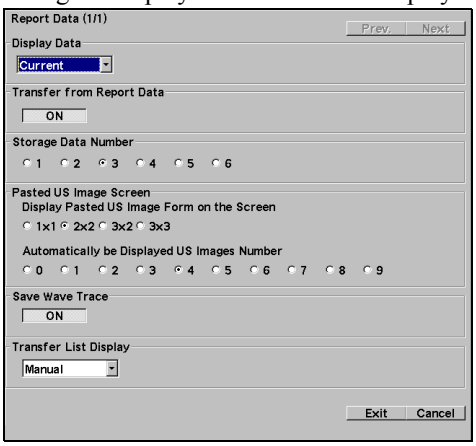


- Caliper Auto Off

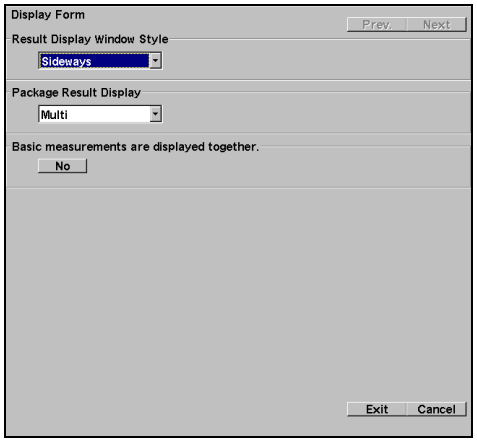


OFF : Results and marks not erased
ON : Results and marks all erased
All Mark Erase : Only marks erased
Remain Active Mark : Erases all marks other than for measurement during starting

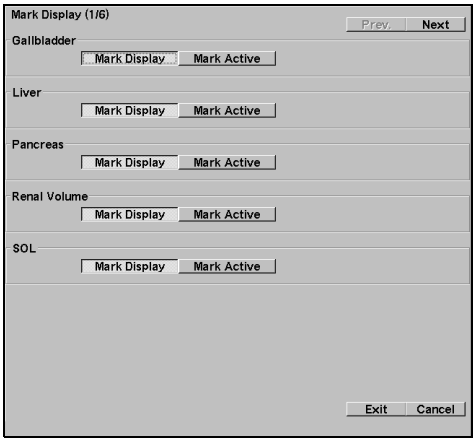
- Report Data
  Selects either average values or the latest values and sets the number of data items registered.
  Measurement data reuse On/Off
  Pasting of Image
  Setting for display of Transfer List Display



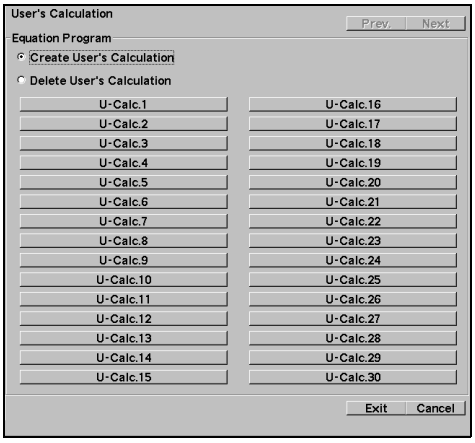
- Display Form
  Selects vertical or horizontal display and switches whether or not measurement item multiple displays display the measurements only during starting.
  Changing whether a simultaneous display with the Basic measurement or not.



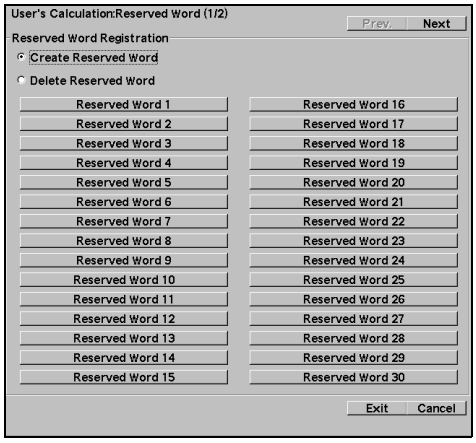
- Mark Display
  Setting for displaying a caliper mark



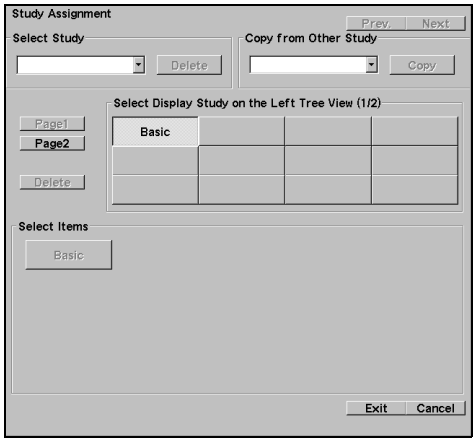
- User's Calculation
  Registers Abdominal measurement equation.



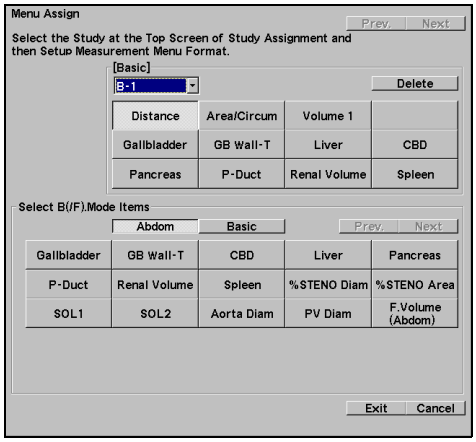
- Reserved Word
  Registers user's Reserved Word.



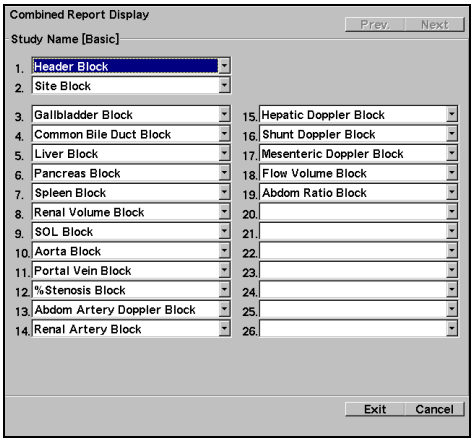
- Study Assignment
  Switches the display on/off for built-in studies and registers new studies.



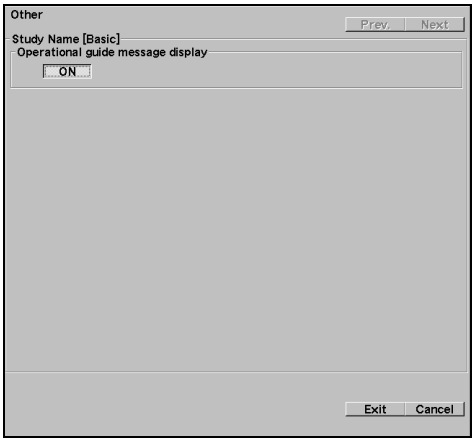
- Study Assignment
  Menu Assign
  Registers to the Menu Assign abdominal measurement menu



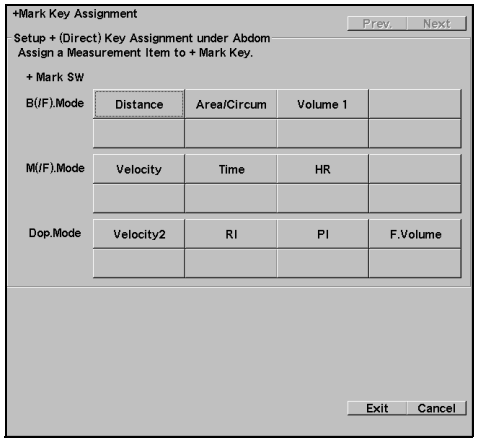
- Study Assignment
  Combined Report Display
  Combination of measurement blocks to be displayed in the report



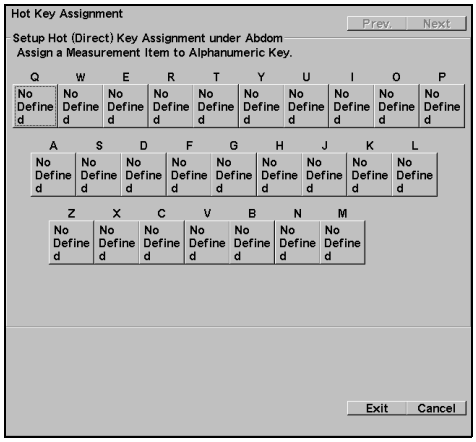
- Study Assignment
  Other
  Measurement guide message display setting



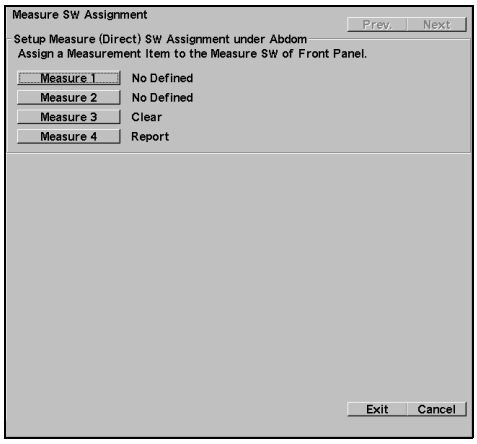
- SW Assignment
  + Mark Key Assignment
  Registers the Basic measurement startedwith the + mark.



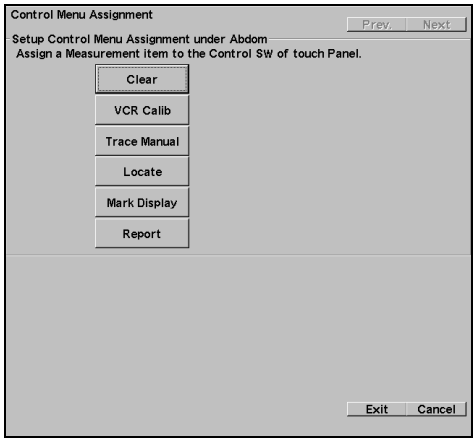
- SW Assignment
  Hot Key Assignment
  Registers measurements to the Keyboard.



- SW Assignment
  Measure SW Assignment
  Registers measurements to the Measure switches.



- Control Menu Assignment
  Registers to control menus on the touch panel.



4-6. Calculation Formula & Reference

4-6-1. Calculation

4-6-1-1. Calculation for B-mode

Measurement function name		Formula
%STENO Diam	%STENO	=100 × (A-B)/A A : Vessel lumen diameter B : Residual diameter
%STENO Area	%STENO	=100 × (A-B)/A A : Vessel lumen area B : Residual area
Spleen Index	SI	=a × b
SOL Area	Area	=π / 4 × d1 × d2
	Volume	=π / 6 × d1 × d2 × d3
Renal Volume	Vol.	0.49 × Length × Width × A-P
F.Volume(MnV)	FV(ml/min)	MnV(cm/s) × CSA(cm^2) × 60sec
F.Volume(VTI)	FV(ml/beat)	VTI(cm) × CSA(cm^2)
	FV(ml/min)	FV (ml/beat) × HR(BPM)

4-6-2. Clinical References

4-6-2-1. D mode

(1) Arteries
Michael Hennerici, Doris Neuerburg-Heusler:
Vascular Diagnosis with Ultrasound Clinical References with Case Studies
Thieme ISBN: 0-86577-603-2

(2) Hepatic Artery
John Herbetko. et al.
Venoocclusive Liver Disease After Bone Marrow Transpolation: Findings at Duplex Sonography
AJR: 158, May 1992

(3) CHA, SPA, SMA
Takefumi Nakamura, MD et al.
Quantitative Measurement of Abdominal Arterial Blood Flow Using Image-Directed Doppler Ultrasonography: Superior Measentric, Splenic, and Common Hepatic Arterial Blood Flow in Normal AdultsJ Cli n Ultrasound 17: 264-268,May 1989

4-7. Abbreviation

Abbreviation	Meaning
%STENO	%Stenosis
%STENO Area	%Stenosis by area
%STENO Diam	%Stenosis by Diameter
A-Ao	Abdominal Aorta
ACC	Acceleration
AccT	Acceleration Time
AccT/FT	AccT/FT
CA	Celiac Artery
CBD	Common Bile Duct
CHA	Common Hepatic Artery
CIA	Common Iliac Artery
Distal	Distal
EDV	End Diastolic Velocity
FlowT	Flow time
MnV	Mean Velocity
F.Volume	Flow Volume
GB	Gallbladder
GB Wall - T	Gallbladder Wall Thickness
HA	Hepatic Artery
Mid	Middle
Pancreas	Pancreas
PI	Pulsatility Index
PSV	Peak Systolic Velocity
Pre Prand	Pre Prandial
Post Prand	Post Prandial
Prox	Proximal
PV	Portal Vein
Renal-A	Renal Artery
Renal Vol.	Renal Volume
Resid	Residual
RI	Resistance Index
SA	Splenic Artery
SOL	Space Occupying Lesions
S/D	Systolic/Diastolic velocity Ratio
Vessl	Vessel

5. OBSTETRICAL MEASUREMENT

5-1. Preface

The description concerning the obstetrical measurement functions is divided into the following six sub-sections.

This section describes the procedure for carrying out obstetric measurements, based on the assumption that products are on the factory default.

Descriptions for the basic operation of the measurement functions and each measurement method (mark type = Caliper, Trace, etc.) are given in the Section 1. "MEASUREMENT FUNCTIONS".

This section consists of 140 pages.

5-2. Obstetrical Measurement Functional Outline

5-2-1. Obstetrical Measurement Functional List

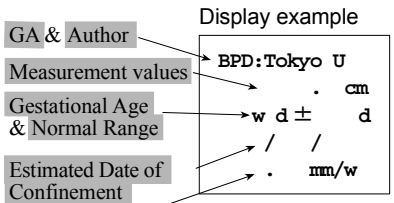
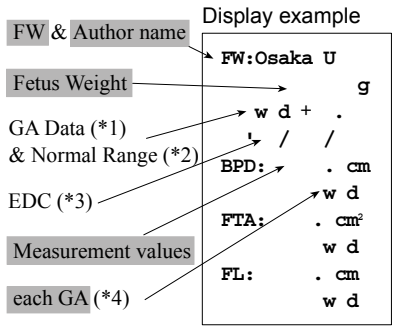
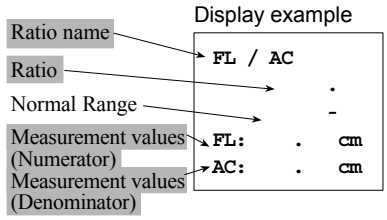
Obstetrical measurement has studies consisting of various combinations of measurement menu, report display, and so on, depending upon the part being examined and the purpose of the examination.

[Remark]
On the factory default, this function contains Basic (for general obstetric measurement) Study, Early (for the early stages of pregnancy) Study, and Twin Basic Study and Twin Early Study (for twins).
In addition, you can freely select Extended (for high risk pregnancy), BPP/Amnio (for BPP/amniotic fluid puncture scoring), Anatomy (for an anatomical checklist of the fetus), and functions for triplets, and so on, using a preset.

The obstetrical measurement is divided as shown in the figure below for each mode.

: Items that are displayed on the factory default.

5-2-1-1. B mode

Measurement function	Measurement menu	Display items	Remark
GA measurement (gestational week)	Each GA table name GA: Author name		The Normal Range display type differs for each table. (±day, ± SD, Upper limit - Lower limit values)
FW measurement (Fetus Weight)	FW(*****) (*****): Author name		Measured at multiple cross-sections. *1:Gestational week from each calculated value *2:Gestational week from FW Table *3:Error from FW Table *4:Expected confinement date from FW Table
Fetus Ratio measurement	@@-@@**** :GA measurement name (*****): Author name		Measured at two cross-sections. The author's name is displayed in the report.

[Remark]
The displayed items used in GA measurement, FW measurement and Ratio measurement differ according to the selected part name and the author.

Measurement function	Measurement menu	Display items	Remark
Amniotic Fluid Index	AFI (*******) (*****): Author name	AFI & Author name AFI Normal Range Q1 Q2 Q3 Q4	Measured at four cross-sections.
	AF Pocket	AF pocket	Measured at one cross-section.
	AFV	AFV	
Cardio thoracic Area Ratio	CTAR	CTAR A B	Area ratio
	CTR	CTR A B	Circumferential length (diameter) ratio
Cervix	Cervix	Cervix	For trans-vaginal inspection

5-2-1-2. B mode, M mode

Measurement function	Measurement menu	Display items	Remark
Fetus cardiac function	LV Function	LVIDd LVIDs EDV ESV EF FS SV RVDd	Evaluation of ejection fraction and contraction coefficient of fetus heart

5-2-1-3. M mode, D mode

Measurement function	Measurement menu	Display items	Remark
Fetus Heart Rate	FHR	FHR	Fetal heart rate
	PreHR(Amnio)	PreHR	Fetal heart rate before and after amniotic fluid examination
	PstHR(Amnio)	PstHR	

5-2-1-4. D mode

Measurement function	Measurement menu	Display items					Remark
Fetal Doppler	Umbilical Artery MCA Uterine Artery Descending Aorta Renal-Artery OB Dop 1 OB Dop 2 OB Dop 3	PI	RI	S/D	PSV	EDV	Diagnosis of fetal circulation dynamics OB Dop1—3 : It is possible to freely define and use a name according to the particular purpose and application. Uterine Artery: Consists of Right/Left.
		MnV					
	PLI	PLI	A	SF			Evaluation of the right ventricular failure of the fetus
	LVOT Flow	pV	MnV	VTI	LVOT	CSA	Qp/Qs displayed in report.
		SV					
	RVOT Flow	pV	MnV	VTI	RVOT	CSA	
		SV					

5-2-1-5. Displayed on report page only

Amniotic Fluid Puncture	Amniocentesis CVS	Input of comment during amniotic fluid puncture (villus puncture)
BPP Scoring	Biophysical Profile	Biophysical Profile scoring
Anatomy CL	Anatomy Check List	Checklist for fetal evaluation

5-2-2. List of obstetrical measurement name built into system

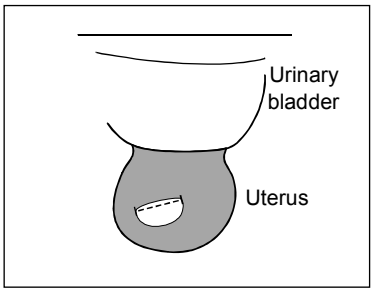
5-2-2-1. List of GA measurement name

	Spelling
EES	Early Embryonic Size
GS, mGS	Gestational Sac, Mean Gestational Sac
CRL	Crown Rump Length
BPD	Biparietal Diameter
BPDo	Biparietal Diameter (outer - outer)
OFD	Outer Orbital Diameter
OFDo	Occipital Frontal Diameter (outer - outer)
HC	Head Circumference
TC	Thoracic Circumference
TL	Thoracic Length
APTD(APD)	Antero Posterior Trunk Diameter
TTD(TAD)	Transverse Trunk Diameter (Transverse Abdominal Diameter)
AC	Abdominal Circumference
FTA	Fetal Trunk cross-sectional Area
AXT	APTD × TTD
AD	Abdominal Diameter
HL	Humerus Length
FL	Femur Length
LV	Length of Vertebrae
TIB	Tibia length
ULNA	Ulna length
RAD	Radius length
FIB	Fibula
BD	Binocular Distance
CD	Cerebral Diameter
LVW	Lateral Ventricular Width
HW	Hemispheric Width
IOD	Inner Orbital Diameter
OOD	Outer Orbital Diameter
NT	Nuchal Translucency
NBL	Nasal Bone Length
User1-10	User setting

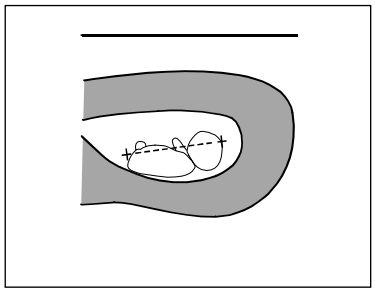
[Remark]
Refer to Section 5-6-4-1. "GA tables (GA Calculation tables)" for the gestational week table of each author.

5-2-2-2. Measured section for each parameter

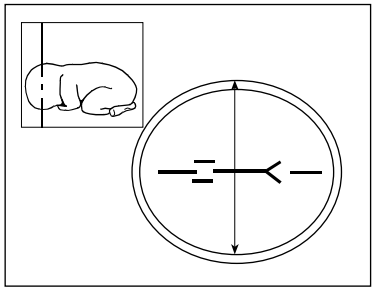
GS (Gestational Sac)



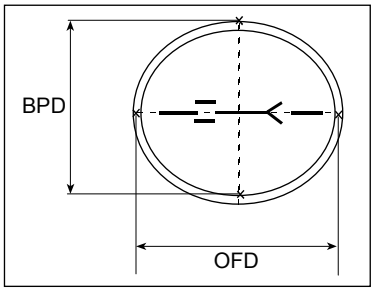
CRL (Crown Rump Length)



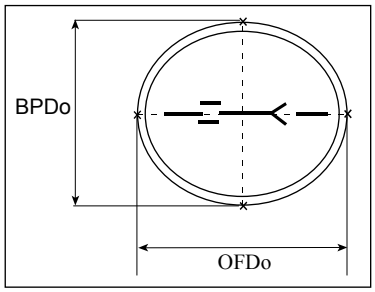
BPD (Biparietal Diameter)



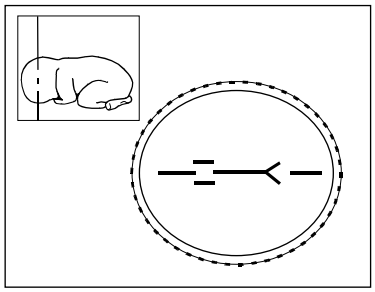
OFD (Occipital Frontal Diameter)



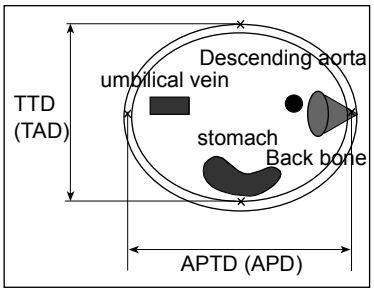
BPDo, OFDo (outer-to-outer)



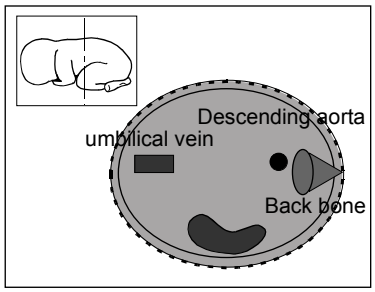
HC (Head Circumference)



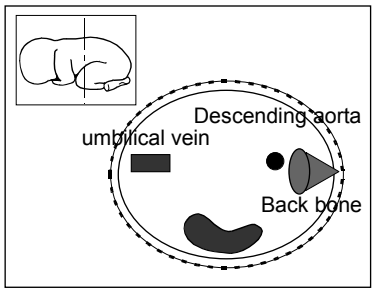
APTD(APD), TTD(TAD)
(Anteroposterior Trunk Diameter)
(Transverse Trunk Diameter)



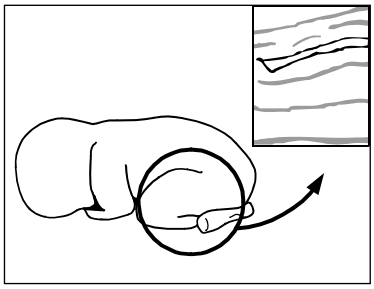
FTA
(Fetal Trunk CrossSectional Area)



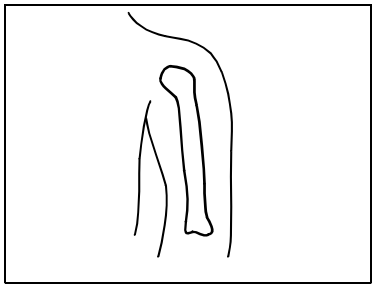
AC
(Abdominal Circumference)



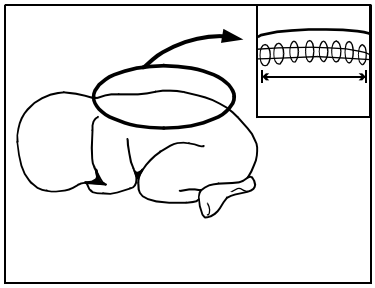
FL (Femur Length)



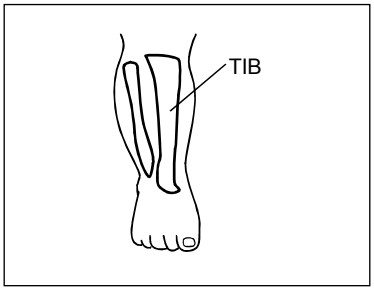
HL (Humerus Length)



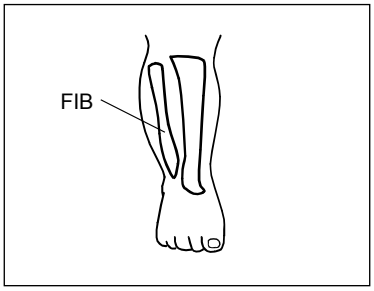
LV (Length of Vertebrae)



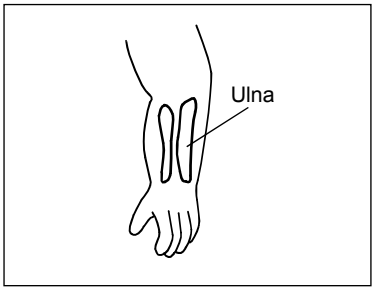
TIB (Tibia)



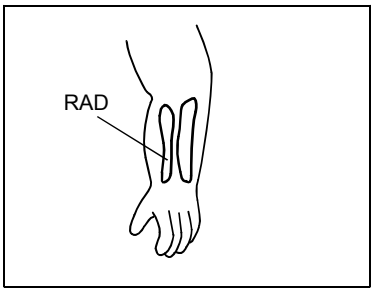
FIB (Fibula)



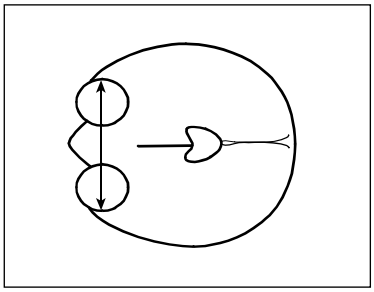
ULNA (Ulna)



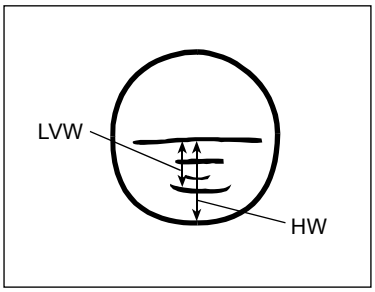
RAD (Radius)



BD (Binocular Distance),
CD (Cerebellar Diameter)



LVW (Lateral Ventricular body width),
HW (Hemispheric Width)



5-2-2-3. List of FW measurement name

Name	Measurement parameter
FW Tokyo U	BPD,APTD,TTD,FL
FW Osaka U	BPD,FTA,FL
FW Hadlock1	AC,FL
FW Hadlock2	AC,HC,FL
FW Hadlock3	BPD,AC,FL
FW Hadlock4	HC,AC
FW Hadlock5	BPD,HC,AC,FL
FW Shinozuka	BPD,AC,FL
FW Shepard	BPD AC
FW Hansmann	BPD,TTD
FW Warsof	BPD,AC
FW Campbell	AC
FW JSUM’03	BPD,AC,FL

Fetal weight growth table name
Brenner
Osaka U
Hadlock
Shinozuka
Doubilet
Yarkoni(twins)
JSUM’03

[Remark]
Refer to Section 5-6-1-1. "Calculation for B-mode", Section 5-6-4-2. "FW Equations (Fetus Weight)", Section 5-6-4-3. "FW Growth tables (Normal Range)" for the formula and table of each author.

5-2-2-4. List of Ratio measurement name

Name	Author
BPDo/OFDoHadlo	Hadlock (= Cephalic Index)
FL/BPD Hohler	Hohler
FL/AC Hadlock	Hadlock
HC/AC Campbell	Campbell
LVW/HW P&J	P&J
FL/AC Hadlock	Hadlock

[Remark]
Refer to Section 5-6-1-1. "Calculation for B-mode", Section 5-6-4-5. "Fetal Ratio tables by Gestational Age" for the formula and table of each author.

5-2-2-5. List of AFI measurement name

Name	Author
AFI Moore	Moore
AFI Phelan	Phelan
AFI Jeng	Jeng

[Remark]
Refer to Section 5-6-1-1. "Calculation for B-mode", Section 5-6-4-6. "AFI tables by Gestational Age" for the formula and table of each author.

5-2-2-6. List of Doppler Range table

Name	Author	
RI-MCA	Shinozuka	RI graph is displayed when MCA is measured.
RI-UmA	Shinozuka	RI graph is displayed when UmA is measured.
RI-MCA	JSUM’03	RI graph is displayed when MCA is measured.
RI-UmA	JSUM’03	RI graph is displayed when UmA is measured.
PI-MCA	Shinozuka	PI graph is displayed when MCA is measured.
PI-UmA	Shinozuka	PI graph is displayed when UmA is measured.
PI-MCA	JSUM’03	PI graph is displayed when MCA is measured.
PI-UmA	JSUM’03	PI graph is displayed when UmA is measured.

[Remark]
Refer to Section 5-6-1-1. "Calculation for B-mode", Section 5-6-4-7. "RI ,PI tables by Gestational Age" for the formula and table of each author.

5-2-3. Items of Special Note

The Obstetrical measurement enable you to input past data for a fetus graph that enables you to visually monitor changes in development with time.

In this case, the gestational week at the date of the examination is necessary, therefore enter one of LMP (last menstrual period), BBT (basal body temperature), EDC (expected confinement date), EGA (past gestational week) and GA (current gestational week) on the ID screen.

The measured values of the blood flow values obtained using this equipment are the absolute values displayed on the observation monitor. They are controlled as positive and negative values for the purpose of calculating the arithmetic index.
If the display of each measured value in a report is set to “Average” in a preset, the positive and negative values are added together and displayed as a mean value. Consequently, when performing multiple measurements of blood flow on the blood flow waveform drawn using the color Doppler method as a guide, use identical recording conditions (forward and reverse flow directions) for all of the blood flow waveforms in order to correctly display each of the arithmetic values arranged in the report.

5-3. Measurement operation procedure

Obstetrical measurement has the following studies.

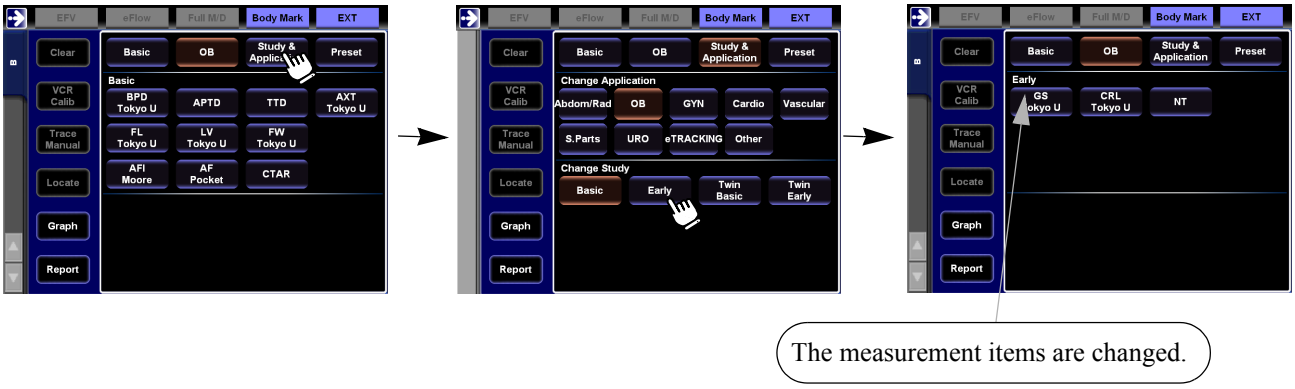
Basic (for general obstetric measurement)
Early (for the early stages of pregnancy)
Extended (for high risk pregnancy)
BPP/Amnio (for BPP/amniotic fluid puncture scoring)
Anatomy (for an anatomical checklist of the fetus)

There are also studies for twins and triplets. The study names are Twin*** and Tri***, respectively. (***:Early, Basic, Extended etc.)

Each measurement name displayed on the measurement menu is determined by the selected study.

<Method of changing a study>

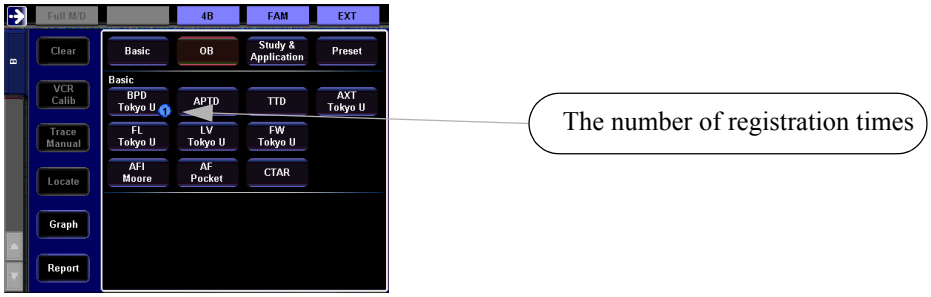
When the Study & Application on the touch panel is selected, study names are displayed, so make a selection.



[Remark]
The factory default settings are Basic (for general obstetric measurement) Study, Early (for the early stages of pregnancy) Study, Twin Basic (for twins) Study and Twin Early (for twins) Study.

<Displaying marks of registered reports>

When the registration of report is made after the measurement of each measurement item, the number of registration times is displayed on the touch panel.



[Remark]
The display examples of measurement results in this chapter are displayed with a vertical display layout.

5-3-1. B mode

[Remark]
The examples of measurement result display in this chapter are displayed with a vertical display layout.

5-3-1-1. GA (gestational week) measurement

The GA measurement uses the estimated gestational week table to calculate gestational week and expected confinement date from the measurement values of the fetus.

The names of the parts of the fetus are displayed in the measurement menu.

There are three types of Normal Range in the estimated gestational week table, ±day, ± SD and %tile. The type of result display for each is different. (Refer to Section 5-6-4-1. "GA tables (GA Calculation tables)" for the names of the parts of the fetus displayed in the measurement menu and the estimated gestational week table.)

⚠ Note
Before starting an examination, always check that the date displayed on the monitor screen is correct. If the data is incorrect, invalid results may be displayed.

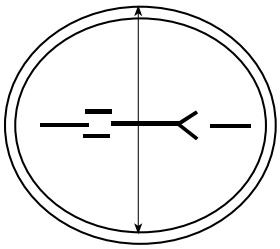
[Remark]
If you selected an SD type or percentile type estimated gestational week table, you cannot display Normal Range unless you enter the gestational week (LMP-GA) obtained from LMP, EGA, BBT, GA, and so on.
Be sure to enter this data on the ID screen.

<Operation method>

The case of the BPD (Tokyo U) is explained.

(1) Display the BPD (biparietal diameter of the fetus head) image.

(2) Select the BPD(Tokyo U) on the touch panel.
→ The + mark is displayed.



(3) Measure the BPD.
→ The gestational week and expected confinement date are calculated.

(4) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

(5) On displaying a graph, select the Graph on the touch panel.

[Remark]
When the measurement values are registered in the gestational age report, the US-GA is displayed on the screen.
US-GA is the mean value of the gestational week obtained from the GA measurement values registered in the report.
It is used to calculate the expected confinement date. The preset function sets whether or not this is displayed.

Also, it can be set whether the calculation is selected from the currently selected study (One Study) or from all studies (All Study). It is set on the All Study on the factory default.

If you obtain the mean value only for the currently selected study, set the One Study with a preset.
Refer to Section 5-5-2. "PRESET list".

<Example of BPD rsults display>

In case of a layout for a vertical display

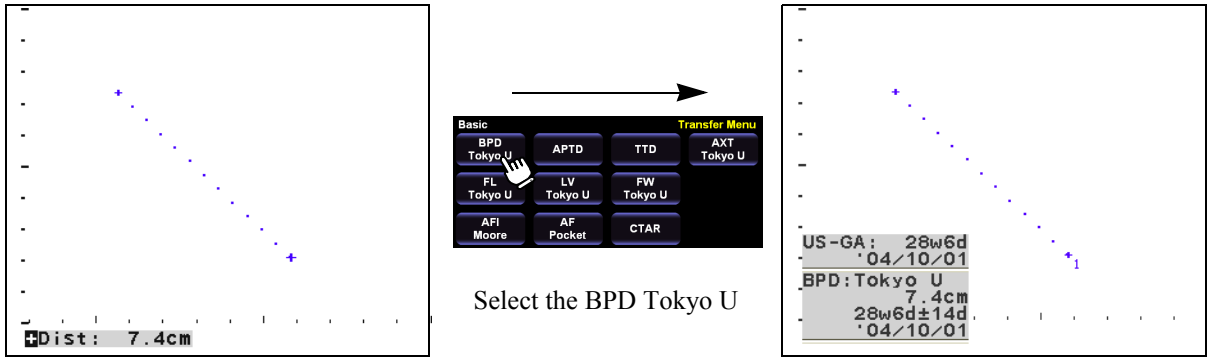
US-GA: w d	US-GA : Mean gestational week
' / /	US-EDC : Expected confinement date obtained from US-GA
BPD : Tokyo U	Name of the part of the fetus to be measured and author of table
cm	Measurement values
w d ± d	Estimated gestational week and error (Normal Range)
' / /	Expected confinement date

[Remark]
In the GA measurement, it can be transcribed to the measurement value by selecting on the touch panel or by pressing the Hot key, after executing the basic measurement.

<Example which posts a Dist measurement value to the BPD value>

When the basic measurement is executed, the touch panel is switched to the Transfer Menu.

In case of the touch panel



Select the BPD Tokyo U

[Remark]
The Transfer Menu is displayed automatically when the Transfer List Display is set in Auto with a preset.
Refer to Section 5-5-2. "PRESET list".

[Remark]
On transcribing with the Hot key, it is possible to transcribe to the GA measurement corresponding to the Hot Key.

[Remark]
When transferring the basic measurement values obtained using the Ellipse method or the Circle method to the circumferential length and area measurement of AC, HC, and so on, it is recommended that you check whether or not the calculation formulas used in the basic measurements (See 1-11-1-1., 1-11-1-2., 1-11-1-3., and 1-11-1-4.) and the calculation formulas for GA measurement used in the literature (Refer to Section 5-6. "Calculation Formula & Reference & Table") are appropriate.

[Remark]
HC, AC, FTA and AXT directly measure the circumference and area using the Trace method, Ellipse method, and so on. In the case of HC, the circumference and area can be calculated and displayed automatically by BPD and OFD (or BPDo and OFDo), and in the case of AC, FTA and AXT by TTD and APTD (or APD and TAD).
Note, however, that when measurement is performed using the Trace method or the Ellipse method, the measurement values are registered preferentially.
Automatically calculated HC, AC, FTA, and AXT are displayed in the menu as HC(*) and in the report as *HC.
The same applies to AD obtained from APTD and TTD.

[Remark]
A mGS measurement is displayed as the mean value of the GS diameter obtained in a 3-axis measurement.
If 3-axis measurement is not performed, the results will not be displayed.

5-3-1-2. Graph function

This function plots the measured values in a graph that indicates the standard range.

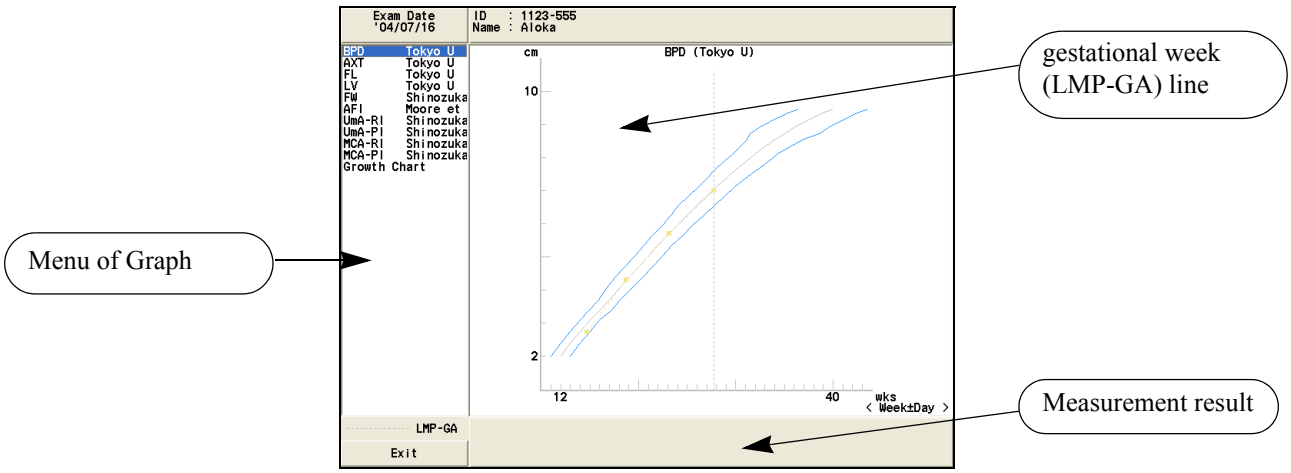
It is used as a guide to see whether or not the measured value is within the standard range.

This function can be executed during a GA measurement that uses an estimated gestational week table, FW measurement in which Range Table is set, Fetus Ratio measurement, AFI measurement and Doppler measurement.

[Remark]
A graph is plotted for the gestational age (LMP-GA) found from the LMP, EGA, BBT, etc. Always input these data when inputting the ID.

[Remark]
The measurement values displayed on the graph are the latest values.

<Example of BPD measurement>



[Remark]
The fetus growth graph shows deviation data ((day, (SD, etc.) related to the number of weeks in each estimated gestational week table. It does not indicate the deviation (cm or mm) of the measurement value, so use it as a rough guide of fetus growth.

<Operation method>

(1) Select the Graph on the touch panel.

→ A graph for the current obstetric measurement is displayed.

(2) For displaying a different graph, select the graph menu on the left side.

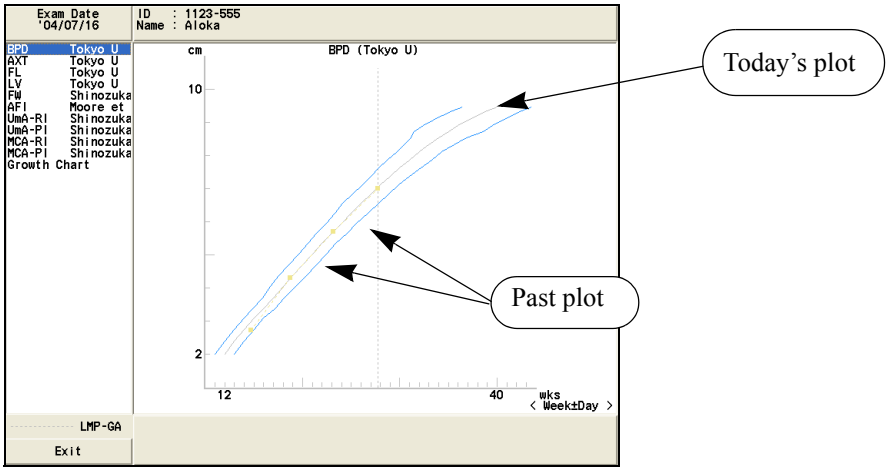
(3) Move the arrow to Exit, and press the ENTER switch.

→ Return from the graph screen to the measurement screen.

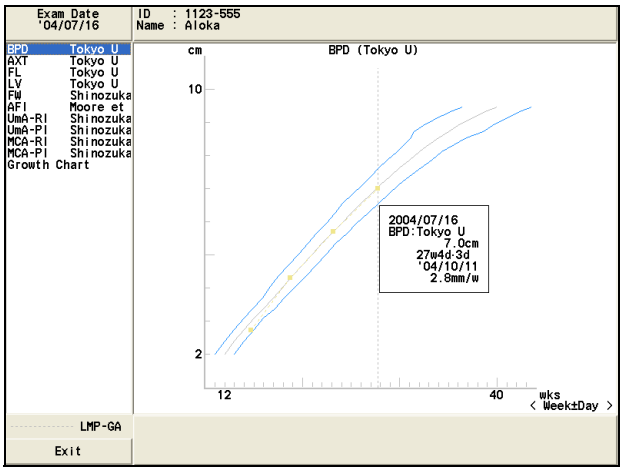
[Remark]
If data is stored, each time you display a graph the past data will also be plotted.
You can display registered patient data from the most recent LMP on graph.

[Remark]
The function that saves the measurement values in the case where the same patient was examined in the past, and

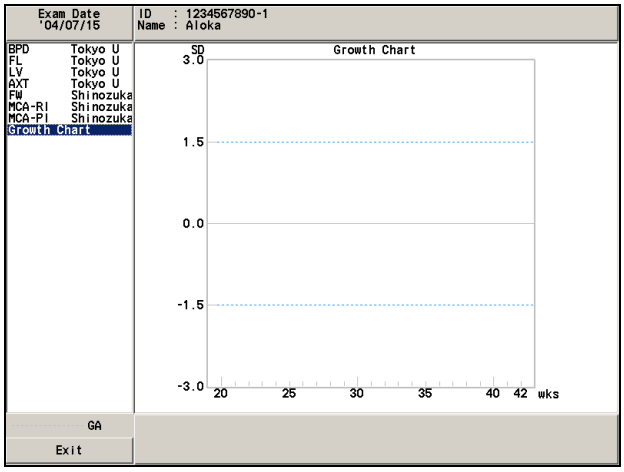
displays the past measurement values on a graph is called the Growth Analysis function. It enables you to observe the progress of the development with time.



[Remark]
Putting the arrow on the plot of today or the past, it is displayed the measurement result corresponding to the plot.



[Remark]
Selecting Growth chart, it is displayed a graph with SD on the vertical axis.



[Remark]
Growth chart is displayed if the obstetrical table of SD type has been assigned to the menu.

5-3-1-3. FW (Fetal weight) measurement

The FW measurement is a measurement in which the estimated fetal weight is calculated from the measured value of several fetuses.

The Author's name is displayed in the measurement menu.
Also, the measurement part and the result display type differ according to the estimation equation that is used.

[Remark]
Refer to Section 5-6-4-2. "FW Equations (Fetus Weight)" for the FW name displayed in the measurement menu and the measurement part.

<Operation method>

The following explanation using FW Tokyo U is provided below as an example.

(1) Display the BPD (biparietal diameter of the fetus head) image.

(2) Select the FW Tokyo U on the touch panel.
→ The + mark is displayed, then measure the BPD.

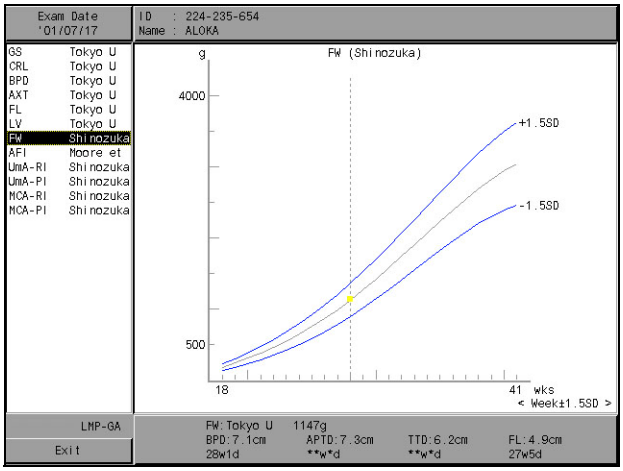
(3) Display a cross-sectional image of the abdominal region, and press the + switch.
→ Measure the APTD.

(4) Press the + switch.
→ Measure the TTD.

(5) Display an image of the femur, and press the + switch.
→ Measure the FL.

(6) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

(7) In displaying graph, select the Graph on the touch panel.



<Example of FW results display>

FW:Tokyo U	Author of table
g	Calculated value of fetal weight
w d± d	Gestation week estimated from the FW Growth table, and error(*1)
' / /	Confinement date estimated from the FW Growth table(*1)
BPD : cm	Biparietal diameter of the fetus head
w d	Gestational week estimated from BPD(*2)
APTD: cm	Antero Posterior Trunk Diameter
TTD : cm	Transverse Abdominal Diameter
FL : cm	Length of femur
w d	Gestational week calculated from FL(*2)

[Remark]
(*1)Displayed only when a preset is used to set the FW formula and the FW Growth Table together and also to display the error, gestational week and expected confinement date.
These values are estimated from the FW Growth Table, so they are not the same values obtained from the FW formula. The factory default settings are OFF.

(*2)Displayed if the gestational week table is assigned by OB-Program of the preset function.
If there are a number of gestational week tables for the same part to be measured, the tables created by the same author will take precedence.

[Remark]
Even if FW measurement is not performed, once GA measurement has been performed a number of times and the measurement items necessary for a FW measurement are obtained, the fetal weight can be automatically calculated. When performing an automatic calculation, set the FW measurement to be displayed to AUTO using the OB-Program of the preset function.

[Remark]
The fetal weight can be displayed in either grams or pounds.
1 pound = 453.592 grams

[Remark]
Setting FW Growth Table of a preset for Doubilet and setting Normal Range of Measurement Method and Disyplay Items (2/4) to ON, you can display the %ile (percentile) of fetus besides the fetal body weight itself.

5-3-1-4. Fetus Ratio measurement

Fetus Ratio measurement is a type of measurement in which the ratio is calculated from the measurement values for two fetuses.

The measurement part and the author's name are displayed in the measurement menu.
Also, the measurement part and the result display type differ according to the estimation equation that is referred to.

[Remark]
For details of the Ratio name and measurement part that are displayed in the measurement menu, refer to Section 5-2-2-4. "List of Ratio measurement name".

[Remark]
On the factory default, Fetus Ratio measurement is not assigned to the menu.
It must be set using the Preset function.

<Operation method>

The following explanation using FL/AC Hadlock is provided below as an example.

(1) Display the FL (femur Length) image.

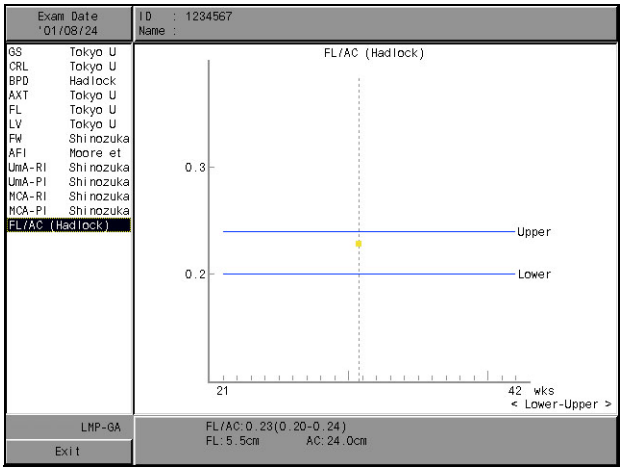
(2) Select the FL/AC Hadlock on the touch panel.
→ The + mark is displayed, then measure the FL.

(3) Display the AC (Abdominal Circumference) image, and then press the + switch.
→ Measure the AC using the Ellipse method.

[Remark]
When the method of using the Ellipse method, refer to Section 1-7-4-2. "Method of performing a measurement using Ellipse".

(4) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

(5) When displaying a graph, select the Graph on the touch panel.



<Example of FL/AC results display>

FL/AC	Ratio name
.	Ratio
-	Normal range
FL : cm	Femur length
AC : cm	Abdominal Circumference

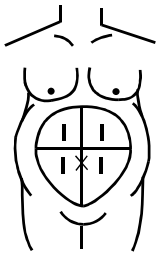
[Remark]
Even if Fetus Ratio measurement is not performed, when a GA measurement has been performed twice and the items necessary for performing ratio measurement are obtained, the ratio can be automatically calculated.
when performing automatic calculation, set the Ratio measurement to be displayed to AUTO using OB-Program of the preset function.

5-3-1-5. Amniotic Fluid Index measurement

This measurement determines the free space in the amniotic fluid pocket (depth) of the uterus, and calculates the amniotic fluid index (AFI: Amniotic Fluid Index).

In the AFI measurement, with dividing gravid uterus into four parts (Q1- Q4) on abdominal wall body surface, the greatest amniotic fluid depth of each divided part is obtained. These four elements are totaled for calculation.

Move the probe parallel to the plane of the mother's body indicated by the arrow, and apply it perpendicularly to the mother’s back.



[Remark]
You can display the normal range of AFI.
For tables that have the normal range, refer to Section 5-2-2-5. "List of AFI measurement name".

[Remark]
You can measure the amniotic fluid cavity of each of the four divided parts without fixing the measurement sequence.

<Operation method>

The following explanation using AFI Moore is provided below as an example.

(1) Display the cross-section of the first of the four divided parts of the area to be examined.

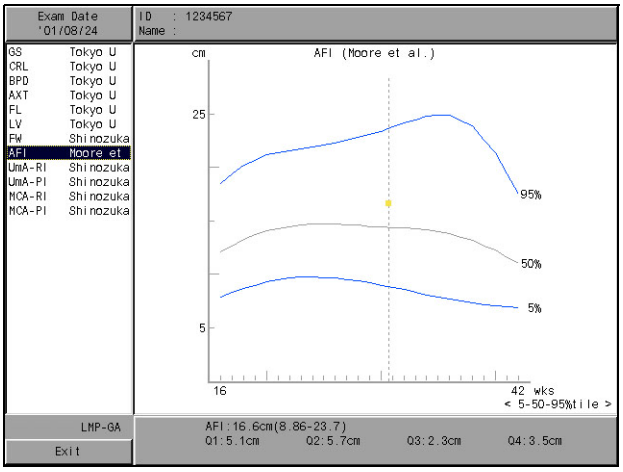
(2) Select the AFI Moore on the touch panel.
→ The + mark is displayed, then measure the Q1.

(3) Display the second cross-section, and press the + switch.
→ Measure the Q2.

(4) Measure Q3 and Q4 using the same procedure.

(5) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

(6) For displaying a graph, select the Graph on the touch panel.



<Example of AFI Moore results display>

AFI:Moore	← The author name of AFI table
cm	← The sum total of Q1+Q2+Q3+Q4
. - .	← Normal range
Q1 : cm	← Measurement value for Q1
Q2 : cm	← Measurement value for Q2
Q3 : cm	← Measurement value for Q3
Q4 : cm	← Measurement value for Q4

5-3-1-6. AF Pocket, AFV measurement

The AF Pocket (Amniotic Fluid Pocket) and AFV (Amniotic Fluid Volume) are used to measure the maximum depth of the free space in the amniotic fluid pocket of the uterus.

[Remark]
The AF Pocket and AFV measurement areas are identical. In the literature they are treated as two distinct areas because they have different names, so register them in the measurement menu using a preset.

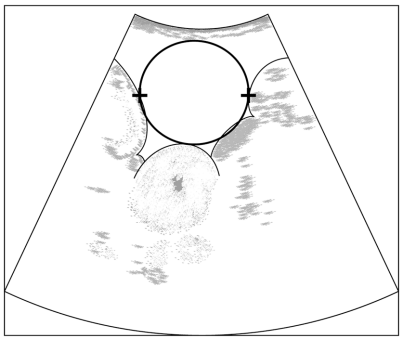
[Remark]
You can use a preset to select either the Caliper method or the Trace method as the measurement tool.

<Operation method>

Here is an explanation using the AF Pocket as an example.

(1) Display the cross-section showing the amniotic fluid pocket surrounded by the placenta and the fetal part.

(2) Select the AF Pocket on the touch panel.
→ The + mark is displayed, so measure the amniotic fluid pocket using the Circle method.



[Remark]
For using the Circle method, refer to Section 1-7-4-2. "Method of performing a measurement using Ellipse".

(3) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of AF Pocket results display>

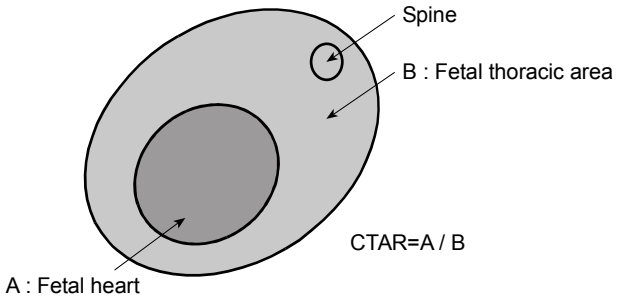
```
AF Pocket
              cm
```

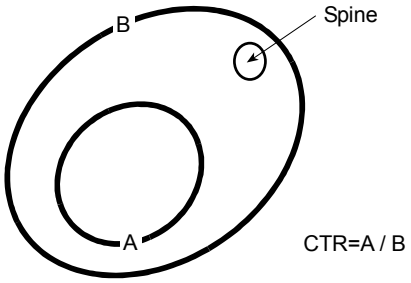
← AF Pocket
← Measurement value

5-3-1-7. CTAR, CTR measurement

The CTAR (Cardio Thoracic Area Ratio) and CTR (Cardio Thoracic Ratio) measurements are used to measure the size of the part of the heart that is in the thorax in order to estimate whether or not there is any enlargement of the heart of the fetus.

CTAR is the ratio of the fetal thoracic cross-sectional area and fetal heart area.
CTR is the ratio of the fetal thoracic circumference and fetal heart circumference





<Operation method>

Here is an explanation using the CTAR as an example.

(1) Using the part that enables the four cavities of the heart to be displayed, display the image that shows the cross-sectional area of the thorax and the cross-sectional area of the heart.

(2) Select the CTAR on the touch panel.
→ The + mark is displayed, so measure the cross-sectional area (A) of the heart using the Ellipse method.

[Remark]
For using the Ellipse method, refer to Section 1-7-4-2. "Method of performing a measurement using Ellipse".

(3) Press the + switch.
→ Measure the cross-sectional area (B) of the thorax using the same method as step (2).

(4) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of CTAR results display>

CTAR:	%	← Cardio Thoracic Area Ratio
A:	cm^2	← Fetal heart area
B:	cm^2	← Fetal thoracic area

[Remark]
CTAR displays a ratio by %.

5-3-1-8. Cervix measurement

The length of the cervix is measured during the middle period of the pregnancy as a method for forecasting early delivery.

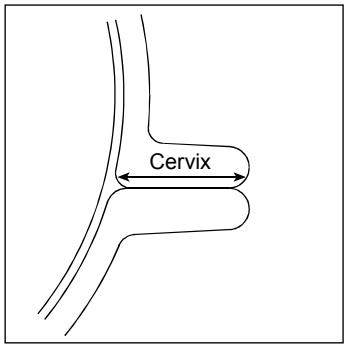
[Remark]
You can use a preset to select either the Caliper method or the Trace method as the measurement tool.
The Trace method for the cervix displays the distance moved by the trace line in real time.

[Remark]
On the factory default, Cervix measurement is not assigned to the menu.
It must be set using the Preset function.

<Operation method>

(1) Display the image of the cervix in the B mode.

(2) Select the Cervix on the touch panel.
→ The + mark is displayed, therefore measure the length of the cervix.



(3) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of Cervix results display>

```
Cervix:        cm
```
← Cervix

5-3-2. M mode

5-3-2-1. Fetal Heart Rate measurement

You can measure the heart rate of the fetus from an M mode image of the heart of the fetus.
There are three methods of measuring the heart rate of the fetus, FHR, PreHR and PstHR.
The method of performing each measurement is identical.

[Remark]
PreHR and PstHR are used to monitor the fetus before and after an amniotic fluid puncture.
In the report they are registered in page for performing an amniotic fluid puncture.

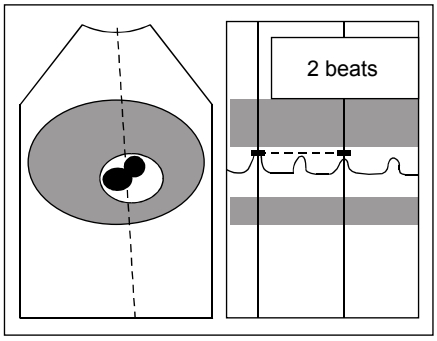
[Remark]
You can measure the heart rate in the D mode as well.

<Operation method>

Here is an explanation using the FHR as an example.

(1) Display the fetal heart rate.

(2) Select the FHR on the touch panel.
→ The line cursor is displayed, so measure HR.



(3) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of FHR results display>

FHR: BPM ← Heart rate

[Remark]
On the factory default, the heart rate is measured as the time between two heartbeats.
You can set 1 to 9 heartbeats using the preset function.
As the setting of a HR measurement of the basic measurement is succeeded to, change Section “1-10-4-1.Measured Method & Display items” of the preset to a new setting.

5-3-2-2. LV Function measurement

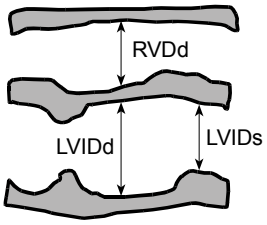
This measurement uses the distance measurement in the M mode to evaluate the ejection function of the left ventricle of the fetus.
Measure the left ventricle end-diastolic diameter (LVIDd) and the left ventricle end-systolic diameter (LVIDs), obtain the capacity of the left ventricle (EDV, ESV) using the Pombo method, then calculate the contraction coefficient (FS), the ejection fraction (EF) and the stroke volume (SV).

Measurement items :

LVIDd Left ventricular internal diameter (diastole)

LVIDs Left ventricular internal diameter (systole)

RVDd Right ventrical diameter (diastole)



Calculation items :

EDV = $(LVIDd)^3$

ESV = $(LVIDs)^3$

EF = (EDV - ESV) / EDV ×100%

SV = EDV - ESV

FS = {(LVIDd - LVIDs) / LVIDd} ×100%

[Remark]
On the factory default, the LV Function measurement is not assigned to the menu. It must be set using the Preset function.

[Remark]
This measurement can also be performed in the B mode.

<Operation method>

(1) Display the M mode image from the cross-section of the heart of the fetus.

(2) Select the LV Function on the touch panel.
→ The + mark is displayed, so measure the end-diastolic left ventricle cavity LVIDd.

(3) Press the + switch.
→ Measure the end-systolic left ventricle LVIDs.

(4) Press the + switch.
→ Measure the end-diastolic right ventricle RVDd.

(5) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of LV Function results display>

```
LV Function
LVIDd:    .   cm   ← Left ventricular internal diameter (diastole)
LVIDs:    .   cm   ← Left ventricular internal diameter (systole)
RVDd :    .   cm   ← Right ventrical diameter (diastole)
EDV:          ml   ← Left ventricular end diastolic volume
ESV:          ml   ← Left ventricular end systolic volume
EF:       .    %   ← Ejection fraction
FS:       .    %   ← Fractional shortening
SV:           ml   ← Stroke volume
```

5-3-3. D mode

5-3-3-1. Fetus Doppler PI and RI measurement.

Obstetrical D mode measurements consist of measurement of the umbilical cord arterial blood flow, middle cerebral artery and the left and right uterine artery blood flow (Rt./Lt. UtA), aorta descendens blood flow, and the renal artery. Each waveform is traced, and blood flow measurement data (PI, RI and S/D for each arterial blood flow) is calculated.
Six measurement menus are provided: UmA for the umbilical cord, MCA for the middle cerebral artery, Rt, UtA, Lt. UtA for the uterine artery, D-Ao for the aorta descendens and Renal-A for the renal artery.
The method of performing each measurement is identical.

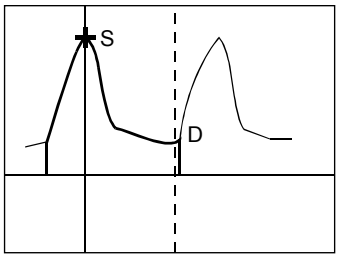
[Remark]
PI and RI calculations use the systolic maximum blood flow velocity (PSV) and the end-diastolic blood flow velocity (EDV).
There are reports to the effect that the diastolic minimum blood flow velocity is sometimes used for these indexes.
The end-diastolic blood flow velocity is not necessarily the same as the diastolic minimum blood flow velocity.
Consequently, when measuring PI and RI, manually shift the time phase of the EDV to the end-diastolic point and also to the minimum blood flow velocity point.
PI and RI are calculated from the blood flow velocity at these points.

<Operation method>

Here is an explanation using UmA as an example.

(1) Display the blood flow Doppler waveform for the umbilical cord artery.

(2) Select the Umbilical Artery on the touch panel.
→ The line cursor (vertical line) is displayed.
(The + mark is displayed in the case of the Manual Trace method.)



(3) Using the Dop Trace method, trace the blood flow Doppler waveform.
→ PI, RI, S/D, etc. are calculated, and line cursors accompanied by the letters “S” and “D” are displayed.

[Remark]
Adjust the line cursors accompanied by the letters “S” and “D” using the ENTER switch and the trackball.
“S”: Peak Systolic Velocity point “D”: End Diastolic Velocity point

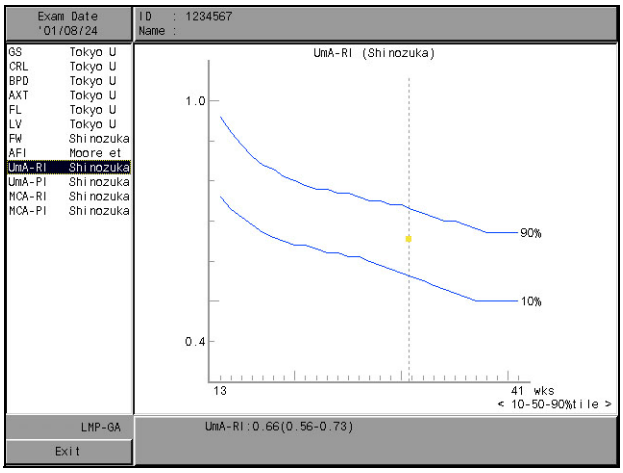
[Remark]
The method of using Dop Trace method differs depending upon whether Auto Trace or Manual Trace is used.
For the operation method, refer to Section 1-7-4-5. "The measurement procedure of the Dop-Trace method".

(4) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

(5) On displaying graph, select the Graph on the touch panel.

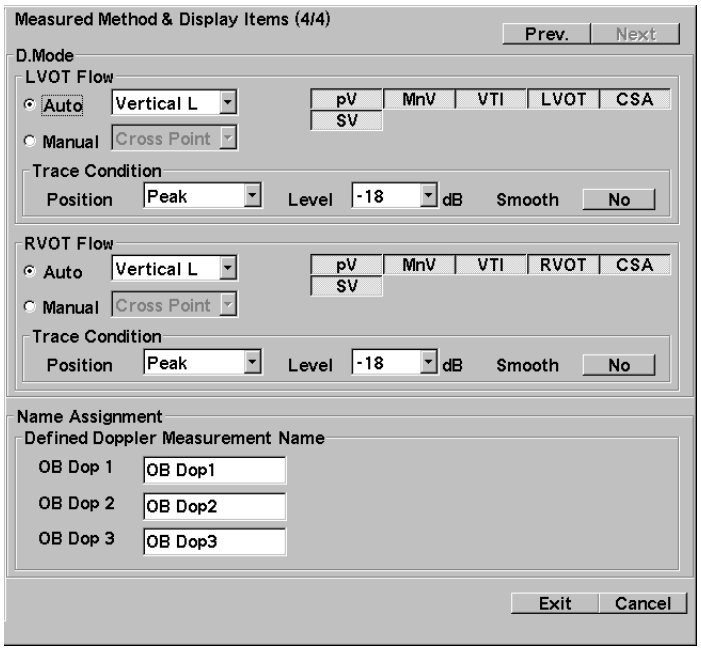
<Example of UmA results display>

UmA	← Umbilical Artery
PI : .	← Pulsatility Index
RI : .	← Resistance Index
S/D: .	← Ratio
PSV: . cm/s	← Peak systolic velocity
EDV: . cm/s	← End diastolic velocity
MnV: . cm/s	← Mean velocity



5-3-3-2. OB Dop 1(-3) measurement

You can register (or create names for) flow measurements for up three arteries other than those of section:5-3-3-1.Fetus Doppler PI and RI measurement. using the Preset function.
The operation procedure for each blood flow measurement created here is the same as that for an Umbilical Artery measurement.

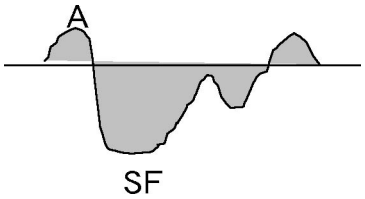


<Example of OB Dop1 results display>

OB Dop1	← OB Doppler 1
PI : .	← Pulsatility Index
RI : .	← Resistance Index
S/D: .	← Ratio
PSV: . cm/s	← Peak systolic velocity
EDV: . cm/s	← End diastolic velocity
MnV: . cm/s	← Mean velocity

5-3-3-3. Preload Index measurement

PLI (Preload index) is a measurement that compares two flow velocity values (A wave and SF wave) for the inferior vena cava of a fetus.
It is used to evaluate right ventricular failure in a fetus.



PLI = | A / SF |

<Operation method>

(1) Display the blood flow Doppler waveform for the inferior vena cava of a fetus.

(2) Select the PLI on the touch panel.

→ A + line mark is displayed, so move the + line to the position of the A wave.

(3) Press the + switch.

→ Move a + line mark to the position of the SF waveform.

(4) Press the ENTER switch and keep it depressed momentarily.

→ Measurement is finalized.

<Example of PLI Dop results display>

PLI :	.	← Preload Index
A :	cm/s	← A wave flow velocity
SF:	cm/s	← SF wave flow velocity

5-3-3-4. LVOT Flow, RVOT Flow measurement

Obtain the velocity time integral (VTI) from the left ventricle (right ventricle) out tract flow waveform, and the stroke volume from the left ventricle (right ventricle) out tract diameter (LVOT (RVOT)). Also, the ratio for left and right outflow is displayed in the report as Qp/Qs.
Two measurement menus, LVOT Flow and RVOT Flow, are provided.
The method of performing each measurement is identical.

[Remark]
On the factory default, LVOT Flow and RVOT Flow measurement are not assigned to the menu.
It must be set using the Preset function.

<Operation method>

Here is an explanation using LVOT Flow as an example.

(1) Display the left ventricle outflow tract B/D mode image.

(2) Select the LVOT Flow on the touch panel.

→ A + line mark is displayed.

(3) Trace the blood flow velocity in the left ventricle outflow path.

→ The velocity-time integration value (VTI) is calculated.

[Remark]
The method of using the Dop Trace method differs depending upon whether Auto Trace or Manual Trace is used.
For details of the method of use, refer to Section 1-7-4-5. "The measurement procedure of the Dop-Trace method".

(4) Press the + switch.

→ The + mark is displayed on the B image. Consequently, when you measure the output path, the outflow path cross-sectional area (CSA) is measured.

[Remark]
The area of the outflow path is calculated on the basis of a circle.

(5) Press the ENTER switch and keep it depressed momentarily.

→ Measurement is finalized.

<Example of LVOT Flow results display>

```
LVOT Flow
pV:     .    cm/s   ← Peak Velocity
MnV:    .    cm/s   ← Mean Velocity
VTI:    .    cm     ← Velocity Time Integral
LVOT:   .    cm     ← Left Ventricular Out Tract diameter
CSA:    .    cm²    ← Cross Sectional Area
SV:          ml     ← Stroke Volume
```

5-3-4. Multiple pregnancies

When performing an examination on multiplet, you can select the multiplet study.
When a study is changed to twins or triplets with a Study Change, the obstetric measurements can be executed for each fetus. Reports can also be displayed for each fetus.
All the measurements except those for the pregnant woman (cervix, UtA) can be used for multi-pregnancy studies
The operation methods are the same as for a single pregnancy.

Subject studies:

For Twin	For Triplets	Subject of examination
Twin Basic	Tri.Basic	Normal pregnancy
Twin Early	Tri.Early	Early pregnancy
Twin Extended	Tri Extended	High-risk pregnancy
Twin BPP/Amnio	Tri.BPP/Amnio	BPP scoring, amniotic fluid sampling
Twin Anatomy	Tri.Anatomy	Anatomical check list for fetal

: Multiplet study display items set at the factory

To switch from one fetus to the other during a measurement, use the switching menu item in the transfer list or measurement menu.
The measurement results are displayed with the codes a, b, and c attached to the name for each item in order to distinguish the results for each fetus.

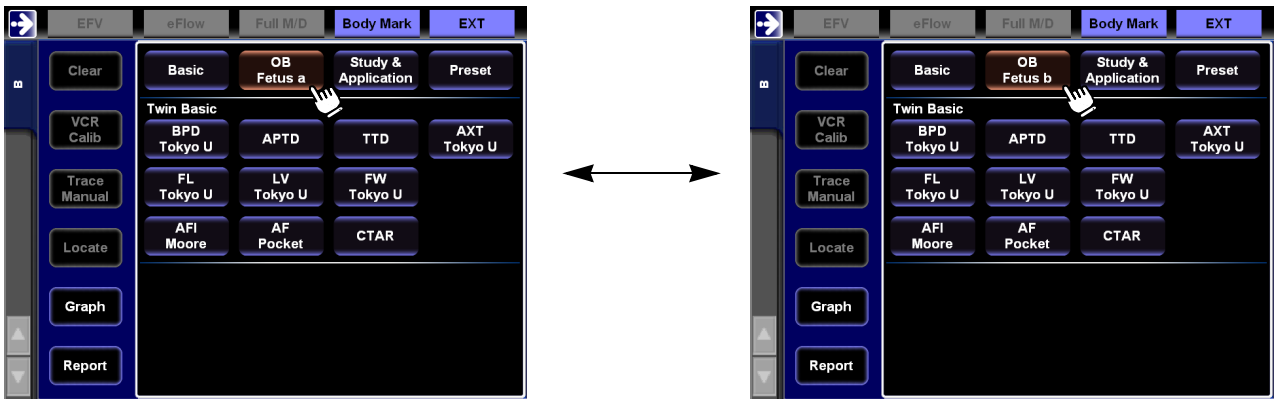
<Operation method>

Here is an explanation using Twin Basic as an example.

(1) After selecting the Study & Application, select the Twin Basic.

(2) The OB switch changes the Fetus a switch.

(3) When you press the Fetus a switch, it is replaced by the Fetus b.



[Remark]
When fetus selection key (Fetus a, Fetus b, Fetus c) is assigned to the Hot key, the fetus selection menu is displayed only by pressing the Hot key, which is convenient.

<Operation procedure for multiplet>

This is the same as for the case of a single fetus.

<Example of multiplet results display>

The codes (a, b, c) for differentiating fetuses from each other are displayed alongside each measurement name.

For Fetus a →

```
aBPD:Tokyo U
           . cm
        w d+  d
      `  /  /
```

For Fetus b →

```
bFW:Tokyo U
            g
BPD:        cm
          w d
APTD:       cm
TTD:        cm
FL:         cm
          w d
```

5-3-5. Interval Growth Rate

Interval Growth Rate is a function that compares the data for the current examination date with previous data for a single examination, and calculates the growth rate, that is, the extent to which the fetus has grown, in one week.
You can display an Interval Growth Rate table by BPD, AC, AD and FL measurement.

[Remark]
In order to display the Interval Growth Rate, set the display using a preset.
Also, although there is no restriction for the author name for GA measurement (BPD, AC, AD, FL), it is necessary to assign an Interval Growth table (Author: Levon N) to each table.
Refer to the “GA Table” in Measured Method & Display Items 1/4, the Built in & User-defined Table “Interval Growth Rate” and OB Program Section 5-5. "PRESET FUNCTION".

[Remark]
It is possible to display the normal range of values of each interval growth rate in a report.

[Remark]
It is necessary to measure the previous measurement value. The measurement value is retrieved from the patient data, so it is necessary to register the patient data in advance using the ID screen.

The method of calculating the Interval Growth Rate is as follows.

Interval Growth Rate =
(Current measurement value – Previous measurement value) mm/ (Present GA value – Previous GA value) week

When GA (BPD) is measured on the day of the examination and also on one previous occasion, it is calculated as follows.

If it is assumed that the previously performed BPD = 50mm (calculated as GA = 21w0d), and the currently performed BPD = 78mm (calculated as GA = 31w0d), the Interval Growth Rate is as follows:
Interval Growth Rate = (78-50)mm /(31-21) wks = 2.8mm/wk

<Example of Interval Growth Rate results display>

```
BPD : Tokyo U
              cm
     w  d  ±  d
    ,    /   /
       .   mm/w
```
← Interval Growth Rate

5-4. Report function

A report arranges and displays each index value and measurement value for obstetrical measurement and also related patient information.

A report displays only the results of measurement. You can register up to six measurement values in a report.

[Remark]
You can set the number of values to be registered using the Report Display of Preset.

You can also plot past measurement values on a growth curve, enabling you to evaluate the growth process of a fetus.

[Remark]
Be sure to enter patient data (Patient ID, Name, etc.) on the ID screen.

5-4-1. Basic Operation of a Report

5-4-1-1. Displaying a Report

In order to display a report, press Report on the touch panel.

5-4-1-2. Ending a Report

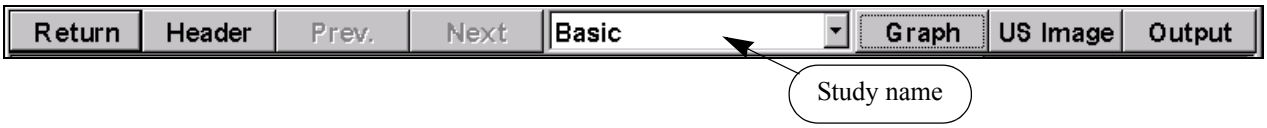
The following two patterns are used to end a report.

(1) Press Report on the touch panel.

(2) Select Return on the Report screen.

5-4-1-3. Function buttons on a Report

The following buttons are displayed on the top section of the Report screen.

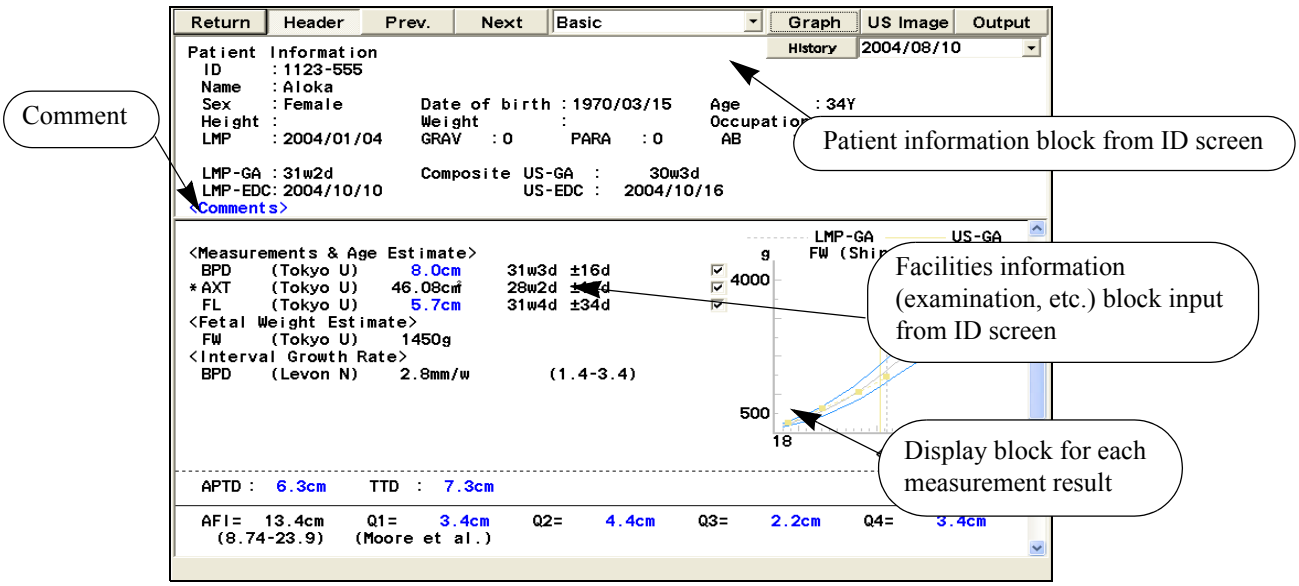


Return	Closes the report.
Header	Switches the header block (patient data display) between Long Form and Short Form.
Prev., Next	Advances or returns the page in block units.
Study name	Switch the study of the displayed report.
Graph	Displays the transition of the obstetrical measurement values from past to present, in the form of a graph.
US Image	Displays an ultrasound image in the report.
Output	Outputs report data to a personal computer, Media, printer or saver.

5-4-2. Report Block

A report block is the unit used to display data (each set of obstetrical measurement data).

It arranges pertinent ultrasound information such as Header (patient information) block, Site information (facilities information) block, and GA, FW & Ratio (gestational week, fetal weight and ratio) block.

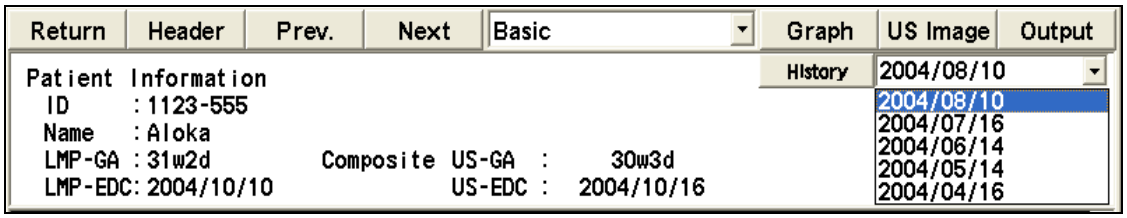


5-4-2-1. Function for displaying the past reports.

It can display the past reports that are on the requested dates.
In addition, pressing the History, it can display the list of the past obstetrical measurement records.
However, it is not possible to Edit (revision / deletion) the past measurement records.

(1) Move the arrow to the ▼ of the combo box identifying the exam. date, and press the ENTER switch.

→ The exam. date of the past is displayed.

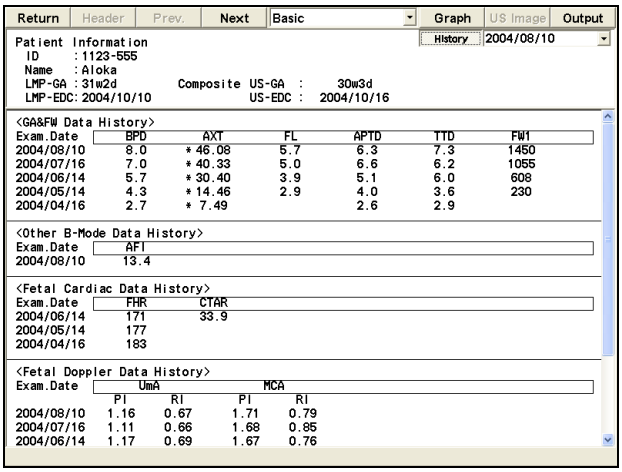


(2) Select the exam. date desired to display, and press the ENTER switch.

→ The report of the requested exam. date is displayed.

(3) Move the arrow to the History, and press the ENTER switch.

→ The list of the past exam. results is displayed.



(4) Press the History again.

→ Return to the screen of report.

5-4-2-2. Comment input function

You can enter comments concerning an ultrasound examination as the results of an ultrasound examination.

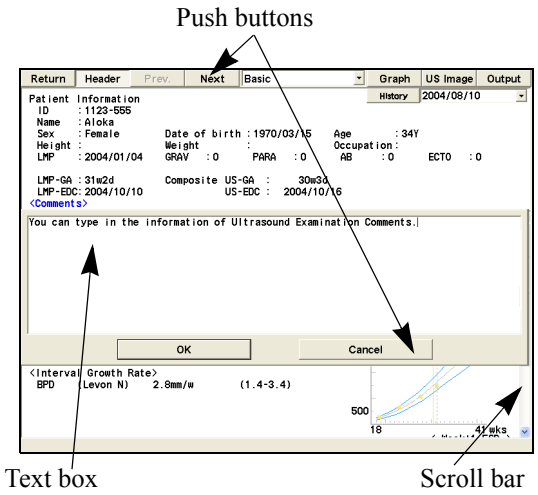
(1) Move the arrow to <Comments>, and press the ENTER switch.

→ A text box for entering a comment is displayed.

(2) Enter a comment from the keyboard.

(3) Select OK.

[Remark]
If you select Cancel, the entered contents are canceled.



5-4-2-3. Edit (edits the data) function

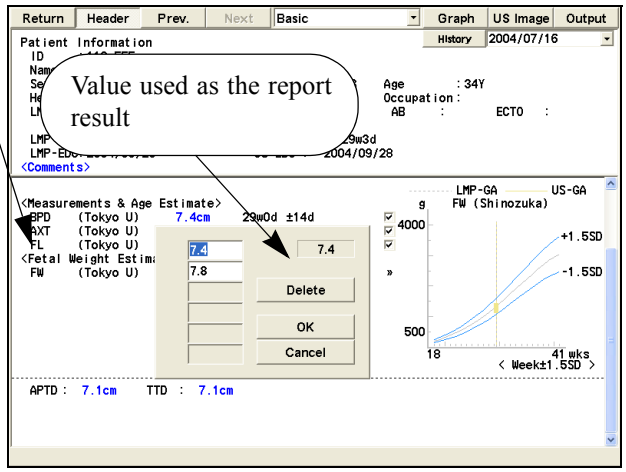
You can delete or modify the measurement results in a report.

[Remark]
You can only edit values displayed in yellow.

<Operation method>

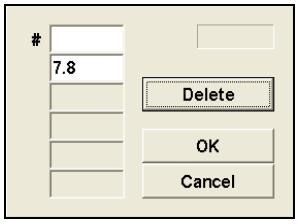
(1) Move the arrow to the measurement value, and press the ENTER switch.

→ The Edit dialog box is displayed.
All of the measured values are displayed.

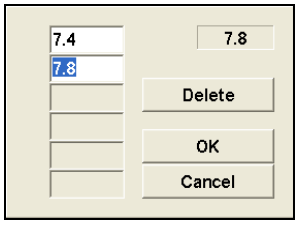


(2) Delete:
Select the measurement value to be deleted, and press Delete.

→ The specified measurement value is deleted, so select OK.

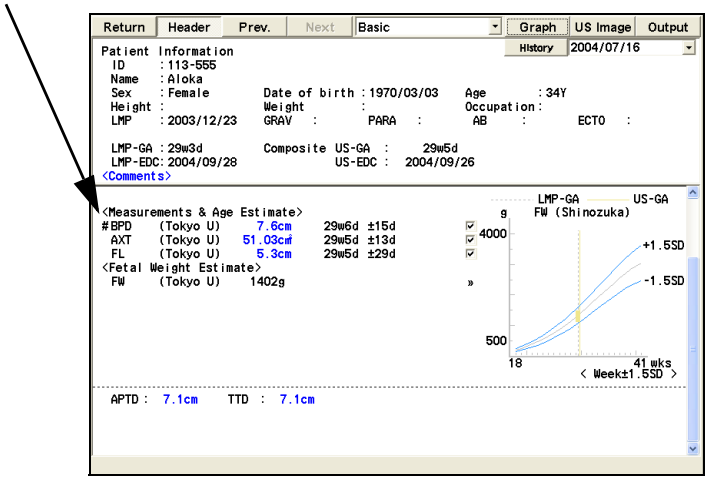


(3) Modify:
Select the measurement value to be modified, enter the new value from the keyboard, then select OK.



→ Displaying a modified measurement value

The mark "#" is attached to the beginning of a measurement item that was modified by entering a numerical value.



[Remark]

Like PI and RI measurement, there are two items of blood flow velocity data (PSV and EDV) within the period between two heartbeats that are mutually related.

Perform an editing operation so as to maintain the mutual time phase relationship.

(4) Change to a different measurement value:

You can change a measurement value displayed on a report to a different measurement value.

→ The displayed color of the selected part changes, so press OK.

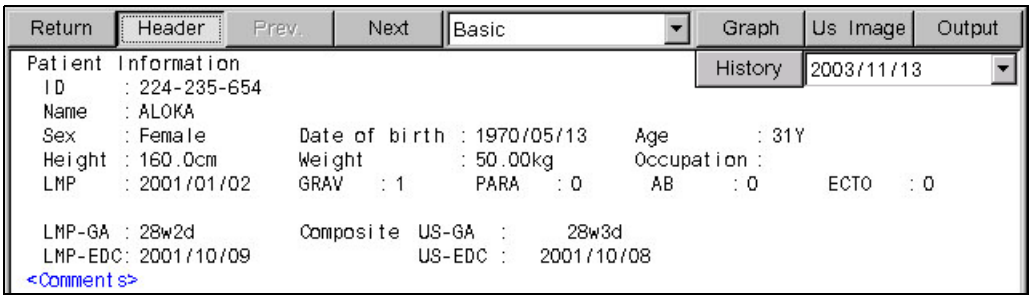
[Remark]

On setting of "Always display the latest measurement value (last measurement value) on the report screen", it is possible to set another measurement value. When the setting is made to the average, there is no difference on what measurement value is selected since all measurement values are averaged.

(Refer to Section 5-5-2. "PRESET list" Report Data)

5-4-3. Description of Various Data Displayed in a Report

5-4-3-1. Patient Information



The meaning of Patient Information displayed in an obstetrical measurement report is as follows.

LMP	: Date of the last menstruation period
GRAV	: Number of gravida
PARA	: Number of para
AB	: Number of abortions or miscarriages
ECTO	: Number of ectopic pregnancies
LMP-GA	: Gestational week calculated from the date of the last menstruation
LMP-EDC	: Expected confinement date calculated from the date of the last menstruation
Composite US-GA	: Mean gestational week calculated from the measured GA
Composite US-EDC	: Expected confinement date calculated from the measured GA

[Remark]
Composite US-GA (EDC) is the mean value of the gestational week obtained from the GA measurement registered in the report.
When the Composite US-GA is demanded, it is possible to set the calculation with whether the currently selected Study(One Study) or all studies (All Study) with preset. On the factory default, it is set on the calculation of all studies (All Study).
If you obtain the mean value only for the currently selected study, set the number of studies used with preset to one. (Refer to Section 5-5-2. "PRESET list" Study Assignment.)

[Remark]
If an input other than LMP (BBT, EGA, EDC or GA) is made using the ID screen, the display will switch over. (BBT-GA, BBT-EDC, etc.)

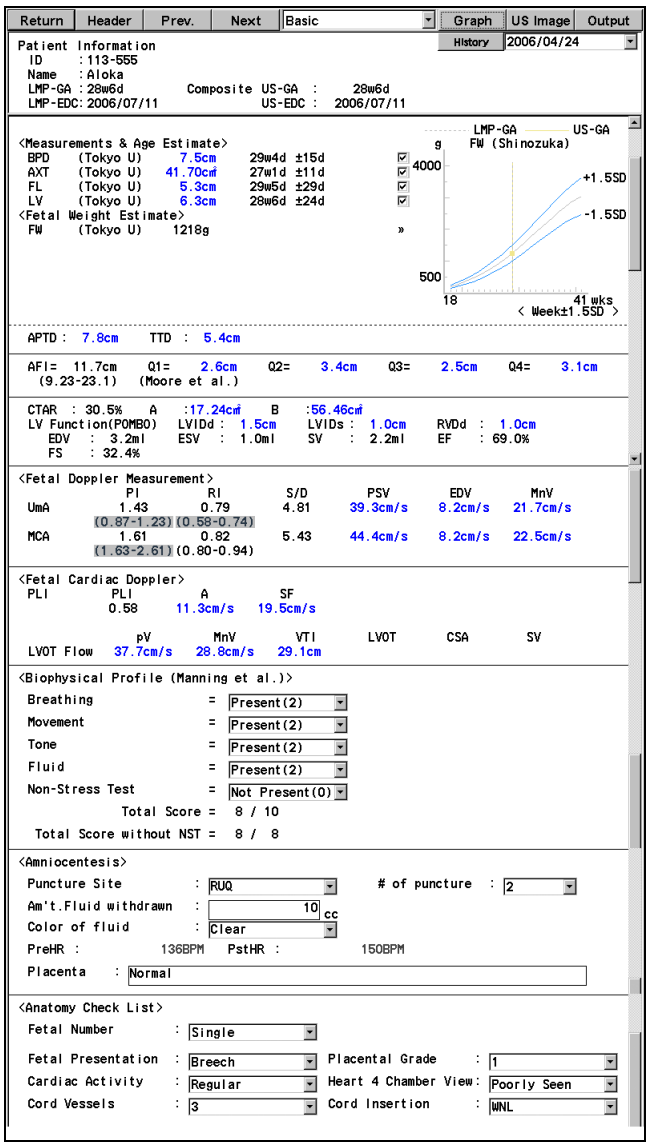
[Remark]
If you changed the Header to Short Form, only the ID, Name, LMP-GA, EDC, US-GA and EDC are displayed.

5-4-3-2. Report

The blocks that can be displayed in an obstetrical measurement report are as follows.
In each study, these blocks are combined with each other and displayed

GA, FW, Ratio Block	Other Block
Fetal Cardiac Block	Fetal Doppler Block
Fetal Cardiac Doppler Block	BPP Block
Amnio / CVS Block	Anatomy Check List Block

[Remark]
In the case of multiplet, you can set a block combination for each fetus.



GA, FW, Ratio Block

Other Block

Fetal Cardiac Block

Fetal Doppler Block

Fetal Cardiac Doppler Block

BPP Block
Amnio / CVS Block
For BPP scoring and inserting a comment concerning amniotic fluid puncture
(Refer to Section 5-4-3-6. "Biophysical Profile Scoring (BPP Scoring) Report")

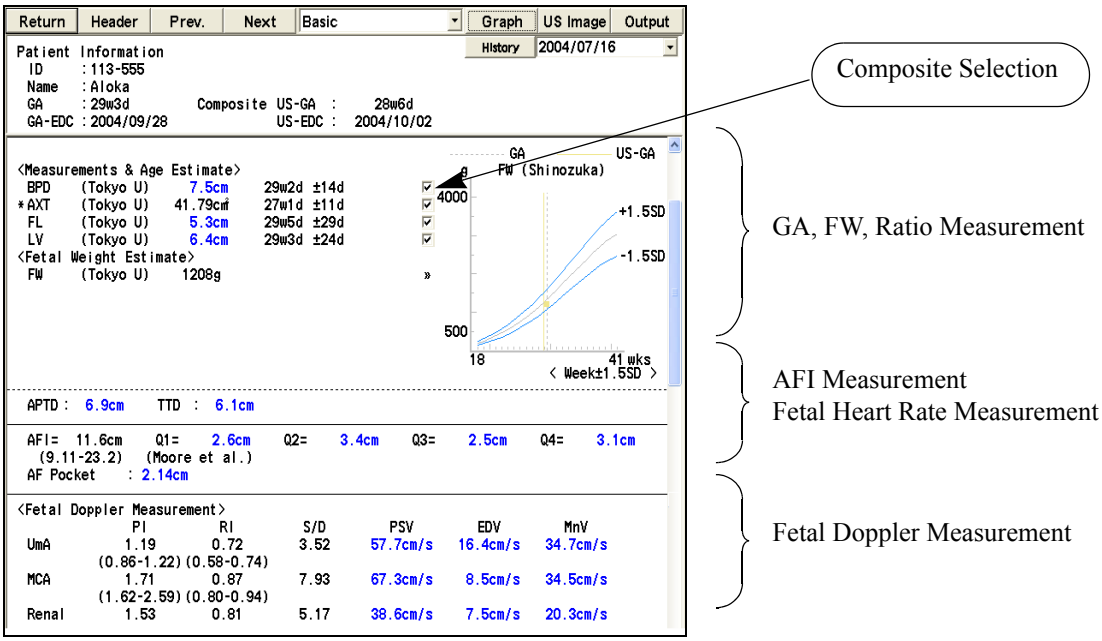
Anatomy Check List Block
For inserting anatomical comments concerning a fetus
(Refer to Section 5-4-3-5. "Anatomy Check List Report")

Fig. Display example for of each block:

[Remark]
On the factory default, you can only display some of these items.

1) Basic Report

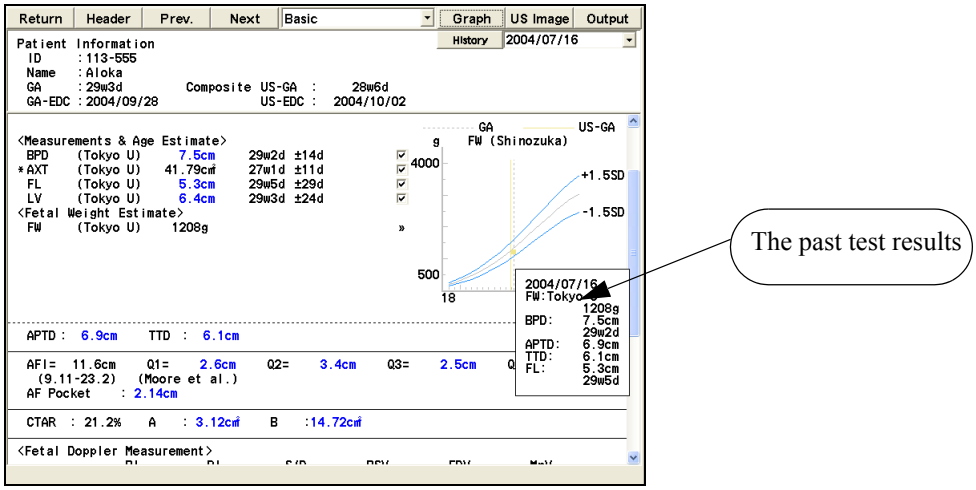
This is a display example of a basic report. The displayed items differ depending upon the measurement and preset conditions.



[Remark]
In the case where the measurement values are outside the normal range, the (normal value range) part is displayed in shaded form.
(This applies to GA measurement, FW measurement, Ratio measurement and Doppler measurement that use tables that can display the normal range.)

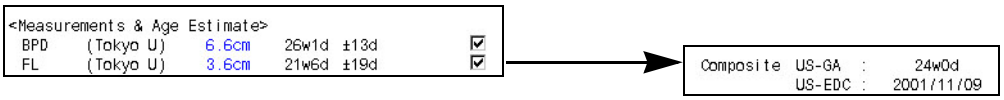
[Remark]
If a report cannot be displayed in a single page, scroll it using Prev. or Next.

[Remark]
Putting the arrow on the plot of the past, it is displayed the measurement result corresponding to the plot.

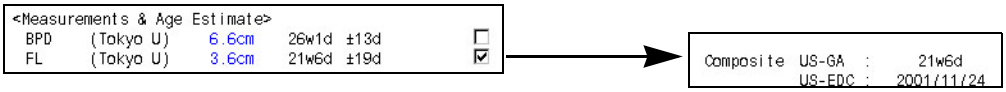


2) Composite Selection function

The Composite Selection function is a function that sets whether or not to add GA measurement registered in a report to the calculation of Composite US-GA in the Header.
If ☐ alongside the GA measurement value is checked ☑ the GA measurement is added to the composite US-GA calculation.



For a GA measurement value that you do not wish to be added to the calculation, move the arrow to the ☑ part, and press the ENTER switch. The check ☑ mark is erased, and Composite US-GA is re-calculated.



5-4-3-3. Graph function

You can select one of the following three kinds of a graph function.

(1) Gr-1: Graph that is displayed simultaneously with the results in GA, FW and Ratio Block (A Doppler Graph is displayed in the Fetal Doppler Block.)

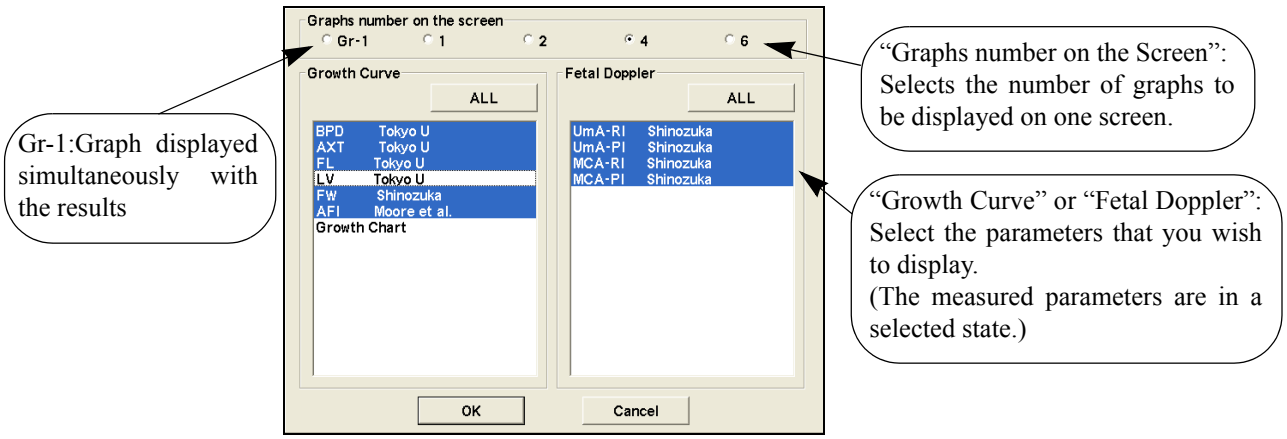
(2) GA Dating Graph: A horizontal bar graph that is displayed alongside the GA and FW values

(3) Graph 1 — 6: Between 1 and 6 graphs are displayed over the entire screen.

<Operation method>

(1) Move the arrow to the Graph on the Report, and press the ENTER switch.

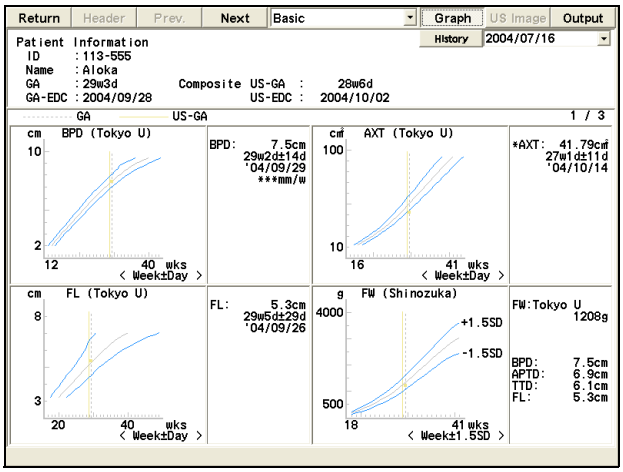
→ The Graph menu is displayed.



[Remark]
You can set the type and number of graphs to be displayed.
The measured obstetrical measurement items are in a selected state.

(2) Select the graph that you wish to display, and select OK.

→ The graph is displayed as shown in the following drawing.



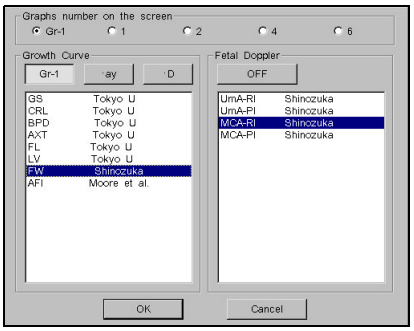
(3) To erase the graph and return to the initial status, select the Graph.

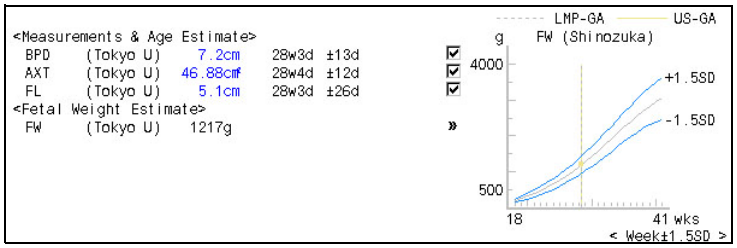
[Remark]
In addition to plots of the measurement values, each graph contains lines that indicate the LMP-GA (dotted line) and Composite US-GA (solid line).

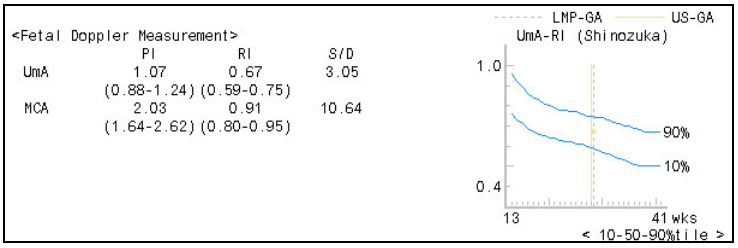
1) Display example of graph:

<Gr-1>

Displayed when the report is opened.
To change the displayed curve, set “Number of graphs on the screen” and “Growth Curve” to “Gr-1”.







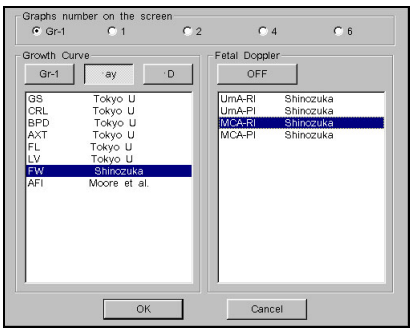
[Remark]
Gr-1 of Fetal Doppler is displayed in the Fetal Doppler Block.

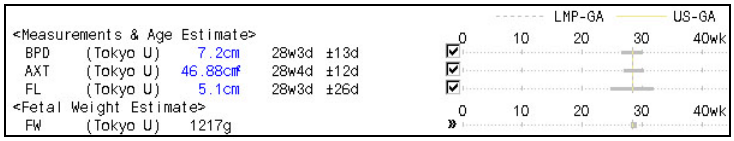
[Remark]
If the graph displayed in Gr-1 is FW Table, » appears to indicate the FW equation used by the plot on the graph.

<GA Dating Graph>

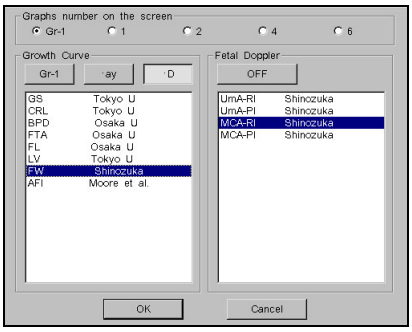
Displayed at the position of the Gr-1 graph.
You can select either ±day or ±SD.

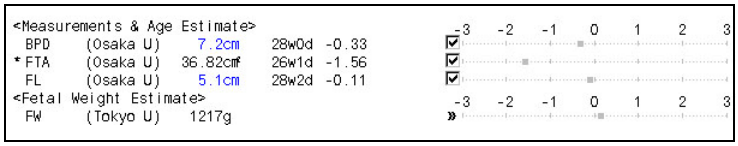
(±day)





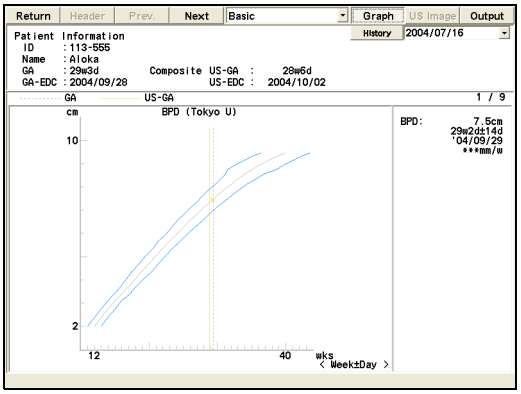
(± SD)



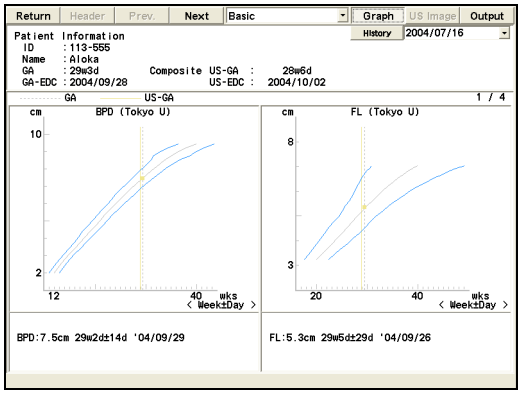


<When the number of graphs is set to 1, 2, 4 or 6>

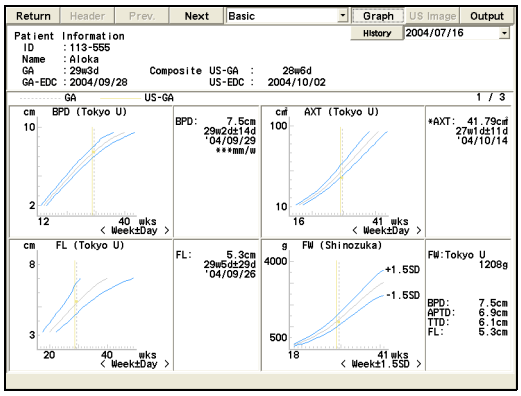
One screens



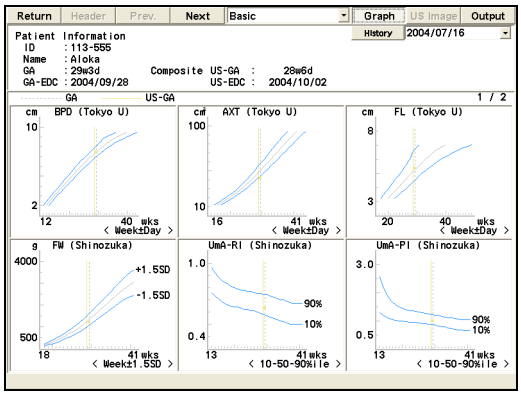
Two screens



Four screens



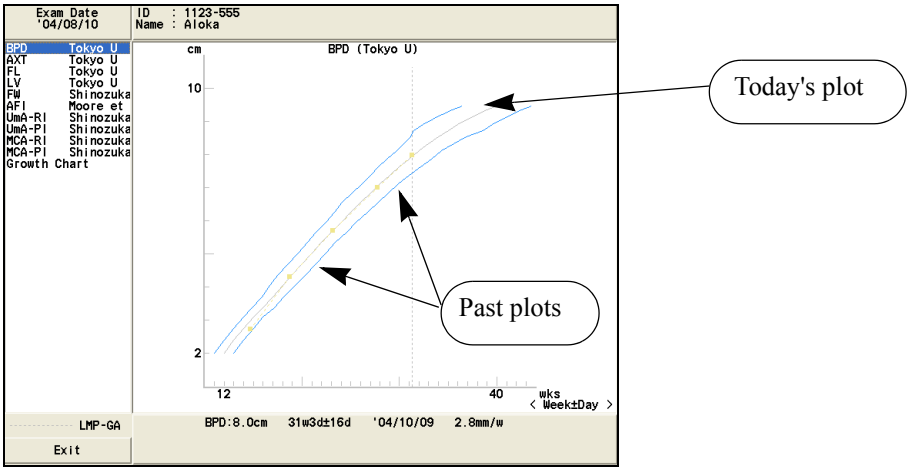
Six screens



[Remark]
You can scroll the page by selecting Prev. or Next.

2) Growth Analysis Graph

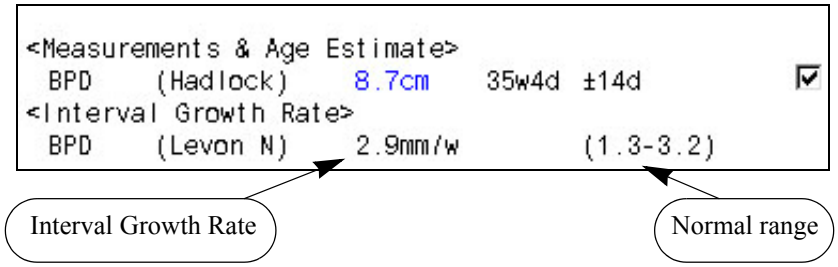
This function saves the measurement values in the case where the same patient was previously examined, and displays the previous measurement values on a graph. It enables you to observe the growth condition along with the passage of time.
If data has been saved, each time a graph is displayed the past data is also plotted.
You can display patient data registered since the most recent LMP, in the graph.
This data is used not only in the graph of the report but also in the graph on the measurement screen.



[Remark]
Putting the arrow on the plot of today or the past, it is displayed the measurement result corresponding to the plot.

5-4-3-4. Interval Growth Rate

When the Internal Growth Rate is set, it is displayed as shown below.



5-4-3-5. Anatomy Check List Report

An Anatomy Check List is “an anatomical checklist for a fetus” which is intended to observe the status of the fetus. It is displayed in the Anatomy Check List Block.

The checklist is set out in the form of questions and answers, such as “was the heart visible” or “how many fetuses are there”. You can select items from the internal and the user’s registered checklist, and set them in a preset for each study.

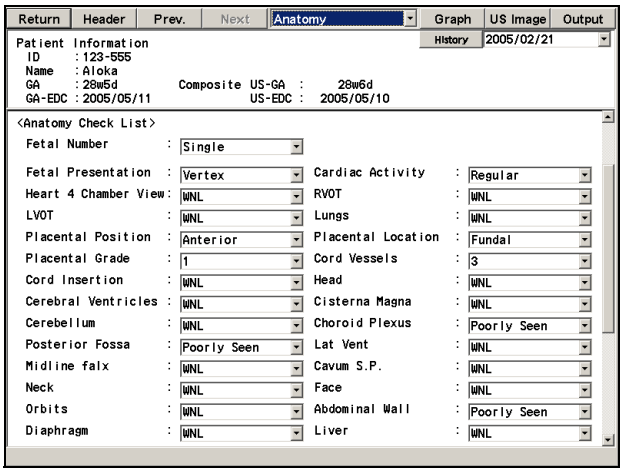
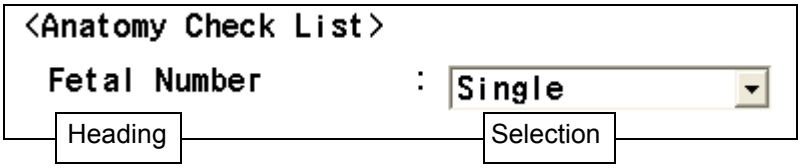


Fig. Report on Anatomy CL Study Display example

[Remark]
On the factory default, this study is not displayed.
(Refer to Section 5-5-2. "PRESET list" Study Assignment)

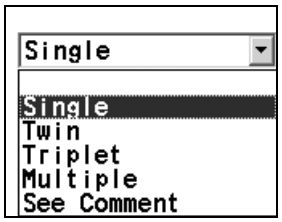
<Operation method>

A checklist consists of headings and selections.



Make a selection from the pull-down menu.

(1) Move the arrow to ▼ of the specified selection, and press the ENTER switch.
→ A selection list of opinions is displayed.



(2) Using the trackball, select a comment and press the ENTER switch.
→ The specified item is transferred to Selection, and the arrow moves to the next selection.

[Remark]
To register a number of items, repeat step (2).

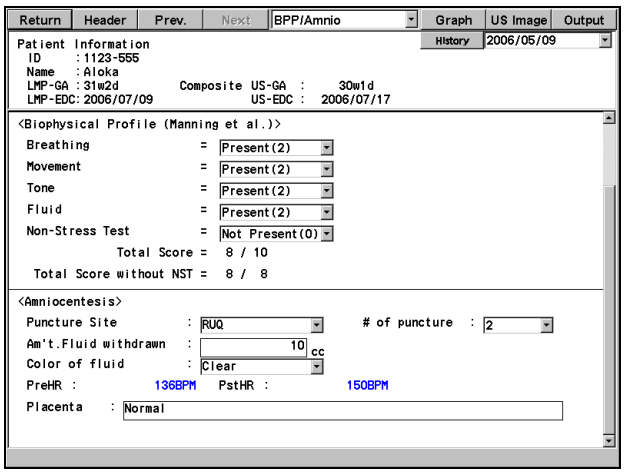
[Remark]
The built-in choices can be registered by the user. Refer to Section 5-5-2. "PRESET list"

[Remark]
On the factory default, an Anatomical check list is displayed in both Early and Twin Early studies.

5-4-3-6. Biophysical Profile Scoring (BPP Scoring) Report

Based on the data obtained from observation of ultrasound images carried out on a fetus over a relative long period of time, the examiner makes a selection according to the evaluation criterion. The corresponding score is added, and the total value is displayed. This report is used mainly for managing high risk pregnancies.

There are two evaluation criteria, that recommended by Vintzileous et al., and that recommended by Manning and et al. One criterion can be set using a preset.



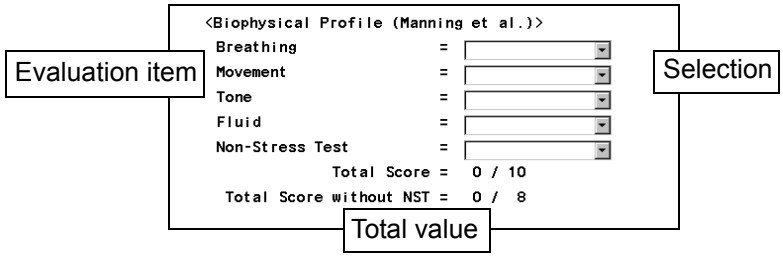
Display example of BPP/Amnio Study report

Fig. Display example of BPP/Amnio Study report

[Remark]
On the factory default, this study cannot be displayed.
(Refer to Section 5-5-2. "PRESET list" Study Assignment) BPP Scoring (Manning et.al)

<Operation method>

The checklist consists of evaluation items and result selections.



Specify an evaluation item from the pull-down menu.

(1) Move the arrow to ▼ in the specified text box, and press the ENTER switch.
→ The selection list is displayed.

(2) Using the trackball, select a name, and press the ENTER switch.
→ The specified item is transferred to the text box.
The number in parenthesis is transferred to Total Score.

[Remark]
In the BPP of Manning et al., there are two selections, Present (2) and Not Present (0).
Also, the Total Score with the exception of the Total Score without NST is displayed.
In the BPP of Vintzileous et al., there are three selections, Present (2), Equivocal (1) and Not Present (0).
Refer to 5-6-3.BPP Scoring.

5-4-3-7. Amnio/CVS Report

This report displays the examination results of Amniocentesis or Chorionic Villus Sampling.
You can enter comments concerning the change in the heart beat of the fetus or the amniotic fluid before and after sampling.

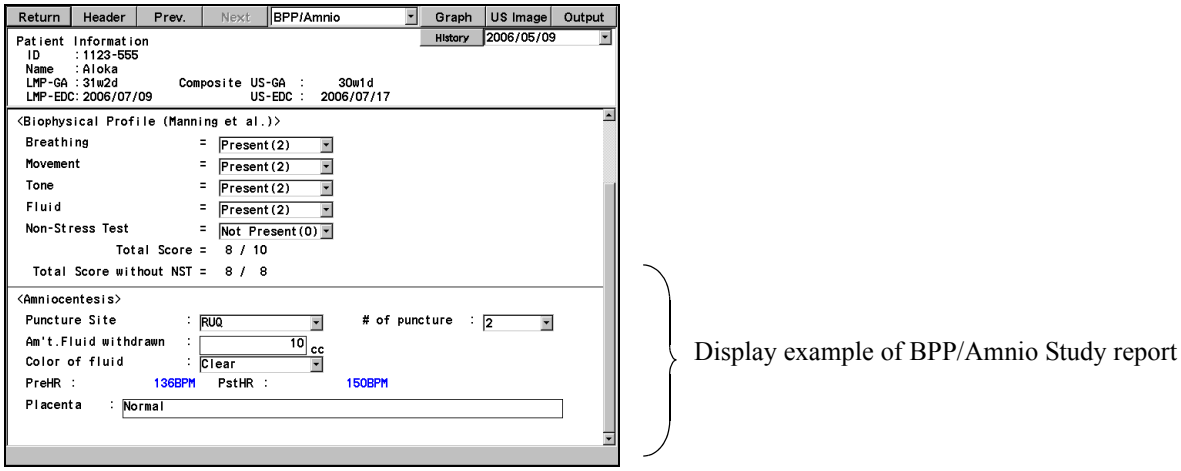


Fig. Display example of BPP/Amnio Study report

[Remark]
On the factory default, this study cannot be displayed.
(Refer to Section 5-5-2. "PRESET list") Example of Amniocentesis

[Remark]
The results of either one (but not both) of amniocentesis and chorionic villus sampling are displayed in the report. The displayed contents of both are the same.

<Displayed contents>

(1) Puncture Site
Select one of the following parts as the puncture site, from the pull-down menu.
RUQ : Right Upper Quadrant
RLQ : Right Lower Quadrant
LUQ : Left Upper Quadrant
LLQ : Left Lower Quadrant

(2) # of puncture(number of puncture operations)
Enter the number of times that a puncture operation was performed for the selected puncture site in Puncture Site.
Specify the number of times from 1 to 10 from the pull-down menu.

(3) Am't Fluid withdrawn (amount of amniotic fluid sampled)
Enter the amount of amniotic fluid obtained by puncturing, from the keyboard.

(4) Color of fluid (nature of the amniotic fluid obtained by puncturing as seen with the naked eye)
Specify the nature of the amniotic fluid obtained by puncturing as seen with the naked eye, from the pull-down menu.
You can make a selection from Clear, Bloody and Dark. You can also enter a comment from the keyboard.

(5) Fetal Heart Rate
The values of the fetal heart rate (PreHR and PstHR measurement) obtained by the M mode or D mode measurement before and after the amniocentesis are displayed as data for managing stress that arises when the fetus is punctured.

(6) Placenta
Enter a comment concerning the placenta from the keyboard.

5-4-3-8. Report of multiplet

If a multiplet study is selected, the report will change over to a multiplet display.
In the case of a multiplet study, the displayed report is divided into Fetus a, Fetus b and Fetus c.

For the method of changing over from one fetus to another in a multiplet study, refer to Section 5-3-4. "Multiple pregnancies".

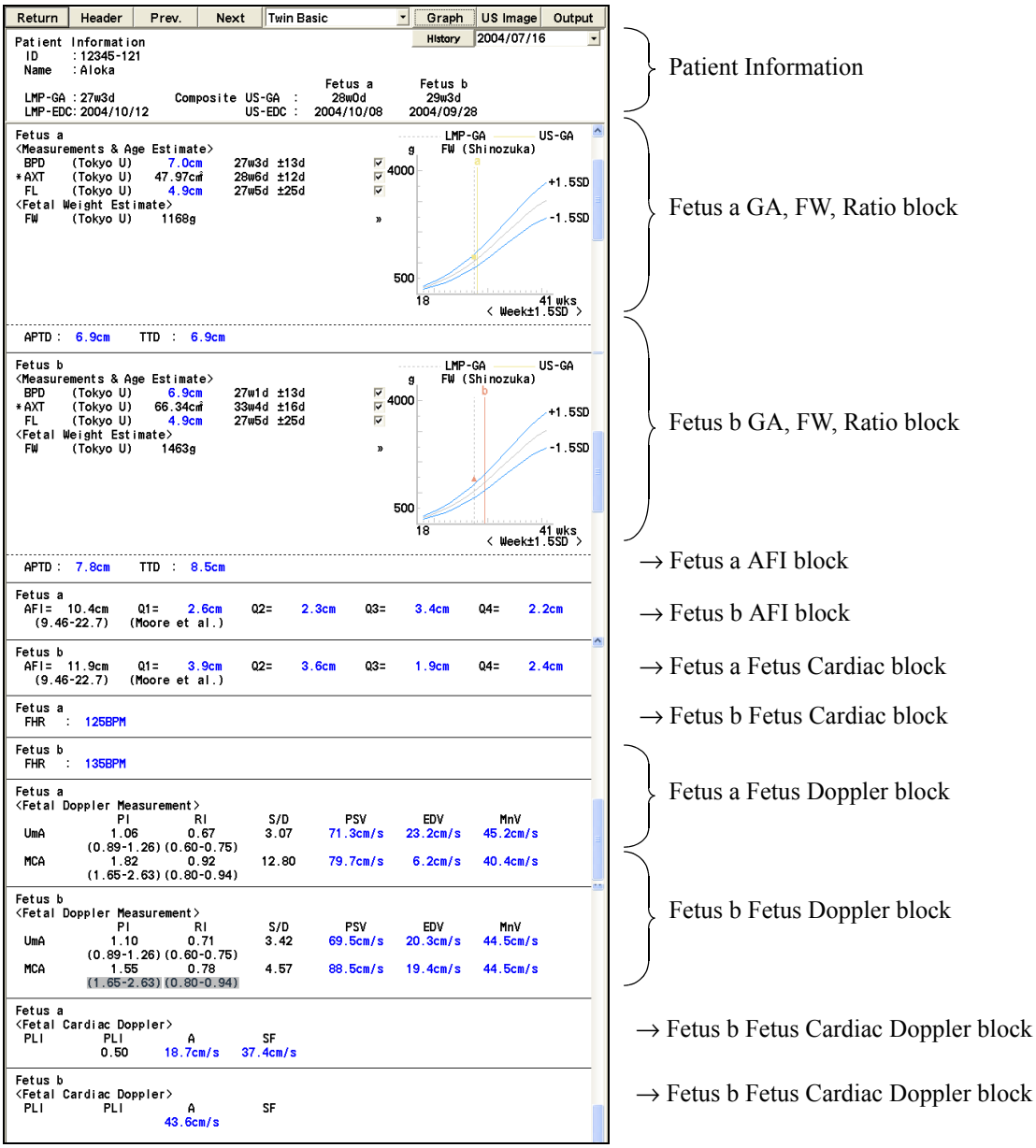
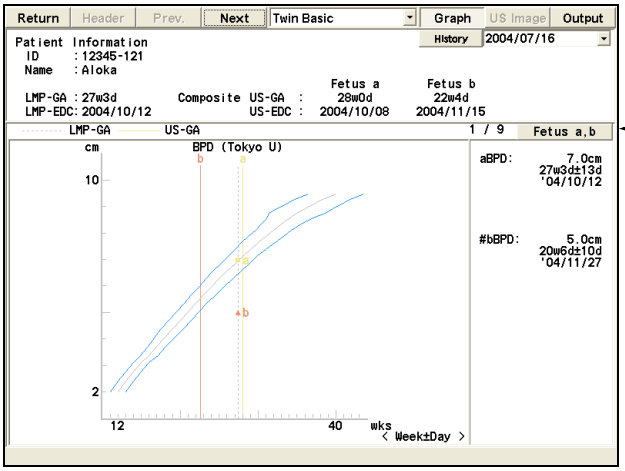


Fig. Twin extended report example

[Remark]
In the case of a multiplet study, Composite US-GA (EDC) is calculated for each fetus.

[Remark]
Only one graph is displayed in the report (1, 2, 4 or 6 screen display), even in the case of multiplet.

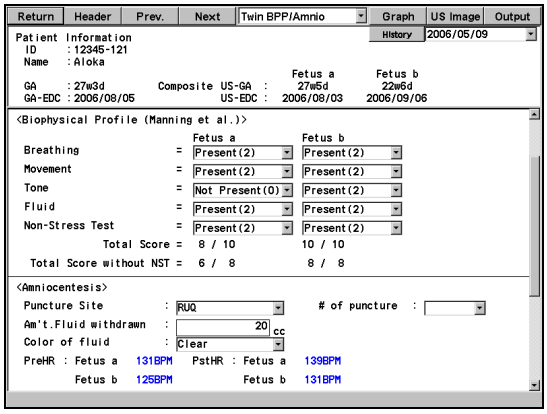
In this case, the respective plots are marked a and b, (c).
If you wish to display a graph for each fetus, press the Fetus a, b, (c) button.
The graph display will switch through Fetus a → Fetus b → (Fetus c) → Fetus a, b, (c).



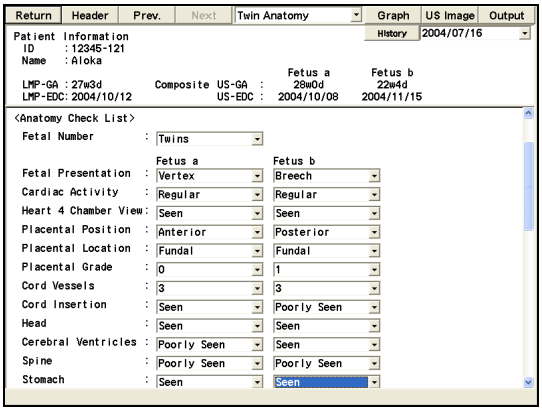
Fetus display changeover button

[Remark]
You can display plots of past studies, even for a multiplet graph

Twin extended report example BPP/Amnio Report



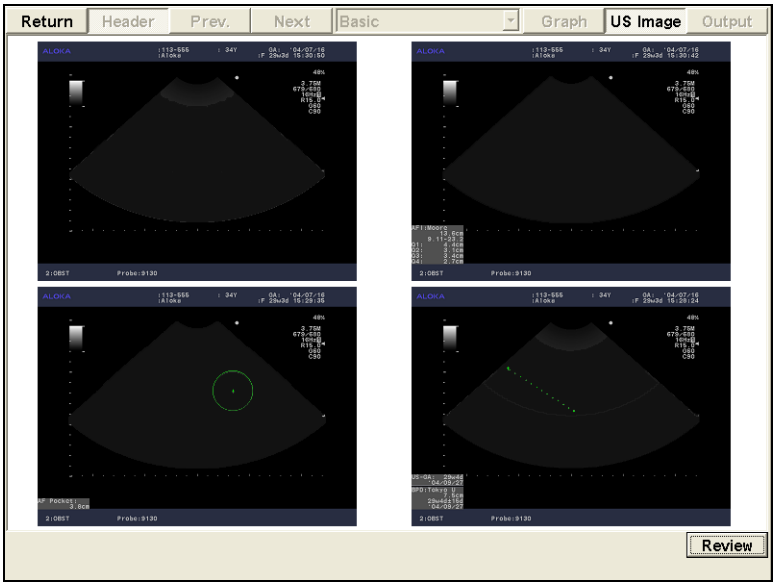
Twin extended report example Anatomy Check List Report



5-4-4. Function that Attaches an Ultrasound Image to a Report

This function automatically displays the current ultrasound image acquired by the examiner in the US Image block of the report.
Also, by using the Review function at the bottom of the Report screen, it is possible to display all of the images stored in the connected medium (f.e. HDD and external media such as USB memory) as thumbnail images. You can also select one of these images, and display it in the report.

When you select US Image on the report screen, the US Image block (ultrasound image page) is displayed.



To return to a normal report, select US Image once again.

5-4-4-1. Images that can be attached to a report

Images that can be attached to a report are the various ultrasound images of the same patient that are stored in the connected medium (f.e. HDD and external media such as USB memory) at the storage destination.

5-4-4-2. Limit for holding attached images

Attached images are held until the New Patient function is executed.

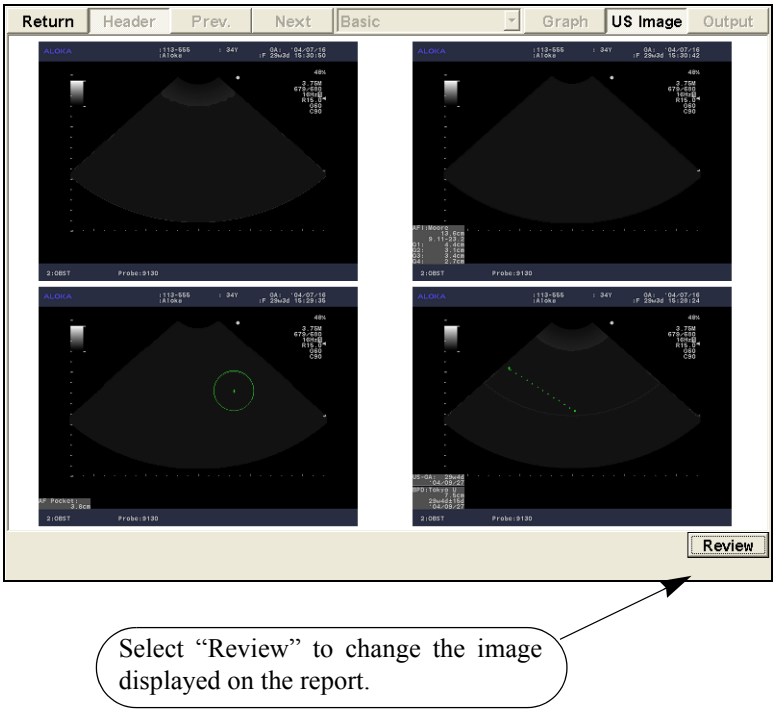
5-4-4-3. Method of attaching images

1) Auto Paste function

The number of images set using the Preset function is automatically selected from the latest images stored in the connected medium (f.e. HDD and external media such as USB memory) and displayed on the US Image block.

[Remark]
The number of displayed images and the display format can be set only by the Preset function.
The factory default settings are Display Pasted US Image Form on the Screen: 2 × 2, and Number of US Images to be Automatically Displayed: 4.

The figure at right shows examples of factory default settings.



Regarding the display sequence, the images are automatically pasted from the latest recorded image, from top left to bottom right.

[Remark]
You can set the format of an image displayed on the Report screen to 1 × 1, 2 × 2, 3 × 2 or 3 × 3.

2) Manual Paste function

This function enables you to change the automatically attached image to another image, or to add an image.

<Operation method>

(1) Select Review at bottom right of the US Image block screen.

→ All of the images of the patient concerned that are stored in the connected medium (f.e. HDD and external media such as USB memory) are displayed as thumbnail images.

(2) Move the arrow to the image that you wish to display, and press the ENTER switch.

→ The selected image is displayed with a blue border.

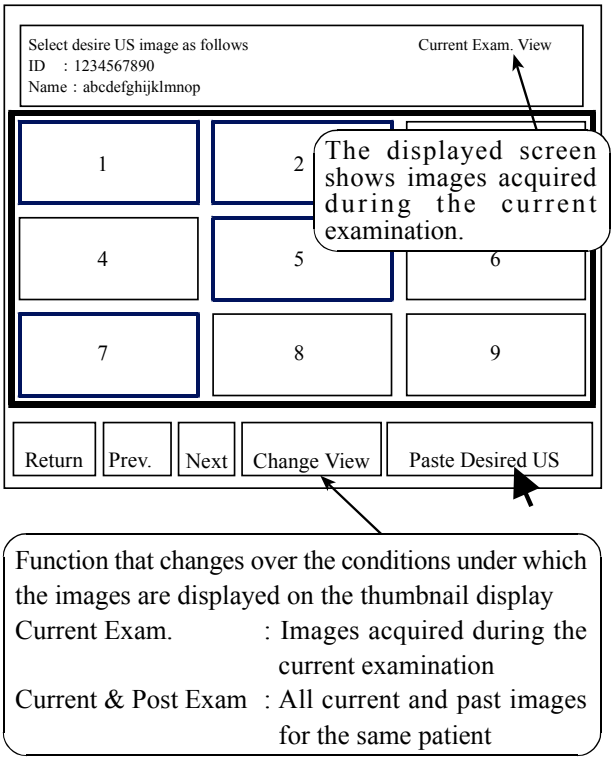


Fig. Thumbnail display

[Remark]
If you wish to select a number of images, repeat step (2). Pressing the ENTER switch on the selected image erases the blue border.

(3) Move the arrow to Paste Desired US, and press the ENTER switch.

→ The selected image is displayed in the US Image block.

[Remark]
Regarding the “Change View” function
By selecting Change View at the bottom of the thumbnail display, you can also display past images for the same patient as a thumbnail display.

[Remark]
Each time you select Change View, the display conditions switch over between “current image only” and “current and past images”. The particular set of conditions displayed is indicated at top right of the thumbnail screen.

5-4-5. Printing Function

This function outputs the entire report data to a dedicated local printer via a USB interface.
The printed data is a text data, graphical data or ultrasound image.

5-4-5-1. Operation sequence

(1) Select Output.

→ A select device dialog box is displayed.

(2) Select to Printer, and press OK.

→ The Print Data Selection dialog box is displayed.

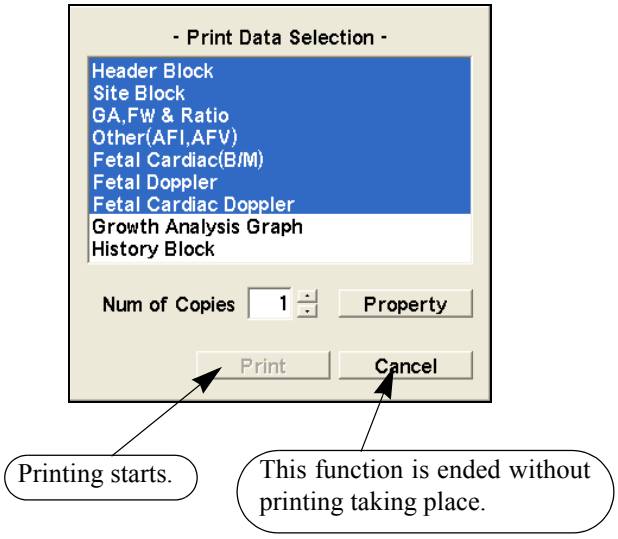
(3) Select the block that you wish to print.

→ The selected block name is highlighted in blue.

[Remark]
To cancel the selection, re-select the same block.

(4) Enter the number of copies, and select Print.

→ Printing starts, and the dialog box closes.



5-4-5-2. Property function

This function enables you to make the minimum necessary detailed settings for a local printer and a B/W digital printer.

(1) Printer name : Select the model of the printer to be used.

(2) Paper sizes : Set the size of the paper to be used. (US letter, A4 alternative selection)
The function does not operate when a digital black and white printer is selected.

(3) Title Inform : Enter the Report Title information
You can enter up to 80 characters. The print position is always Center.

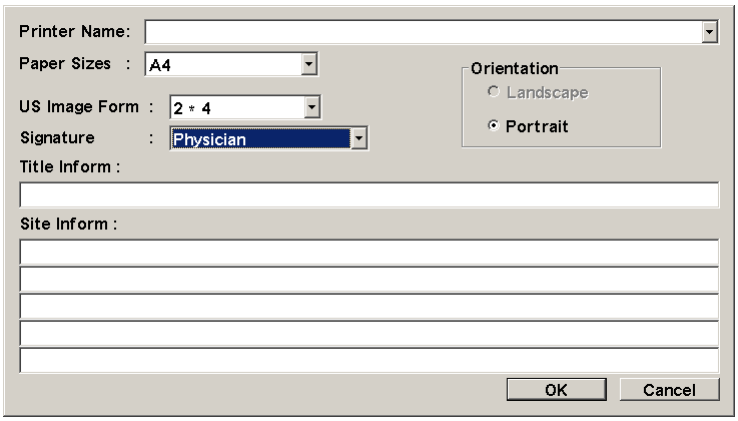
(4) Site Inform : Enter the facilities information (department, address, telephone No., FAX No., etc.).
You can enter up to 80 characters × 5 lines. The print position is always Center.

(5) Orientation : Set the orientation of the paper.
At present, the orientation is set to Portrait (vertical direction printing) only.

(6) US Image Form : When printing the US Image block, you can change the printing format to 1 × 2, 1 × 3, 2 × 2 or 2 × 4.
The function does not operate when a digital black and white printer is selected.

(7) Signature : Selects if the Signature field is set as Physician only, both Physician and Sonographer, or no field is displayed (None).

[Remark]
These settings are held subsequently so long as they are not renewed.



5-4-6. Output to a Personal Computer

This function outputs the entire report to a personal computer using an RS-232C interface.

5-4-6-1. Operation procedure

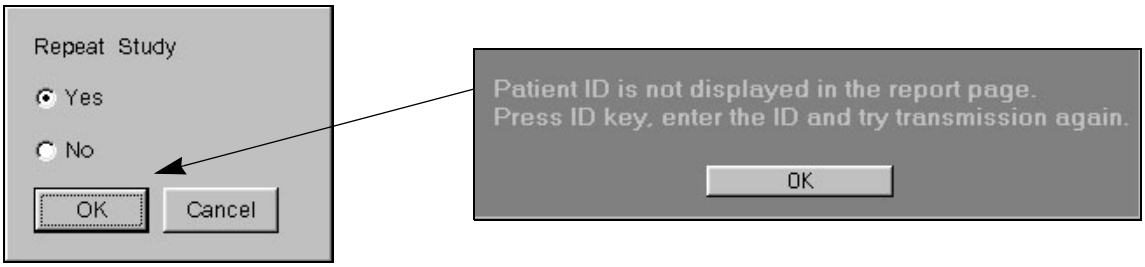
(1) Select Output.

→ The Select Device dialog box is displayed.

(2) Select to PC.

→ The "Repeat study" dialog box is displayed.

[Remark]
If an ID is not input, a message to that effect will be displayed.
Press the ID key on the front panel.



(3) If you wish to repeat a study, select Yes and press OK.

→ Communication starts.

[Remark]
If you select Cancel, the system returns to the status that existed prior to the execution of this function.

[Remark]
The patient data and all of the data registered in the report (excluding the ultrasound image data) is output data to a personal computer.

5-4-7. Output to a CSV file

This function outputs the values registered in the report (measured values and calculated values) and the comment data to the connected medium(f.e. external media such as USB memory) as a CSV file.

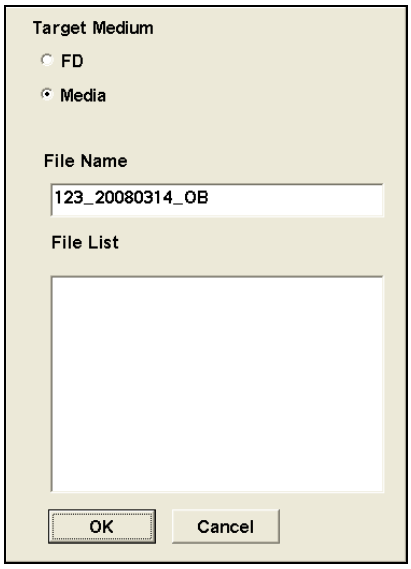
5-4-7-1. Operation procedure

(1) Select Output.

→ The “Select device” dialog box is displayed.

(2) Select the Export CSV File.

→ The media selection dialog box appears.



[Remark]
The filename is automatically attached by means of [ID- Date Application], but can be changed by entering the desired name from the keyboard.

(3) Select the medium, enter the filename, and then press OK.

→ The data is written to the selected medium.

[Remark]
If you select Cancel, the equipment will return to the condition that existed prior to the execution of this function.

[Remark]
When you open the CSV file, the patient information, numerical values and comments appear in that sequence.

5-5. Preset function

5-5-1. Preset Settings

The obstetrical measurement preset consists broadly of the following three functions.

(1) Create Measurement Tools= Settings related to the measurement procedure, mark size, and report display

(2) Study Assignment = Sets the menu, transfer list, report display configuration, and so on, for each study

(3) SW Assignment = Settings for assigning various measurement functions to switches for shortcut operations

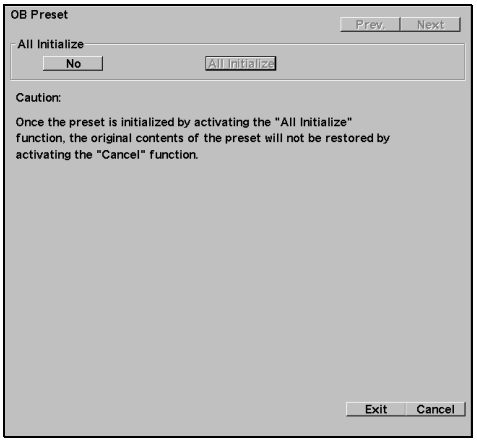
The preset functions related to obstetrical measurements and their configuration are shown below.

OB Preset					
	Create Measurement tools				Setting of the items that are common to OB measurement and Basic measurements (hereafter called items).
		Basic Measurement			Refer to Section 1-10. "PRESET FUNCTION"
		Application Measurement			Settings concerning OB measurement to be used, Mark Style and result display.
			Measurement Method & Display Items		Selection and setting of each OB measurement method, Mark Style and result display items.
				B.Mode	B mode measurement settings.
				M.Mode	M mode measurement settings.
				D.Mode	D mode measurement settings.
				F.Mode	Flow mode measurement settings.
			Caliper Mark Control		Setting of the measurement mark size and dot line. Substituted by Basic measurement preset.
			Unit Selection		Setting of the display unit for performing OB measurement. Substituted by Basic measurement preset.
			Caliper Auto Off		Setting of the measurement mark for canceling a freeze condition, and also the automatic result erasure function.
			Report Data		Selection of the method of displaying measurement values on the report (mean value or not).
				Anatomy Check List	Setting of the Anatomy Check List.
			Display Form		Setting of OB measurement result display style.
				Mark Display	Setting for displaying a caliper mark.
			Built-in & User-Defined Table		Built-in obstetric table and equation list and user definition.
				GA Table	Built-in gestational age in weeks table list and user definition.
				FW Equation	Built-in fetal weight equation list and user definition.
				FW Growth	Built-in fetal weight growth graph table list and user definition.
				Fetus Ratio	Built-in fetus ratio measurement list.
				AFI Table	Built-in AFI measurement standard value table list.
				Doppler Table	Built-in obstetric Doppler measurement standard value table list.
				Interval Growth Rate	Built-in Interval Growth Rate table list.
				User's Name	New measurement area name registration.
			User’s Calculation		Function is for making the registration of calculation formulas voluntarily by user.
				Reserved Word	Function is for making the registration name(Reserved Word) voluntarily by user.

OB Preset				
	Study Assignment			Setting of measurement menu registration, report display configuration, and transfer list for each Ultrasound Examination Study.
		Defined study name		Basic, Early, Twin Basic, Twin Early.
			OB Program	Selection of a measurement registered in the menu and a measurement registered on the report.
			GA FW Ratio	Registers gestational age in weeks tables, fetal weight measurements, and ratio equations.
			Other	Registers amniotic fluid index, fetal cardiac function, and Doppler measurement report display.
			Anatomy Check List Assign	Setting of the check list to be displayed on the report.
			Graph Number	Displays and registers fetal graphs displayed in reports.
		Menu Assignment		Function that enables a measurement menu to be created and edited from the contents set by OB-Program.
		Combined Report Display		Function that enables the configuration of a report to be edited.
		Other		Function that enables a selection of whether or not to display a measurement operation guide message.
	SW Assignment			Setting of registration of the direct execution switches.
		+ Mark Key Assignment		Function that assigns the basic measurements to be executed when the + switch is pressed.
		Hot Key Assignment		Function that assigns the measurement function that operates when a specific alphabet key is pressed.
		Measure SW Assignment		Function that assigns the measurement function that operates when the User switch is pressed.
		Control Menu Assignment		Assigning the control menu on the touch panel.

5-5-2. PRESET list

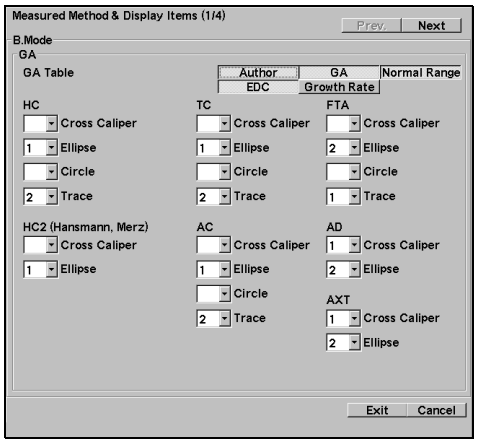
- OB Preset
  Returns the registered contents to their default settings.



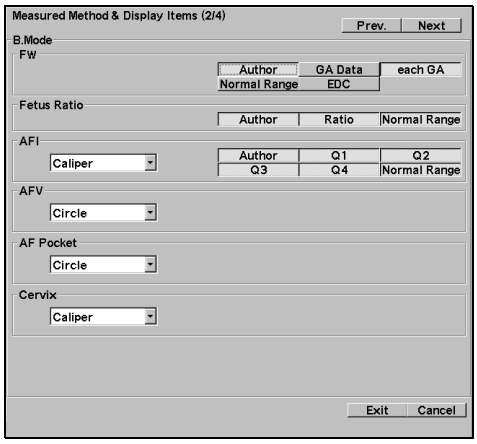
- Create Measurement Tools
  Basic Measurement

Refer to Section 1.

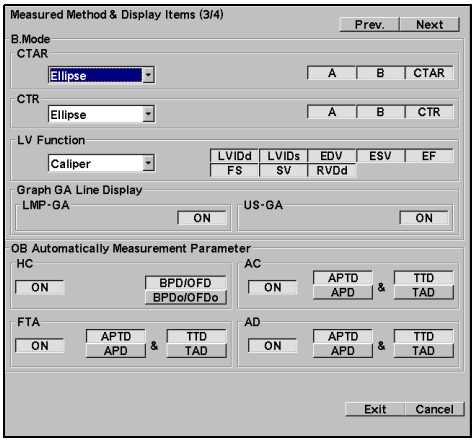
- Measured Method & Display Items1/4
  B mode measurement settings 1



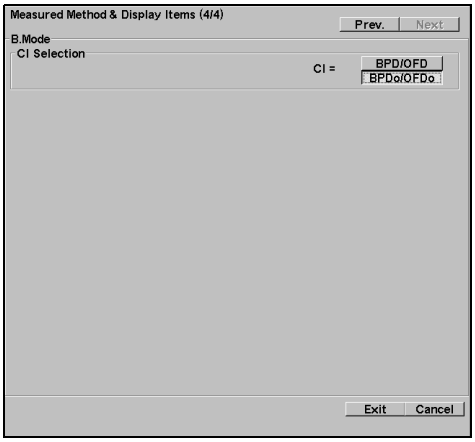
- Measured Method & Display Items 2/4
  B mode measurement settings 2



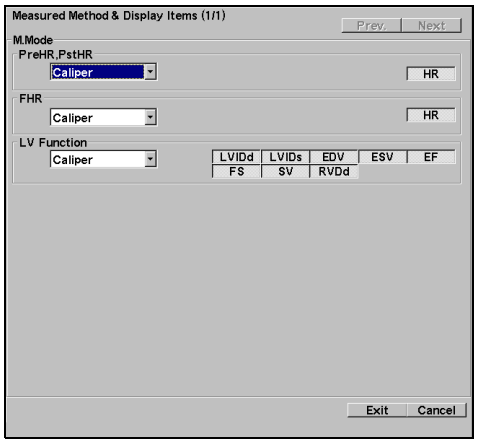
- Measured Method & Display Items3/4
  B mode measurement settings 3



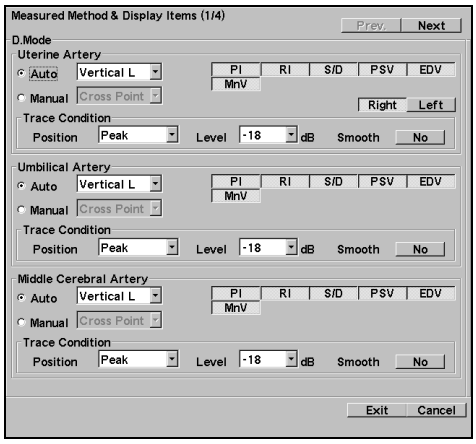
- Measured Method & Display Items4/4
  B mode measurement settings 4



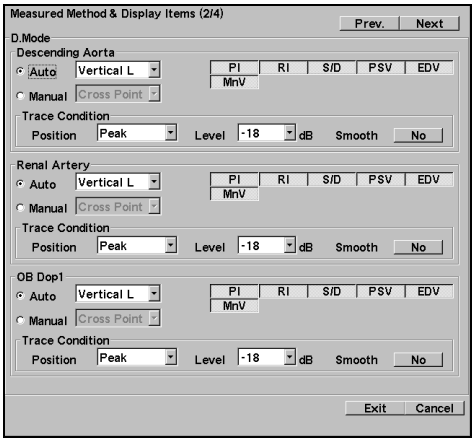
- Measured Method & Display Items1/1
  M mode measurement settings



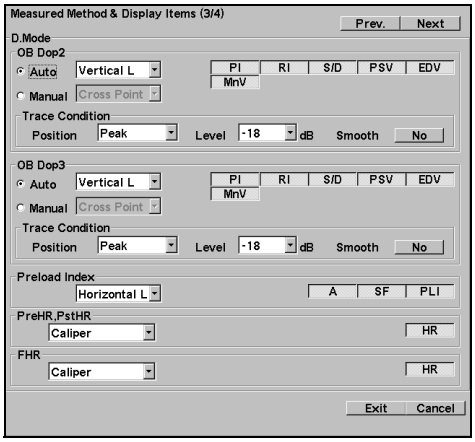
- Measured Method & Display Items1/4
  D mode measurement settings 1



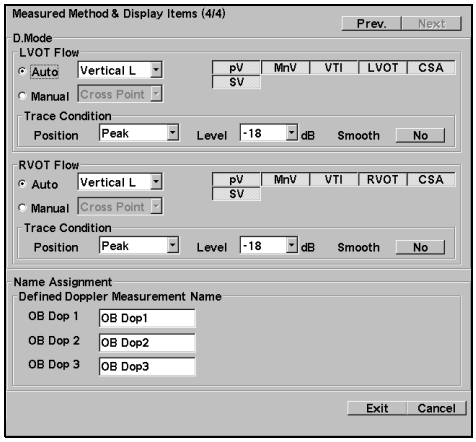
- Measured Method & Display Items2/4
  D mode measurement settings 2



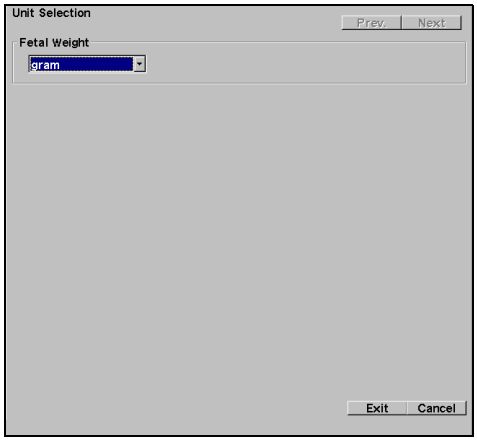
- Measured Method & Display Items3/4
  D mode measurement settings 3



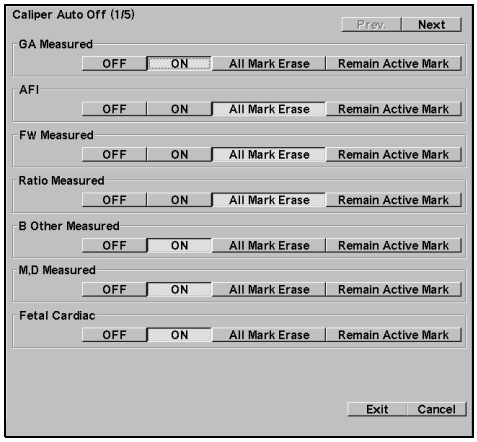
- Measured Method & Display Items4/4
  D mode measurement settings 4



- Unit Selection
  Fetal weight unit switching (gram→ Pound)

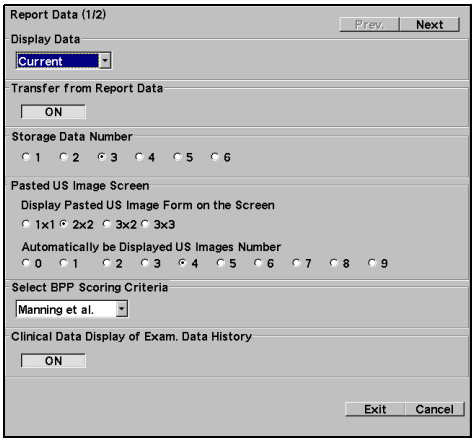


- Caliper Auto Off setting



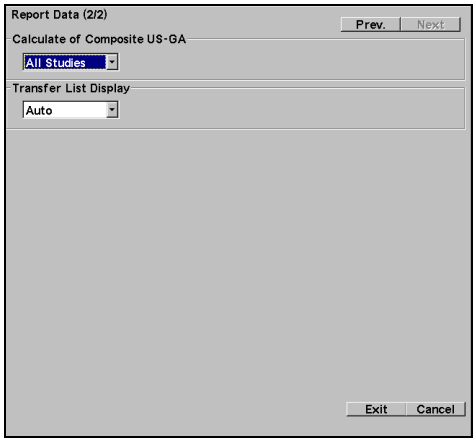
OFF : Results and marks not erased
ON : Results and marks all erased
All Mark Erase : Only marks erased
Remain Active Mark : Erases all marks other than for measurement during starting

- Report Data (1/2)



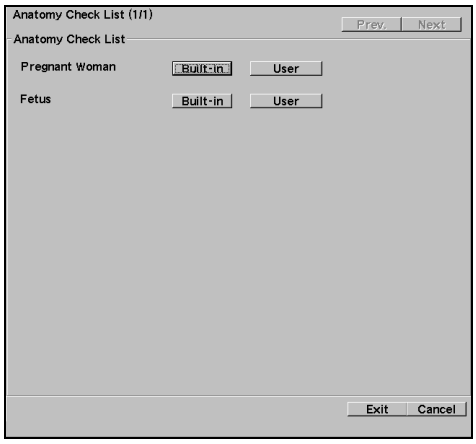
Selects either average values or the latest values and sets the number of data items registered.
Measurement data reuse ON/OFF
BPP score type selection
Pasting of Image
ON/OFF of past result display

- Report Data (2/2)



Setting of Calculation with whether the currently selected Study(One Study) or all studies (All Study)
Auto display of Transfer List Display

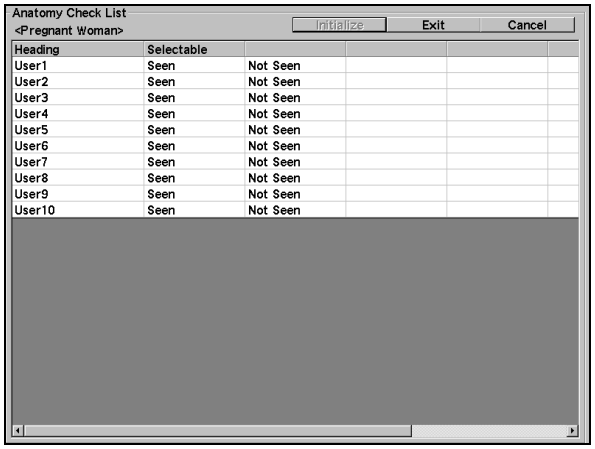
- Anatomy Check List
  Built-in checklist items, list of choices, and user registration



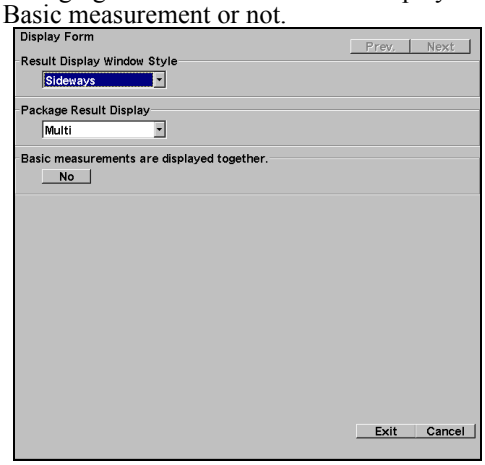
You can change (user selection) the built-in choices.

- Built-in
  The built-in choices can be registered by the user.

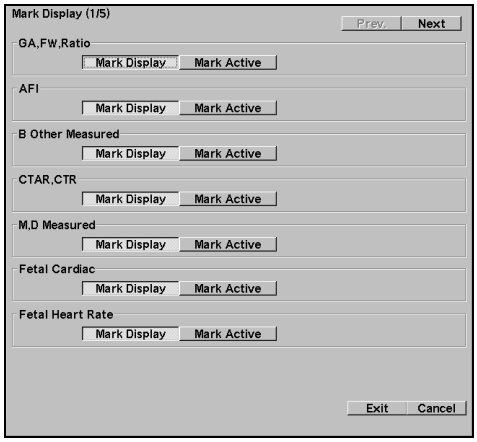
- User registration screen



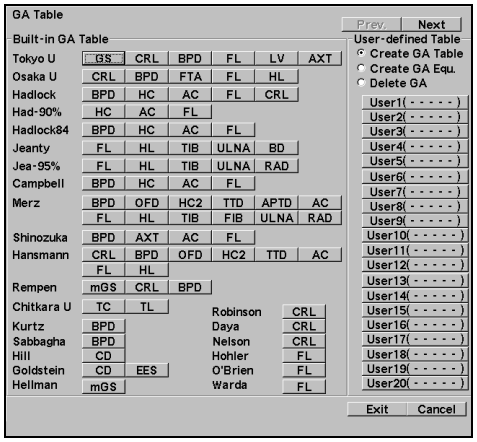
- Display Form
  Selects vertical or horizontal display and switches whether or not measurement item multiple displays display the measurements only during starting.
  Changing whether a simultaneous display with the Basic measurement or not.



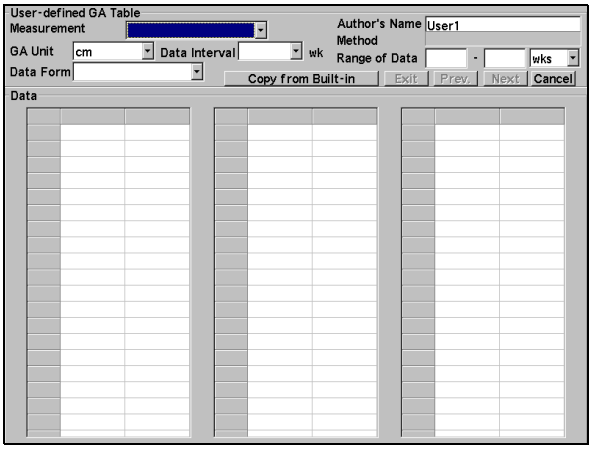
- Mark Display
  Setting for displaying caliper mark and measurement results



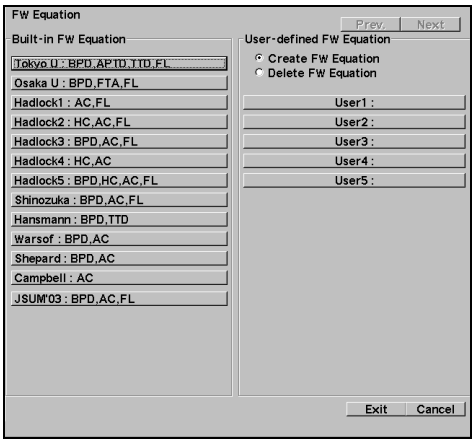
- Built-in & User-defined GA Table
  Lists the built-in fetal weight equations and those defined by the user.



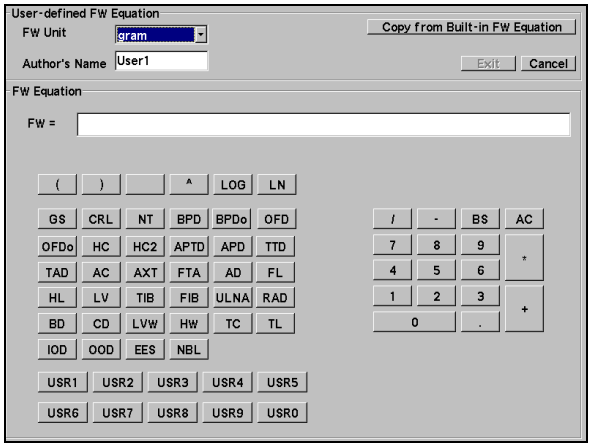
- User registration screen



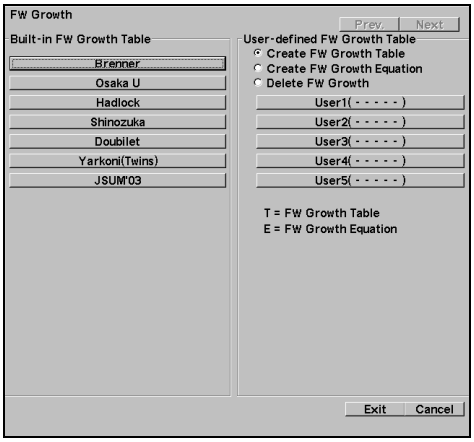
- Built-in & User-defined FW Equation
  Lists the built-in fetal weight equations and those defined by the user.



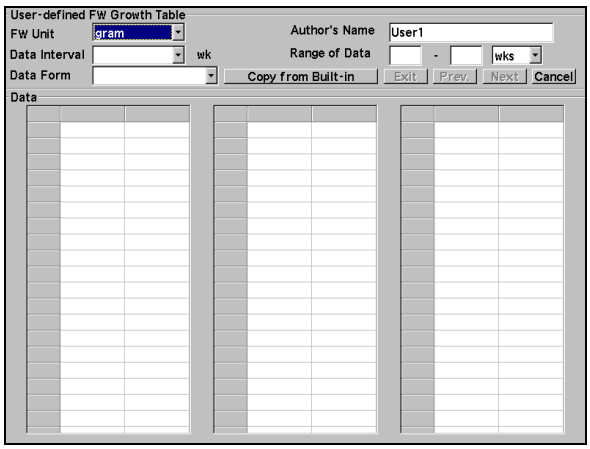
- User registration screen



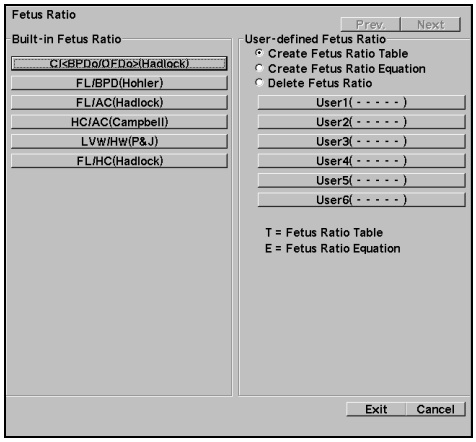
- Built-in & User-defined FW Growth
  Lists the built-in fetal weight growth graph tables and those defined by the user



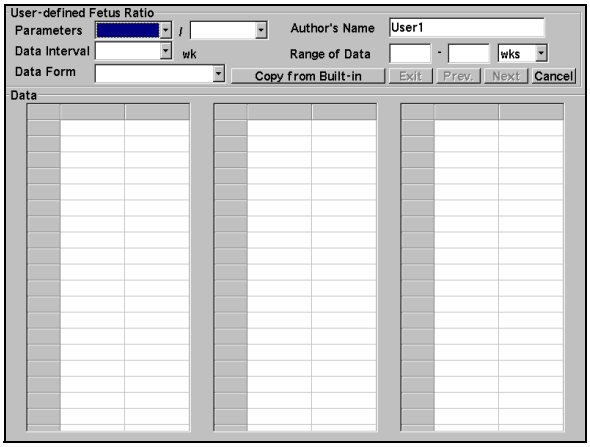
- User registration screen



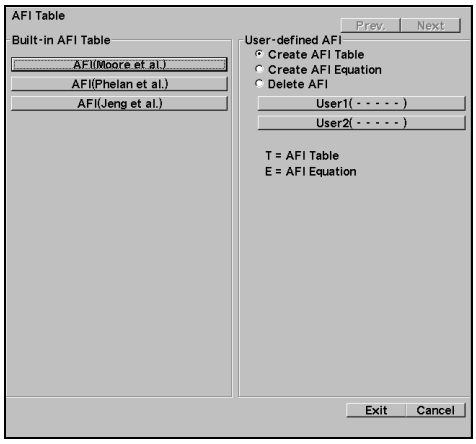
- Built-in & User-defined Fetus Ratio
  Lists the built-in fetus ratio measurements and those defined by the user



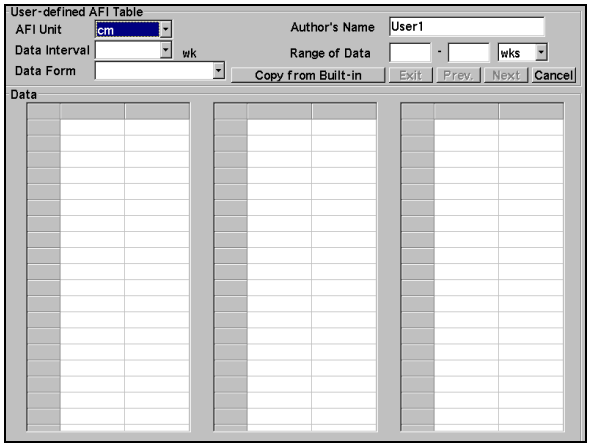
- User registration screen



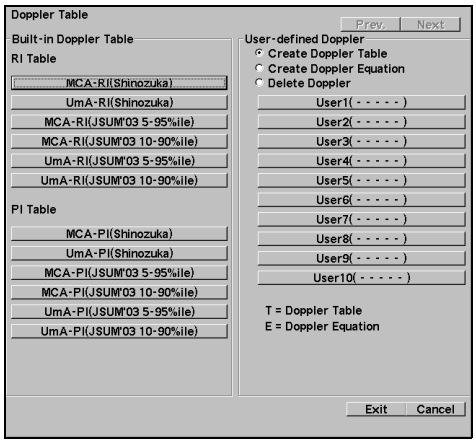
- Built-in & User-defined AFI Table
  Built-in AFI measurement standard value table list and user registration and those defined by the user



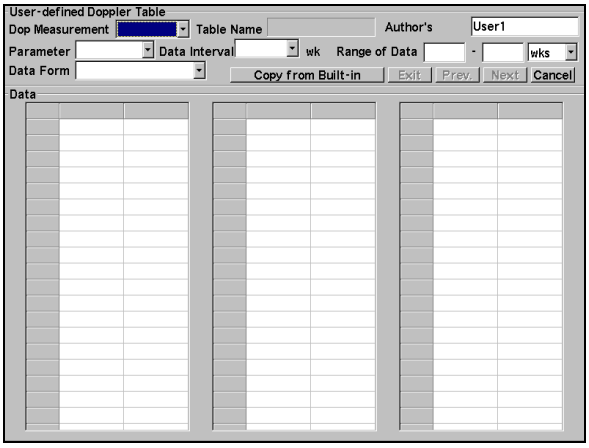
- User registration screen



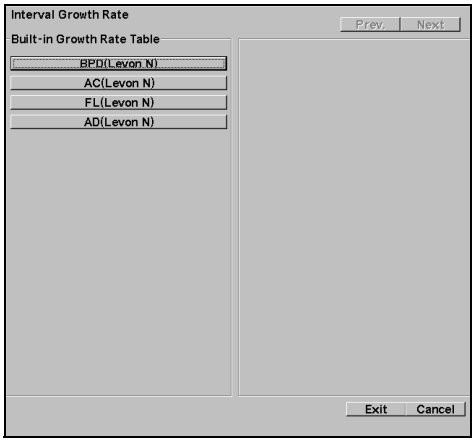
- Built-in & User-defined Doppler Table
  Lists the built-in obstetric Doppler measurement standard value tables and those defined by the user



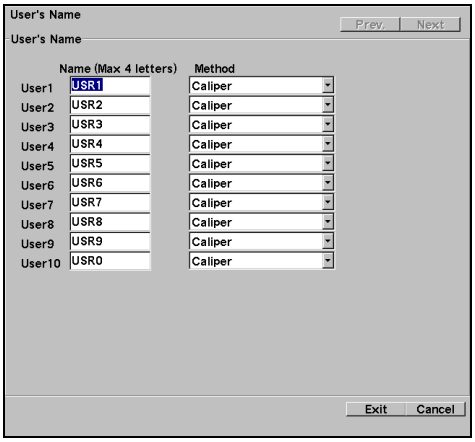
- User registration screen



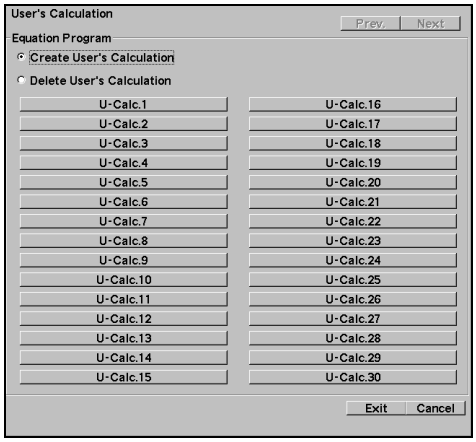
- Interval Growth Rate
  Interval Growth Rate built-in table



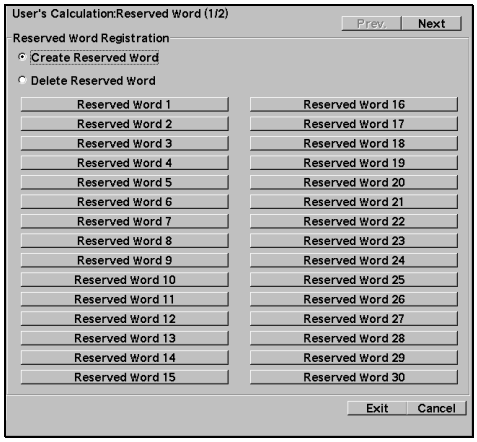
- Built-in & User-defined User's Name
  Registration of new measurement area name



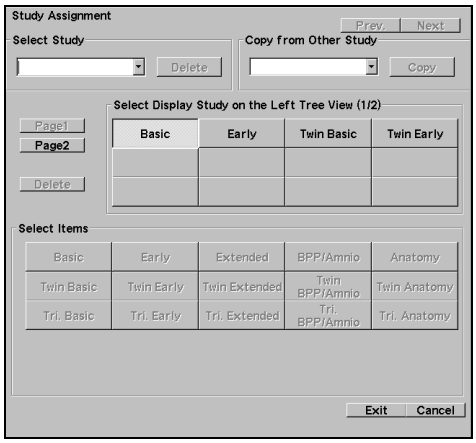
- User's Calculation
  Registers Obstetrical measurement equation.



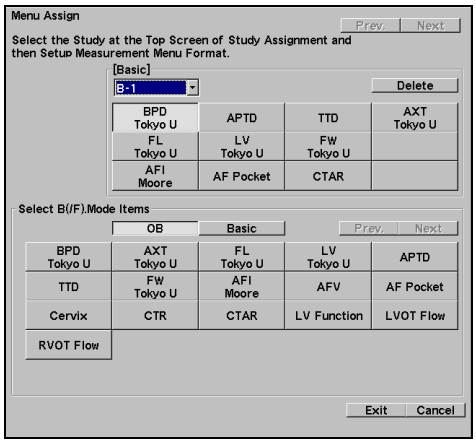
- Reserved Word
  Registers user's Reserved Word.



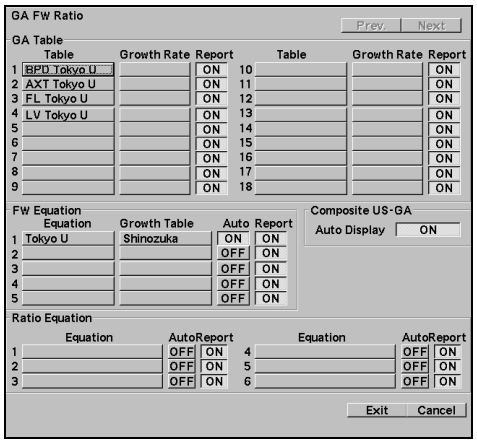
- Study Assignment
  Switches the display on/off for built-in studies and registers new studies.



- Study Assignment
  Registers to the Menu Assign obstetric measurement menu → Set the OB-Program before using Menu Assign.

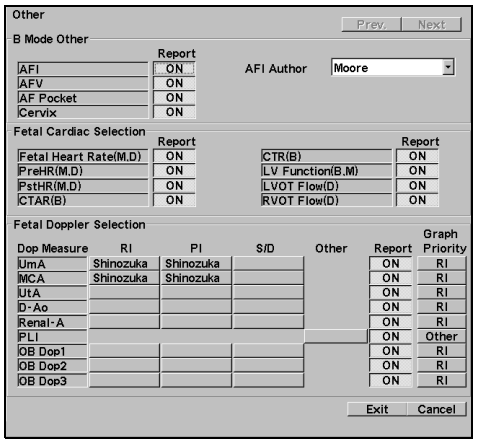


- Study Assignment
  OB Program GA Table
  Registers gestational age in weeks tables and fetal weight measurement and ratio equations.



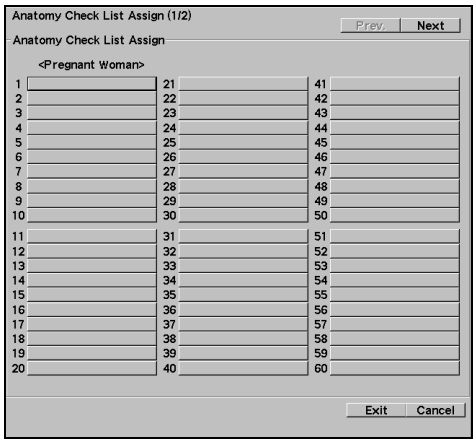
Registered tables and equations are displayed on the Menu Assign screen.
It is also possible to set whether or not reports are displayed and whether or not average number of week values (US-GA) are displayed on the screen.

- Study Assignment
  OB Program Other
  Sets the amniotic fluid index, fetal cardiac function, and Doppler measurements

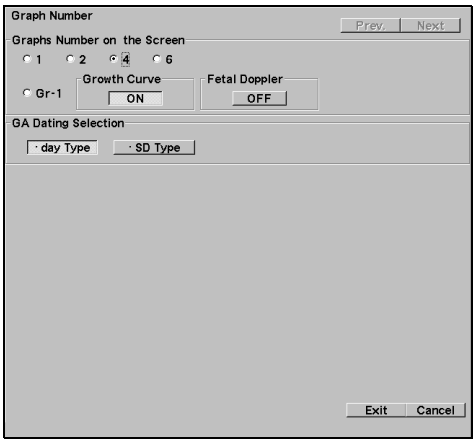


Sets whether or not to display in reports combinations of measurement blocks displayed in reports and selects the standard value table for Doppler measurement values.

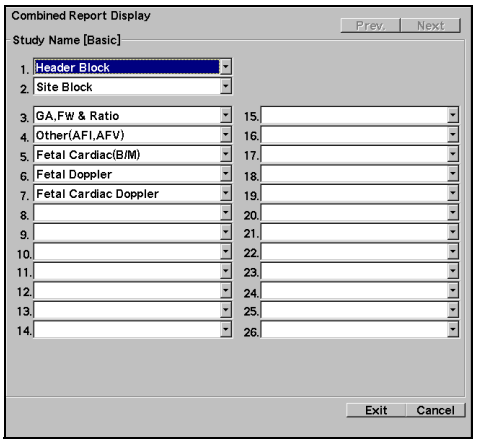
- Study Assignment
  OB Program Anatomy Check List Assign
  Selects the checklist items.



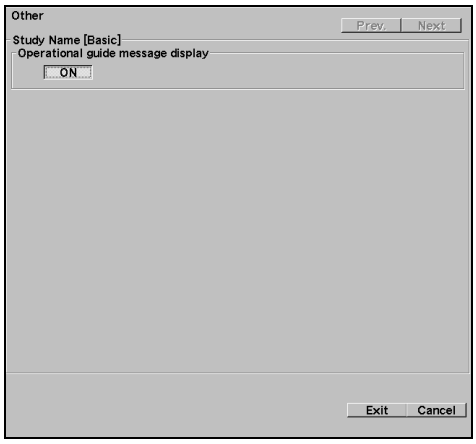
- Study Assignment
  OB-Program Graph Number
  Selects the number of graphs displayed in reports.



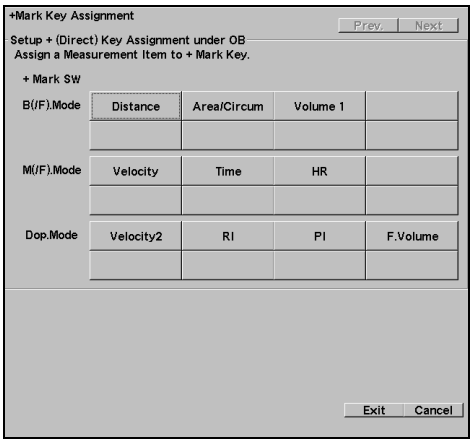
- Study Assignment
  Combined Report Display
  Combination of measurement blocks to be displays in the report



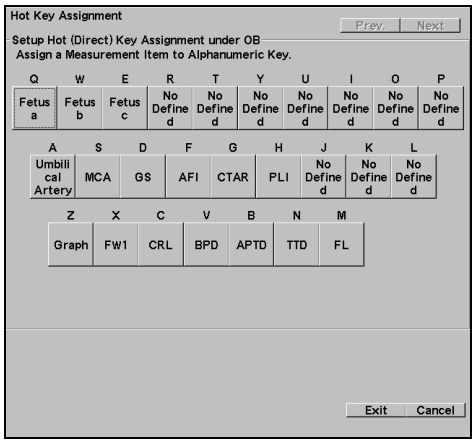
- Study Assignment
  Other
  Measurement guide message display setting



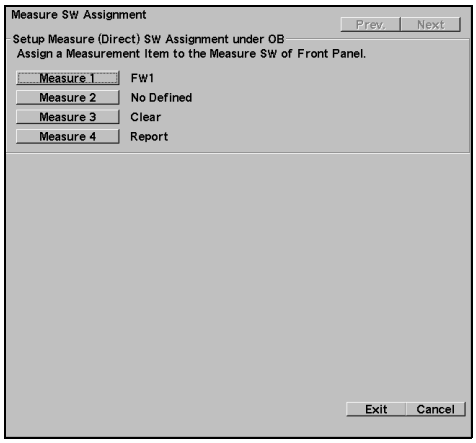
- SW Assignment
  + Mark Key Assignment
  Registers the measurement started with the + mark.



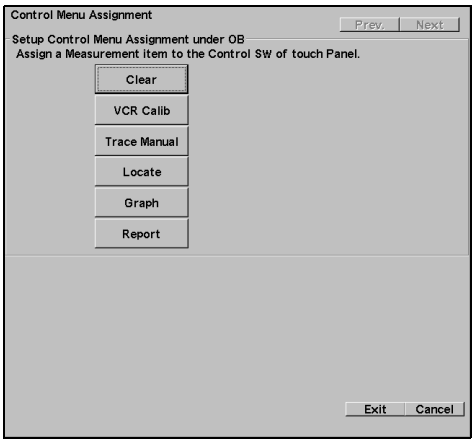
- SW Assignment
  Hot key Assignment
  Registers measurements to the Keyboard.



- SW Assignment
  Measure SW Assignment
  User1, User2, Clear and Report switch Assignment



- SW Assignment
  Control Menu Assignment
  User1, User2, Clear and Report switch Assignment



5-6. Calculation Formula & Reference & Table

5-6-1. Calculation

5-6-1-1. Calculation for B-mode

Measurement name	Item	Calculation	Remark
Ratio			
	CI	Cephalic Index = BPDo ÷ OFDo (14 ≤ LMP – GA ≤ 40wks)	
	HC/AC	Ratio of HC to AC (13 ≤ LMP – GA ≤ 42wks)	
	FL/BPD	Ratio of FL to BPD (23 ≤ LMP – GA ≤ 40wks)	
	FL/HC	Ratio of FL to HC (15 ≤ LMP – GA ≤ 42wks)	
	FL/AC	Ratio of FL to AC (21 ≤ LMP – GA ≤ 42wks)	
	LVW/HW	Ratio of LVW to HW (15 ≤ LMP – GA ≤ 38wks)	
Gestational week (ID Screen)			
	LMP – GA (Gestational Age by Last Menstrual Period)		
		GA = (Exam date – LMP) ÷ 7	It calculates from the date of LMP.
	BBT – GA (Gestational Age by BBT)		
		GA = (Exam date – BBT + 14) ÷ 7	It calculates from the date of BBT.
	EGA – GA (Gestational Age by EGA)		It calculates from the date of EGA.
		GA = (Exam date – EGA) ÷ 7 + EGA – MA***	
	LMP – EDC (Estimated Date of Confinement)		
		EDC = 280 + LMP	It calculates from the date of LMP.
	BBT – EDC (Estimated Date of Confinement)		
		EDC = (280 – 14) + BBT	It calculates from the date of BBT.
	EGA – EDC (Estimated Date of Confinement)		
		EDC = EGA date + (280 – EGA – MA***)	It calculates from the date of EGA.
	EGA – MA***: Mean equivalent gestational week for a past examination date and time		
		US – GA(Composite GA by Ultrasound)	GA measurement mean gestational week
		US Composite GA = (USGA1+USGA2+...+USGAn) ÷ n	USGA1,USGA2,...,USGAn

Measurement name	Item	Calculation	Remark
	US – EDC(Estimated Date of Confinement by Ultrasoundall GA parameters) US Composite EDC = Exam date + (280 – US – GA) GA Gestational Age Type in on ID screen GA – EDC EDC= Exam.data + (280 – GA)		

Measurement name	Item	Calculation	Remark
Gestational week • Estimated Date of Confinement			
		GA estimated Gestational Age by US measurement Calculated from the estimated gestational week table.	
Fetal Weight			
Tokyo U	FW(g)	= FW (BPD,APTD,TTD,FL) BPD,APTD,TTD,FL:cm $= 1.07\ (BPD)^3 + 3.42(APTD)(TTD)(FL)$	
Osaka U	FW(g)	= FW (BPD,FTA,FL) BPD,FL:cm FTA:cm^2 $= 1.25647(BPD)^3 + 3.50665(FTA)(FL) + 6.3$	
Hadlock1	FW(g)	= FW (AC,FL)= log10(FW) AC,FL:cm $\log10(FW)= 1.304 + 0.05281(AC) + 0.1938(FL) - 0.004(AC)(FL)$	
Hadlock2	FW(g)	= FW (AC,HC,FL) AC,HC,FL:cm $\log10(FW) = 1.326 - 0.00326(AC)(FL) + 0.0107(HC) + 0.0438(AC) + 0.158(FL)$	
Hadlock3	FW(g)	= FW (BPD,AC,FL) BPD,AC,FL:cm $\log10(FW) = 1.335 - 0.0034(AC)(FL) + 0.0316(BPD) + 0.0457(AC) + 0.1623(FL)$	
Hadlock4	FW(g)	= FW (HC,AC) HC,AC:cm $\log10(FW) = 1.182 + 0.0273(HC) + 0.07057(AC) - 0.00063(AC)^2 - 0.0002184(HC)(AC)$	
Hadlock5	FW(g)	= FW (BPD,HC,AC,FL) BPD,HC,AC,FL:cm $\log10(FW) = 1.3596 - 0.00386(AC)(FL) + 0.0064(HC) + 0.00061(BPD)(AC) + 0.0424(AC) + 0.174(FL)$	
Shepard	FW(g)	= FW (BPD,AC) BPD,AC:cm $\log10(FW) = (3 - 1.7492) + 0.166(BPD) + 0.046(AC) - 2.646(AC)(BPD) \div 1000$	
Shinozuka	FW(g)	= FW (BPD,AC,FL) BPD,AC,FL:cm $= 1.07\ (BPD)^3 + 0.3(AC)^2(FL)$	
Hansmann	FW(kg)	= FW (BPD,TTD) BPD,TTD:mm $= - 0.105775(BPD) + 0.000930707(BPD)^2 + 0.0649145(TTD) - 0.000205620(TTD)^2 + 0.515263$	

Measurement name	Item	Calculation	Remark
Warsof	FW(kg)	= FW (BPD,AC) BPD,AC:cm $\log10(FW) = -1.599 + 0.144(BPD) + 0.032(AC) - 0.111(BPD)^2(AC) \div 1000$	
Campbell	FW(g)	= FW (AC) AC:mm $\log e(FW) = -4.564 + 0.0282(AC) - 0.0000331(AC)^2 + \log e1000$	

Measurement name	Item	Calculation	Remark
Amniotic Fluid Index	AFI	Amniotic Fluid Index= Q1 + Q2 + Q 3+ Q4	
Cardio Thoracic Ratio	CTR	Cardio Thoracic Ratio =A/B	
		A: Cardiac cross-section circumferential length (diameter)	
		B: Thorax cross-section circumferential length (diameter)	
	CTAR	Cardio Thoracic Area Ratio =A/B	
		A: Cardiac cross-sectional area B: Thorax cross-sectional area	
Interval Growth Rate			
	Interval Growth Rate		
		= (Current Study data– Previous Study data)mm/(Current GA data – Previous GA data)week	
		BPD,AD,AC,FL Reference: Levon N	

5-6-1-2. Calculation for M-mode

Measurement name	Item	Calculation	Remark
Heart Rate			
	FHR	HR= # × 60 ÷ (Time for # cardiac cycle)	
	P reFHR	HR= # × 60 ÷ (Time for # cardiac cycle)	
	PostFHR	HR= # × 60 ÷ (Time for # cardiac cycle)	Time for # cardiac cycle
LV Function			
	EDV	EDV= $(LVIDd)^3$	Pombo
	ESV	ESV= $(LVIDs)^3$	Pombo
	SV	SV= EDV – ESV	
	EF	EF= (SV ÷ EDV) × 100 (%)	
	FS	FS= {(LVIDd – LVIDs) ÷ LVIDd} × 100 (%)	

5-6-1-3. Calculation for D-mode

Measurement name	Item	Calculation	Remark
Index	PI	PI=(PSV – EDV) ÷ MeanV	PSV, EDV, MeanV
	RI	RI=(PSV – EDV) ÷ PSV	PSV, EDV
	S/D	Systolic Velocity ÷ Diastolic Velocity	PSV, EDV
	PLI	|A| / |SF|	|A|,|SF|
		A/B, (A – B) ÷ A (A>B)	A, B
LVOT Flow	CSA	$CSA= \pi /4 \times (CSD)^2$	
	SV	$SV= CSA_{LVOT} \times VTI$	
RVOT Flow	CSA	$CSA= \pi /4 \times (CSD)^2$	
	SV	$SV= CSA_{RVOT} \times VTI$	
	Qp/Qs	$= SV_{RVOT} \div SV_{LVOT}$	

5-6-1-4. Compound measurement items

Measurement name	Item	Calculation	Remark
HC	HC	$= \pi \sqrt{\{(BPD^2+OFD^2)/2\}}$	BPD, OFD (BPDo,OFDo)
HC2	HC2	$=2.325 \times \sqrt{(BPD)^2+(OFD)^2}$	BPD, OFD (BPDo,OFDo)
AC	AC	$= \pi \sqrt{\{(APTD^2+TTD^2)/2\}}$	APTD, TTD (APD,TAD)
FTA	FTA	$= \pi (APTD \times TTD) /4$	APTD, TTD(APD,TAD)
AD	AD	=(APTD+TTD)/2	APTD, TTD (APD,TAD)

5-6-2. Anatomy Check List

The Anatomy Check list built in equipment

(Pregnant Woman):

Heading	Selection
Fetal Number	Single, Twin, Triplet, Multiple, See Comment, NA
Cervix	WNL, Poorly Seen, Not Seen, See Comment, NA
Uterus	Anteverted, Retroverted, Anteflexed, Retroflexed, Absent, See Comment, NA
Endometrium	Prominent, Normal, Fluid, Polyp, See Comment, NA
Myometrium	Unremarkable, Heterogeneous, See Comment, NA
Right Ovary	WNL, Enlarged, Not Seen, Absent, See Comment, NA
Left Ovary	WNL, Enlarged, Not Seen, Absent, See Comment, NA
Right Fallopian Tube	Hydrosalpinx, Pyosalpinx, Not Seen, See Comment, NA
Left Fallopian Tube	Hydrosalpinx, Pyosalpinx, Not Seen, See Comment, NA
Right Adnexa	WNL, Absent, Free Fluid, See Comment, NA
Left Adnexa	WNL, Absent, Free Fluid, See Comment, NA

(Fetus):

Heading	Selection
Fetal Presentation	Vertex, Breech, Transverse, Oblique, See Comment, NA
Placental Position	Anterior, Posterior, Fundal, R-Lateral, L-Lateral, See Comment, NA
Placental Location	Fundal, Mid, Low, Partial Previa, Complete Previa, See Comment, NA
Placental Grade	0, 1, 2, 3, See Comment, NA
AFV	Normal, Increased, Decreased, See Comment, NA
Head	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Cerebral Ventricles	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Cisterna Magna	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Cerebellum	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Choroid Plexus	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Posterior Fossa	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Lat Vent	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Midline falx	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Cavum S.P.	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Neck	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Nuchal Fold	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Face	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Orbits	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Cardiac Activity	Regular, Irregular, Absent, See Comment,, NA
Heart 4 Chamber View	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Outflow Tract	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
RVOT	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
LVOT	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Lungs	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Abdominal Wall	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Diaphragm	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA

Liver	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Stomach	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Cord Vessels	3, 2, See Comment
Cord Insertion	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Right Kidney	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Left Kidney	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Renals	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Urinary Bladder	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Spine	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Spine - Lumbar	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Spine - Cervical	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Spine - Thoracic	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Spine - Sacral	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Right Arm	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Left Arm	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Right Leg	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Left Leg	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Right Hand	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Left Hand	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Right Foot	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Left Foot	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Upper Extremities	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Lower Extremities	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Limbs	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Digits	WNL, Poorly Seen, Not Seen, Abnormal, See Comment, NA
Gender	Not Seen, Male, Female, See Comment, NA

[Remark]
NA : Not Available = Blank

5-6-3. BPP Scoring

1) Criteria for Scoring Biophysical Variables According to Vintzelios

Parameter	Present Score of 2	Equivocal Score of 1	Not Present Score of 0
Nonstress test	5 or more FHR accelerations of at least 15 bpm in amplitude and at least 15-seconds duration associated with fetal movement in a 20-minute period.(NST 2)	2 or 4 accelerations of at least 15 bpm and at least 15-seconds duration associated with fetal movements in a 20-minute period.(NST 1)	1 or 0 acceleration in a 20-minute period. (NST 0)
Fetal movement	At least 3 gross (trunk and limbs) episodes of fetal movements within 30 minutes. Simultaneous limb and trunk movements are counted as a single movement.(FM 2)	1 or 2 fetal movements within 30 minutes.(FM1)	Absence of fetal movements within 30 minutes.(FM 0)
Fetal breathing movement	At least 1 episode of fetal breathing of at least 60-seconds duration within a 30-minute observation period.(FBM 2)	At least 1 episode of fetal breathing lasting 30 to 60 seconds within 30 minutes.(FBM 1)	Absence of fetal breathing, or breathing lasting less than 30 seconds within 30 minutes.(FBM 0)
Fetal tone	At least 1 episode of extension of extremities with return to position of flexion and also 1 episode of extension of spine with return to position of flexion.(FT 2)	At least 1 episode of extension of extremities with return to position of flexion or 1 episode of extension of spine with return to point of flexion.(FT 1)	Extremities in extension. Fetal movements not followed by return to flexion. Open hand. (FT 0)
Amniotic fluid volume	Fluid evident throughout the uterine cavity. A pocket that measures 2 cm or more in vertical diameter.(AF 2)	A pocket that measures less than 2cm but more than 1cm vertical diameter.(AF 1)	Crowding of fetal small parts. Largest pocket less than 1cm in vertical diameter.(AF 0)
Placental grading	Placental grade 0,1, or 2.(PL2)	Placenta posterior; difficult to evaluate.(PL 1)	Placental grade 3.(PL 0)

2) Biophysical profile scoring According to Manning and Coworkers

Parameter	Present Score of 2	Not Present Score of 0
Breathing	30 seconds or more of breathing noted in 30-minute period.	Less than 30-second period or no breathing in 30 minutes.
Movement	3 or more gross body/limb movements in 30-minute period.	Less than 3 gross body/limb movements in 30 minutes.
Tone	At least 1 episode of flexion or extension with return to normal position in a 30-minute period.	Failure to observe any flexion or extension in a 30-minute period.
Fluid	One pocket of a amniotic fluid measuring 2cm in both vertical and horizontal planes.	Faiure to identify fluid pocket measuring 2cm in any plane.
Nonstress test	Negative or reactive test.	Less than 2 accelerations of at least 15 bpm.

TOTAL POSSIBLE SCORE 10

5-6-4. References

5-6-4-1. GA tables (GA Calculation tables)

wks: week (**.*wks = **w*d)

Author		Range	Data form	Reference
Tokyo U	GS CRL BPD FL LV AxT	4-12wks 8-15wks 12-40wks 20-40wks 21-40wks 16-41wks	Week ±day	Tokyo University Takashi Okai, et al. JAPAN SOCIETY OF OBSTETRICS AND GYNECOLOGY Volume38,No.8
Osaka U	CRL BPD FTA FL HL	7-13wks 10-40wks 14-40wks 13-40wks 13-40wks	Week ±SD	Mineo Aoki Perinatal Care Vol.9 No.5, (407-422)
Hadlock	BPD	12.1-42.0wks	Measurement ±day	Fetal Biparietal Diameter : A Critical Re-evaluation of the Relation to Menstrual Age by means of Real-time Ultrasound. Hadlock FP, Deter RL, Harrist RB, Park SK : Journal of Ultrasound in Medicine 1:97, 97-104
	HC	13.3-41.4wks	Measurement ±day	Fetal Head Circumference : Relation to Menstrual Age Hadlock FP, Deter RL, Harrist RB, Park SK AJR 138:649-653, April 1982
	AC	15.4-40.6wks	Measurement ±day	Fetal Abdominal Circumference as a Predictor of Menstrual Age Hadlock FP, Deter RL, Harrist RB, Park SK AJR 139:367-370, August 1982
	FL	12.6-40.3wks	Measurement ±day	Fetal Femur Length as a Predictor of Menstrual Age : Sonographically Measured Hadlock FP, Deter RL, Harrist RB, Park SK AJR 138:875-878, May 1982
	CRL	5.5-18.0wks	Measurement ±day	Fetal Crown-Rump Length: Reevaluation of Relation to Menstrual Age(5-18 weeks) with High-Resolution Real-Time US Hadlock FP, Shah YP, Kanon DJ, Lindsey JV Radiology, 182: 501-505. <Table 3>
Hadlock 90%	HC AC FL	14.0-40.0wks	10-50-90%tile	(Estimating fetal age ; Computer-assisted analysis of multiple fetal growth parameters) Radiology 1984 ; 152 : 497-501 Table Data : 90 percentile data form {Growth format}

Author		Range	Data form	Reference
Hadlock 84	BPD HC AC FL	12.1-42.0wks 12.0-42.0wks 12.0-42.0wks 12.1-42.0wks	Measurement ±day	Estimating Fetal Age: Computer Assisted Analysis of Multiple Fetal Growth Parameters Hadlock FP, Deter RL, Harrist RB, Park SK Radiology 152:497-501, 1984. <Table 1, 2>
Jeanty	HL FL TIB ULNA BD	12.4-40wks 12.4-40.0wks 13.3-39.5wks 13.1-40.2wks 10.3-40.1wks	Measurement ±day	Estimation of Gestational Age from Measurements of Fetal Long Bones Jeanty P, Rodesch F, Delbeke D, Dumont JE Journal of Ultrasound in Medicine 3:75-79, February 1984
Jeanty 95%	HL FL TIB ULNA RAD	11.0-40.0wks 11.0-40.0wks 11.0-40.0wks 11.0-40.0wks 11.0-40.0wks	5-50-95% tile	(Fetal limb biometry) Radiology 1983 ; 147 : 602 Table Data : 95 percentile data form {Growth format}
Campbell	BPD HC AC FL	13.0-40.0wks 14.0-40.0wks 14.0-40.0wks 15.0-40.0wks	Week±day	Materials provided: Professor Campbell's Group at Harris Birthright Centre, King's College Hospital
Merz	BPD OFD HC2 TTD APTD AC FL TIB FIB HL RAD ULNA	13.0-41.0wks 13.0-41.0wks 13.0-41.0wks 13.0-41.0wks 13.0-41.0wks 13.0-41.0wks 13.0-41.0wks 13.0-41.0wks 13.0-41.0wks 13.0-41.0wks 13.0-41.0wks 13.0-41.0wks	5-50-95% tile	Das normale fetale Wachstumsprofilein einheitliches Modell zur Berechnung von Normkurven für die gägigen Kopf-und Abdomeparameter sowie die großen Extremi täenknochen. Ultraschall in Med. 17(1996),153-162 Table Data : 95 percentile data form {Growth format} $HC2=2.325 \times \sqrt{(BPD)^2+(OFD)^2}$
Shinozuka	BPD A × T AC FL	10.1-38.3wks 16.1-39.2wks 15.3-41.2wks 16.1-39.3wks	Measurement ±day	Norio Shinozuka, et al. Jpn. J. Med. Ultrasonics Vol. 23 No. 2 (1996). <Table 2,3,4,5>

Author		Range	Data form	Reference
Hansmann	CRL BPD OFD HC2 TTD AC HL FL	7.0-23.0wks 12.0-42.0wks 14.0-40.0wks 14.0-40.0wks 12.0-42.0wks 12.0-40.0wks 13.0-39.0wks 13.0-40.0wks	week±day	Ultrashalldiagnostick in Geburtshilfe und Gynakologie Hansmann M., Hackeloer B.J. and Staudach A Springer-Verlag, Berlin, Heidelberg, New York, Tokyo 1985 [English version] Ultrasound Diagnosis in Obstetrics and Gynecology Hansmann M., Hackeloer B.J. and Staudach A Springer-Verlag, Berlin, Heidelberg, New York, Tokyo 1985 $HC2=2.325 \times \sqrt{(BPD)^2+(OFD)^2}$
Rempen	mGS CRL BPD	4.6-14.1wks 6.0-13.5wks 6.6-13.5wks	Measurement ±day	Biometrie in der Fruhgraviditat (1.Trmenon) Der Frauenarzt, 32, 4/1991
Chitkara U et al	TC TL	16.0-40.0wks 16.0-40.0wks	10-50-90%tile	Prenatal sonographic assessment of the fetal thorax: Normal values Usha Chitkara, M.D., Joanne Rosenberg, R.D.M.S., Frank A. Chervenak, M.D., Gertrud S. Berkowitz, Ph.D., Rebecca Levine, M.A., Richard M. Fagerstrom, Ph.D., Barbara Walker, R.D.M.S., and Richard L. Berkowitz, M.D. American Journal of Obstetrics and Gynecology, Volume 156, Number 5, May 1987, pp.1069-1987. <Table 2>
Kurtz	BPD	12.0-41.6wks	Measurement ±day	Analysis of Biparietal Diameter as an Accurate Indicator of Gestational Age Kurtz AB, Wapner RJ, Kurtz RJ, Dershaw DD, Rubin CS, Beuglet CC Journal of Clinical Ultrasound 8:319-326, August 1980
Sabbagha	BPD	16.0-37.2wks	Measurement ±day	Sonar Biparietal Diameter : I. Analysis of Percentile Growth Differences in Two Normal Populations Using Same Methodology Sabbagha RE, Barton FB, Barton BA American Journal of Obstetrics and Gynecology 126:479-484, October 1976

Author		Range	Data form	Reference
Hill	CD	15.1-38.4wks	Measurement ±day	Lyndon M. Hill, MD, David Guzick, MD, PhD, Joanne Fries, RDMS, Joyce Hixson, RDMS, and Dawn Rivello, RDMS, "The Transverse Cerebellar Diameter in Estimating Gestational Age in the Large for Gestational Age Fetus", American Journal of Obstetrics and Gynecology, Volume 75, Number 6, June 1990, pp.981-985.
Goldstein	CD	15.0-39.0wks	10-50-90%tile	Cerebellar measurements with ultrasonography in the evaluation of fetal growth and development. Israel Goldstein, M.D., E. Albert Reece, M.D., Gianluigi Pilu, M.D., Luciano Bovicelli, M.D., and John C. Hobbins, M.D. American Journal of Obstetrics and Gynecology, May 1987, pp.1065-1069. <Table 1>
	EES	43days-67days	10-50-90%tile	Endovaginal Ultrasonographic Measurement of Early Embryonic ize as a Means of Assessing Gestational Age Steven R. Goldstein, MD, Robert Wolfson, MD, PhD J. Ultrasound Med. 13:27-31, 1994. <Figure 3>
Hellman	mGS	5.0-12.1wks		(Growth and development of the human fetus prior to the 20th week of gestation) American Journal of Obstetrics & Gynecology 1969 ; 103 : 784-800
Robinson	CRL	6.2-13.6wks	Measurement ±day	A Critical Evaluation of Sonar "Crown-Rump Length" Measurements Robinson HP, Fleming JEE British Journal of Obstetrics and Gynecology 82:702-710, September 1975
Daya	CRL	6.1-13.2wks	Measurement ±day	(Accuracy of gestational age estimation by means of fetalcrown-rump length measurement) American Journal of Obstetrics & Gynecology1993 ; 168 : 903-908 Table Data : 9 {Dating format}
Nelson	CRL	8.1-15.0wks	Measurement ±day	Comparison of Methods for Determining Crown-Rump Measurement by Real-Time Ultrasound Nelson LH Journal of Clinical Ultrasound 9:67-70, February 1981

Author		Range	Data form	Reference
Hohler	FL	12.0-40.5wks	Measurement ±day	Fetal Femur Length : Equation for Computer Calculation of Gestational Age from Ultrasound Measurements Hohler CW, Quetel TA American Journal of Obstetrics and Gynecology 143:479-481, June 1982
O'Brien	FL	14.0-40.0wks	Week± 2SD	Assessment of Gestational Age in the Second Trimester by Real-Time Ultrasound Measurement of the Femur Length. O'-Brien GD, Queennan JT, Campbell S (American Journal of Obstetrics & Gynecology 139:540-545, Mar. 1981)
Warda	FL	13.1-40.6wks	Measurement ±day	Fetal Femur Length : A Critical Reevaluation of the Relationship to Menstrual Age Warda AH, Deter RL, Rossavik IK, Carpenter RJ, Hadlock FP American Journal of Obstetrics and Gynecology 66(1):69-75, July 1985
Chitty	BPD HC	12.0-42.0wks 12.0-42.0wks	3-50-97% tile	Charts of fetal size:2.Head measurements Lyn S Chitty British Journal of Obstetrics and Gynaecology February 1994, Vol.101, pp.35-43 <Table 4,7>
	AC	12.0-42.0wks		Charts of fetal size:3.Abdominal measurements Lyn S Chitty British Journal of Obstetrics and Gynaecology February 1994, Vol.101, pp.125-131 <Table 4>
	FL	12.0-42.0wks		Charts of fetal size:4.Femur length Lyn S Chitty British Journal of Obstetrics and Gynaecology February 1994, Vol.101, pp.132-135 <Table 2>
JSUM'03	CRL BPD AC FL	56.0-80.0 days 10.0-42.0wks 16.0-42.0wks 16.0-42.0wks	Measurement ±day week ± SD week ± SD week ± SD	Regarding Public Notice concerning Standardization of Fetus Ultrasound Measurement and Japanese Standard Value J Med Ultrasonics Vol.28 No.5 2001

Author		Range	Data form	Reference
Sonek	NBL	11.0-40.0wks	5-95%ile	Nasal bone length throughout gestation : normal ranges based on 3537 fetal ultrasound measurements. J. D. SONEK Ultrasound Obstet Gynecol 2003 ; 21 ; 152-155

5-6-4-2. FW Equations (Fetus Weight)

Author	Measurement Part	Reference
Tokyo U	BPD,APTD, TTD,FL	Formulas for fetal weight estimation by Ultrasound measurements based on neonatal specific gravities Norio Shinozuka, Takashi Okai, Shiro Kohzuma, Masaaki Mukubo, Chen-Ting Shih, Tsugio Maeda, Yoshinori Kuwabara, and Masahiko Mizuno Am J Obstet Gynecol :Volume157 Number5:1140-1145,November1987
Osaka U	BPD,FTA,FL	Mineo Aoki Perinatal Care Vol.9 No.5,(407-422)
Hadlock	1:AC,FL 2:AC,HC,FL 3:BPD,AC,FL 4:HC,AC 5: BPD,HC,AC,FL	Estimation of fetal weight with the use of head,body,and femur measurement-A prospective study Frank P. Hadlock, R.B.Harrist, Ralph S.Sharman, Russel L Deter, and Seung K.Park Am J Obstet Gynecol :Volume151 Number3: 333-337, Febrary1,1985 Sonographic Estimation of Fetal weight Frank P. Hadlock, R.B.Harrist, Robert J.Carpenter, Russel L Deter, Seung K.Park Radiology Volume150 Number2:535-540
Shinozuka	BPD, AC, FL	Norio Shonozuka, et al. Jpn J Med Ultrasonics, Volume 23, Number 12, 1996, pp.877-888.
Shepard	BPD AC	An evaluation of two equations for predicting fetal weight by Ultrasound Mary Jo Shepard, Virginia A.Richards, PHIL, Richard L. Berkowitz.,Steven L. Warsof,John C.Hobbins Am J Obstet Gynecol :Volume142 Number1:47-54,January1,1982
Hansmann	BPD,TTD	Ultrashalldiagnostick in Geburtshilfe und Gynakologie Hansmann M., Hackeloer B.J. and Staudach A Springer-Verlag, Berlin, Heidelberg, New York, Tokyo 1985

Author	Measurement Part	Reference
Warsof	BPD,AC	The estimation of fetal weight by computer-assisted analysys Steven L.Warsof, Parviz Gohari, Richard L. Berkowitz, John C.Hobbins Am J Obstet Gynecol :Volume128 Number8:881-892-,August15,1977
Campbell	AC	Ultrasonic measurement of fetal abdominal circumference in estimation of fetal weight. Campbell S, Wilkin D, Am J Obstet Gynecol :82:689,1975
JSUM'03	BPD, AC, FL	Regarding Public Notice concerning Standardization of Fetus Ultrasound Measurement and Japanese Standard Value J Med Ultrasonics Vol.28 No.5 2001

5-6-4-3. FW Growth tables (Normal Range)

wks: weeks (**.*wks = **w*d)

Author	Range	Data form	Reference
Brenner	21.0-44.0wks	10-50-90% tile	A Standard of Fetal Growth for the United States of America Brenner WE, Edelman DA, Hendricks CH American Journal of Obstetrics and Gynecology 126:555-564, November 1976
Osaka U	16.0-40.0wks	± 1, 1.5, 2SD	Mineo Aoki Perinatal Care Vol.9 No.5,(407-422)
Hadlock	10.0-40.0wks	10-50-90%tile	In Utero Analysis of Fetal Growth : A Sonographic Weight standard. Hadlock FP, Harrist RB, Martinez-Poyer J Radiology 181:129-133,1991
Shinozuka	18.0-41.0wks	± 1.5SD	Norio Shinozuka, et al. Jpn J Med Ultrasonics, Volume 23, Number 12, 1996, pp.877-888. <Table 1>
Yarkoni (Twins)	16.0-38.0wks	5-50-95%tile	Estimated Fetal Weight in the Evaluation of Growth in Twin Gestations: A Prospective Longitudinal Study Shaul Yarkoni, MD, E. Albert Reece, MD, Theodore Holford, PhD, Theresa Z. O'Connor, MPH, AndJohn C. Hobbins, MD. Obstetrics & Gynecology, Volume 69, Number 4, April 1987, pp.636-639. <Table 1>

Author	Range	Data form	Reference
Doubilet	10.0-43wks	10-90% tile	Improved Birth Weight Table for Neonates Developed from Gestations Dated by Early Ultrasonographty: Doubilet PM et al; J Ultrasound Med 16;241-249,1997
JSUM'03	18.0-41.0wks	± 1.5SD	Regarding Public Notice concerning Standardization of Fetus Ultrasound Measurement and Japanese Standard Value J Med Ultrasonics Vol.28 No.5 2001

5-6-4-4. Interval Growth Rate Table

wks: weeks (**.*wks = **w*d)

Author	Measurement Part		Data form	Reference
Levon N	BPD Average AD FL AC	17.0-36.0wks Interval of 4weeks 6weeks 8weeks 10weeks	10-50-90%tile	Normal Interval Fetal Growth Rates Based on Obstetrical Ultrasonographic Measurements Levon N.Nazarian,MD, Ethan J.Halpern,MD, Alfred B.Kurtz,MD, Walter W. Hauck,PhD, Laurence Needleman,MD J Ultrasound Med 14:829-836,1995

5-6-4-5. Fetal Ratio tables by Gestational Age

wks: weeks (**.*wks = **w*d)

Ratio	Author	Range	Data form	Reference
CI (BPDo/ OFDo)	Hadlock	14.0-40.0wks	± 2SD	Estimated Fetal Age : Effect of Head Shape on BPD Hadlock FP, Deter RL, Carpenter RJ, Park SK American Journal of Roentgenology 137:83-85, July 1981
FL/BPD	Hohler	23.0-40.0wks	10-90%tile	Comparison of Ultrasound Femur Length and Biparietal Diameter in Late Pregnancy Hohler CW, Quetel TA American Journal of Obstetrics and Gynecology 141:759-762, December 1981

Ratio	Author	Range	Data form	Reference
FL/AC	Hadlock	21.0-42.0wks	± 2SD	A Date-Independent Predictor of Intrauterine Growth Retardation : Femur Length/Abdominal Circumference Ratio Hadlock FP, Deter RL, Harrist RB, Roecker E, Park SK American Journal of Roentgenology 141:979-984, November 1983
HC/AC	Campbell	13.0-42.0wks	5-95%tile	Ultrasound Measurements of the Fetal Head to Abdominal Circumference Ratio in the Assessment of Growth Retardation Campbell S, Thoms A British Journal of Obstetrics and Gynecology 84:165-174, March 1977
LVW/HW	P & J	15.0-38.0wks	± 2SD	Fetal Lateral Ventricular Ratio Determination During the Second Trimester Dolores H Pretorius, Julia A Drose,Michael L.Manco-Johnson. J Ultrasound Med 5: 121-124, March 1986 Evaluation of Fetal Intracranial Anatomy by Static and Real-Time Ultrasound Michael L. Johnson, Morgan G . Dunne, Lawrence A Mack, Carop L. Rashbaum J Clin Ultrasound 8 : 311-318, August 1980
FL/HC	Hadlock	15.0-42.0wks	± 2SD	The Femur Length/Head Circumference Relation in Obstetric Sonography Frank P. Hadlock, MD, Ronald B. Harrist, PhD, Yogesh Shah, MD, Seung K. Park, MD. Journal of Ultrasound in Medicine, Volume 3, October 1984, pp.439-442. <Table 1>

5-6-4-6. AFI tables by Gestational Age

wks: weeks (**.*wks = **w*d)

	Author	Range	Data form	Reference
AFI(mm)	Moore et al.	16.0-42.0wks	5-95%tile	The amniotic fluid index in normal human pregnancy Thomas R. Moore, MD, and Jonathan E. Cayle, MD American Journal of Obstetrics and Gynecology, Volume 162, Number 5, May 1990, pp.1168-1173. <Table 6>
AFI(cm)	Phelan et al.	36.0-42.0wks	Lower-Upper	Amniotic Fluid Volume Assessment with the Four-Quadrant Technique at 36-42 Weeks' Gestation Jeffrey P. Phelan, M.D., Carl Vernon Smith, M.D., Paula Broussard, R.N., Mary Small, M.D. The Journal of Reproductive Medicine, Volume 32, Number 7, July 1987, pp.540-542. <Table 1>
AFI(cm)	Jeng et al.	13.0-42.0wks	± 1SD	Amniotic Fluid Index Measurement with the Four-Quadrant Technique During Pregnancy Cherng-Jye Jeng, M.D., Tian-Jii Jou, M.D., Kuo-Gon Wang, M.D., Yuh-Cheng Yang, M.D., Yi-Nan Lee, M.D., Chung-Chi Lan, M.D. The Journal of Reproductive Medicine, Volume 35, Number 7, July 1990, pp.674-677. <Table 1>

5-6-4-7. RI ,PI tables by Gestational Age

	Author	Range	Data form	Reference
RI-MCA RI-UmA PI-MCA PI-UmA	Shinozuka	21.0-41.0wks 13.0-41.0wks 21.0-41.0wks 13.0-41.0wks	10-90%ile	Ultrasound in Obstetrics and Gynecology (N. Shinozuka's Home Page) Norio Shinozuka http://www.shinozuka.com/
RI-MCA RI-UmA PI-MCA PI-UmA	JSUM'03	20.0-41.0wks 20.0-41.0wks 20.0-41.0wks 20.0-41.0wks	10-90%ile, 10-95%ile	Regarding Public Notice concerning Standardization of Fetus Ultrasound Measurement and Japanese Standard Value J Med Ultrasonics Vol.28 No.5 2001

5-6-4-8. BPP Scoring

(1) Frank A.Manning, et al. :
Antepartum fetal evaluation: Development of a fetal biophysical profile score
Am J Obstet Gynecol. 1980 Mar 15; 136(6): 787-95.

(2) Antony M. Vintzileos, et al. :
The fetal biophysical profile and its predictive value.
Obstetrics and Gynecology62: 271 - 278, 1983

5-6-4-9. B, M mode

(1) CTR
D Paladini, S K Chita, L D. :
Prenatal measurement of cardiothoracic ratio in evaluation of heart disease
Archives of Disease in Childhood, 1990; 65; 20 - 23

(2) CTAR
Yoshihide Chiba et al. :
Quantitative Analysis of Cardiac Function in Non-Immunological Hydrops fetalis
Fetal Diagn Ther 1990; 5: 175 - 188

(3) AFV, AF Pocket
Manning FA et al. :
Quantitative amniotic fluid volume determination by ultrasound: Antepartum detection of intrauterine growth retardation.
Am J Obstet Gynec 139: 254 - 259, 1981

(4) Cervix
Andersen HF, Nugent CE, Wanty SD, Hayashi RH. :
Prediction of risk for preterm delivery by ultrasonographic measurement of cervical length.
Am J Obstet Gynecol. 1990 Sep; 163(3): 859 - 67

(5) Fetal Heart Rate
CALLEN:
Ultrasonography in Obstetrics and Gynecology 4th Edition
SAUNDESS p132 SBN0-7216-8132-8

(6) LV Function (EF, FS), LVOT, RVOT
Y. Chiba
ISBN4-7653-0572-4 C3047 P9800E

5-6-4-10. D mode

(1) Fetal Doppler Recommendation
Kleinman, Huhta, and Silverman
Doppler echocardiography in the human fetus
Jounal of the American Society of Echocardiography
Volume1: Number4, July-August 1988: 287-290

(2) Uterine Artery, Umbilical artery, MCA, Descending Aorta, Renal Artery: PI, RI, S/D
Dopplersonographic in der Geburtshife
H.Fendel & Ch. Sohn MEDICAL VIEWI
SBN4-89553-288-7 C3047 P6180

(3) Uterine Artery
(PI, S/D)
McCowan et al. :
Uterine artery flow velocity waveforms in normal and growth-retarded pregnancies
Am J Obstet Gynecol Volume158 Number 3, Part1: , March1988: 499-504
(RI)
S.Bewley et al. :
Uteroplacental Doppler flow velocity waveforms in the second trimester.
A complex circulation
British Journal of Obstetrics and Gynecology
September1989, Vol.96, pp1040-1046

S.Campbell et al:
New Doppler Technique for Assessing uteroplacental Blood Flow
THE LANCET, MARCH 26, 1983, p673-677

(S/D)
B.J.Trudinger et al. :
Uteroplacental blood flow velocity-time waveform in normal and complicated pregnancy
British Journal of Obstetrics and Gynecology
January 1985, Vol.92, pp39-45

Trudinger, Giles, and Cook:
Flow velocity waveforms in the maternal uteroplacental and umbilical placental circulations
Am J Obstet Gynecol Volume152 Number2, : May15, 1983: 155-163

(4) Umbilical artery

(PI,RI(=Pourcelot ratio), S/D (=A/B))

R.S.Thompson et al.
Doppler ultrasound waveform indices: A/B Ratio, pulsatility index and Pourcelot ratio
British Journal of Obstetrics and Gynecology
June1988, Vol.95, pp581-588

R.S.Thompson et al. :
Umbilical artery velocity waveforms: normal reference values for A/B ratio and Pourcelot Ratio
British Journal of Obstetrics and Gynecology
June1988, Vol.95, pp589-591

(S/D =A/B)

B.J.Trudinger et al. :
Fetal umbilical artery flow velocity waveforms and placental resistance :
clinical significance
British Journal of Obstetrics and Gynecology
January 1985, Vol.92, pp23-30

W. B. Giles et al. :
Fetal umbilical artery flow velocity waveforms and placental resistance :
Pathological Correction
British Journal of Obstetrics and Gynecology
January 1985, Vol.92, pp31-38

Schulman et al. :
Umbilical velocity wave ratios in human pregnancy
Am. J. Obstet. Gynecol.
April 1 19984, Volume148 Number7, 985-990

Trudinger, Giles, and Cook:
Flow velocity waveforms in the maternal uteroplacental and umbilical placental circulations
Am J Obstet Gynecol Volume152 Number2,: May15, 1983: 155-163

(PI)

R. L. A. ERSKINE and J. W. K. RITCHIE:
Umbilical Artery Blood Flow Characteristics in Normal and Growth-Retarded Fetuses
British Journal of Obstetrics and Gynecology
Vol.92 p605, 1985

(5) MCA
(PI)
S.Vyas et al. :
Middle cerebral artery flow velocity waveforms in fetal hypoxaemia
British Journal of Obstetrics and Gynecology
September 1990, Vol.97, pp797-803

(S/D)
Woo et al. :
Middle Cerebral Artery Doppler Flow Velocity Waveforms
Obstetrics & Gynecology Vol.70, NO.4, OCTOBER 1987: 613-616

(6) Renal artery, PI
Vyas, Nicolaides, and Campbell:
Renal artery flow-velocity waveforms in normal and hypoxemic fetuses
Am J Obstet Gynecol Volume161 Number 1, July 1989168-172

(7) PL I(Pre Load Index)
Toru Kanzaki, Yoshihide Chiba:
Evaluation of the Preload Condition of the Fetus by Inferior Vena Caval Blood Flow Pattern
Fetal Diagn Ther 1990; 5: 168-174

5-6-5. Data in the fetal growth table inside the system

GA Table

Table No. 1 GS
(Tokyo University method)

GS (cm)	Gestational week (age of fetus in weeks)	±day
1.00	4	7
1.60	5	8
2.20	6	11
2.70	7	12
3.40	8	13
4.10	9	14
4.80	10	15
5.70	11	16
6.70	12	17

Table No. 2 CRL
(Tokyo University method)

CRL (cm)	Gestational week (age of fetus in weeks)	±day
1.40	8	7
2.10	9	7
2.90	10	7
3.70	11	7
4.60	12	7
5.70	13	7
7.10	14	8
8.80	15	14

Table No. 3 BPD
(Tokyo University method)

BPD (cm)	Gestational week (age of fetus in weeks)	±day
2.00	12	7
2.40	13	7
2.76	14	7
3.10	15	7
3.38	16	8
3.72	17	8
4.05	18	9
4.39	19	10
4.71	20	10
5.04	21	10
5.35	22	10
5.67	23	11
5.97	24	11
6.27	25	12
6.56	26	13
6.84	27	13
7.12	28	13
7.38	29	14
7.64	30	15
7.88	31	16
8.12	32	16
8.34	33	18
8.55	34	20
8.74	35	25
8.92	36	25
9.08	37	25
9.23	38	25
9.36	39	25
9.47	40	25

Table No. 4 FL
(Tokyo University method)

FL (cm)	Gestational week (age of fetus in weeks)	±day
3.23	20	17
3.44	21	18
3.65	22	19
3.87	23	21
4.09	24	22
4.31	25	24
4.54	26	25
4.76	27	25
4.98	28	25
5.19	29	28
5.41	30	30
5.61	31	32
5.82	32	35
6.01	33	38
6.19	34	42
6.37	35	46
6.53	36	50
6.68	37	54
6.82	38	57
6.93	39	60
7.04	40	64

Table No. 5 LV
(Tokyo University method)

LV (cm)	Gestational week (age of fetus in weeks)	±day
4.05	21	7
4.39	22	9
4.71	23	11
5.01	24	12
5.30	25	14
5.57	26	17
5.82	27	19
6.06	28	21
6.30	29	24
6.51	30	25
6.72	31	28
6.93	32	31
7.13	33	34
7.32	34	35
7.51	35	38
7.70	36	40
7.89	37	42
8.08	38	44
8.27	39	46
8.47	40	48

Table No. 6 A × T

(Tokyo University method)

wk	cm2	±day
16	12.18	8
17	14.02	8
18	16.04	8
19	18.22	8
20	20.57	8
21	23.09	9
22	25.77	9
23	28.61	9
24	31.61	10
25	34.75	10
26	38.03	11
27	41.43	11
28	44.96	12
29	48.59	12
30	52.32	13
31	56.12	14
32	59.99	15
33	63.91	15
34	67.86	16
35	71.82	17
36	75.78	17
37	79.71	18
38	83.59	18
39	87.39	19
40	91.10	19
41	94.69	20

Table No. 7 CRL

(Osaka University method)

CRL (cm)	Gestational week (age of fetus in weeks)	± 1SD (cm)
0.87	7	0.16
1.30	8	0.26
2.04	9	0.37
3.00	10	0.48
4.12	11	0.58
5.30	12	0.69
6.49	13	0.79

Table No. 8 BPD

(Osaka University method)

BPD (cm)	Gestational week (age of fetus in weeks)	± 1SD
1.33	10	0.19
1.72	11	0.20
2.09	12	0.21
2.46	13	0.22
2.82	14	0.23
3.18	15	0.24
3.52	16	0.25
3.86	17	0.26
4.20	18	0.27
4.53	19	0.28
4.85	20	0.29
5.17	21	0.29
5.48	22	0.30
5.79	23	0.31
6.09	24	0.32
6.39	25	0.32
6.67	26	0.33
6.95	27	0.34
7.23	28	0.34
7.49	29	0.35
7.74	30	0.35
7.98	31	0.36
8.21	32	0.36
8.43	33	0.37
8.62	34	0.37
8.80	35	0.37
8.96	36	0.38
9.10	37	0.38
9.21	38	0.38
9.30	39	0.39
9.36	40	0.39

Table No. 9 FTA

(Osaka University method)

FTA (cm2)	Gestational week (age of fetus in weeks)	± 1SD (cm2)
5.60	14	1.2
7.30	15	1.4
9.20	16	1.6
11.30	17	1.8
13.50	18	2.0
15.80	19	2.3
18.40	20	2.5
21.00	21	2.8
23.80	22	3.1
26.80	23	3.4
29.90	24	3.7
33.10	25	4.0
36.50	26	4.4
39.90	27	4.7
43.40	28	5.1
47.10	29	5.4
50.80	30	5.8
54.50	31	6.2
58.30	32	6.7
62.10	33	7.1
65.80	34	7.5
69.50	35	8.0
73.20	36	8.4
76.80	37	8.9
80.20	38	9.4
83.50	39	9.9
86.60	40	10.4

Table No. 10 FL
(Osaka University method)

FL (cm)	Gestational week (age of fetus in weeks)	± 1SD (cm)
0.94	13	0.21
1.26	14	0.22
1.57	15	0.22
1.88	16	0.22
2.18	17	0.23
2.47	18	0.23
2.75	19	0.24
3.03	20	0.24
3.30	21	0.24
3.57	22	0.25
3.83	23	0.25
4.08	24	0.25
4.32	25	0.26
4.56	26	0.26
4.78	27	0.27
5.01	28	0.27
5.22	29	0.27
5.43	30	0.28
5.63	31	0.28
5.82	32	0.29
6.01	33	0.29
6.19	34	0.29
6.36	35	0.30
6.53	36	0.30
6.69	37	0.31
6.84	38	0.31
6.98	39	0.31
7.12	40	032

Table No. 11 HL
(Osaka University method)

HL (cm)	Gestational week (age of fetus in weeks)	± 1SD (cm)
1.01	13	0.20
1.31	14	0.21
1.59	15	0.21
1.87	16	0.21
2.15	17	0.22
2.41	18	0.22
2.67	19	0.22
2.91	20	0.23
3.15	21	0.23
3.38	22	0.23
3.61	23	0.24
3.82	24	0.24
4.03	25	0.24
4.23	26	0.25
4.42	27	0.25
4.60	28	0.25
4.78	29	0.26
4.94	30	0.26
5.10	31	0.26
5.25	32	0.27
5.39	33	0.27
5.53	34	0.27
5.65	35	0.28
5.77	36	0.28
5.88	37	0.28
5.98	38	0.29
6.08	39	0.29
6.16	40	0.29

Table No. 12 BPD
(Hadlock)

BPD (cm)	Gestational week (age of fetus in weeks)	±day	BPD (cm)	Gestational week (age of fetus in weeks)	±day
2.00	12w1d	6	6.10	25w0d	9
2.10	12w4d	6	6.20	25w2d	9
2.20	12w6d	6	6.30	25w5d	9
2.30	13w1d	6	6.40	26w1d	9
2.40	13w2d	6	6.50	26w3d	9
2.50	13w4d	6	6.60	26w6d	9
2.60	13w6d	6	6.70	27w1d	9
2.70	14w1d	6	6.80	27w4d	9
2.80	14w4d	6	6.90	28w0d	9
2.90	14w5d	6	7.00	28w2d	9
3.00	15w0d	6	7.10	28w5d	9
3.10	15w2d	6	7.20	29w1d	9
3.20	15w4d	6	7.30	29w4d	9
3.30	15w6d	6	7.40	29w6d	9
3.40	16w1d	6	7.50	30w3d	14
3.50	16w4d	6	7.60	30w6d	14
3.60	16w6d	6	7.70	31w1d	14
3.70	17w1d	6	7.80	31w4d	14
3.80	17w3d	6	7.90	32w0d	14
3.90	17w5d	6	8.00	32w4d	14
4.00	18w0d	10	8.10	32w6d	14
4.10	18w2d	10	8.20	33w2d	14
4.20	18w4d	10	8.30	33w6d	14
4.30	18w6d	10	8.40	34w1d	14
4.40	19w1d	10	8.50	34w5d	14
4.50	19w4d	10	8.60	35w1d	14
4.60	19w6d	10	8.70	35w4d	14
4.70	20w1d	10	8.80	36w1d	25
4.80	20w4d	10	8.90	36w4d	25
4.90	20w6d	10	9.00	37w0d	25
5.00	21w1d	10	9.10	37w4d	25
5.10	21w4d	10	9.20	38w0d	25
5.20	21w6d	10	9.30	38w4d	25
5.30	22w1d	10	9.40	38w6d	25
5.40	22w4d	10	9.50	39w3d	25
5.50	22w6d	10	9.60	39w6d	25
5.60	23w1d	10	9.70	40w4d	25
5.70	23w4d	10	9.80	41w0d	25
5.80	23w6d	10	9.90	41w4d	25
5.90	24w1d	9	10.00	42w0d	25
6.00	24w4d	9			

Table No. 13 HC
(Hadlock)

HC (cm)	Gestational week (age of fetus in weeks)	±day	HC (cm)	Gestational week (age of fetus in weeks)	±day
8.00	13w3d	9	23.50	25w3d	16
8.50	13w5d	9	24.00	25w6d	16
9.00	14w0d	9	24.50	26w3d	16
9.50	14w2d	9	25.00	26w6d	16
10.00	14w4d	9	25.50	27w4d	16
10.50	15w0d	9	26.00	28w0d	16
11.00	15w2d	9	26.50	28w1d	16
11.50	15w4d	9	27.00	29w1d	16
12.00	15w6d	9	27.50	29w6d	16
12.50	16w2d	9	28.00	30w2d	19
13.00	16w4d	9	28.50	31w0d	19
13.50	17w0d	9	29.00	31w4d	19
14.00	17w2d	9	29.50	32w1d	19
14.50	17w5d	9	30.00	32w6d	19
15.00	18w1d	11	30.50	33w4d	19
15.50	18w3d	11	31.00	34w1d	19
16.00	18w6d	11	31.50	34w6d	19
16.50	19w1d	11	32.00	35w4d	19
17.00	19w4d	11	32.50	36w2d	24
17.50	20w0d	11	33.00	37w0d	24
18.00	20w3d	11	33.50	37w5d	24
18.50	20w6d	11	34.00	38w4d	24
19.00	21w1d	11	34.50	39w1d	24
19.50	21w4d	11	35.00	40w0d	24
20.00	22w1d	11	35.50	40w6d	24
20.50	22w4d	11	36.00	41w4d	24
21.00	23w0d	11			
21.50	23w3d	11			
22.00	23w6d	11			
22.50	24w3d	16			
23.00	24w6d	16			

Table No. 14 AC
(Hadlock)

AC (cm)	Gestational week (age of fetus in weeks)	±day	AC (cm)	Gestational week (age of fetus in weeks)	±day
10.00	15w4d	13	25.50	29w5d	15
10.50	16w1d	13	26.00	30w1d	21
11.00	16w4d	13	26.50	30w4d	21
11.50	16w6d	13	27.00	31w1d	21
12.00	17w2d	13	27.50	31w4d	21
12.50	17w6d	13	28.00	32w1d	21
13.00	18w1d	14	28.50	32w4d	21
13.50	18w4d	14	29.00	33w1d	21
14.00	19w1d	14	29.50	33w4d	21
14.50	19w4d	14	30.00	34w1d	21
15.00	20w0d	14	30.50	34w4d	21
15.50	20w3d	14	31.00	35w1d	21
16.00	20w6d	14	31.50	35w4d	21
16.50	21w2d	14	32.00	36w1d	18
17.00	21w5d	14	32.50	36w4d	18
17.50	22w1d	14	33.00	37w1d	18
18.00	22w4d	14	33.50	37w4d	18
18.50	23w1d	14	34.00	38w1d	18
19.00	23w4d	15	34.50	38w5d	18
19.50	24w0d	15	35.00	39w1d	18
20.00	24w4d	15	35.50	39w5d	18
20.50	24w6d	15	36.00	40w1d	18
21.00	25w3d	15	36.50	40w6d	18
21.50	25w6d	15			
22.00	26w2d	15			
22.50	26w6d	15			
23.00	27w2d	15			
23.50	27w5d	15			
24.00	28w1d	15			
24.50	28w5d	15			
25.00	29w1d	15			

Table No. 15 FL
(Hadlock)

FL (cm)	Gestational week (age of fetus in weeks)	±day	FL (cm)	Gestational week (age of fetus in weeks)	±day
1.00	12w6d	10	4.50	24w4d	22
1.10	13w1d	10	4.60	24w6d	22
1.20	13w3d	10	4.70	25w2d	22
1.30	13w4d	10	4.80	25w5d	22
1.40	13w6d	10	4.90	26w1d	22
1.50	14w1d	10	5.00	26w4d	22
1.60	14w4d	10	5.10	27w0d	22
1.70	14w6d	10	5.20	27w3d	22
1.80	15w1d	10	5.30	27w6d	22
1.90	15w3d	10	5.40	28w1d	22
2.00	15w5d	10	5.50	28w5d	22
2.10	16w0d	10	5.60	29w1d	22
2.20	16w2d	10	5.70	29w4d	22
2.30	16w4d	10	5.80	30w0d	22
2.40	16w6d	10	5.90	30w4d	22
2.50	17w1d	10	6.00	30w6d	22
2.60	17w4d	10	6.10	31w3d	22
2.70	17w6d	10	6.20	31w6d	22
2.80	18w1d	10	6.30	32w2d	22
2.90	18w4d	10	6.40	32w6d	22
3.00	18w6d	10	6.50	33w2d	22
3.10	19w1d	10	6.60	33w6d	22
3.20	19w4d	10	6.70	34w1d	22
3.30	19w6d	10	6.80	34w5d	22
3.40	20w2d	10	6.90	35w1d	22
3.50	20w5d	10	7.00	35w5d	22
3.60	21w0d	10	7.10	36w1d	22
3.70	21w3d	10	7.20	36w5d	22
3.80	21w6d	10	7.30	37w1d	22
3.90	22w1d	10	7.40	37w5d	22
4.00	22w4d	10	7.50	38w2d	22
4.10	22w6d	10	7.60	38w6d	22
4.20	23w2d	22	7.70	39w2d	22
4.30	23w5d	22	7.80	39w6d	22
4.40	24w1d	22	7.90	40w3d	22

Table No. 16 CRL
(Hadlock)

CRL (cm)	Gestational week (age of fetus in weeks)	CRL (cm)	Gestational week (age of fetus in weeks)
0.2	5w5d	6.6	12w6d
0.4	6w1d	6.8	13w0d
0.6	6w3d	7.0	13w1d
0.8	6w5d	7.2	13w3d
1.0	7w0d	7.4	13w4d
1.2	7w3d	7.6	13w5d
1.4	7w5d	7.8	13w6d
1.6	8w0d	8.0	14w0d
1.8	8w2d	8.2	14w1d
2.0	8w4d	8.4	14w2d
2.2	8w6d	8.6	14w4d
2.4	9w1d	8.8	14w5d
2.6	9w3d	9.0	14w6d
2.8	9w4d	9.2	15w0d
3.0	9w6d	9.4	15w2d
3.2	10w1d	9.6	15w3d
3.4	10w2d	9.8	15w5d
3.6	10w3d	10.0	15w6d
3.8	10w5d	10.2	16w0d
4.0	10w6d	10.4	16w2d
4.2	11w0d	10.6	16w3d
4.4	11w2d	10.8	16w5d
4.6	11w3d	11.0	16w6d
4.8	11w4d	11.2	17w1d
5.0	11w5d	11.4	17w2d
5.2	11w6d	11.6	17w4d
5.4	12w0d	11.8	17w5d
5.6	12w1d	12.0	17w6d
5.8	12w2d		
6.0	12w3d		
6.2	12w4d		
6.4	12w5d		

[Remark]
It is already setup at 0.1cm step.

Table No. 17 HC
(Had-90%)
10-90% Data form

(week)	10%	—	50%	—	90%
14	9.10		9.70		10.30
15	10.40		11.00		11.60
16	11.70		12.40		13.10
17	13.00		13.80		14.60
18	14.20		15.10		16.00
19	15.50		16.40		17.40
20	16.70		17.70		18.70
21	17.80		18.90		20.00
22	18.90		20.10		21.30
23	20.10		21.30		22.50
24	21.10		22.40		23.70
25	22.20		23.50		24.90
26	23.20		24.60		26.00
27	24.10		25.60		27.10
28	25.10		26.60		28.10
29	25.90		27.50		29.10
30	26.80		28.40		30.00
31	27.60		29.30		31.00
32	28.40		30.10		31.80
33	29.00		30.80		32.60
34	29.70		31.50		33.30
35	30.40		32.20		34.10
36	30.90		32.80		34.70
37	31.40		33.30		35.20
38	31.90		33.80		35.80
39	32.20		34.20		36.20
40	32.60		34.60		36.60

Table No. 18 AC
(Had-90%)
10-90% Data form

(week)	10%	—	50%	—	90%
14	6.70		7.30		7.90
15	7.90		8.60		9.30
16	9.10		9.90		10.70
17	10.30		11.20		12.10
18	11.50		12.50		13.50
19	12.60		13.70		14.80
20	13.80		15.00		16.30
21	14.90		16.20		17.60
22	16.00		17.40		18.80
23	17.00		18.50		20.00
24	18.10		19.70		21.30
25	19.10		20.80		22.50
26	20.10		21.90		23.70
27	21.10		23.00		24.90
28	22.00		24.00		26.00
29	23.00		25.10		27.20
30	23.90		26.10		28.30
31	24.90		27.10		29.40
32	25.80		28.10		30.40
33	26.70		29.10		31.50
34	27.50		30.00		32.50
35	28.30		30.90		33.50
36	29.20		31.80		34.40
37	30.00		32.70		35.40
38	30.80		33.60		36.40
39	31.60		34.40		37.30
40	32.40		35.30		38.20

Table No. 19 FL
(Had-90%)
10-90% Data form

(week)	10%	—	50%	—	90%
14	1.30		1.40		1.50
15	1.60		1.70		1.90
16	1.80		2.00		2.20
17	2.20		2.40		2.60
18	2.50		2.70		2.90
19	2.70		3.00		3.30
20	3.00		3.30		3.60
21	3.20		3.50		3.80
22	3.50		3.80		4.10
23	3.70		4.10		4.50
24	4.00		4.40		4.80
25	4.20		4.60		5.00
26	4.50		4.90		5.30
27	4.60		5.10		5.60
28	4.90		5.40		5.90
29	5.10		5.60		6.10
30	5.30		5.80		6.30
31	5.50		6.00		6.50
32	5.60		6.20		6.80
33	5.80		6.40		7.00
34	6.00		6.60		7.20
35	6.20		6.80		7.40
36	6.40		7.00		7.60
37	6.60		7.20		7.90
38	6.70		7.40		8.10
39	6.80		7.50		8.20
40	7.00		7.70		8.40

Table No. 20 BPD: Biparietal diameter
(Hadlock-84)

(cm)	Gestational week (age of fetus in weeks)	±day	(cm)	Gestational week (age of fetus in weeks)	±day	(cm)	Gestational week (age of fetus in weeks)	±day
1.5	12w1d	8	4.8	20w4d	12	8.1	32w4d	22
1.6	12w2d	8	4.9	20w6d	12	8.2	33w0d	22
1.7	12w4d	8	5.0	21w1d	12	8.3	33w3d	22
1.8	12w5d	8	5.1	21w3d	12	8.4	33w6d	22
1.9	13w0d	8	5.2	21w5d	12	8.5	34w2d	22
2.0	13w1d	8	5.3	22w1d	12	8.6	34w5d	22
2.1	13w3d	8	5.4	22w3d	12	8.7	35w1d	22
2.2	13w4d	8	5.5	22w5d	12	8.8	35w4d	22
2.3	13w6d	8	5.6	23w1d	12	8.9	36w0d	22
2.4	14w0d	8	5.7	23w3d	12	9.0	36w3d	22
2.5	14w2d	8	5.8	23w5d	12	9.1	36w6d	22
2.6	14w4d	8	5.9	24w1d	15	9.2	37w3d	22
2.7	14w5d	8	6.0	24w3d	15	9.3	37w6d	22
2.8	15w0d	8	6.1	24w6d	15	9.4	38w2d	22
2.9	15w2d	8	6.2	25w1d	15	9.5	38w5d	22
3.0	15w3d	8	6.3	25w4d	15	9.6	39w1d	22
3.1	15w5d	8	6.4	25w6d	15	9.7	39w5d	22
3.2	16w0d	8	6.5	26w2d	15	9.8	40w1d	22
3.3	16w2d	8	6.6	26w4d	15	9.9	40w4d	22
3.4	16w4d	8	6.7	27w0d	15	10.0	41w1d	22
3.5	16w5d	8	6.8	27w3d	15	10.1	41w4d	22
3.6	17w0d	8	6.9	27w5d	15	10.2	42w1d	22
3.7	17w2d	8	7.0	28w1d	15			
3.8	17w4d	8	7.1	28w4d	15			
3.9	17w6d	8	7.2	28w6d	15			
4.0	18w1d	12	7.3	29w2d	15			
4.1	18w3d	12	7.4	29w5d	15			
4.2	18w5d	12	7.5	30w1d	22			
4.3	19w0d	12	7.6	30w3d	22			
4.4	19w2d	12	7.7	30w6d	22			
4.5	19w4d	12	7.8	31w2d	22			
4.6	19w6d	12	7.9	31w5d	22			
4.7	20w1d	12	8.0	32w1d	22			

Table No. 21 HC
(Hadlock-84)

(cm)	Gestational week (age of fetus in weeks)	±day	(cm)	Gestational week (age of fetus in weeks)	±day
5.5	12w0d	8	21.5	23w4d	10
6.0	12w2d	8	22.0	24w0d	14
6.5	12w4d	8	22.5	24w4d	14
7.0	12w6d	8	23.0	25w0d	14
7.5	13w1d	8	23.5	25w4d	14
8.0	13w3d	8	24.0	26w0d	14
8.5	13w5d	8	24.5	26w4d	14
9.0	14w0d	8	25.0	27w1d	14
9.5	14w2d	8	25.5	27w5d	14
10.0	14w5d	8	26.0	28w2d	14
10.5	15w0d	8	26.5	28w6d	14
11.0	15w2d	8	27.0	29w3d	14
11.5	15w4d	8	27.5	30w0d	21
12.0	16w0d	8	28.0	30w5d	21
12.5	16w2d	8	28.5	31w2d	21
13.0	16w4d	8	29.0	32w0d	21
13.5	17w0d	8	29.5	34w4d	21
14.0	17w2d	8	30.0	33w2d	21
14.5	17w5d	8	30.5	34w0d	21
15.0	18w1d	10	31.0	34w4d	21
15.5	18w3d	10	31.5	35w2d	21
16.0	18w6d	10	32.0	36w0d	19
16.5	19w2d	10	32.5	36w6d	19
17.0	19w4d	10	33.0	37w4d	19
17.5	20w0d	10	33.5	38w2d	19
18.0	20w3d	10	34.0	39w1d	19
18.5	20w6d	10	34.5	39w6d	19
19.0	21w2d	10	35.0	40w5d	19
19.5	21w5d	10	35.5	41w4d	19
20.0	22w1d	10			
20.5	22w4d	10			
21.0	23w1d	10			

[Remark]
It is already setup at 0.1cm step.

Table No. 22 AC
(Hadlock-84-84)

(cm)	Gestational week (age of fetus in weeks)	±day	(cm)	Gestational week (age of fetus in weeks)	±day
5.0	12w0d	12	21.5	26w0d	15
5.5	12w3d	12	22.0	26w3d	15
6.0	12w6d	12	22.5	26w6d	15
6.5	13w1d	12	23.0	27w3d	15
7.0	13w4d	12	23.5	27w6d	15
7.5	14w0d	12	24.0	28w2d	15
8.0	14w3d	12	24.5	28w5d	15
8.5	14w6d	12	25.0	29w2d	15
9.0	15w1d	12	25.5	29w5d	15
9.5	15w4d	12	26.0	30w1d	21
10.0	16w0d	12	26.5	30w4d	21
10.5	16w3d	12	27.0	31w1d	21
11.0	16w6d	12	27.5	31w4d	21
11.5	17w2d	12	28.0	32w0d	21
12.0	17w5d	12	28.5	32w4d	21
12.5	18w1d	14	29.0	33w0d	21
13.0	18w4d	14	29.5	33w3d	21
13.5	19w0d	14	30.0	34w0d	21
14.0	19w3d	14	30.5	34w3d	21
14.5	19w6d	14	31.0	35w0d	21
15.0	20w2d	14	31.5	35w3d	21
15.5	20w5d	14	32.0	35w6d	21
16.0	21w1d	14	32.5	36w3d	21
16.5	21w4d	14	33.0	36w6d	21
17.0	22w0d	14	33.5	37w3d	21
17.5	22w3d	14	34.0	37w6d	21
18.0	22w6d	14	34.5	38w3d	21
18.5	23w2d	14	35.0	38w6d	21
19.0	23w5d	14	35.5	39w3d	21
19.5	24w1d	15	36.0	39w6d	21
20.0	24w4d	15	36.5	40w3d	21
20.5	25w1d	15	37.0	41w0d	21
21.0	25w4d	15	37.5	41w3d	21
			38.0	42w0d	21

Table No. 23 FL
(Hadlock--84)

(cm)	Gestational week (age of fetus in weeks)	±day	(cm)	Gestational week (age of fetus in weeks)	±day	(cm)	Gestational week (age of fetus in weeks)	±day
0.7	12w1d	10	3.9	22w4d	13	7.1	36w3d	22
0.8	12w3d	10	4.0	22w6d	13	7.2	36w6d	22
0.9	12w5d	10	4.1	23w2d	13	7.3	37w3d	22
1.0	13w0d	10	4.2	23w5d	13	7.4	37w6d	22
1.1	13w2d	10	4.3	24w0d	15	7.5	38w3d	22
1.2	13w4d	10	4.4	24w3d	15	7.6	38w6d	22
1.3	13w6d	10	4.5	24w6d	15	7.7	39w3d	22
1.4	14w1d	10	4.6	25w2d	15	7.8	39w6d	22
1.5	14w3d	10	4.7	25w5d	15	7.9	40w3d	22
1.6	14w5d	10	4.8	26w1d	15	8.0	40w6d	22
1.7	15w0d	10	4.9	26w3d	15	8.1	41w3d	22
1.8	15w2d	10	5.0	26w6d	15	8.2	42w0d	22
1.9	15w4d	10	5.1	27w2d	15			
2.0	16w0d	10	5.2	27w5d	15			
2.1	16w2d	10	5.3	28w1d	15			
2.2	16w4d	10	5.4	28w4d	15			
2.3	16w6d	10	5.5	29w0d	15			
2.4	17w2d	10	5.6	29w3d	15			
2.5	17w4d	10	5.7	29w6d	15			
2.6	17w6d	10	5.8	30w2d	21			
2.7	18w2d	13	5.9	30w5d	21			
2.8	18w4d	13	6.0	31w2d	21			
2.9	18w6d	13	6.1	31w5d	21			
3.0	19w2d	13	6.2	32w1d	21			
3.1	19w4d	13	6.3	32w4d	21			
3.2	20w0d	13	6.4	33w0d	21			
3.3	20w2d	13	6.5	33w4d	21			
3.4	20w5d	13	6.6	34w0d	21			
3.5	21w0d	13	6.7	34w3d	21			
3.6	21w3d	13	6.8	35w0d	21			
3.7	21w5d	13	6.9	35w3d	21			
3.8	22w1d	13	7.0	35w6d	21			

[Remark]
It is already setup at 0.1cm step.

Table No. 24 FL

(Jeanty)

FL (cm)	Gestational week (age of fetus in weeks)	±day	FL (cm)	Gestational week (age of fetus in weeks)	±day
1.00	12w4d	16	4.60	25w3d	16
1.10	12w6d	16	4.70	25w6d	16
1.20	13w2d	16	4.80	26w1d	16
1.30	13w4d	16	4.90	26w4d	16
1.40	13w6d	16	5.00	27w0d	15
1.50	14w1d	16	5.10	27w3d	16
1.60	14w4d	16	5.20	27w6d	16
1.70	14w6d	16	5.30	28w1d	16
1.80	15w1d	16	5.40	28w4d	16
1.90	15w4d	16	5.50	29w1d	16
2.00	15w6d	16	5.60	29w4d	16
2.10	16w2d	16	5.70	29w6d	16
2.20	16w4d	16	5.80	30w2d	16
2.30	16w6d	16	5.90	30w5d	15
2.40	17w2d	16	6.00	31w1d	16
2.50	17w4d	16	6.10	31w4d	16
2.60	18w0d	15	6.20	32w0d	15
2.70	18w2d	16	6.30	32w3d	16
2.80	18w5d	15	6.40	32w6d	16
2.90	19w0d	15	6.50	33w2d	16
3.00	19w3d	16	6.60	33w5d	15
3.10	19w6d	16	6.70	34w1d	16
3.20	20w1d	16	6.80	34w4d	16
3.30	20w4d	16	6.90	35w0d	15
3.40	20w6d	16	7.00	35w4d	16
3.50	21w1d	16	7.10	35w6d	16
3.60	21w4d	16	7.20	36w3d	16
3.70	22w0d	15	7.30	36w6d	16
3.80	22w3d	16	7.40	37w2d	16
3.90	22w5d	15	7.50	37w5d	15
4.00	23w1d	16	7.60	38w1d	16
4.10	23w4d	16	7.70	38w4d	16
4.20	23w6d	16	7.80	39w1d	16
4.30	24w2d	16	7.90	39w4d	16
4.40	24w5d	15	8.00	40w0d	15
4.50	25w0d	15			

Table No. 25 HL

(Jeanty)

HL (cm)	Gestational week (age of fetus in weeks)	±day	HL (cm)	Gestational week (age of fetus in weeks)	±day
1.00	12w4d	19	4.10	24w6d	20
1.10	12w6d	19	4.20	25w2d	19
1.20	13w1d	19	4.30	25w5d	20
1.30	13w4d	19	4.40	26w1d	19
1.40	13w6d	19	4.50	26w5d	20
1.50	14w1d	19	4.60	27w1d	19
1.60	14w4d	19	4.70	27w5d	20
1.70	14w6d	19	4.80	28w1d	19
1.80	15w1d	19	4.90	28w6d	20
1.90	15w4d	19	5.00	29w2d	19
2.00	15w6d	20	5.10	29w6d	19
2.10	16w2d	20	5.20	30w2d	20
2.20	16w5d	20	5.30	30w6d	19
2.30	17w1d	20	5.40	31w3d	19
2.40	17w3d	19	5.50	32w0d	20
2.50	17w6d	19	5.60	32w4d	19
2.60	18w1d	19	5.70	33w1d	20
2.70	18w4d	20	5.80	33w4d	20
2.80	19w0d	20	5.90	34w1d	19
2.90	19w3d	19	6.00	34w6d	20
3.00	19w6d	19	6.10	35w2d	20
3.10	20w2d	19	6.20	35w6d	20
3.20	20w5d	20	6.30	36w4d	19
3.30	21w1d	19	6.40	37w1d	19
3.40	21w4d	19	6.50	37w5d	20
3.50	22w0d	20	6.60	38w2d	20
3.60	22w4d	19	6.70	38w6d	20
3.70	22w6d	20	6.80	39w4d	19
3.80	23w3d	20	6.90	40w1d	19
3.90	23w6d	19			
4.00	24w2d	20			

Table No. 26 TIB
(Jeanty)

TIB (cm)	Gestational week (age of fetus in weeks)	±day	TIB (cm)	Gestational week (age of fetus in weeks)	±day
1.00	13w3d	20	4.10	25w5d	20
1.10	13w5d	20	4.20	26w1d	21
1.20	14w1d	21	4.30	26w4d	21
1.30	14w3d	20	4.40	27w1d	21
1.40	14w6d	21	4.50	27w4d	21
1.50	15w1d	21	4.60	28w0d	20
1.60	15w4d	21	4.70	28w4d	21
1.70	15w6d	21	4.80	29w0d	20
1.80	16w1d	21	4.90	29w3d	20
1.90	16w4d	21	5.00	29w6d	21
2.00	17w0d	20	5.10	30w3d	20
2.10	17w3d	20	5.20	30w6d	21
2.20	17w6d	21	5.30	31w3d	20
2.30	18w1d	21	5.40	31w6d	21
2.40	18w4d	21	5.50	32w3d	20
2.50	18w6d	21	5.60	32w6d	21
2.60	19w2d	20	5.70	33w3d	20
2.70	19w5d	20	5.80	33w6d	21
2.80	20w1d	21	5.90	34w3d	20
2.90	20w4d	21	6.00	34w6d	21
3.00	21w0d	20	6.10	35w3d	20
3.10	21w3d	20	6.20	35w6d	21
3.20	21w6d	21	6.30	36w4d	21
3.30	22w1d	21	6.40	37w0d	20
3.40	22w4d	21	6.50	37w4d	21
3.50	23w1d	21	6.60	38w0d	21
3.60	23w4d	21	6.70	38w4d	21
3.70	23w6d	21	6.80	39w1d	21
3.80	24w3d	20	6.90	39w5d	20
3.90	24w6d	21			
4.00	25w2d	20			

Table No. 27 ULNA
(Jeanty)

ULNA (cm)	Gestational week (age of fetus in weeks)	±day	ULNA (cm)	Gestational week (age of fetus in weeks)	±day
1.00	13w1d	21	4.40	28w2d	22
1.10	13w4d	21	4.50	28w6d	21
1.20	13w6d	21	4.60	29w3d	22
1.30	14w1d	22	4.70	29w6d	22
1.40	14w4d	22	4.80	30w4d	22
1.50	15w0d	22	4.90	31w1d	22
1.60	15w3d	22	5.00	31w4d	22
1.70	15w5d	22	5.10	32w1d	22
1.80	16w1d	21	5.20	32w6d	22
1.90	16w4d	21	5.30	33w3d	22
2.00	16w6d	22	5.40	34w0d	22
2.10	17w2d	22	5.50	34w4d	22
2.20	17w5d	22	5.60	35w1d	22
2.30	18w1d	21	5.70	35w6d	21
2.40	18w4d	21	5.80	36w3d	22
2.50	19w0d	22	5.90	37w1d	22
2.60	19w3d	22	6.00	37w5d	22
2.70	19w6d	21	6.10	38w2d	22
2.80	20w2d	22	6.20	39w0d	22
2.90	20w6d	22	6.30	39w4d	22
3.00	21w1d	22	6.40	40w2d	22
3.10	21w5d	22			
3.20	22w1d	21			
3.30	22w5d	22			
3.40	23w1d	21			
3.50	23w4d	22			
3.60	24w1d	21			
3.70	24w4d	22			
3.80	25w1d	21			
3.90	25w4d	22			
4.00	26w1d	21			
4.10	26w5d	22			
4.20	27w1d	22			
4.30	27w5d	22			

Table No. 28 BD
(Jeanty)

BD (cm)	Gestational week (age of fetus in weeks)	±day	BD (cm)	Gestational week (age of fetus in weeks)	±day
1.50	10w3d	24	5.10	31w6d	23
1.60	11w0d	24	5.20	32w4d	24
1.70	11w4d	24	5.30	33w0d	24
1.80	12w1d	24	5.40	33w4d	24
1.90	12w6d	23	5.50	34w1d	24
2.00	13w3d	23	5.60	34w6d	23
2.10	14w0d	23	5.70	35w3d	23
2.20	14w4d	23	5.80	36w0d	23
2.30	15w1d	24	5.90	36w4d	23
2.40	15w6d	23	6.00	37w1d	24
2.50	16w3d	23	6.10	37w6d	23
2.60	17w0d	23	6.20	38w3d	23
2.70	17w4d	23	6.30	39w0d	23
2.80	18w1d	24	6.40	39w4d	23
2.90	18w6d	23	6.50	40w1d	24
3.00	19w3d	23			
3.10	20w0d	24			
3.20	20w4d	24			
3.30	21w1d	24			
3.40	21w5d	24			
3.50	22w2d	24			
3.60	22w6d	24			
3.70	23w4d	24			
3.80	24w1d	23			
3.90	24w5d	23			
4.00	25w2d	23			
4.10	25w6d	23			
4.20	26w4d	24			
4.30	27w1d	23			
4.40	27w5d	23			
4.50	28w2d	23			
4.60	28w6d	23			
4.70	29w4d	24			
4.80	30w1d	23			
4.90	30w5d	24			
5.00	31w2d	24			

Table No. 29 FL
(Jea-95%)

FL (week)	95% Data form 5%	— 50%	— 95% cm
11	--	0.60	--
12	--	0.90	--
13	0.60	1.20	1.90
14	0.50	1.50	1.90
15	1.10	1.90	2.60
16	1.30	2.20	2.40
17	2.00	2.50	2.90
18	1.90	2.80	3.10
19	2.30	3.10	3.80
20	2.20	3.30	3.90
21	2.70	3.60	4.50
22	2.90	3.90	4.40
23	3.50	4.10	4.80
24	3.40	4.40	4.90
25	3.80	4.60	5.40
26	3.90	4.90	5.30
27	4.50	5.10	5.70
28	4.50	5.30	5.70
29	4.90	5.60	6.20
30	4.90	5.80	6.20
31	5.30	6.00	6.70
32	5.30	6.20	6.70
33	5.60	6.40	7.10
34	5.70	6.50	7.00
35	6.10	6.70	7.30
36	6.10	6.90	7.40
37	6.40	7.10	7.70
38	6.20	7.20	7.90
39	6.40	7.40	8.30
40	6.60	7.50	8.10

Table No. 30 HL
(Jea-95%)

HL (week)	95% Data form 5%	— 50%	— 95% cm
11	--	0.60	--
12	0.30	0.90	1.00
13	0.50	1.30	2.00
14	0.50	1.60	2.00
15	1.10	1.80	2.60
16	1.20	2.10	2.50
17	1.90	2.40	2.90
18	1.80	2.70	3.00
19	2.20	2.90	3.60
20	2.30	3.20	3.60
21	2.80	3.40	4.00
22	2.80	3.60	4.00
23	3.20	3.80	4.50
24	3.10	4.10	4.60
25	3.50	4.30	5.10
26	3.60	4.50	4.90
27	4.20	4.60	5.10
28	4.10	4.80	5.20
29	4.40	5.00	5.60
30	4.40	5.20	5.60
31	4.70	5.30	5.90
32	4.70	5.50	5.90
33	5.00	5.60	6.20
34	5.00	5.70	6.20
35	5.20	5.80	6.50
36	5.30	6.00	6.30
37	5.70	6.10	6.40
38	5.50	6.10	6.60
39	5.60	6.20	6.90
40	5.60	6.30	6.90

Table No. 31 TIB
(Jea-95%)

TIB (week)	95% Data form 5%	— 50%	— 95% cm
11	--	0.40	--
12	--	0.70	--
13	0.40	1.00	1.70
14	0.20	1.30	1.90
15	0.50	1.60	2.70
16	0.70	1.90	2.50
17	1.50	2.20	2.90
18	1.40	2.40	2.90
19	1.90	2.70	3.50
20	1.90	2.90	3.50
21	2.40	3.20	3.90
22	2.50	3.40	3.90
23	3.00	3.60	4.30
24	2.80	3.90	4.50
25	3.10	4.10	5.00
26	3.30	4.30	4.90
27	3.90	4.50	5.10
28	3.80	4.70	5.20
29	4.00	4.90	5.70
30	4.10	5.10	5.60
31	4.60	5.20	5.80
32	4.60	5.40	5.90
33	4.90	5.60	6.20
34	4.70	5.70	6.40
35	4.80	5.90	6.90
36	4.90	6.00	6.80
37	5.20	6.10	7.10
38	5.40	6.20	6.90
39	5.80	6.40	6.90
40	5.80	6.50	6.90

Table No. 32 ULNA
(Jea-95%)

ULNA (week)	95% Data form 5%	— 50%	— 95% cm
11	--	0.50	--
12	--	0.80	--
13	0.30	1.10	1.80
14	0.40	1.30	1.70
15	1.00	1.60	2.20
16	0.80	1.90	2.40
17	1.10	2.10	3.20
18	1.30	2.40	3.00
19	2.00	2.60	3.20
20	2.10	2.90	3.20
21	2.50	3.10	3.60
22	2.40	3.30	3.70
23	2.70	3.50	4.30
24	2.90	3.70	4.10
25	3.40	3.90	4.40
26	3.40	4.10	4.40
27	3.70	4.30	4.80
28	3.70	4.40	4.80
29	4.00	4.60	5.10
30	3.80	4.70	5.40
31	3.90	4.90	5.90
32	4.00	5.00	5.80
33	4.30	5.20	6.00
34	4.40	5.30	5.90
35	4.70	5.40	6.10
36	4.70	5.50	6.10
37	4.90	5.60	6.20
38	4.80	5.70	6.30
39	4.90	5.70	6.60
40	5.00	5.80	6.50

Table No. 33 Radius
(Jea-95%)

Radius (week)	95% Data form 5%	— 50%	— 95% cm
11	--	0.50	--
12	--	0.70	--
13	--	1.00	--
14	0.80	1.30	1.20
15	1.20	1.50	1.90
16	0.90	1.80	2.10
17	1.10	2.00	2.90
18	1.40	2.20	2.60
19	2.00	2.40	2.90
20	2.10	2.70	2.80
21	2.50	2.90	3.20
22	2.40	3.10	3.40
23	2.60	3.20	3.90
24	2.70	3.40	3.80
25	3.10	3.60	4.00
26	3.00	3.70	4.10
27	3.30	3.90	4.50
28	3.30	4.00	4.50
29	3.60	4.20	4.70
30	3.40	4.30	4.90
31	3.40	4.40	5.30
32	3.70	4.50	5.10
33	4.10	4.60	5.10
34	3.90	4.70	5.30
35	3.80	4.80	5.70
36	4.10	4.80	5.40
37	4.50	4.90	5.30
38	4.50	4.90	5.30
39	4.60	5.00	5.40
40	4.60	5.00	5.40

Table No. 34 BPD
(Campbell)

BPD (cm)	Gestational week (age of fetus in weeks)	±day
2.40	13	
2.80	14	7
3.20	15	7
3.70	16	7
4.10	17	7
4.40	18	7
4.70	19	8
5.10	20	8
5.40	21	8
5.80	22	8
6.10	23	9
6.40	24	9
6.70	25	9
7.00	26	10
7.30	27	10
7.50	28	11
7.80	29	11
8.00	30	12
8.30	31	13
8.50	32	14
8.70	33	15
8.90	34	17
9.10	35	19
9.30	36	20
9.50	37	21
9.70	38	
9.80	39	
10.00	40	

Table No. 35 HC

(Campbell)

HC (cm)	Gestational week (age of fetus in weeks)	±day
11.50	14	10
12.60	15	10
13.70	16	11
14.80	17	12
15.90	18	13
17.00	19	14
18.10	20	15
19.20	21	16
20.40	22	17
21.50	23	17
22.70	24	17
23.80	25	17
24.90	26	18
26.00	27	19
27.10	28	19
28.10	29	20
29.00	30	21
29.90	31	22
30.80	32	25
31.50	33	27
32.00	34	29
32.50	35	29
33.00	36	30
33.50	37	30
34.00	38	35
34.30	39	
34.50	40	

Table No. 36 AC

(Campbell)

AC (cm)	Gestational week (age of fetus in weeks)	±day
9.00	14	14
10.10	15	15
11.20	16	15
12.30	17	15
13.40	18	15
14.50	19	15
15.60	20	16
16.70	21	16
17.80	22	16
18.80	23	17
19.90	24	18
21.00	25	19
22.10	26	19
23.10	27	20
24.20	28	20
25.30	29	20
26.40	30	21
27.50	31	22
28.60	32	22
29.70	33	25
30.80	34	28
31.70	35	30
32.50	36	30
33.10	37	30
33.80	38	30
34.40	39	
35.00	40	

Table No. 37 FL

(Campbell)

FL (cm)	Gestational week (age of fetus in weeks)	±day
1.80	15	6
2.20	16	6
2.50	17	6
2.80	18	7
3.00	19	7
3.30	20	7
3.60	21	7
3.90	22	8
4.20	23	8
4.40	24	8
4.70	25	9
4.90	26	10
5.20	27	10
5.40	28	11
5.60	29	12
5.80	30	13
6.10	31	14
6.30	32	15
6.50	33	17
6.60	34	18
6.80	35	20
6.90	36	22
7.10	37	
7.20	38	
7.40	39	
7.50	40	

Table No. 38 BPD

(Merz)

(week)	5%	—	50%	—	95%cm
13	2.30		2.60		3.00
14	2.50		2.90		3.30
15	2.80		3.20		3.60
16	3.10		3.50		3.90
17	3.50		3.90		4.30
18	3.80		4.20		4.60
19	4.10		4.60		5.00
20	4.50		4.90		5.30
21	4.80		5.20		5.70
22	5.10		5.60		6.00
23	5.40		5.90		6.40
24	5.70		6.20		6.70
25	6.10		6.50		7.00
26	6.40		6.80		7.30
27	6.60		7.10		7.70
28	6.90		7.40		7.90
29	7.20		7.70		8.20
30	7.40		8.00		8.50
31	7.70		8.20		8.80
32	7.90		8.50		9.00
33	8.10		8.70		9.20
34	8.30		8.90		9.50
35	8.50		9.10		9.70
36	8.70		9.20		9.80
37	8.80		9.40		10.00
38	8.90		9.50		10.10
39	9.00		9.60		10.30
40	9.10		9.70		10.30
41	9.10		9.80		10.40

Table No. 39 OFD
(Merz)

(week)	5%	— 50%	— 95%cm
13	2.80	3.20	3.60
14	3.10	3.50	4.00
15	3.50	3.90	4.30
16	3.90	4.30	4.80
17	4.30	4.70	5.20
18	4.70	5.20	5.60
19	5.10	5.60	6.10
20	5.60	6.00	6.50
21	6.00	6.50	6.90
22	6.40	6.90	7.40
23	6.80	7.30	7.80
24	7.20	7.70	8.20
25	7.50	8.10	8.60
26	7.90	8.40	9.00
27	8.20	8.80	9.30
28	8.60	9.10	9.70
29	8.90	9.40	10.00
30	9.20	9.70	10.30
31	9.40	10.00	10.60
32	9.70	10.20	10.80
33	9.90	10.50	11.10
34	10.10	10.70	11.30
35	10.30	10.90	11.50
36	10.40	11.00	11.60
37	10.50	11.20	11.80
38	10.60	11.30	11.90
39	10.70	11.40	12.00
40	10.80	11.40	12.10
41	10.80	11.50	12.10

Table No. 40 HC
(Merz)

(week)	5%	— 50%	— 95%cm
13	8.40	9.60	10.80
14	9.40	10.60	11.90
15	10.50	11.80	13.00
16	11.70	13.00	14.30
17	13.00	14.30	15.60
18	14.20	15.50	16.80
19	15.50	16.80	18.10
20	16.70	18.10	19.40
21	18.00	19.30	20.70
22	19.20	20.60	22.00
23	20.40	21.80	23.20
24	21.60	23.00	24.40
25	22.70	24.10	25.60
26	23.80	25.30	26.70
27	24.80	26.30	27.80
28	25.80	27.30	28.90
29	26.80	28.30	29.90
30	27.70	29.20	30.80
31	28.20	30.10	31.70
32	29.30	30.90	32.50
33	30.00	31.60	33.30
34	30.70	32.30	34.00
35	31.30	32.90	34.60
36	31.80	33.50	35.20
37	32.20	33.90	35.60
38	32.60	34.30	36.10
39	32.90	34.60	36.40
40	33.10	34.90	36.60
41	33.20	35.00	36.80

Table No. 41 TTD
(Merz)

(week)	5%	— 50%	— 95%cm
13	1.80	2.20	2.60
14	2.10	2.50	2.90
15	2.50	2.90	3.30
16	2.80	3.20	3.70
17	3.10	3.60	4.00
18	3.50	3.90	4.40
19	3.80	4.30	4.80
20	4.10	4.60	5.10
21	4.40	5.00	5.50
22	4.80	5.30	5.80
23	5.10	5.60	6.20
24	5.40	6.00	6.50
25	5.70	6.30	6.90
26	6.00	6.60	7.20
27	6.30	7.00	7.60
28	6.70	7.30	7.90
29	7.00	7.60	8.30
30	7.30	7.90	8.60
31	7.60	8.20	8.90
32	7.80	8.50	9.20
33	8.10	8.80	9.60
34	8.40	9.10	9.90
35	8.70	9.40	10.20
36	8.90	9.70	10.50
37	9.20	10.00	10.80
38	9.40	10.20	11.00
39	9.70	10.50	11.30
40	9.90	10.70	11.60
41	10.10	10.90	11.80

Table No. 42 APTD
(Merz)

(week)	5%	— 50%	— 95%cm
13	1.70	2.10	2.50
14	2.00	2.40	2.80
15	2.30	2.80	3.20
16	2.70	3.10	3.60
17	3.00	3.50	3.90
18	3.30	3.80	4.30
19	3.70	4.20	4.70
20	4.00	4.50	5.00
21	4.30	4.80	5.40
22	4.60	5.20	5.70
23	5.00	5.50	6.10
24	5.30	5.90	6.40
25	5.60	6.20	6.80
26	5.90	6.50	7.10
27	6.20	6.80	7.50
28	6.50	7.20	7.80
29	6.80	7.50	8.10
30	7.10	7.80	8.50
31	7.40	8.10	8.80
32	7.70	8.40	9.10
33	8.00	8.70	9.40
34	8.30	9.00	9.70
35	8.50	9.30	10.00
36	8.80	9.60	10.30
37	9.00	9.80	10.60
38	9.30	10.10	10.90
39	9.50	10.30	11.10
40	9.70	10.60	11.40
41	9.90	10.80	11.60

Table No. 43 AC

(Merz)

(week)	5%	—	50%	—	95%cm
13	5.50		6.70		8.00
14	6.50		7.80		9.10
15	7.60		8.90		10.20
16	8.60		10.00		11.40
17	9.60		11.10		12.50
18	10.70		12.20		13.60
19	11.70		13.20		14.80
20	12.70		14.30		15.90
21	13.80		15.40		17.00
22	14.80		16.50		18.10
23	15.80		17.50		19.30
24	16.80		18.60		20.40
25	17.80		19.60		21.50
26	18.80		20.70		22.60
27	19.80		21.70		23.60
28	20.70		22.70		24.70
29	21.70		23.70		25.70
30	22.50		24.70		26.80
31	23.50		25.70		27.80
32	24.40		26.60		28.80
33	25.30		27.60		29.80
34	26.20		28.50		30.80
35	27.00		29.40		31.70
36	27.90		30.30		32.70
37	28.70		31.10		33.60
38	29.40		31.90		34.40
39	30.10		32.70		35.20
40	30.80		33.40		36.00
41	31.40		34.10		36.70

Table No. 44 FL

(Merz)

(week)	5%	—	50%	—	95%cm
13	0.80		1.10		1.40
14	1.10		1.50		1.80
15	1.50		1.80		2.10
16	1.80		2.10		2.50
17	2.10		2.40		2.80
18	2.40		2.70		3.10
19	2.70		3.00		3.40
20	2.90		3.30		3.70
21	3.20		3.60		4.00
22	3.50		3.90		4.20
23	3.70		4.10		4.50
24	4.00		4.40		4.80
25	4.20		4.60		5.00
26	4.50		4.90		5.30
27	4.70		5.10		5.50
28	4.90		5.30		5.80
29	5.10		5.60		6.00
30	5.30		5.80		6.20
31	5.50		6.00		6.40
32	5.70		6.20		6.70
33	5.90		6.40		6.90
34	6.10		6.60		7.10
35	6.30		6.80		7.30
36	6.50		7.00		7.40
37	6.60		7.10		7.60
38	6.80		7.30		7.80
39	6.90		7.40		7.90
40	7.10		7.60		8.10
41	7.20		7.70		8.20

Table No. 45 TIB

(Merz)

(week)	5%	—	50%	—	95%cm
13	0.60		0.90		1.20
14	0.90		1.20		1.50
15	1.20		1.50		1.80
16	1.50		1.80		2.10
17	1.80		2.10		2.40
18	2.10		2.40		2.70
19	2.30		2.60		3.00
20	2.60		2.90		3.20
21	2.80		3.10		3.50
22	3.00		3.40		3.70
23	3.30		3.60		4.00
24	3.50		3.80		4.20
25	3.70		4.10		4.40
26	3.90		4.30		4.70
27	4.10		4.50		4.90
28	4.30		4.70		5.10
29	4.50		4.90		5.30
30	4.60		5.10		5.50
31	4.80		5.20		5.60
32	5.00		5.40		5.80
33	5.10		5.60		6.00
34	5.30		5.70		6.20
35	5.40		5.90		6.30
36	5.60		6.00		6.50
37	5.70		6.20		6.60
38	5.80		6.30		6.70
39	5.90		6.40		6.90
40	6.00		6.50		7.00
41	6.10		6.60		7.10

Table No. 46 FIB

(Merz)

(week)	5%	—	50%	—	95%cm
13	0.50		0.80		1.10
14	0.80		1.10		1.40
15	1.10		1.40		1.70
16	1.40		1.70		2.00
17	1.70		2.00		2.30
18	1.90		2.30		2.60
19	2.20		2.50		2.90
20	2.40		2.80		3.10
21	2.70		3.00		3.40
22	2.90		3.30		3.60
23	3.10		3.50		3.80
24	3.30		3.70		4.10
25	3.50		3.90		4.30
26	3.80		4.10		4.50
27	3.90		4.30		4.70
28	4.10		4.50		4.90
29	4.30		4.70		5.10
30	4.50		4.90		5.30
31	4.70		5.10		5.50
32	4.80		5.20		5.70
33	5.00		5.40		5.80
34	5.10		5.60		6.00
35	5.30		5.70		6.10
36	5.40		5.80		6.30
37	5.50		6.00		6.40
38	5.60		6.10		6.50
39	5.70		6.20		6.60
40	5.80		6.30		6.70
41	5.90		6.30		6.80

Table No. 47 HL
(Merz)

(week)	5%	—	50%	—	95%cm
13	0.70		1.00		1.30
14	1.00		1.30		1.70
15	1.40		1.70		2.00
16	1.70		2.00		2.30
17	2.00		2.30		2.60
18	2.20		2.60		2.90
19	2.50		2.80		3.20
20	2.70		3.10		3.40
21	3.00		3.30		3.70
22	3.20		3.60		3.90
23	3.40		3.80		4.20
24	3.70		4.00		4.40
25	3.90		4.20		4.60
26	4.10		4.50		4.80
27	4.30		4.70		5.00
28	4.50		4.80		5.20
29	4.60		5.00		5.40
30	4.80		5.20		5.60
31	5.00		5.40		5.80
32	5.10		5.50		6.00
33	5.30		5.70		6.10
34	5.40		5.90		6.30
35	5.60		6.00		6.40
36	5.70		6.10		6.60
37	5.80		6.30		6.70
38	5.90		6.40		6.80
39	6.00		6.50		6.90
40	6.10		6.60		7.00
41	6.20		6.60		7.10

Table No. 48 RAD
(Merz)

(week)	5%	—	50%	—	95%cm
13	0.30		0.60		0.90
14	0.60		1.00		1.30
15	1.00		1.30		1.60
16	1.20		1.60		1.90
17	1.50		1.80		2.20
18	1.70		2.10		2.40
19	2.00		2.30		2.60
20	2.20		2.50		2.90
21	2.40		2.80		3.10
22	2.60		3.00		3.30
23	2.80		3.20		3.50
24	3.00		3.30		3.70
25	3.20		3.50		3.90
26	3.30		3.70		4.10
27	3.50		3.90		4.20
28	3.60		4.00		4.40
29	3.80		4.20		4.50
30	3.90		4.30		4.70
31	4.10		4.40		4.80
32	4.20		4.60		5.00
33	4.30		4.70		5.10
34	4.40		4.80		5.20
35	4.50		4.90		5.30
36	4.60		5.00		5.40
37	4.70		5.10		5.50
38	4.80		5.20		5.60
39	4.90		5.30		5.70
40	4.90		5.30		5.80
41	5.00		5.40		5.80

Table No. 49 ULNA
(Merz)

(week)	5%	—	50%	—	95%cm
13	0.50		0.80		1.10
14	0.80		1.10		1.40
15	1.20		1.50		1.80
16	1.50		1.80		2.10
17	1.70		2.10		2.40
18	2.00		2.30		2.70
19	2.30		2.60		2.90
20	2.50		2.80		3.20
21	2.70		3.10		3.40
22	3.00		3.30		3.70
23	3.20		3.50		3.90
24	3.40		3.70		4.10
25	3.60		3.90		4.30
26	3.80		4.10		4.50
27	4.00		4.30		4.70
28	4.20		4.50		4.90
29	4.30		4.70		5.10
30	4.50		4.90		5.20
31	4.60		5.00		5.40
32	4.80		5.20		5.60
33	4.90		5.30		5.70
34	5.10		5.50		5.90
35	5.20		5.60		6.00
36	5.30		5.70		6.10
37	5.40		5.80		6.30
38	5.50		5.90		6.40
39	5.60		6.00		6.50
40	5.70		6.10		6.60
41	5.80		6.20		6.60

Table No. 50 BPD

(Shinozuka)

(cm)	Gestational week (age of fetus in weeks)	±day	(cm)	Gestational week (age of fetus in weeks)	±day	(cm)	Gestational week (age of fetus in weeks)	±day
1.3	10w1d	4	4.5	19w4d	6	7.7	30w6d	12
1.4	10w3d	4	4.6	20w0d	7	7.8	31w2d	12
1.5	10w5d	4	4.7	20w2d	7	7.9	31w5d	12
1.6	11w0d	4	4.8	20w4d	7	8.0	32w1d	12
1.7	11w2d	4	4.9	20w6d	7	8.1	32w5d	12
1.8	11w4d	4	5.0	21w1d	7	8.2	33w1d	13
1.9	11w6d	4	5.1	21w3d	7	8.3	33w5d	13
2.0	12w1d	4	5.2	21w6d	7	8.4	34w2d	13
2.1	12w3d	4	5.3	22w1d	8	8.5	34w6d	13
2.2	12w6d	4	5.4	22w3d	8	8.6	35w3d	14
2.3	13w1d	5	5.5	22w5d	8	8.7	36w0d	14
2.4	13w3d	5	5.6	23w1d	8	8.8	36w5d	14
2.5	13w5d	5	5.7	23w3d	8	8.9	37w4d	14
2.6	14w0d	5	5.8	23w5d	8	9.0	38w3d	15
2.7	14w2d	5	5.9	24w1d	8			
2.8	14w4d	5	6.0	24w3d	9			
2.9	14w6d	5	6.1	24w5d	9			
3.0	15w1d	5	6.2	25w1d	9			
3.1	15w3d	5	6.3	25w3d	9			
3.2	15w5d	5	6.4	25w5d	9			
3.3	16w0d	5	6.5	26w1d	9			
3.4	16w2d	5	6.6	26w3d	10			
3.5	16w4d	5	6.7	26w6d	10			
3.6	16w6d	6	6.8	27w2d	10			
3.7	17w1d	6	6.9	27w4d	10			
3.8	17w4d	6	7.0	28w0d	10			
3.9	17w6d	6	7.1	28w3d	10			
4.0	18w1d	6	7.2	28w5d	11			
4.1	18w3d	6	7.3	29w1d	11			
4.2	18w5d	6	7.4	29w4d	11			
4.3	19w0d	6	7.5	30w0d	11			
4.4	19w2d	6	7.6	30w3d	11			

Table No. 51 A × T

(Shinozuka)

(cm2)	Gestational week (age of fetus in weeks)	±day	(cm2)	Gestational week (age of fetus in weeks)	±day
10.0	16w1d	8	72.0	34w2d	16
12.0	17w0d	8	74.0	34w6d	17
14.0	17w6d	8	76.0	35w3d	17
16.0	18w4d	8	78.0	35w6d	17
18.0	19w3d	8	80.0	36w3d	18
20.0	20w1d	8	82.0	37w0d	18
22.0	20w6d	9	84.0	37w4d	18
24.0	21w4d	9	86.0	38w1d	18
26.0	22w2d	9	88.0	38w5d	19
28.0	22w6d	9	90.0	39w2d	19
30.0	23w4d	9			
32.0	24w1d	10			
34.0	24w5d	10			
36.0	25w2d	10			
38.0	25w6d	10			
40.0	26w3d	11			
42.0	27w0d	11			
44.0	27w3d	11			
46.0	28w0d	12			
48.0	28w4d	12			
50.0	29w0d	12			
52.0	29w3d	13			
54.0	30w0d	13			
56.0	30w3d	13			
58.0	31w0d	14			
60.0	31w3d	14			
62.0	31w6d	14			
64.0	32w3d	15			
66.0	32w6d	15			
68.0	33w3d	15			
70.0	33w6d	16			

Table No. 52 AC
(Shinozuka)

(cm)	Gestational week (age of fetus in weeks)	±day	(cm)	Gestational week (age of fetus in weeks)	±day
10.0	15w3d	8	26.0	31w6d	13
10.5	16w0d	8	26.5	32w3d	13
11.0	16w4d	8	27.0	33w1d	13
11.5	17w0d	8	27.5	33w5d	14
12.0	17w4d	9	28.0	34w2d	14
12.5	18w0d	9	28.5	35w0d	14
13.0	18w4d	9	29.0	35w4d	14
13.5	19w0d	9	29.5	36w2d	14
14.0	19w4d	9	30.0	37w0d	14
14.5	20w0d	9	30.5	37w5d	14
15.0	20w3d	10	31.0	38w2d	15
15.5	21w0d	10	31.5	29w0d	15
16.0	21w3d	10	32.0	39w6d	15
16.5	22w0d	10	32.5	40w4d	15
17.0	22w3d	10	33.0	41w2d	15
17.5	22w6d	10			
18.0	23w3d	11			
18.5	23w6d	11			
19.0	24w3d	11			
19.5	24w6d	11			
20.0	25w3d	11			
20.5	25w6d	11			
21.0	26w3d	12			
21.5	27w0d	12			
22.0	27w3d	12			
22.5	28w0d	12			
23.0	28w4d	12			
23.5	29w0d	12			
24.0	29w4d	13			
24.5	30w1d	13			
25.0	30w5d	13			
25.5	31w2d	13			

Table No. 53 FL
(Shinozuka)

FL (cm)	Gestational week (age of fetus in weeks)	±day	FL (cm)	Gestational week (age of fetus in weeks)	±day
2.0	16w1d	6	5.1	28w5d	10
2.1	16w3d	6	5.2	29w2d	11
2.2	16w6d	6	5.3	29w5d	11
2.3	17w1d	7	5.4	30w2d	11
2.4	17w3d	7	5.5	30w5d	11
2.5	17w6d	7	5.6	31w2d	11
2.6	18w1d	7	5.7	31w6d	11
2.7	18w3d	7	5.8	32w3d	11
2.8	18w6d	7	5.9	33w0d	12
2.9	19w1d	7	6.0	33w3d	12
3.0	19w4d	8	6.1	34w0d	12
3.1	20w0d	8	6.2	34w4d	12
3.2	20w2d	8	6.3	35w1d	12
3.3	20w5d	8	6.4	35w5d	12
3.4	21w1d	8	6.5	36w2d	12
3.5	21w3d	8	6.6	37w0d	12
3.6	21w6d	8	6.7	37w4d	13
3.7	22w2d	9	6.8	38w1d	13
3.8	22w5d	9	6.9	38w5d	13
3.9	23w1d	9	7.0	39w3d	13
4.0	23w3d	9			
4.1	24w0d	9			
4.2	24w3d	9			
4.3	24w6d	9			
4.4	25w3d	9			
4.5	25w6d	10			
4.6	26w2d	10			
4.7	26w5d	10			
4.8	27w2d	10			
4.9	27w5d	10			
5.0	28w2d	10			

Table No. 54 CRL
(Hansmann)

CRL (cm)	Gestational week (age of fetus in weeks)	±day
1.10	7	
1.30	8	9
1.80	9	9
2.60	10	8
3.60	11	8
4.70	12	8
6.00	13	8
7.30	14	9
8.60	15	9
9.70	16	8
11.00	17	8
12.00	18	8
13.00	19	8
14.00	20	9
15.00	21	11
16.10	22	11
17.50	23	11

Table No. 55 BPD
(Hansmann)

BPD (cm)	Gestational week (age of fetus in weeks)	±day
2.00	12	8
2.40	13	8
2.80	14	8
3.20	15	8
3.50	16	8
3.80	17	8
4.20	18	9
4.60	19	9
4.90	20	9
5.20	21	10
5.60	22	11
5.90	23	12
6.20	24	12
6.50	25	13
6.80	26	14
7.10	27	15
7.40	28	16
7.70	29	18
8.00	30	20
8.20	31	21
8.50	32	23
8.70	33	25
8.90	34	27
9.10	35	30
9.30	36	30
9.50	37	30
9.60	38	30
9.80	39	30
9.90	40	30
10.00	41	30
10.10	42	30

Table No. 56 OFD
(Hansmann)

OFD (cm)	Gestational week (age of fetus in weeks)	±day
3.10	14	10
3.80	15	9
4.10	16	8
4.60	17	8
5.00	18	8
5.40	19	9
5.80	20	9
6.30	21	10
6.70	22	10
7.20	23	11
7.60	24	12
8.00	25	14
8.40	26	15
8.80	27	16
9.10	28	17
9.50	29	19
9.80	30	21
10.00	31	23
10.30	32	26
10.50	33	32
10.70	34	32
10.90	35	32
11.10	36	32
11.20	37	32
11.30	38	32
11.40	39	35
11.50	40	39

Table No. 57 HC
(Hansmann)

HC (cm)	Gestational week (age of fetus in weeks)	±day
10.60	14	8
11.50	15	8
12.70	16	8
14.00	17	8
15.20	18	8
16.40	19	9
17.60	20	9
19.00	21	9
20.30	22	9
21.50	23	10
22.60	24	10
24.00	25	11
25.10	26	12
26.30	27	13
27.40	28	14
28.40	29	15
29.30	30	17
30.30	31	20
31.10	32	22
31.80	33	23
32.50	34	27
33.20	35	31
33.70	36	31
34.00	37	31
34.40	38	31
34.70	39	31
34.90	40	35

Table No. 58 TTD
(Hansmann)

TTD (cm)	Gestational week (age of fetus in weeks)	±day
1.70	12	7
2.00	13	7
2.40	14	7
2.70	15	8
3.10	16	8
3.40	17	9
3.70	18	9
4.00	19	10
4.40	20	11
4.70	21	12
5.00	22	13
5.30	23	14
5.60	24	15
5.90	25	15
6.20	26	16
6.50	27	17
6.90	28	17
7.20	29	18
7.40	30	19
7.80	31	20
8.10	32	21
8.30	33	22
8.60	34	25
8.90	35	28
9.20	36	31
9.40	37	31
9.70	38	31
9.90	39	31
10.10	40	31
10.30	41	31
10.50	42	33

Table No. 59 AC
(Hansmann)

AC (cm)	Gestational week (age of fetus in weeks)
5.30	12
6.30	13
7.50	14
8.50	15
9.70	16
10.70	17
11.60	18
12.60	19
13.50	20
14.50	21
15.50	22
16.50	23
17.30	24
18.30	25
19.10	26
20.20	27
21.10	28
22.20	29
23.00	30
24.00	31
24.90	32
25.80	33
26.80	34
27.70	35
28.70	36
29.60	37
30.60	38
31.50	39
32.00	40

Table No. 60 HL
(Hansmann)

HL (cm)	Gestational week (age of fetus in weeks)	±day
1.10	13	19
1.40	14	19
1.70	15	19
2.00	16	20
2.30	17	19
2.50	18	19
2.80	19	20
3.00	20	19
3.30	21	19
3.50	22	20
3.70	23	20
3.90	24	19
4.10	25	20
4.30	26	20
4.50	27	20
4.70	28	20
4.90	29	20
5.10	30	20
5.30	31	20
5.50	32	20
5.70	33	20
5.90	34	19
6.10	35	20
6.30	36	19
6.50	37	20
6.70	38	20
6.90	39	19

Table No. 61 FL
(Hansmann)

FL (cm)	Gestational week (age of fetus in weeks)	±day
1.00	13	
1.20	14	7
1.60	15	7
1.80	16	8
2.20	17	9
2.50	18	10
2.80	19	10
3.10	20	11
3.40	21	11
3.60	22	12
3.90	23	13
4.10	24	14
4.40	25	14
4.70	26	15
4.90	27	15
5.10	28	16
5.40	29	16
5.60	30	17
5.90	31	18
6.10	32	19
6.30	33	20
6.50	34	21
6.70	35	22
6.90	36	23
7.10	37	23
7.30	38	23
7.40	39	23
7.50	40	23

Table No. 62 mGS
(Rempen)

mGS (cm)	Gestational week (age of fetus in weeks)	±day	GS (cm)	Gestational week (age of fetus in weeks)	±day
0.20	4w6d	10d	3.80	9w1d	10d
0.30	5w0d	10d	3.90	9w2d	10d
0.40	5w1d	10d	4.00	9w3d	10d
0.50	5w2d	10d	4.10	9w4d	10d
0.60	5w2d	10d	4.20	9w5d	10d
0.70	5w3d	10d	4.30	9w6d	10d
0.80	5w4d	10d	4.40	9w6d	10d
0.90	5w5d	10d	4.50	10w0d	10d
1.00	5w5d	10d	4.60	10w1d	10d
1.10	5w6d	10d	4.70	10w2d	10d
1.20	6w0d	10d	4.80	10w3d	10d
1.30	6w1d	10d	4.90	10w4d	10d
1.40	6w2d	10d	5.00	10w5d	10d
1.50	6w2d	10d	5.10	10w6d	10d
1.60	6w3d	10d	5.20	11w0d	10d
1.70	6w4d	10d	5.30	11w1d	10d
1.80	6w5d	10d	5.40	11w2d	10d
1.90	6w6d	10d	5.50	11w3d	10d
2.00	6w6d	10d	5.60	11w4d	10d
2.10	7w0d	10d	5.70	11w5d	10d
2.20	7w1d	10d	5.80	11w6d	10d
2.30	7w2d	10d	5.90	12w0d	10d
2.40	7w3d	10d	6.00	12w1d	10d
2.50	7w4d	10d	6.10	12w2d	10d
2.60	7w4d	10d	6.20	12w3d	10d
2.70	7w5d	10d	6.30	12w4d	10d
2.80	7w6d	10d	6.40	12w5d	10d
2.90	8w0d	10d	6.50	12w6d	10d
3.00	8w1d	10d	6.60	13w0d	10d
3.10	8w2d	10d	6.70	13w1d	10d
3.20	8w3d	10d	6.80	13w2d	10d
3.30	8w3d	10d	6.90	13w3d	10d
3.40	8w4d	10d	7.00	13w4d	10d
3.50	8w5d	10d	7.10	13w5d	10d
3.60	8w6d	10d	7.20	14w0d	10d
3.70	9w0d	10d	7.30	14w1d	10d

Table No. 63 CRL
(Rempen)

CRL (cm)	Gestational week (age of fetus in weeks)	±day	CRL (cm)	Gestational week (age of fetus in weeks)	±day
0.20	6w0d	6d	4.20	10w6d	6d
0.30	6w1d	6d	4.30	11w0d	6d
0.40	6w2d	6d	4.40	11w0d	6d
0.50	6w3d	6d	4.50	11w1d	6d
0.60	6w4d	6d	4.60	11w2d	6d
0.70	6w5d	6d	4.70	11w2d	6d
0.80	6w6d	6d	4.80	11w3d	6d
0.90	7w0d	6d	4.90	11w4d	6d
1.00	7w1d	6d	5.00	11w4d	6d
1.10	7w2d	6d	5.10	11w5d	6d
1.20	7w3d	6d	5.20	11w5d	6d
1.30	7w4d	6d	5.30	11w6d	6d
1.40	7w5d	6d	5.40	12w0d	6d
1.50	7w6d	6d	5.50	12w0d	6d
1.60	7w6d	6d	5.60	12w1d	6d
1.70	8w0d	6d	5.70	12w1d	6d
1.80	8w1d	6d	5.80	12w2d	6d
1.90	8w2d	6d	5.90	12w3d	6d
2.00	8w3d	6d	6.00	12w3d	6d
2.10	8w4d	6d	6.10	12w4d	6d
2.20	8w5d	6d	6.20	12w4d	6d
2.30	8w5d	6d	6.30	12w5d	6d
2.40	8w6d	6d	6.40	12w5d	6d
2.50	9w0d	6d	6.50	12w6d	6d
2.60	9w1d	6d	6.60	12w6d	6d
2.70	9w2d	6d	6.70	13w0d	6d
2.80	9w3d	6d	6.80	13w0d	6d
2.90	9w3d	6d	6.90	13w1d	6d
3.00	9w4d	6d	7.00	13w1d	6d
3.10	9w5d	6d	7.10	13w2d	6d
3.20	9w6d	6d	7.20	13w2d	6d
3.30	9w6d	6d	7.30	13w3d	6d
3.40	10w0d	6d	7.40	13w3d	6d
3.50	10w1d	6d	7.50	13w4d	6d
3.60	10w2d	6d	7.60	13w4d	6d
3.70	10w2d	6d	7.70	13w4d	6d
3.80	10w3d	6d	7.80	13w5d	6d
3.90	10w4d	6d			
4.00	10w5d	6d			
4.10	10w5d	6d			

Table No. 64 BPD

(Rempen)

BPD (cm)	Gestational week (age of fetus in weeks)	±day
0.30	6w6d	8
0.40	7w1d	8
0.50	7w3d	8
0.60	7w5d	8
0.70	8w0d	8
0.80	8w2d	8
0.90	8w4d	8
1.00	8w6d	8
1.10	9w1d	8
1.20	9w3d	8
1.30	9w5d	8
1.40	10w0d	8
1.50	10w2d	8
1.60	10w4d	8
1.70	10w6d	8
1.80	11w1d	8
1.90	11w3d	8
2.00	11w5d	8
2.10	12w0d	8
2.20	12w2d	8
2.30	12w4d	8
2.40	12w6d	8
2.50	13w1d	8
2.60	13w3d	8
2.70	13w5d	8

Table No. 65 TC

(Chitkara U)

(week)	10% —	50% —	90%cm
16	7	9.1	11.3
17	7.9	10	12.2
18	8.8	11	13.1
19	9.7	11.9	14
20	10.6	12.8	15
21	11.6	13.7	15.8
22	12.5	14.6	16.7
23	13.4	15.5	17.6
24	14.3	16.4	18.5
25	15.2	17.3	19.4
26	16.1	18.2	20.3
27	17	19.1	21.3
28	17.9	20	22.2
29	18.8	21	23.1
30	19.7	21.9	24
31	20.6	22.8	24.9
32	21.5	23.7	25.8
33	22.5	24.6	26.7
34	23.4	25.5	27.6
35	24.3	26.4	28.5
36	25.2	27.3	29.4
37	26.1	28.2	30.3
38	27	29.1	31.2
39	27.9	30	32.2
40	28.8	30.9	33.1

Table No. 66 TL

(Chitkara U)

(week)	10% —	50% —	90%cm
16	1.3	2	2.8
17	1.5	2.2	3
18	1.7	2.4	3.2
19	1.8	2.7	3.4
20	2	2.8	3.6
21	2.2	3	3.7
22	2.4	3.2	3.9
23	2.6	3.4	4.1
24	2.8	3.5	4.3
25	3	3.7	4.5
26	3.2	3.9	4.7
27	3.3	4.1	4.9
28	3.5	4.3	5
29	3.7	4.5	5.2
30	3.9	4.7	5.4
31	4.1	4.9	5.6
32	4.3	5	5.8
33	4.5	5.2	6
34	4.7	5.4	6.2
35	4.8	5.6	6.4
36	5	5.8	6.5
37	5.2	6	6.7
38	5.4	6.2	6.9
39	5.6	6.4	7.1
40	5.8	6.5	7.3

Table No. 67 BPD
(Kurtz)

BPD (cm)	Gestational week (age of fetus in weeks)	±day	BPD (cm)	Gestational week (age of fetus in weeks)	±day
2.00	12w0d	0	6.00	23w6d	12
2.10	12w0d	0	6.10	24w1d	12
2.20	12w5d	4	6.20	24w4d	11
2.30	13w0d	4	6.30	24w6d	11
2.40	13w1d	4	6.40	25w2d	11
2.50	13w4d	4	6.50	25w4d	11
2.60	13w5d	4	6.60	26w0d	11
2.70	14w0d	4	6.70	26w3d	10
2.80	14w2d	5	6.80	26w5d	10
2.90	14w4d	5	6.90	27w1d	9
3.00	14w6d	5	7.00	27w4d	8
3.10	15w1d	6	7.10	27w6d	8
3.20	15w2d	6	7.20	28w2d	8
3.30	15w4d	6	7.30	28w5d	8
3.40	15w6d	6	7.40	29w1sd	7
3.50	16w1d	7	7.50	29w4d	7
3.60	16w3d	7	7.60	30w0d	7
3.70	16w5d	8	7.70	30w2d	8
3.80	17w0d	8	7.80	30w4d	8
3.90	17w2d	8	7.90	31w1d	10
4.00	17w4d	8	8.00	31w4d	10
4.10	17w6d	10	8.10	32w1d	10
4.20	18w1d	12	8.20	32w4d	10
4.30	18w3d	13	8.30	33w0d	11
4.40	18w6d	13	8.40	33w3d	12
4.50	19w1d	15	8.50	34w0d	12
4.60	19w3d	14	8.60	34w2d	13
4.70	19w5d	13	8.70	35w0d	11
4.80	20w0d	13	8.80	35w3d	12
4.90	20w2d	12	8.90	36w1d	12
5.00	20w4d	11	9.00	36w4d	12
5.10	20w6d	11	9.10	37w1d	9
5.20	21w1d	12	9.20	37w6d	8
5.30	21w4d	12	9.30	38w2d	7
5.40	21w6d	13	9.40	39w0d	8
5.50	22w1d	13	9.50	39w5d	8
5.60	22w4d	13	9.60	40w2d	8
5.70	22w6d	12	9.70	41w0d	8
5.80	23w1d	12	9.80	41w6d	9
5.90	23w4d	11			

Table No. 68 BPD
(Sabbagha)

BPD (cm)	Gestational week (age of fetus in weeks)	±day	BPD (cm)	Gestational week (age of fetus in weeks)	±day
3.50	16w0d	9	6.60	26w0d	16
3.60	16w2d	12	6.70	26w2d	16
3.70	16w5d	16	6.80	26w5d	17
3.80	17w0d	14	6.90	27w0d	16
3.90	17w2d	14	7.00	27w2d	18
4.00	17w5d	12	7.10	27w5d	17
4.10	18w0d	14	7.20	27w5d	21
4.20	18w2d	14	7.30	28w0d	21
4.30	18w5d	14	7.40	28w2d	24
4.40	19w0d	14	7.50	28w5d	23
4.50	19w2d	14	7.60	29w0d	26
4.60	19w5d	14	7.70	29w5d	23
4.70	20w0d	14	7.80	30w0d	21
4.80	20w2d	14	7.90	30w2d	21
4.90	20w5d	14	8.00	30w5d	23
5.00	21w0d	14	8.10	31w0d	23
5.10	21w2d	14	8.20	31w2d	26
5.20	21w5d	14	8.30	32w0d	26
5.30	21w5d	12	8.40	32w2d	26
5.40	22w0d	12	8.50	33w0d	26
5.50	22w2d	12	8.60	33w2d	28
5.60	22w5d	12	8.70	34w0d	30
5.70	23w0d	12	8.80	34w2d	30
5.80	23w2d	14	8.90	35w2d	30
5.90	23w5d	14	9.00	35w5d	28
6.00	24w0d	16	9.10	36w2d	28
6.10	24w2d	16	9.20	36w2d	23
6.20	24w5d	17	9.30	36w5d	21
6.30	25w0d	16	9.40	37w0d	19
6.40	25w2d	14	9.50	37w2d	19
6.50	25w5d	14			

Table No. 69 CD
(Hill)

CD (cm)	Gestational week (age of fetus in weeks)	±day	CD (cm)	Gestational week (age of fetus in weeks)	±day
1.40	15w1d	7	5.00	36w5d	22
1.50	15w5d	7	5.10	37w1d	22
1.60	16w4d	7	5.20	37w4d	22
1.70	17w1d	7	5.30	37w5d	22
1.80	17w6d	7	5.40	38w0d	22
1.90	18w4d	13	5.50	38w2d	22
2.00	19w2d	13	5.60	38w4d	22
2.10	20w0d	13			
2.20	20w5d	13			
2.30	21w3d	13			
2.40	22w1d	13			
2.50	22w5d	13			
2.60	23w4d	13			
2.70	24w1d	14			
2.80	24w6d	14			
2.90	25w4d	14			
3.00	26w1d	14			
3.10	26w6d	14			
3.20	27w4d	14			
3.30	28w1d	14			
3.40	28w5d	14			
3.50	29w3d	14			
3.60	30w0d	17			
3.70	30w4d	17			
3.80	31w1d	17			
3.90	31w5d	17			
4.00	32w2d	17			
4.10	32w5d	17			
4.20	33w3d	17			
4.30	33w6d	17			
4.40	34w3d	17			
4.50	34w5d	17			
4.60	35w2d	17			
4.70	35w5d	17			
4.80	36w1d	22			
4.90	36w4d	22			

Table No.70 CD
(Goldstein)

CD (week)	10%	—	50%	—	90%cm
15	1.00		1.40		1.60
16	1.40		1.60		1.70
17	1.60		1.70		1.80
18	1.70		1.80		1.90
19	1.80		1.90		2.20
20	1.80		2.00		2.20
21	1.90		2.20		2.40
22	2.10		2.30		2.40
23	2.20		2.40		2.60
24	2.20		2.50		2.80
25	2.30		2.80		2.90
26	2.50		2.90		3.20
27	2.60		3.00		3.20
28	2.70		3.10		3.40
29	2.90		3.40		3.80
30	3.10		3.50		4.00
31	3.20		3.80		4.30
32	3.30		3.80		4.20
33	3.20		4.00		4.40
34	3.30		4.00		4.40
35	3.10		4.05		4.70
36	3.60		4.30		5.50
37	3.70		4.50		5.50
38	4.00		4.85		5.50
39	5.20		5.20		5.50

Table No. 71 EES
(Goldstein)

(cm)	Gestational week (age of fetus in weeks)	±day
0.1	6w1d	3
0.2	6w2d	3
0.3	6w3d	3
0.4	6w4d	3
0.5	6w5d	3
0.6	6w6d	3
0.7	7w0d	3
0.8	7w1d	3
0.9	7w2d	3
1.0	7w3d	3
1.1	7w4d	3
1.2	7w5d	3
1.3	7w6d	3
1.4	8w0d	3
1.5	8w1d	3
1.6	8w2d	3
1.7	8w3d	3
1.8	8w4d	3
1.9	8w5d	3
2.0	8w6d	3
2.1	9w0d	3
2.2	9w1d	3
2.3	9w2d	3
2.4	9w3d	3
2.5	9w4d	3

Table No. 72 mGS
(Hellman)

mGS (cm)	Gestational week (age of fetus in weeks) in weeks)	±day	GS (cm)	Gestational week (age of fetus in weeks) in weeks)	±day
1.00	5w0d		4.60	10w1d	
1.10	5w1d		4.70	10w2d	
1.20	5w2d		4.80	10w3d	
1.30	5w3d		4.90	10w4d	
1.40	5w4d		5.00	10w5d	
1.50	5w5d		5.10	10w6d	
1.60	5w6d		5.20	11w0d	
1.70	6w0d		5.30	11w1d	
1.80	6w1d		5.40	11w2d	
1.90	6w2d		5.50	11w3d	
2.00	6w3d		5.60	11w4d	
2.10	6w4d		5.70	11w5d	
2.20	6w5d		5.80	11w6d	
2.30	6w6d		5.90	12w0d	
2.40	7w0d		6.00	12w1d	
2.50	7w1d				
2.60	7w2d				
2.70	7w3d				
2.80	7w4d				
2.90	7w5d				
3.00	7w6d				
3.10	8w0d				
3.20	8w1d				
3.30	8w2d				
3.40	8w3d				
3.50	8w4d				
3.60	8w5d				
3.70	8w6d				
3.80	9w0d				
3.90	9w1d				
4.00	9w2d				
4.10	9w3d				
4.20	9w4d				
4.30	9w5d				
4.40	9w6d				
4.50	10w0d				

Table No. 73 CRL
(Robinson)

CRL (cm)	Gestational week (age of fetus in weeks)	±day
0.60	6w2d	5
0.80	6w5d	5
1.00	7w1d	5
1.20	7w4d	5
1.40	7w6d	5
1.60	8w1d	5
1.80	8w3d	5
2.00	8w5d	5
2.20	9w0d	5
2.40	9w1d	5
2.60	9w3d	5
2.80	9w5d	5
3.00	9w6d	5
3.20	10w1d	5
3.40	10w2d	5
3.60	10w4d	5
3.80	10w5d	5
4.00	10w6d	5
4.20	11w1d	5
4.40	11w2d	5
4.60	11w3d	5
4.80	11w4d	5
5.00	11w6d	5
5.20	12w0d	5
5.40	12w1d	5
5.60	12w2d	5
5.80	12w3d	5
6.00	12w4d	5
6.20	12w5d	5
6.40	12w6d	5
6.60	13w0d	5
6.80	13w1d	5
7.00	13w2d	5
7.20	13w3d	5
7.40	13w4d	5
7.60	13w5d	5
7.80	13w6d	5

Table No. 74 CRL
(Daya)

CRL (cm)	Gestational week (age of fetus in weeks)	±day	CRL (cm)	Gestational week (age of fetus in weeks)	±day
0.20	6w1d	5	4.30	11w1d	5
0.30	6w2d	5	4.40	11w2d	5
0.40	6w3d	5	4.50	11w2d	5
0.50	6w4d	5	4.60	11w3d	5
0.60	6w5d	5	4.70	11w4d	5
0.70	6w6d	5	4.80	11w4d	5
0.80	7w0d	5	4.90	11w5d	5
0.90	7w1d	5	5.00	11w5d	5
1.00	7w2d	5	5.10	11w6d	5
1.10	7w3d	5	5.20	11w6d	5
1.20	7w4d	5	5.30	12w0d	6
1.30	7w5d	5	5.40	12w0d	5
1.40	7w6d	5	5.50	12w1d	5
1.50	8w0d	5	5.60	12w1d	5
1.60	8w1d	5	5.70	12w2d	5
1.70	8w2d	5	5.80	12w2d	5
1.80	8w3d	5	5.90	12w3d	6
1.90	8w4d	5	6.00	12w3d	5
2.00	8w5d	5	6.10	12w3d	5
2.10	8w6d	5	6.20	12w4d	6
2.20	8w6d	5	6.30	12w4d	5
2.30	9w0d	5	6.40	12w5d	6
2.40	9w1d	5	6.50	12w5d	5
2.50	9w2d	5	6.60	12w5d	6
2.60	9w3d	5	6.70	12w6d	5
2.70	9w4d	5	6.80	12w6d	6
2.80	9w4d	5	6.90	12w6d	5
2.90	9w5d	5	7.00	13w0d	6
3.00	9w6d	5	7.10	13w0d	5
3.10	10w0d	5	7.20	13w0d	6
3.20	10w1d	5	7.30	13w1d	6
3.30	10w1d	5	7.40	13w1d	5
3.40	10w2d	5	7.50	13w1d	6
3.50	10w3d	5	7.60	13w1d	6
3.60	10w3d	5	7.70	13w2d	6
3.70	10w4d	5	7.80	13w2d	6
3.80	10w5d	5	7.90	13w2d	6
3.90	10w6d	5	8.00	13w2d	5
4.00	10w6d	5			
4.10	11w0d	5			
4.20	11w0d	5			

Table No. 75 CRL
(Nelson)

CRL (cm)	Gestational week (age of fetus in weeks)	CRL (cm)	Gestational week (age of fetus in weeks)
1.00	8w1d	7.20	13w3d
1.20	8w2d	7.40	13w4d
1.40	8w3d	7.60	13w6d
1.60	8w5d	7.80	14w0d
1.80	8w6d	8.00	14w1d
2.00	9w0d	8.20	14w2d
2.20	9w1d	8.40	14w3d
2.40	9w2d	8.60	14w5d
2.60	9w4d	8.80	14w6d
2.80	9w5d	9.00	15w0d
3.00	9w6d		
3.20	10w0d		
3.40	10w1d		
3.60	10w3d		
3.80	10w4d		
4.00	10w5d		
4.20	10w6d		
4.40	11w0d		
4.60	11w2d		
4.80	11w3d		
5.00	11w4d		
5.20	11w5d		
5.40	11w6d		
5.60	12w0d		
5.80	12w2d		
6.00	12w3d		
6.20	12w4d		
6.40	12w5d		
6.60	13w0d		
6.80	13w1d		
7.00	13w2d		

Table No. 76 FL
(Hohler)

FL (cm)	Gestational week (age of fetus in weeks)	FL (cm)	Gestational week (age of fetus in weeks)
1.00	12w0d	4.50	24w3d
1.10	12w2d	4.60	24w6d
1.20	12w4d	4.70	25w2d
1.30	12w6d	4.80	25w5d
1.40	13w2d	4.90	26w1d
1.50	13w4d	5.00	26w4d
1.60	13w6d	5.10	27w0d
1.70	14w1d	5.20	27w3d
1.80	14w4d	5.30	27w6d
1.90	14w6d	5.40	28w2d
2.00	15w1d	5.50	28w5d
2.10	15w3d	5.60	29w1d
2.20	15w6d	5.70	29w4d
2.30	16w1d	5.80	30w0d
2.40	16w4d	5.90	30w4d
2.50	16w6d	6.00	31w0d
2.60	17w1d	6.10	31w3d
2.70	17w4d	6.20	31w6d
2.80	17w6d	6.30	32w2d
2.90	18w2d	6.40	32w6d
3.00	18w4d	6.50	33w2d
3.10	19w0d	6.60	33w5d
3.20	19w3d	6.70	34w2d
3.30	19w5d	6.80	34w5d
3.40	20w1d	6.90	35w2d
3.50	20w3d	7.00	35w5d
3.60	20w6d	7.10	36w1d
3.70	21w2d	7.20	36w5d
3.80	21w4d	7.30	37w1d
3.90	22w0d	7.40	37w5d
4.00	22w3d	7.50	38w1d
4.10	22w6d	7.60	38w5d
4.20	23w2d	7.70	39w2d
4.30	23w4d	7.80	39w5d
4.40	24w0d	7.90	40w2d
		8.00	40w5d

Table No. 77 FL
(O'Brien)

(week)	(cm)	± 2SD
14	1.66	0.25
15	1.99	0.23
16	2.20	0.30
17	2.52	0.29
18	2.96	0.31
19	3.24	0.31
20	3.48	0.25
21	3.75	0.41
22	4.09	0.39
23	4.35	0.36
24	4.64	0.35
25	4.80	0.46
26	5.11	0.50
27	5.30	0.32
28	5.44	0.41
29	5.73	0.43
30	5.87	0.38
31	6.15	0.45
32	6.28	0.42
33	6.49	0.46
34	6.57	0.44
35	6.77	0.48
36	6.95	0.46
37	7.08	0.43
38	7.18	0.56
39	7.42	0.51
40	7.54	0.56

Table No. 78 FL
(Warda)

FL (cm)	Gestational week (age of fetus in weeks)	±day	FL (cm)	Gestational week (age of fetus in weeks)	±day
1.00	13w1d	9	7.00	36w3d	26
1.20	13w5d	10	7.20	37w2d	27
1.40	14w3d	11	7.40	38w1d	27
1.60	14w6d	11	7.60	39w0d	28
1.80	15w4d	12	7.80	39w6d	29
2.00	16w1d	12	8.00	40w6d	29
2.20	16w6d	12			
2.40	17w4d	13			
2.60	18w1d	13			
2.80	18w6d	14			
3.00	19w5d	14			
3.20	20w3d	15			
3.40	21w1d	15			
3.60	21w6d	16			
3.80	22w5d	16			
4.00	23w4d	17			
4.20	24w2d	18			
4.40	25w1d	18			
4.60	25w6d	19			
4.80	26w5d	19			
5.00	27w4d	20			
5.20	28w3d	20			
5.40	29w2d	21			
5.60	30w1d	22			
5.80	31w0d	22			
6.00	31w6d	23			
6.20	32w6d	24			
6.40	33w5d	24			
6.60	34w4d	25			
6.80	35w4d	26			

Table No. 79 BPD
(Chitty)

(week)	3%	— 50%	— 97% mm
12	14.4	18.3	22.1
13	18	22	26.0
14	21.5	25.6	29.8
15	25	29.3	33.5
16	28.5	32.8	37.2
17	31.8	36.3	40.8
18	35.2	39.8	44.4
19	38.4	43.2	48.0
20	41.6	46.5	51.4
21	44.8	49.8	54.8
22	47.8	53	58.1
23	50.8	56.1	61.4
24	53.8	59.2	64.6
25	56.6	62.1	67.7
26	59.4	65	70.7
27	62	67.8	73.6
28	64.6	70.5	76.5
29	67.1	73.1	79.2
30	69.5	75.7	81.9
31	71.8	78.1	84.4
32	74	80.4	86.8
33	76	82.6	89.2
34	78	84.7	91.4
35	79.9	86.7	93.5
36	81.6	88.6	95.5
37	83.2	90.3	97.4
38	84.7	92	99.2
39	86.1	93.5	100.8
40	87.3	94.8	102.3
41	88.5	96.1	103.7
42	89.4	97.2	104.9

Table No. 80 HC
(Chitty)

(week)	3%	— 50%	— 97% mm
12	55.5	68.1	80.8
13	69.1	82.2	95.2
14	82.6	96	109.5
15	95.8	109.7	123.6
16	108.8	123.1	137.5
17	121.6	136.4	151.2
18	134.1	149.3	164.6
19	146.4	162	177.7
20	158.4	174.5	190.6
21	170.1	186.6	203.2
22	181.5	198.5	215.5
23	192.6	210	227.4
24	203.4	221.2	239.1
25	213.8	232.1	250.4
26	223.8	242.6	261.3
27	233.5	252.7	271.9
28	242.9	262.5	282.1
29	251.8	271.8	291.9
30	260.3	280.7	301.2
31	268.3	289.2	310.2
32	275.9	297.3	318.7
33	283.1	304.9	326.7
34	289.8	312	334.3
35	296	318.7	341.3
36	301.7	324.8	347.9
37	306.9	330.4	354.0
38	311.5	335.5	359.5
39	315.6	340	364.5
40	319.2	344	368.9
41	322.1	347.4	372.7
42	324.5	350.3	376.0

Table No. 81 AC
(Chitty)

(week)	3%	— 50%	— 97% mm
12	48	55.8	63.6
13	58.5	67.4	76.3
14	68.8	78.9	88.9
15	79.1	90.3	101.5
16	89.3	101.6	113.9
17	99.5	112.9	126.4
18	109.5	124.1	138.7
19	119.5	135.2	150.9
20	129.4	146.2	163.1
21	139.2	157.1	175.1
22	148.9	168	187.1
23	158.5	178.7	198.9
24	167.9	189.3	210.7
25	177.3	199.8	222.3
26	186.6	210.2	233.8
27	195.7	220.4	245.2
28	204.7	230.6	256.4
29	213.5	240.5	267.6
30	222.3	250.4	278.6
31	230.8	260.1	289.4
32	239.3	269.7	300.1
33	247.6	279.1	310.6
34	255.7	288.4	321.0
35	263.7	297.5	331.3
36	271.5	306.4	341.3
37	279.1	315.1	351.2
38	286.5	323.7	360.9
39	293.8	332.1	370.5
40	300.9	340.4	379.8
41	307.8	348.4	389.0
42	314.5	356.2	398.0

Table No. 82 FL
(Chitty)

(week)	3%	— 50%	— 97% mm
12	4.4	7.7	11.1
13	7.5	10.9	14.4
14	10.6	14.1	17.6
15	13.6	17.2	20.8
16	16.5	20.3	24.0
17	19.4	23.3	27.2
18	22.3	26.3	30.2
19	25.1	29.2	33.3
20	27.9	32.1	36.3
21	30.6	34.9	39.2
22	33.2	37.6	42.0
23	35.8	40.3	44.8
24	38.3	42.9	47.6
25	40.8	45.5	50.2
26	43.1	48	52.8
27	45.4	50.4	55.3
28	47.6	52.7	57.8
29	49.8	55	60.1
30	51.8	57.1	62.4
31	53.8	59.2	64.6
32	55.7	61.2	66.7
33	57.5	63.1	68.7
34	59.2	64.9	70.6
35	60.8	66.6	72.4
36	62.3	68.2	74.1
37	63.7	69.7	75.8
38	64.9	71.1	77.3
39	66.1	72.4	78.7
40	67.2	73.6	79.9
41	68.1	74.6	81.1
42	69	75.6	82.2

Table No. 83 CRL
(JSUM'03)

(day)	10%	50%	90%mm
49	6.8	10.1	16.0
51	7.3	10.5	15.7
53	8.1	11.3	16.0
55	9.0	12.5	17.0
57	10.2	14.0	18.4
59	11.6	15.8	20.4
61	13.1	17.8	22.7
63	14.9	20.0	25.4
65	16.7	22.5	28.3
67	18.7	25.0	31.4
69	20.9	27.6	34.6
71	23.1	30.3	37.8
73	25.4	33.1	41.0
75	27.9	35.8	44.1
77	30.4	38.4	47.0
79	32.9	40.9	49.6
81	35.5	43.3	51.3

Table No. 84 BPD
(JSUM'03)

BPD (mm)	Gestational week (age of fetus in weeks)	± 1.5SD
12.6	10	3.5
15.9	11	3.6
19.3	12	3.6
22.7	13	3.7
26.1	14	3.8
29.5	15	3.9
32.9	16	4.0
36.3	17	4.0
39.6	18	4.1
43.0	19	4.2
46.2	20	4.3
49.5	21	4.4
52.6	22	4.5
55.7	23	4.6
58.8	24	4.6
61.7	25	4.7
64.6	26	4.8
67.4	27	4.9
70.1	28	5.0
72.6	29	5.1
75.1	30	5.1
77.4	31	5.2
79.6	32	5.3
81.7	33	5.4
83.6	34	5.5
85.3	35	5.5
86.9	36	5.6
88.3	37	5.7
89.6	38	5.8
90.6	39	5.9
91.5	40	5.9
92.2	41	6.1
92.6	42	6.1

Table No. 85 AC
(JSUM'03)

AC (cm)	Gestational week (age of fetus in weeks)	± 1.5SD
10.4	16	1.4
11.4	17	1.5
12.5	18	1.6
13.5	19	1.7
14.5	20	1.7
15.5	21	1.8
16.5	22	1.9
17.5	23	2.0
18.5	24	2.0
19.5	25	2.1
20.5	26	2.2
21.4	27	2.2
22.4	28	2.3
23.3	29	2.4
24.2	30	2.4
25.1	31	2.5
25.9	32	2.6
26.8	33	2.6
27.6	34	2.7
28.4	35	2.8
29.2	36	2.9
29.9	37	2.9
30.6	38	3.0
31.3	39	3.1
31.9	40	3.2
32.5	41	3.2
33.1	42	3.3

Table No.86 FL
(JSUM'03)

FL (mm)	Gestational week (age of fetus in weeks)	±1.5 SD
20.1	16	4.0
22.7	17	4.0
25.3	18	4.1
27.8	19	4.1
30.4	20	4.2
32.9	21	4.2
35.4	22	4.3
37.9	23	4.4
40.3	24	4.4
42.7	25	4.4
45.0	26	4.5
47.3	27	4.5
49.6	28	4.6
51.7	29	4.6
53.8	30	4.7
55.8	31	4.8
57.8	32	4.8
59.6	33	4.8
61.4	34	4.9
63.0	35	5.0
64.6	36	5.0
66.0	37	5.1
67.4	38	5.1
68.6	39	5.2
69.6	40	5.2
70.6	41	5.2
71.4	42	5.3

Table No.87 NBL
(Sonek)

Gestational week (age of fetus in)	5%	50%	95% ile
11	1.4	2.3	3.3
12	1.8	2.8	4.2
13	2.3	3.1	4.6
14	2.5	3.8	5.3
15	3	4.3	5.7
16	3.4	4.7	6.2
17	4	5.3	6.6
18	4.3	5.7	7
19	5	6.3	7.9
20	5.2	6.7	8.3
21	5.6	7.1	9
22	5.8	7.5	9.3
23	6.4	7.9	9.6
24	6.8	8.3	10
25	6.5	8.5	10.7
26	7.4	8.9	10.9
27	7.5	9.2	11.3
28	7.6	9.8	12.1
29	7.7	9.8	11.8
30	7.9	10	12.6
31	8.2	10.4	12.6
32	8.6	10.5	13.6
33	8.7	10.8	12.8
34	9.1	10.9	12.8
35	8.5	11	14.1
36	7.8	10.8	12.8
37	8.7	11.4	14.5
38	9.3	11.7	15.7
39	9.2	10.9	14
40	10.4	12.1	14.5

FW GROWTH Table

Table No. 1 FW
(Brenner)

(week)	10%	— 50%	— 90%(g)
21	280	410	860
22	320	480	920
23	370	550	990
24	420	640	1080
25	490	740	1180
26	570	860	1320
27	660	990	1470
28	770	1150	1660
29	890	1310	1890
30	1030	1460	2100
31	1180	1630	2290
32	1310	1810	2500
33	1480	2010	2690
34	1670	2220	2880
35	1870	2430	3090
36	2190	2650	3290
37	2310	2870	3470
38	2510	3030	3610
39	2680	3170	3750
40	2750	3280	3870
41	2800	3360	3980
42	2830	3410	4060
43	2840	3420	4100
44	2790	3390	4110

Table No. 2 FW
(Osaka U)

(wk)	(g)	± 1SD(g)
16	137	29
17	176	31
18	223	35
19	280	42
20	347	50
21	425	60
22	512	71
23	611	83
24	720	96
25	839	110
26	968	125
27	1106	140
28	1253	155
29	1407	171
30	1568	188
31	1735	204
32	1906	222
33	2079	239
34	2254	257
35	2428	276
36	2600	296
37	2767	317
38	2928	339
39	3080	362
40	3220	387

Table No. 3 FW
(Hadlock)

(week)	10%	— 50%	— 90%(g)
10	29	35	41
11	37	45	53
12	48	58	68
13	61	73	85
14	77	93	109
15	97	117	137
16	121	146	171
17	150	181	212
18	185	223	261
19	227	273	319
20	275	331	387
21	331	399	467
22	398	478	559
23	471	568	665
24	556	670	784
25	652	785	918
26	758	913	1068
27	876	1055	1234
28	1004	1210	1416
29	1145	1379	1613
30	1294	1559	1824
31	1453	1751	2049
32	1621	1953	2285
33	1794	2162	2530
34	1973	2377	2781
35	2154	2595	3036
36	2335	2813	3291
37	2513	3028	3543
38	2686	3236	3786
39	2851	3435	4019
40	3004	3619	4234

Table No. 4 FW
(Shinozuka)

(wk)	(g)	± SD(g)
18	188	45
19	247	61
20	312	77
21	384	94
22	464	112
23	552	130
24	650	149
25	757	169
26	873	189
27	999	211
28	1134	233
29	1277	255
30	1428	279
31	1584	303
32	1745	328
33	1910	354
34	2075	380
35	2239	407
36	2399	435
37	2554	463
38	2699	492
39	2832	522
40	2949	553
41	3047	584

Table No. 5 FW
(Yorkoni)

(week)	10%	—	50%	—	95%(g)
16	132		154		207
17	173		215		249
18	214		276		291
19	223		300		412
20	232		324		534
21	275		432		705
22	319		540		876
23	347		598		880
24	376		656		885
25	549		793		1118
26	722		931		1352
27	755		1087		1563
28	789		1244		1774
29	900		1395		1883
30	1011		1546		1992
31	1198		1693		2392
32	1385		1840		2793
33	1491		2032		3000
34	1597		2224		3208
35	1703		2427		3336
36	1809		2631		3465
37	2239		2824		3679
38	2669		3017		3894

Table No. 6 FW
(Hadlock)

(week)	10%	—	50%	—	90%(g)
25	490		660		889
26	568		760		1016
27	660		875		1160
28	765		1005		1322
29	884		1153		1504
30	1020		1319		1706
31	1171		1502		1928
32	1338		1702		2167
33	1519		1918		2421
34	1714		2146		2687
35	1919		2383		2959
36	2129		2622		3230
37	2340		2859		3493
38	2544		3083		3736
39	2735		3288		3952
40	2904		3462		4217
41	3042		3597		4254
42	3142		3685		4322
43	3195		3717		4324

Table No.7 FW
(JSUM'03)

(week)	(g)	—
18.0	187	46
19.0	247	61
20.0	313	77
21.0	387	94
22.0	469	112
23.0	560	130
24.0	660	149
25.0	771	169
26.0	892	190
27.0	1023	211
28.0	1163	233
29.0	1313	256
30.0	1470	279
31.0	1635	303
32.0	1805	328
33.0	1980	354
34.0	2156	380
35.0	2333	407
36.0	2507	435
37.0	2676	463
38.0	2838	493
39.0	2989	523
40.0	3125	553
41.0	3244	584

Interval Growth Rate

Table No. 1 4W BPD (Levon)

(week)	10%	—	50%	—	90%
17	2.5		3.5		4.4
18	2.5		3.4		4.4
19	2.4		3.4		4.4
20	2.4		3.3		4.3
21	2.3		3.3		4.3
22	2.3		3.2		4.2
23	2.2		3.2		4.1
24	2.1		3.1		4
25	2		3		3.9
26	1.9		2.9		3.8
27	1.8		2.8		3.7
28	1.7		2.6		3.6
29	1.5		2.5		3.5
30	1.4		2.4		3.4
31	1.3		2.2		3.2
32	1.1		2.1		3.1
33	0.9		1.9		2.9
34	0.8		1.7		2.7
35	0.6		1.6		2.5
36	0.4		1.4		2.3

Table No. 2 6W BPD (Levon)

(week)	10%	—	50%	—	90%
17	2.8		3.5		4.1
18	2.8		3.4		4.1
19	2.7		3.4		4
20	2.7		3.3		4
21	2.6		3.3		3.9
22	2.6		3.2		3.9
23	2.5		3.2		3.8
24	2.4		3.1		3.7
25	2.3		3		3.6
26	2.2		2.9		3.5
27	2.1		2.8		3.4
28	2		2.6		3.3
29	1.9		2.5		3.2
30	1.7		2.4		3
31	1.6		2.2		2.9
32	1.4		2.1		2.7
33	1.3		1.9		2.6
34	1.1		1.7		2.4
35	0.9		1.6		2.2
36	0.7		1.4		2

Table No. 3 8W BPD (Levon)

(week)	10%	—	50%	—	90%
17	3		3.5		4
18	2.9		3.4		3.9
19	2.9		3.4		3.9
20	2.9		3.3		3.8
21	2.8		3.3		3.8
22	2.7		3.2		3.7
23	2.7		3.2		3.6
24	2.6		3.1		3.6
25	2.5		3		3.5
26	2.4		2.9		3.4
27	2.3		2.8		3.3
28	2.2		2.6		3.1
29	2		2.5		3
30	1.9		2.4		2.9
31	1.7		2.2		2.7
32	1.6		2.1		2.6
33	1.4		1.9		2.4
34	1.3		1.7		2.2
35	1.1		1.6		2.1
36	0.9		1.4		1.9

Table No. 4 10W BPD (Levon)

(week)	10%	—	50%	—	90%
17	3.1		3.5		3.9
18	3		3.4		3.8
19	3		3.4		3.8
20	3		3.3		3.7
21	2.9		3.3		3.7
22	2.8		3.2		3.6
23	2.8		3.2		3.6
24	2.7		3.1		3.5
25	2.6		3		3.4
26	2.5		2.9		3.3
27	2.4		2.8		3.2
28	2.3		2.6		3
29	2.1		2.5		2.9
30	2		2.4		2.8
31	1.8		2.2		2.6
32	1.7		2.1		2.5
33	1.5		1.9		2.3
34	1.4		1.7		2.1
35	1.2		1.6		2
36	1		1.4		1.8

Table No. 5 4W AC

(Levon)

(week)	10%	—	50%	—	90%
17	7.2		11.5		15.9
18	7.1		11.5		15.8
19	7		11.4		15.7
20	6.9		11.3		15.6
21	6.8		11.1		15.5
22	6.6		11		15.4
23	6.5		10.9		15.3
24	6.4		10.7		15.1
25	6.2		10.6		14.9
26	6		10.4		14.8
27	5.8		10.2		14.6
28	5.7		10		14.4
29	5.5		9.8		14.2
30	5.2		9.6		14
31	5		9.4		13.8
32	4.8		9.2		13.5
33	4.5		8.9		13.3
34	4.3		8.7		13
35	4		8.4		12.8
36	3.7		8.1		12.5

Table No.6 6W AC

(Levon)

(week)	10%	—	50%	—	90%
17	8.6		11.5		14.5
18	8.5		11.5		14.4
19	8.4		11.4		14.3
20	8.3		11.3		14.2
21	8.2		11.1		14.1
22	8.1		11		14
23	7.9		10.9		13.8
24	7.8		10.7		13.7
25	7.6		10.6		13.5
26	7.5		10.4		13.3
27	7.3		10.2		13.2
28	7.1		10		13
29	6.9		9.8		12.8
30	6.7		9.6		12.6
31	6.5		9.4		12.3
32	6.2		9.2		12.1
33	6		8.9		11.9
34	5.7		8.7		11.6
35	5.5		8.4		11.3
36	5.2		8.1		11.1

Table No. 7 8W AC

(Levon)

(week)	10%	—	50%	—	90%
17	9.3		11.5		13.7
18	9.2		11.5		13.7
19	9.1		11.4		13.6
20	9		11.3		13.5
21	8.9		11.1		13.4
22	8.8		11		13.2
23	8.7		10.9		13.1
24	8.5		10.7		12.9
25	8.3		10.6		12.8
26	8.2		10.4		12.6
27	8		10.2		12.4
28	7.8		10		12.2
29	7.6		9.8		12
30	7.4		9.6		11.8
31	7.2		9.4		11.6
32	6.9		9.2		11.4
33	6.7		8.9		11.1
34	6.4		8.7		10.9
35	6.2		8.4		10.6
36	5.9		8.1		10.3

Table No. 8 10W AC

(Levon)

(week)	10%	—	50%	—	90%
17	9.7		11.6		13.3
18	9.7		11.5		13.3
19	9.6		11.4		13.2
20	9.5		11.3		13.1
21	9.3		11.1		13
22	9.2		11		12.8
23	9.1		10.9		12.7
24	8.9		10.7		12.5
25	8.8		10.6		12.4
26	8.6		10.4		12.2
27	8.4		10.2		12
28	8.2		10		11.8
29	8		9.8		11.6
30	7.8		9.6		11.4
31	7.6		9.4		11.2
32	7.4		9.2		11
33	7.1		8.9		10.7
34	6.9		8.7		10.5
35	6.6		8.4		10.2
36	6.3		8.1		9.9

Table No. 9 4W FL

(Levon)

(week)	10%	—	50%	—	90%
17	2.1		3.1		4.2
18	2		3		4.1
19	1.9		2.9		4
20	1.8		2.8		3.9
21	1.7		2.7		3.8
22	1.6		2.6		3.7
23	1.5		2.6		3.6
24	1.4		2.5		3.5
25	1.4		2.4		3.4
26	1.3		2.3		3.3
27	1.2		2.2		3.3
28	1.1		2.2		3.2
29	1.1		2.1		3.1
30	1		2		3.1
31	0.9		2		3
32	0.9		1.9		3
33	0.8		1.9		2.9
34	0.8		1.8		2.9
35	0.7		1.8		2.8
36	0.7		1.7		2.8

Table No. 10 6W FL

(Levon)

(week)	10%	—	50%	—	90%
17	2.4		3.1		3.8
18	2.3		3		3.7
19	2.2		2.9		3.6
20	2.1		2.8		3.5
21	2		2.7		3.4
22	1.9		2.6		3.3
23	1.9		2.6		3.2
24	1.8		2.5		3.2
25	1.7		2.4		3.1
26	1.6		2.3		3
27	1.5		2.2		2.9
28	1.5		2.2		2.9
29	1.4		2.1		2.8
30	1.3		2		2.7
31	1.3		2		2.7
32	1.2		1.9		2.6
33	1.2		1.9		2.6
34	1.1		1.8		2.5
35	1.1		1.8		2.5
36	1		1.7		2.4

Table No.11 8W FL

(Levon)

(week)	10%	—	50%	—	90%
17	2.6		3.1		3.7
18	2.5		3		3.7
19	2.4		2.9		3.4
20	2.3		2.8		3.3
21	2.2		2.7		3.3
22	2.1		2.6		3.2
23	2		2.6		3.1
24	1.9		2.5		3
25	1.9		2.4		2.9
26	1.8		2.3		2.8
27	1.7		2.2		2.8
28	1.6		2.2		2.7
29	1.6		2.1		2.6
30	1.5		2		2.6
31	1.5		2		2.5
32	1.4		1.9		2.4
33	1.3		1.9		2.4
34	1.3		1.8		2.3
35	1.3		1.8		2.3
36	1.2		1.7		2.3

Table No. 12 10W FL

(Levon)

(week)	10%	—	50%	—	90%
17	2.7		3.1		3.6
18	2.6		3		3.5
19	2.5		2.9		3.3
20	2.4		2.8		3.2
21	2.3		2.7		3.2
22	2.2		2.6		3.1
23	2.1		2.6		3
24	2		2.5		2.9
25	2		2.4		2.8
26	1.9		2.3		2.7
27	1.8		2.2		2.7
28	1.7		2.2		2.6
29	1.7		2.1		2.5
30	1.6		2		2.5
31	1.6		2		2.4
32	1.5		1.9		2.3
33	1.4		1.9		2.3
34	1.4		1.8		2.2
35	1.4		1.8		2.2
36	1.3		1.7		2.2

Table No. 13 4W AD

(Levon)

(week)	10%	—	50%	—	90%
17	2.3		3.7		5.1
18	2.3		3.7		5
19	2.2		3.6		5
20	2.2		3.6		5
21	2.2		3.5		4.9
22	2.1		3.5		4.9
23	2.1		3.5		4.9
24	2		3.4		4.8
25	2		3.4		4.8
26	1.9		3.3		4.7
27	1.9		3.3		4.6
28	1.8		3.2		4.6
29	1.7		3.1		4.5
30	1.7		3.1		4.5
31	1.6		3		4.4
32	1.5		2.9		4.3
33	1.4		2.8		4.2
34	1.4		2.8		4.2
35	1.3		2.7		4.1
36	1.2		2.6		4

Table No. 14 6W AD

(Levon)

(week)	10%	—	50%	—	90%
17	2.7		3.7		4.6
18	2.7		3.7		4.6
19	2.7		3.6		4.6
20	2.7		3.6		4.5
21	2.6		3.5		4.5
22	2.6		3.5		4.4
23	2.5		3.5		4.4
24	2.5		3.4		4.4
25	2.4		3.4		4.3
26	2.4		3.3		4.2
27	2.3		3.3		4.2
28	2.3		3.2		4.1
29	2.2		3.1		4.1
30	2.1		3.1		4
31	2.1		3		3.9
32	2		2.9		3.9
33	1.9		2.8		3.8
34	1.8		2.8		3.7
35	1.7		2.7		3.6
36	1.7		2.6		3.5

Table No. 15 8W AD

(Levon)

(week)	10%	—	50%	—	90%
17	3		3.7		4.4
18	2.9		3.7		4.4
19	2.9		3.6		4.3
20	2.9		3.6		4.3
21	2.8		3.5		4.3
22	2.8		3.5		4.2
23	2.8		3.5		4.2
24	2.7		3.4		4.1
25	2.7		3.4		4.1
26	2.6		3.3		4
27	2.5		3.3		4
28	2.5		3.2		3.9
29	2.4		3.1		3.8
30	2.4		3.1		3.8
31	2.3		3		3.7
32	2.2		2.9		3.6
33	2.1		2.8		3.5
34	2.1		2.8		3.5
35	2		2.7		3.4
36	1.9		2.6		3.3

Table No. 16 10W AD

(Levon)

(week)	10%	—	50%	—	90%
17	3.1		3.7		4.2
18	3.1		3.7		4.2
19	3		3.6		4.2
20	3		3.6		4.2
21	3		3.5		4.1
22	2.9		3.5		4.1
23	2.9		3.5		4
24	2.8		3.4		4
25	2.8		3.4		3.9
26	2.7		3.3		3.9
27	2.7		3.3		3.8
28	2.6		3.2		3.8
29	2.6		3.1		3.7
30	2.5		3.1		3.6
31	2.4		3		3.6
32	2.3		2.9		3.5
33	2.3		2.8		3.4
34	2.2		2.8		3.3
35	2.1		2.7		3.2
36	2		2.6		3.2

Ratio Normal Range

Table No. 1 CI: BPDo/OFDo (Hadlock)

GA (wk)	Lower	Upper
14	0.7	0.86
15	0.7	0.86
16	0.7	0.86
17	0.7	0.86
18	0.7	0.86
19	0.7	0.86
20	0.7	0.86
21	0.7	0.86
22	0.7	0.86
23	0.7	0.86
24	0.7	0.86
25	0.7	0.86
26	0.7	0.86
27	0.7	0.86
28	0.7	0.86
29	0.7	0.86
30	0.7	0.86
31	0.7	0.86
32	0.7	0.86
33	0.7	0.86
34	0.7	0.86
35	0.7	0.86
36	0.7	0.86
37	0.7	0.86
38	0.7	0.86
39	0.7	0.86
40	0.7	0.86

Table No. 2 FL/AC (Hadlock)

GA (wk)	Lower	Upper
21	0.20	0.24
22	0.20	0.24
23	0.20	0.24
24	0.20	0.24
25	0.20	0.24
26	0.20	0.24
27	0.20	0.24
28	0.20	0.24
29	0.20	0.24
30	0.20	0.24
31	0.20	0.24
32	0.20	0.24
33	0.20	0.24
34	0.20	0.24
35	0.20	0.24
36	0.20	0.24
37	0.20	0.24
38	0.20	0.24
39	0.20	0.24
40	0.20	0.24
41	0.20	0.24
42	0.20	0.24

Table No. 3 FL/BPD (Hohler)

GA (wk)	Lower	Upper
23	0.71	0.87
24	0.71	0.87
25	0.71	0.87
26	0.71	0.87
27	0.71	0.87
28	0.71	0.87
29	0.71	0.87
30	0.71	0.87
31	0.71	0.87
32	0.71	0.87
33	0.71	0.87
34	0.71	0.87
35	0.71	0.87
36	0.71	0.87
37	0.71	0.87
38	0.71	0.87
39	0.71	0.87
40	0.71	0.87

Table No. 4 HC/AC (Campbell)

GA (wk)	Lower	Upper
13	1.14	1.31
14	1.14	1.31
15	1.05	1.39
16	1.05	1.39
17	1.07	1.29
18	1.07	1.29
19	1.09	1.26
20	1.09	1.26
21	1.06	1.25
22	1.06	1.25
23	1.05	1.21
24	1.05	1.21
25	1.04	1.22
26	1.04	1.22
27	1.05	1.22
28	1.05	1.22
29	0.99	1.21
30	0.99	1.21
31	0.96	1.17
32	0.96	1.17
33	0.96	1.11
34	0.96	1.11
35	0.93	1.11
36	0.93	1.11
37	0.92	1.05
38	0.92	1.05
39	0.87	1.06
40	0.87	1.06
41	0.93	1.00
42	0.93	1.00

Table No. 5 LVW/HW
(P&J)

GA (wk)	Lower	Upper
15	0.38	0.74
16	0.46	0.68
17	0.49	0.67
18	0.41	0.61
19	0.41	0.57
20	0.38	0.54
21	0.31	0.53
22	0.29	0.51
23	0.26	0.42
24	0.27	0.43
25	0.29	0.37
26	0.24	0.36
27	0.23	0.34
28	0.18	0.45
29	0.22	0.37
30	0.26	0.34
31	0.23	0.36
32	0.26	0.36
33	0.25	0.37
34	0.23	0.33
35	0.26	0.31
36	0.23	0.34
37	0.24	0.34
38	0.22	0.33

Table No. 6 FL/HC
(Hadlock FL HC)

(wk)	Lower	Upper
15	0.15	0.17
16	0.13	0.17
17	0.15	0.18
18	0.16	0.18
19	0.16	0.18
20	0.17	0.2
21	0.16	0.2
22	0.18	0.2
23	0.19	0.21
24	0.19	0.21
25	0.19	0.2
26	0.19	0.2
27	0.19	0.2
28	0.19	0.21
29	0.2	0.21
30	0.19	0.21
31	0.19	0.21
32	0.19	0.21
33	0.2	0.22
34	0.19	0.22
35	0.2	0.22
36	0.2	0.22
37	0.21	0.23
38	0.21	0.23
39	0.21	0.23
40	0.21	0.23
41	0.22	0.23
42	0.2	0.24

AFI Table

Table No. 1 AFI values
(Moore)

(week)	5%	—	50%	—	95%cm
16	7.90		12.10		18.50
17	8.30		12.70		19.40
18	8.70		13.30		20.20
19	9.00		13.70		20.70
20	9.30		14.10		21.20
21	9.50		14.30		21.40
22	9.70		14.50		21.60
23	9.80		14.60		21.80
24	9.80		14.70		21.90
25	9.70		14.70		22.10
26	9.70		14.70		22.30
27	9.50		14.60		22.60
28	9.40		14.60		22.80
29	9.20		14.50		23.10
30	9.00		14.50		23.40
31	8.80		14.40		23.80
32	8.60		14.40		24.20
33	8.30		14.30		24.50
34	8.10		14.20		24.80
35	7.90		14.00		24.90
36	7.70		13.80		24.90
37	7.50		13.50		24.40
38	7.30		13.20		23.90
39	7.20		12.70		22.60
40	7.10		12.30		21.40
41	7.00		11.60		19.40
42	6.90		11.00		17.50

Table No. 2 AFI values
(Phelan)

(week)	Lower	Upper(cm)
36	8.0	17.6
37	8.8	17.4
38	8.7	18.1
39	7.5	17.3
40	7.8	17.0
41	4.3	13.3
42	3.8	13.2

Table No. 3 AFI values
(Jeng, et. al.)

(week)	mean	1SDcm
13	9.70	1.70
14	9.70	1.70
15	13.70	3.50
16	13.70	3.50
17	12.50	3.40
18	12.50	3.40
19	14.30	3.10
20	14.30	3.10
21	14.50	3.30
22	14.50	3.30
23	15.20	3.30
24	15.20	3.30
25	16.40	5.30
26	16.40	5.30
27	16.40	4.80
28	16.40	4.80
29	17.00	5.00
30	17.00	5.00
31	15.60	4.20
32	15.60	4.20
33	16.50	4.70
34	16.50	4.70
35	16.00	4.90
36	16.00	4.90
37	16.50	4.90
38	16.50	4.90
39	14.00	4.80
40	14.00	4.80
41	13.70	5.50
42	13.70	5.50

Doppler Range Table

Table No. 1 Umbilical artery PI
(Shinozuka)

(week)	10%	—	90%
13	1.29		2.58
14	1.20		2.22
15	1.13		1.97
16	1.08		1.79
17	1.05		1.66
18	1.02		1.57
19	1.00		1.50
20	0.99		1.45
21	0.97		1.41
22	0.96		1.37
23	0.95		1.35
24	0.94		1.33
25	0.92		1.31
26	0.91		1.29
27	0.90		1.27
28	0.88		1.25
29	0.87		1.23
30	0.85		1.21
31	0.82		1.19
32	0.80		1.16
33	0.78		1.14
34	0.75		1.12
35	0.73		1.10
36	0.70		1.08
37	0.68		1.06
38	0.67		1.05
39	0.66		1.04
40	0.66		1.03
41	0.67		1.03

Table No. 2 Umbilical artery RI
(Shinozuka)

(week)	10%	—	90%
13	0.76		0.96
14	0.73		0.92
15	0.71		0.89
16	0.69		0.86
17	0.67		0.84
18	0.66		0.83
19	0.65		0.81
20	0.64		0.80
21	0.64		0.79
22	0.63		0.78
23	0.62		0.78
24	0.62		0.77
25	0.61		0.77
26	0.61		0.76
27	0.60		0.75
28	0.59		0.75
29	0.58		0.74
30	0.57		0.74
31	0.56		0.73
32	0.55		0.72
33	0.54		0.71
34	0.53		0.70
35	0.52		0.70
36	0.51		0.69
37	0.50		0.68
38	0.50		0.67
39	0.50		0.67
40	0.50		0.67
41	0.50		0.67

Table No. 3 Middle cerebral arteryPI
(Shinozuka)

(week)	10%	—	90%
21	1.51		2.02
22	1.56		2.19
23	1.59		2.34
24	1.62		2.46
25	1.64		2.54
26	1.65		2.60
27	1.65		2.63
28	1.65		2.63
29	1.63		2.61
30	1.61		2.57
31	1.58		2.52
32	1.54		2.45
33	1.49		2.38
34	1.44		2.30
35	1.38		2.21
36	1.32		2.13
37	1.25		2.05
38	1.19		1.98
39	1.12		1.92
40	1.05		1.87
41	0.99		1.83

Table No. 4 Middle cerebral arteryRI
(Shinozuka)

(week)	10%	—	90%
21	0.77		0.86
22	0.78		0.89
23	0.79		0.91
24	0.80		0.92
25	0.80		0.93
26	0.80		0.94
27	0.80		0.94
28	0.80		0.95
29	0.80		0.94
30	0.79		0.94
31	0.79		0.93
32	0.78		0.92
33	0.77		0.91
34	0.76		0.90
35	0.75		0.89
36	0.73		0.88
37	0.72		0.87
38	0.70		0.86
39	0.68		0.85
40	0.66		0.84
41	0.64		0.83

Table No. 5 Umbilical arteryPI

(JSUM'03)

(week)	5%ile	10%ile	50%ile	90%ile	95%ile
20	1.132	1.140	1.420	1.594	1.630
21	1.064	1.100	1.300	1.492	1.518
22	0.965	1.038	1.250	1.524	1.563
23	1.045	1.050	1.230	1.540	1.620
24	1.000	1.012	1.260	1.476	1.594
25	0.883	0.895	1.155	1.375	1.491
26	0.868	0.941	1.180	1.456	1.592
27	0.780	0.838	1.060	1.322	1.384
28	0.880	0.930	1.090	1.290	1.380
29	0.830	0.867	1.050	1.264	1.300
30	0.771	0.810	1.010	1.246	1.324
31	0.740	0.782	0.940	1.108	1.200
32	0.695	0.748	0.970	1.141	1.195
33	0.688	0.739	0.940	1.150	1.194
34	0.677	0.730	0.911	1.101	1.136
35	0.710	0.781	0.920	1.110	1.205
36	0.687	0.719	0.900	1.080	1.142
37	0.710	0.730	0.880	1.060	1.090
38	0.657	0.700	0.894	1.057	1.170
39	0.711	0.750	0.900	1.085	1.138
40	0.649	0.703	0.900	1.121	1.149
41	0.590	0.609	0.885	1.115	1.147

Table No. 6 Umbilical arteryRI

(JSUM'03)

(week)	5%ile	10%ile	50%ile	90%ile	95%ile
20	0.699	0.716	0.780	0.830	0.832
21	0.684	0.710	0.760	0.808	0.819
22	0.652	0.669	0.733	0.812	0.860
23	0.660	0.660	0.713	0.780	0.781
24	0.656	0.661	0.750	0.790	0.810
25	0.597	0.630	0.710	0.759	0.781
26	0.620	0.642	0.717	0.770	0.807
27	0.564	0.590	0.680	0.767	0.780
28	0.600	0.623	0.690	0.765	0.786
29	0.572	0.596	0.680	0.750	0.768
30	0.551	0.574	0.653	0.748	0.769
31	0.550	0.561	0.630	0.708	0.735
32	0.518	0.550	0.639	0.710	0.736
33	0.515	0.539	0.619	0.711	0.732
34	0.495	0.519	0.610	0.680	0.695
35	0.524	0.541	0.610	0.702	0.710
36	0.499	0.520	0.598	0.668	0.690
37	0.510	0.520	0.580	0.660	0.684
38	0.487	0.503	0.590	0.670	0.680
39	0.498	0.530	0.616	0.673	0.695
40	0.477	0.491	0.598	0.670	0.690
41	0.447	0.469	0.583	0.659	0.690

Table No. 7 Middle cerebral arteryPI

(JSUM'03)

(week)	5%ile	10%ile	50%ile	90%ile	95%ile
20	1.426	1.433	1.550	2.192	2.320
21	1.250	1.290	1.580	1.880	1.989
22	1.220	1.290	1.580	1.930	2.110
23	1.344	1.388	1.646	2.070	2.154
24	1.375	1.446	1.625	2.024	2.230
25	1.377	1.455	1.880	2.232	2.249
26	1.238	1.344	1.640	2.118	2.367
27	1.516	1.666	2.100	2.340	2.483
28	1.500	1.530	1.938	2.393	2.488
29	1.583	1.635	2.060	2.408	2.606
30	1.509	1.600	2.125	2.690	2.717
31	1.508	1.564	2.000	2.656	2.812
32	1.415	1.480	1.911	2.360	2.413
33	1.349	1.437	1.935	2.243	2.306
34	1.235	1.520	1.835	2.270	2.310
35	1.258	1.350	1.920	2.350	2.473
36	1.188	1.326	1.700	2.224	2.407
37	1.080	1.172	1.540	1.950	1.994
38	1.045	1.086	1.545	1.970	2.091
39	1.011	1.175	1.560	1.809	1.918
40	1.070	1.070	1.280	1.738	1.849
41	0.925	0.994	1.550	1.885	1.917

Table No. 8 Middle cerebral arteryRI

(JSUM'03)

(week)	5%ile	10%ile	50%ile	90%ile	95%ile
20	0.746	0.750	0.790	0.882	0.926
21	0.712	0.730	0.790	0.850	0.869
22	0.720	0.720	0.790	0.840	0.870
23	0.713	0.742	0.805	0.866	0.883
24	0.740	0.743	0.807	0.857	0.860
25	0.752	0.772	0.836	0.929	0.949
26	0.700	0.736	0.781	0.864	0.922
27	0.790	0.800	0.860	0.895	0.910
28	0.765	0.775	0.842	0.910	0.920
29	0.770	0.800	0.870	0.910	0.929
30	0.779	0.799	0.869	0.926	0.941
31	0.776	0.791	0.852	0.984	1.000
32	0.738	0.770	0.843	0.900	0.913
33	0.733	0.757	0.840	0.883	0.892
34	0.700	0.770	0.832	0.891	0.905
35	0.720	0.730	0.843	0.912	0.923
36	0.679	0.718	0.800	0.900	0.922
37	0.640	0.692	0.760	0.850	0.860
38	0.652	0.670	0.777	0.857	0.869
39	0.600	0.664	0.790	0.820	0.841
40	0.652	0.660	0.710	0.800	0.837
41	0.592	0.615	0.742	0.837	0.849

5-7. Abbreviation

Abbreviation	Meaning
AB	Abortus
AC	Abdominal Circumference
AD	Abdominal Diameter
AF	Amniotic Fluid
AFI	Amniotic Fluid Index
AF Pocket	Amnio Fluid Pocket
AFV	Amniotic Fluid Volume
APTD or (APD)	Antero Posterior Trunk Diameter
A × T	APTD × TTD
B	B(CTR,CTAR)
BBT	Based on Basal Body Temperature
BD	Binocular Distance
BPD	Biparietal Diameter
BPDo	Biparietal Diameter (outer - outer)
CD	Cerebral Diameter
CI	Cephalic Index
CRL	Crown Rump Length
CSA	Cross Sectional Area
CTAR	Cardio thoracic Area Ratio
CTR	Cardio thoracic Ratio
D-Ao	Descending Aorta
ECTOP	Ectopic
EDC	Estimated Date of Confinement
EDV	End Diastolic Velocity
EDV	End Diastolic Volume
EES	Early Embryonic Size
EF	Ejection Fraction
ESV	End Systolic Volume
FHR	Fetus Heart Rate
FIB	Fibula
FL	Femur Length
FS	Fractional Shortening
FTA	Fetal Trunk cross-sectional Area

Abbreviation	Meaning
FW	Fetus Weight
GA	Gestational Age
Grav	Gravida
GS	Gestational Sac
Lt	Left
LMP	Last Menstrual Period
HC	Head Circumference
HL	Humerus Length
HW	Hemispheric Width
IOD	Inner Orbital Diameter
LLQ	Left Lower Quadrant
LUQ	Left Upper Quadrant
LV	Length of Vertebrae
LV Function	Left Ventricular Function
LVIDd,s	Left ventricular Internal Diameter (diastole, Systole)
LVOT	Left Ventricular Out Tract diameter
LVOT Flow	Left Ventricular Outflow Tract Flow
LVW	Lateral Ventricular Width
MCA	Middle Cerebral Artery
mGS	mean Gestational Sac
MnV	Mean Velocity
NBL	Nasal Bone Length
NT	Nuchal Translucency
OBDop1-3	OB Doppler 1-3
OFD	Occipital Frontal Diameter
OFDo	Occipital Frontal Diameter (outer - outer)
OOD	Outer Orbital Diameter
Para	Para
PI	Pulsatility Index
PLI	Preload Index
PreFHR	Fetus Heart Rate Before Biopsy
Pst FHR	Fetus Heart Rate after Biopsy
PSV	Peak Systolic Velocity
pV	peak Velocity

Abbreviation	Meaning
RAD	Radius length
Renal-A	Renal Artery
RI	Resistance Index
RLQ	Right Lower Quadrant
RUQ	Right Upper Quadrant
Rt	Right
Rt./Lt.	Right/Left
RVDd	Right Ventricular Diameter (diastole)
RVOT	Right Ventricular Out Tract diameter
RVOT Flow	Right Ventricular Outflow Tract Flow
S/D	S/D ratio
SF	Systolic forward Flow PLI
SV	Stroke Volume
TC	Thoracic Circumference
TIB	Tibia length
TL	Thoracic Length
TTD(or TAD)	Transverse Trunk Diameter (or Transverse Abdominal Diameter)
ULNA	Ulna length
UmA	Umbilical Artery
US-EDC	Estimated Date of Confinement by Ultrasound all GA parameters
US-GA	Composite GA by Ultrasound
UtA	Uterine Artery
VTI	Velocity Time Integral

6. GYNECOLOGICAL MEASUREMENT

6-1. Preface

The description concerning the gynecological measurement functions is divided into the following six sub-sections.

This section describes the procedure for carrying out gynecological measurements, based on the assumption that products are on the factory default.

Descriptions of the basic operations of the measurement functions and each measurement method (mark type = Caliper, Trace, etc.) are given in the Section 1. "MEASUREMENT FUNCTIONS".

This section consists of 44 pages.

6-2. Gynecological Measurement Functional Outline

6-2-1. Gynecological Measurement Functional List

Gynecological measurements use studies consisting of various combinations of the measurement menu, report display, and so on, depending upon the part being examined and the purpose of the examination.

[Remark]
On the factory default, it contains GYN Study, Follicles Study and Bladder Study.

The gynecological measurement is divided as shown in the figure below for each mode.

: Items that are displayed on the factory default.

6-2-1-1. B mode

Measurement function	Measurement menu	Display items	Remark
Uterus measurement	Uterus	Ut-V Ut-L Ut-AP Ut-W	Measure at two cross-sections.
	Endom-T	Endom-T	Measure at one cross-section.
	Cervix	Crv-L Crv-AP Crv-W	Measure at two cross-sections.
Cervix measurement	Ovary	Ov-V Ov-L Ov-AP Ov-W	Measure at a number of cross-sections. Consists of Right/Left.
Ovary measurement	Follicles	Rt.Follicles Lt.Follicles	Measurement can be performed at up to 10 points at both left and right.
Follicles Volume measurement	Rt. Follicles Volume	Rt.Fol.Vol.	Measurement can be performed at up to 10 points at both left and right.
	Lt. Follicles Volume	Lt.Fol.Vol.	
Bladder measurement	Bladder Volume	Bl-V Bl-L Bl-W Bl-AP	Measure at two cross-sections. Display the amount of urine discharged as Void Volume in the report. Consists of Pre/Pst.

6-2-1-2. D mode

Measurement function	Measurement menu	Display items	Remark
Ovarian artery measurement	Uterine Artery	PI RI S/D PSV EDV MnV	Consists of Right/Left.
Uterine artery measurement	Ovarian Artery	PI RI S/D PSV EDV MnV	Consists of Right/Left.
	GYN Dop 1 GYN Dop 2 GYN Dop 3	PI RI S/D PSV EDV MnV	GYN Dop1 — 3: It is possible to freely define and use a name according to the particular purpose and application.

6-2-2. Items of Special Note

In Follicles and Endom-T measurement, it is possible to display the management of growth change along with the passage of time, based on the menstrual cycle.
In this case, enter the LMP (last menstrual period) or BBT (basal body temperature).
The measured values of the blood flow values obtained using this equipment are the absolute values displayed on the observation monitor. They are controlled as positive and negative values for the purpose of calculating the arithmetic index.
If the display of each measured value in a report is set to “Average” in a preset, the positive and negative values are added together and displayed as a mean value. Consequently, when performing multiple measurements of blood flow on the blood flow waveform drawn using the color Doppler method as a guide, use identical recording conditions (forward and reverse flow directions) for all of the blood flow waveforms in order to correctly display each of the arithmetic values arranged in the report.

6-3. Measurement operation procedure

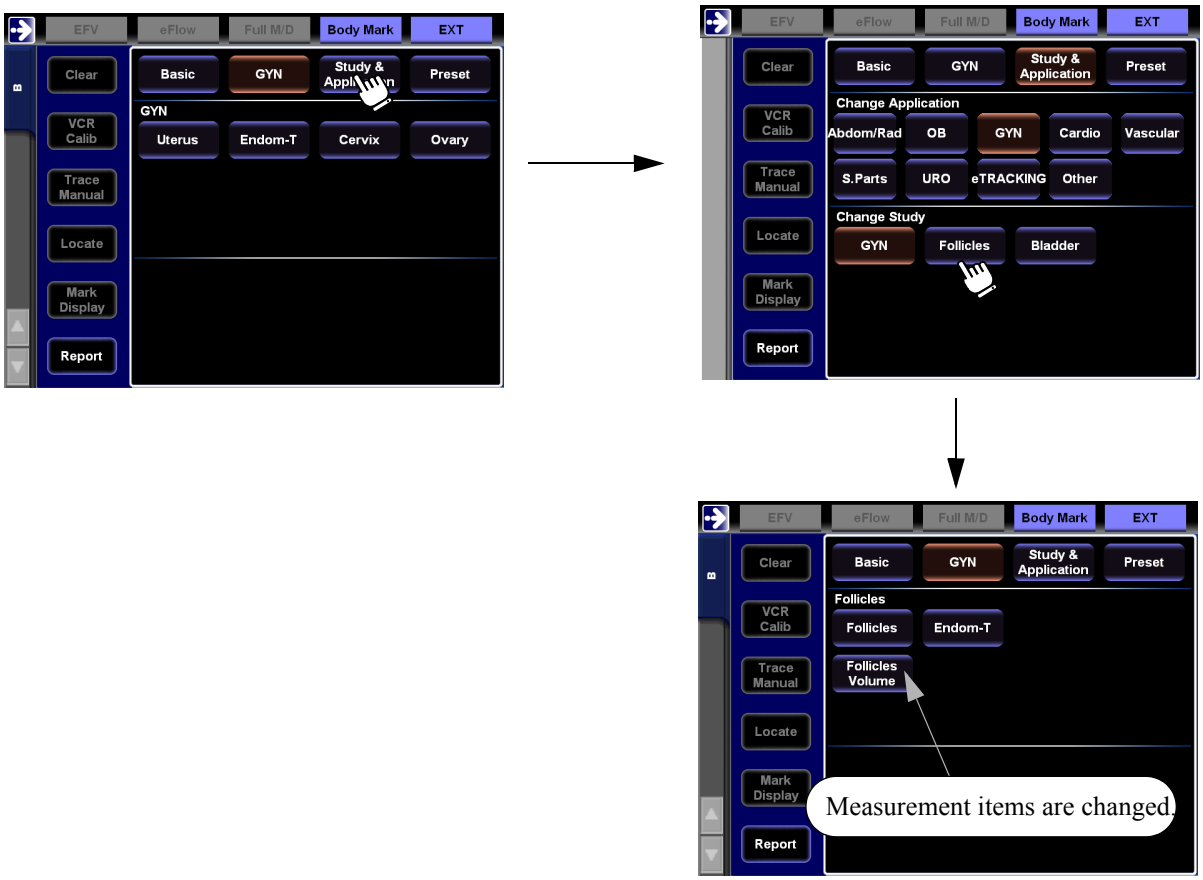
Obstetrical measurements use the following studies.

GYN (for general gynecologic measurement)
Follicles (for follicles)
Bladder (for bladder measurement)

Each measurement name displayed on the measurement menu is determined by the selected study.

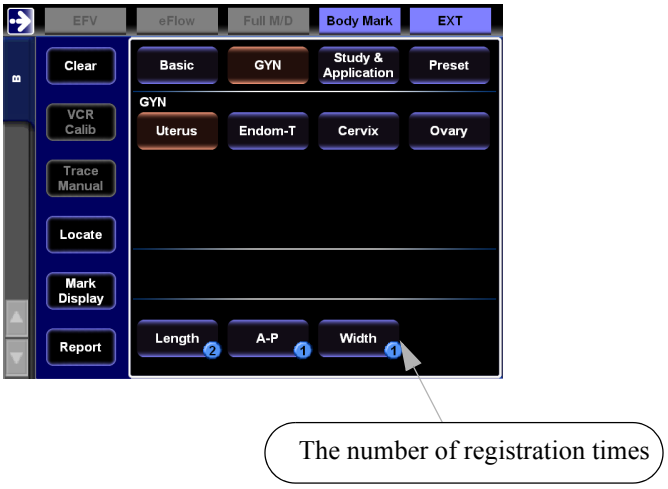
<Method of changing a study>

When a Study & Application of the touch panel is selected, the study names are displayed, so make a selection.



<Displaying marks of registered reports >

When the registration of report is made after the measurement of each measurement item, the number of registration times is displayed on the touch panel.



[Remark]
The display examples of measurement results in this chapter are displayed with a layout for a vertical display.

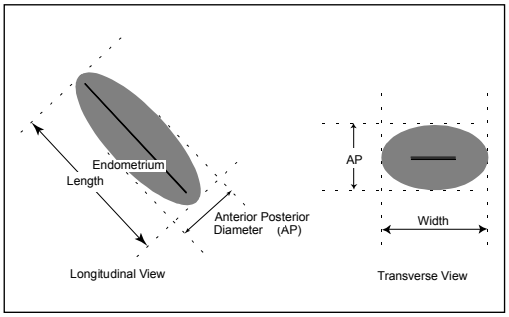
6-3-1. B mode

6-3-1-1. Uterus measurement

The uterus is approximated to an ellipsoid, then the length of the longitudinal view (length), the anterior-posterior (A-P), and the width of the transverse view (Width) are measured, and the volume is calculated.

[Remark]
Measure these three axes in such a way that they intersect each other.

[Remark]
You can perform this measurement using GYN Study.



<Operation method>

(1) Display the longitudinal and transverse images of the uterus in the 2B mode.

(2) Select the Uterus on the touch panel.
→ The + mark is displayed, so measure Length using a longitudinal image.

(3) Press the + switch.
→ Measure A-P using a longitudinal image.

(4) Press the + switch.
→ Measure the width using a transverse image.
The volume (Ut-V) is calculated.

(5) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of Uterus results display>

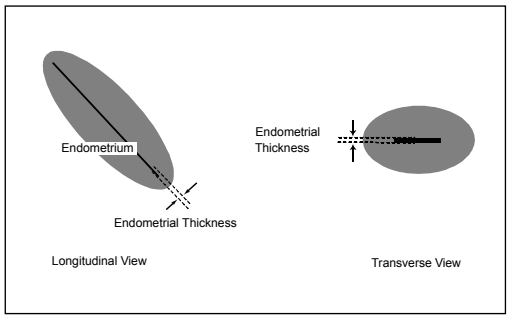
Uterus		
Ut-V :	**cm^3**	Uterus Volume
Ut-L :	**cm**	Uterus Length
Ut-AP:	**cm**	Uterus Anterior-posterior
Ut-W :	**cm**	Uterus Width

6-3-1-2. Endom-T measurement

Measure the thickness of the endometrium.

[Remark]
When evaluating the change in the thickness of the endometrium based on the menstrual cycle, first enter the LMP (last menstrual period) or BBT (basal body temperature) on the ID screen.

[Remark]
You can perform this measurement using GYN Study or Follicles Study.



<Operation method>

(1) Display the image of the endometrium.

(2) Select the Endom-T on the touch panel.
→ The + mark is displayed, so measure the endometrium.

(3) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of Endom-T results display>

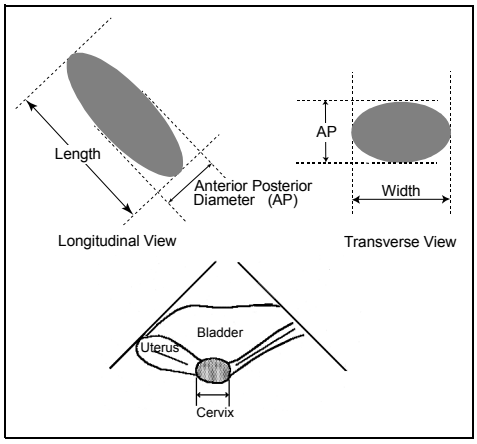
```
Endom-T
          cm
```

Endometrial Thickness

6-3-1-3. Cervix measurement

Measure the major and minor axes of the longitudinal view of the uterine cervix (Length, AP) and the major axis of the transverse view (Width).

[Remark]
You can perform this measurement using GYN Study.



<Operation method>

(1) Display the longitudinal and transverse view images of the uterine cervix in the 2B mode.

(2) Select the Cervix on the touch panel.
→ The + mark is displayed, so measure the Length using the longitudinal image.

(3) Press the + switch.
→ Measure the A-P using the longitudinal image.

(4) Press the + switch.
→ Measure the Width using the transverse image.

(5) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

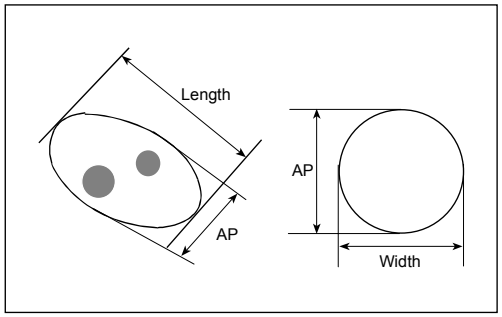
<Example of Cervix results display>

Cervix		
Crv-L :	**cm**	Cervix Length
Crv-AP:	**cm**	Cervix Anterior-posterior
Crv-W :	**cm**	Cervix Width

6-3-1-4. Ovary measurement

The left and right ovaries are approximated to ellipsoids, then the length of the longitudinal view (Length), the anterior-posterior (A-P), and the width of the transverse view (Width) are measured, and from the results the volume of the ovaries is calculated.

[Remark]
Measure these three axes in such a way that they intersect each other.
The switching between the Right and Left can be made with the touch panel.
[Remark]
You can perform this measurement using GYN Study.



<Operation method>

The case of the Right of the Ovary is explained.

(1) Display the longitudinal and transverse images of the right ovary in the 2B mode.

(2) Select the Ovary on the touch panel.
→ The + mark is displayed, so measure the Length using the longitudinal image.

(3) Press the + switch.
→ Measure the A-P using the longitudinal image.

(4) Press the + switch.
→ Measure the Width using the transverse image.
Volume(Ov-V) is computed.

(5) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of Ovary results display>

Rt.Ovary		
Ov-V :	cm^3	Ovary Volume
Ov-L :	cm	Ovary Length
Ov-AP:	cm	Ovary Anterior-posterior
Ov-W :	cm	Ovary Width

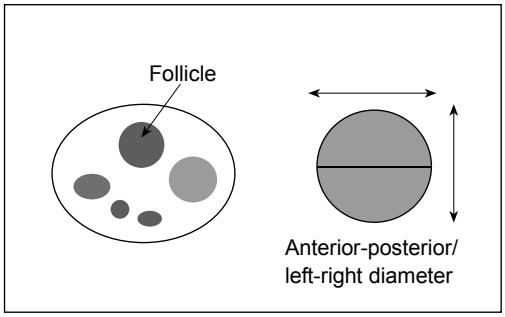
6-3-1-5. Follicles measurement

This function measures the size of the left and right follicles. You can measure up to 10 follicles in each of the left and right ovaries.
The switching between the Right and Left can be made with the touch panel.

[Remark]
When evaluating the change in the number of follicles and the follicle diameter based on the menstrual cycle, first enter the LMP (last menstrual period) or BBT (basal body temperature).

[Remark]
If you wish to measure both the front-rear and left-right axes of each follicle, change over the measurement method to the 2 Caliper method or the Cross Caliper method. For details, Refer to Section 6-5-2. "PRESET list"

[Remark]
You can perform this measurement using Follicles Study.



<Operation method>

The case of the Right of the Follicles is explained.

(1) Record an image showing the follicles of the right ovary.

(2) Select the Follicles on the touch panel.
→ The + mark is displayed, so measure the follicle.

[Remark]
When you perform measurement using the Caliper (Vol.) method, the capacity is displayed together with the measured values.
When using the 2 Caliper method or the Cross Caliper method, if you press the ENTER switch after performing step (2) the + mark for the second axis will be displayed. If you wish to continue performing measurement, press the + switch.

[Remark]
When measuring by either 2 Caliper (avg) method or Cross Caliper (avg) method, the mean value along with the values of the two axes is displayed.

(3) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

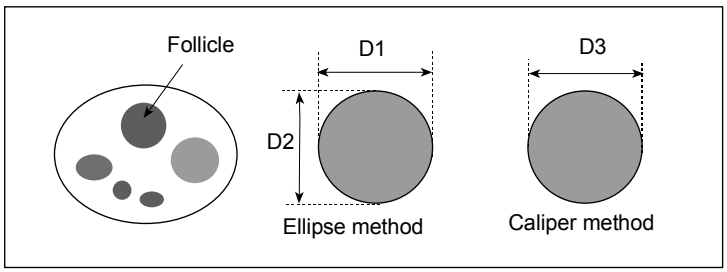
<Example of Follicles results display>

`Rt.Follicles 1:  2.4cm`	First Follicle measurement value
`Rt.Follicles 2:  2.4cm`	Second Follicle measurement value
`Rt.Follicles 9:  2.4cm`	Ninth Follicle measurement value
`Rt.Follicles 0:  2.4cm`	Tenth Follicle measurement value

[Remark]
You can measure up to 10 follicles.
The number of follicles is displayed in front of the measurement value.

6-3-1-6. Follicles Volume measurement

This function measures the size of the left and right follicles. Using Ellipse+Caliper method, measure the length of three axes (D1, D2 and D3), then find the follicle volume. You can measure up to 10 follicles in each of the left and right ovaries. The switching between the Right and Left can be made with the touch panel.



[Remark]
When evaluating the change in the number of follicles and the follicle diameter based on the menstrual cycle, first enter the LMP (last menstrual period) or BBT (basal body temperature).

[Remark]
You can perform this measurement using Follicles Study.

<Operation method>

The case of the Right of the Follicles Volume is explained.

(1) Record the longitudinal and transverse images of follicle in the right ovary with 2B mode.

(2) Select the Follicles Volume on the touch panel.

(3) When + mark is shown, using Ellipse method, measure two axes (D1 and D2) with the trackball and ENTER switch.
→ The average is displayed with value for the two axes.

(4) Press the + switch.
→ Using Caliper method, measure D3 in the transverse image.
The volume is calculated.

(5) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

< Example of Follicles Volume results display >

Rt.Fol.Vol.		
1:	cm	D1 Follicles measurement(Ellipse method)
:	cm	D2 Follicles measurement(Ellipse method)
2:	cm	D3 Follicles measurement(Caliper method)
ave:	cm	Average
Vol.:	cm^3	Volume

[Remark]
When proceeding to measure, press the + switch.
Up to ten examples can be measured, but only five examples at a time can be displayed.
You may also stop measurement after only one or two axes.

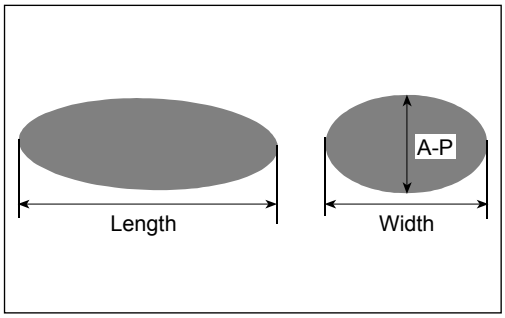
6-3-1-7. Bladder Volume measurement

This function enables you to calculate the volume of the bladder before and after it is full, and to calculate the amount of urine discharged from the difference in these values.
The bladder is approximated to an ellipsoid, then the left of the major axis of the longitudinal view (AP, Width) are measured, and from these results the volume of the bladder is calculated.

[Remark]
Measure these three axes in such a way that they intersect each other.

The switching between the Pre Void and Post Void can be made with the touch panel.

[Remark]
You can perform this measurement using Bladder Study.



<Operation method>

The case of the Pre Void is explained.

(1) Record the longitudinal and transverse images of the bladder before and after urination in the 2B mode.

(2) Select the Bladder Volume, and select the Pre Void on the touch panel.
→ The + mark is displayed, so measure the Length using the longitudinal image.

(3) Press the + switch.
→ Measure the A-P using the longitudinal image.

(4) Press the + switch.
→ Measure the Width using the transverse image. Volume(Bl-V) is computed.

(5) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of Bladder Volume results display>

```
PreBldr Vol.
Bl-V :      cm³   ← Bladder Volume
Bl-L :      cm    ← Bladder Length
Bl-AP:      cm    ← Bladder Anterior-posterior
Bl-W :      cm    ← Bladder Width
```

The same measurement items are displayed for PstBldr Vol too.

[Remark]
Display the amount of urine discharged (Pre-Pst) from the volume (PreBldr Vol.) calculated using Pre Bldr Vol. measurement and the volume (Pst Bldr Vol.) calculated using Pst Bldr Vol. measurement.

6-3-2. D mode

6-3-2-1. Uterine Artery, Ovarian Artery measurement

Gynecological Dop mode measurements include the measurement of blood flow through the left and right uterine arteries and also the measurement of blood flow through the ovarian arteries.
A waveform for each artery is traced, and the blood flow measurement data (PI, RI, S/D), and so on, is obtained.
As the measurement menu, the Uterine Artery for arteria uterine and the Ovarian Artery for arteria ovariea are available. The switching between the Right and Left can be made with the touch panel.

[Remark]
In PI and RI measurement, the peak systolic velocity (PSV) and the end diastolic velocity (EDV) are used.
There are also reports stating that these indexes use the minimum diastolic velocity.
The end diastolic velocity and the minimum diastolic velocity are not necessary the same.
Consequently, when performing these measurements, manually move the time phase of the EDV to the end diastolic point or to the minimum velocity point.
[Remark]
You can perform this measurement using GYN Study.

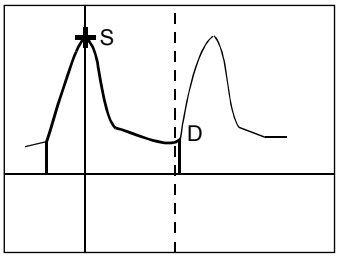
<Operation method>

The case of the Right of the Uterine Artery is explained.

(1) Record the blood flow Doppler waveform for the right uterine artery.

(2) Select the Uterine Artery on the touch panel.
→ The line cursor (vertical) is displayed.
(The + mark is displayed in the case of the Manual Trace method.)

(3) Using the Dop Trace method, trace the Doppler waveform.
→ PI, RI, S/D, and so on, are measured, and line cursors accompanied by the letters “S” and “D” are displayed.



[Remark]
Adjust the line cursors accompanied by the letters “S” and “D” using the ENTER switch and the trackball.
“S”: Peak Systolic Velocity point “D”: End Diastolic Velocity point
[Remark]
In the Dop Trace method, the operation method for Auto Trace is different from that of Manual Trace. For details of the operation procedure, refer to Section 1-7-4-5. "The measurement procedure of the Dop-Trace method".

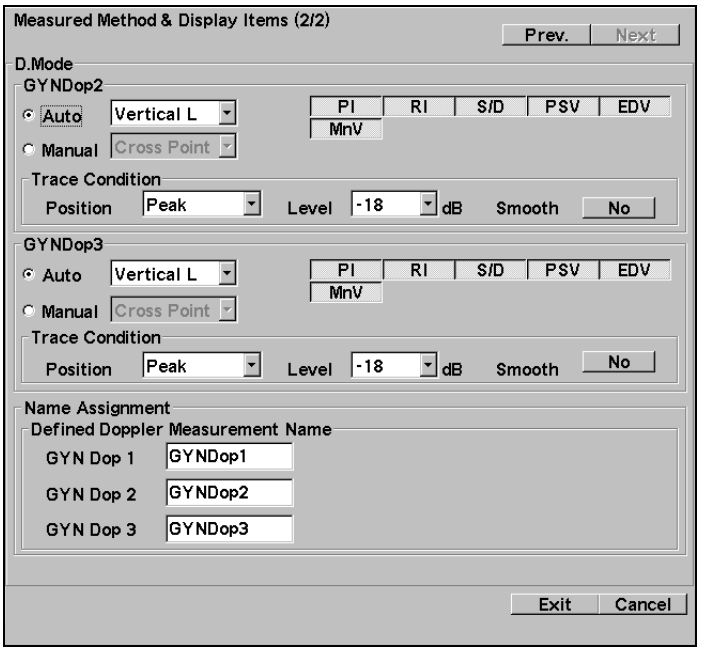
(4) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of Uterine Artery, Ovarian Artery results display>

```
Rt.UtA
PI  :                ← Pulsatility Index
RI  :                ← Resistance Index
S/D :                ← Systolic / Diastolic
PSV :        cm/s    ← Peak Systolic Velocity
EDV :        cm/s    ← End Diastolic Velocity
MnV :        cm/s    ← Mean velocity
```

6-3-2-2. GYN Dop 1(- 3) measurement

You can register (or create) up to three measurements of arterial blood flow other than the blood flow through the uterus or the ovaries by using the Preset function.
The procedure for performing all of the blood flow measurements created here is the same as that for Uterine Artery.



<Example of GYN Dop 1 results display>

```
GYN Dop1
PI  :                ← Pulsatility Index
RI  :                ← Resistance Index
S/D :                ← Systolic / Diastolic
PSV :        cm/s    ← Peak Systolic Velocity
EDV :        cm/s    ← End Diastolic Velocity
MnV :        cm/s    ← Mean velocity
```

6-4. Report function

A report arranges and displays each index value and measurement value for gynecological measurement and also related patient information.
A report displays only the results of the measurement. You can register up to six measurement values in a report.

[Remark]
You can set the number of values to be registered using Report Display of Preset.

[Remark]
Be sure to enter patient data (Patient ID, Name, etc.) on the ID screen.

6-4-1. Basic Operation of a Report

6-4-1-1. Displaying a Report

In order to display a report, press Report on the touch panel.

6-4-1-2. Ending a Report

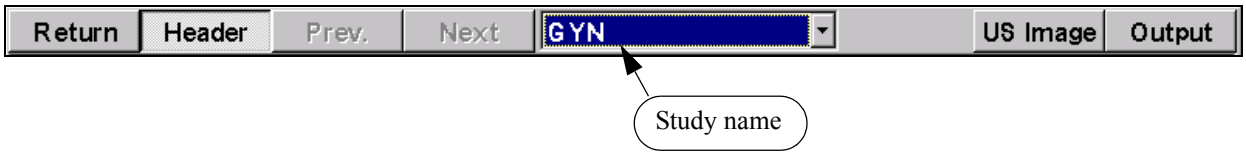
The following two patterns are used to end a report.

(1) Press Report on the touch panel.

(2) Select Return on the Report screen.

6-4-1-3. Function buttons on a Report

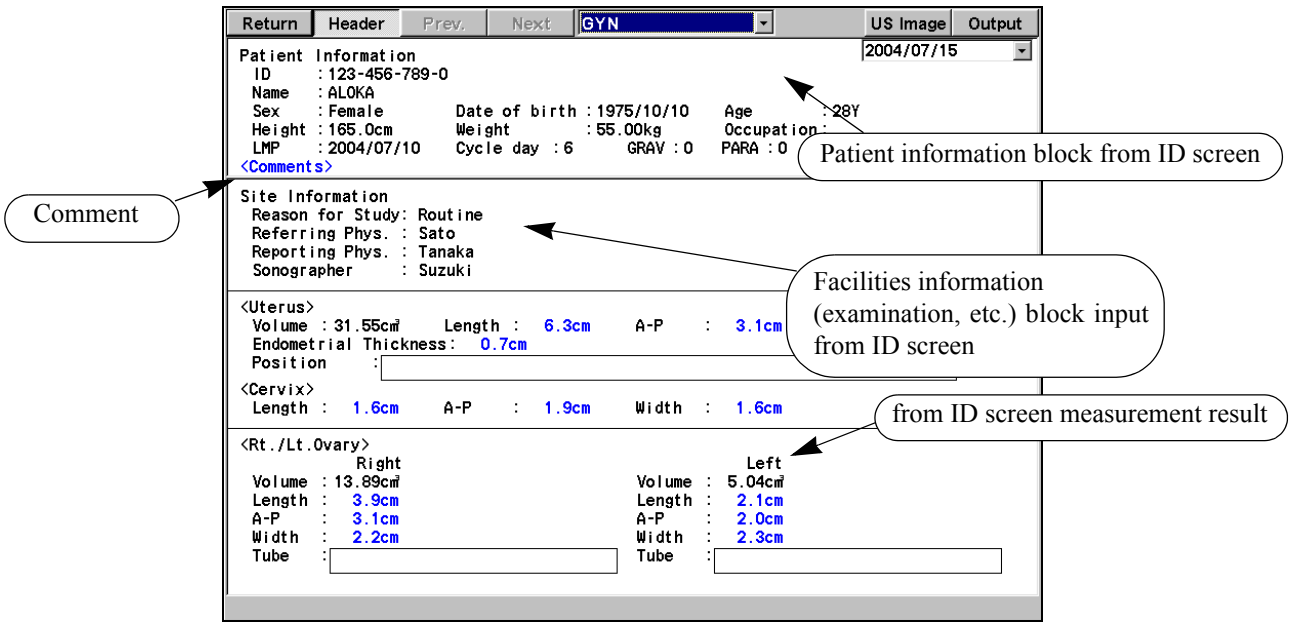
The following buttons are displayed on the top section of the Report screen.



Return	Closes the report.
Header	Switches the header block (patient data display) between Long Form and Short Form.
Prev., Next	Advances or returns the page in block units.
Study name	Switch the study of the displayed report.
US Image	Displays an ultrasound image in the report.
Output	Outputs report data to a personal computer, Media, printer or saver.

6-4-2. Report Block

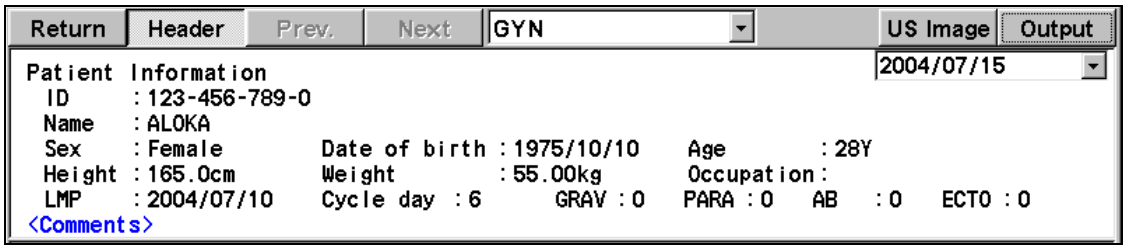
A report block is the unit used to display data (each set of gynecological measurement data).
It arranges pertinent ultrasound information such as Header (patient information) block, Site information (facilities information) block, and Uterus block.



6-4-2-1. Function for displaying the past reports.

It can display the past reports that are on the requested dates.
However, it is not possible to Edit (revision / deletion) the past measurement records.

(1) Move the arrow to the ▼ of the combo box identifying the exam. date, and press the ENTER switch.
→ The exam. date of the past is displayed.



(2) Select the exam. date desired to display, and press the ENTER switch.
→ The report of the requested exam. date is displayed.

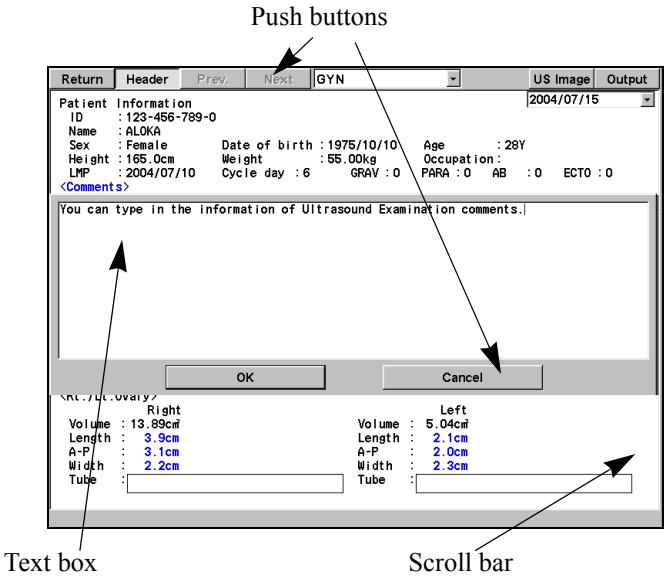
6-4-2-2. Comment input function

You can enter comments concerning an ultrasound examination as the results of an ultrasound examination.

(1) Move the arrow to <Comments>, and press the ENTER switch.
→ A text box for entering a comment is displayed.

(2) Enter a comment from the keyboard.

(3) Select OK.



[Remark]
If you select Cancel, the entered contents are canceled.

6-4-2-3. Edit (edits the data) function

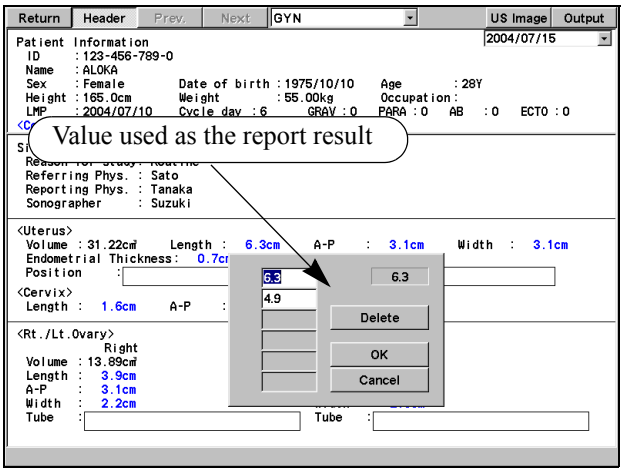
You can delete or modify the measurement results in a report.

[Remark]
You can only edit values displayed in yellow.

<Operation method>

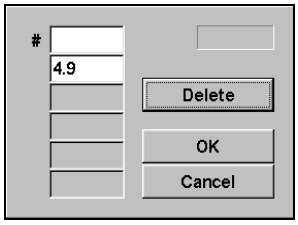
(1) Move the arrow to the measurement value, and press the ENTER switch.

→ The Edit dialog box is displayed.
All of the measured values are displayed.

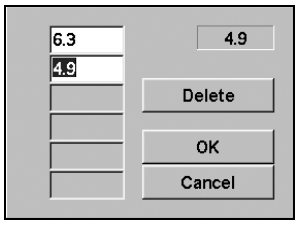


(2) Delete:
Select the measurement value to be deleted, and press Delete.

→ The specified measurement value is deleted, so select OK.

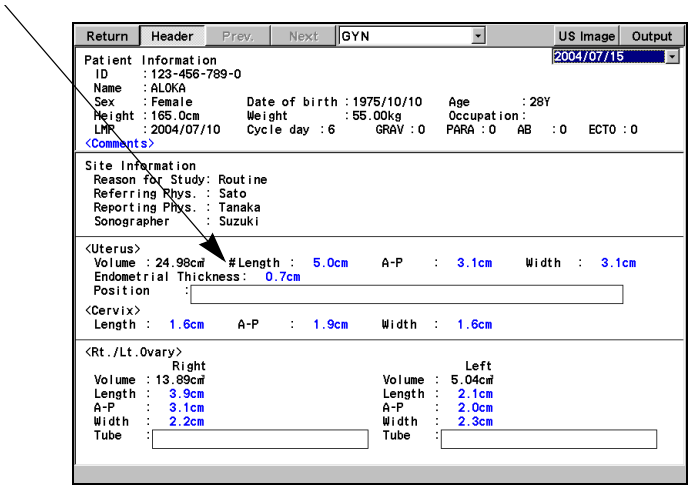


(3) Modify:
Select the measurement value to be modified, enter the new value from the keyboard, then select OK.



→ Displaying a modified measurement value

The mark “#” is attached to the beginning of a measurement item that was modified by entering a numerical value.



[Remark]

Like PI and RI measurement, there are two items of blood flow velocity data (PSV and EDV) within the period between two heartbeats that are mutually related.

Perform an editing operation so as to maintain the mutual time phase relationship.

(4) Change to a different measurement value:

You can change a measurement value displayed on a report to a different measurement value.

→ The displayed color of the selected part changes, so press OK.

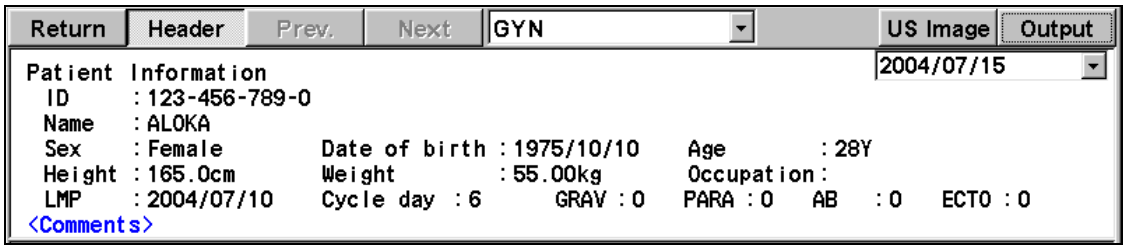
[Remark]

This function operates only when the setting “Always display the latest measurement value (last measurement value) on the report screen” is activated. If the result is set to the mean value, it remains unchanged regardless of what measurement value is selected.

(Refer to Section 6-5-2. "PRESET list" Report Data)

6-4-3. Description of Various Data Displayed in a Report

6-4-3-1. Patient Information

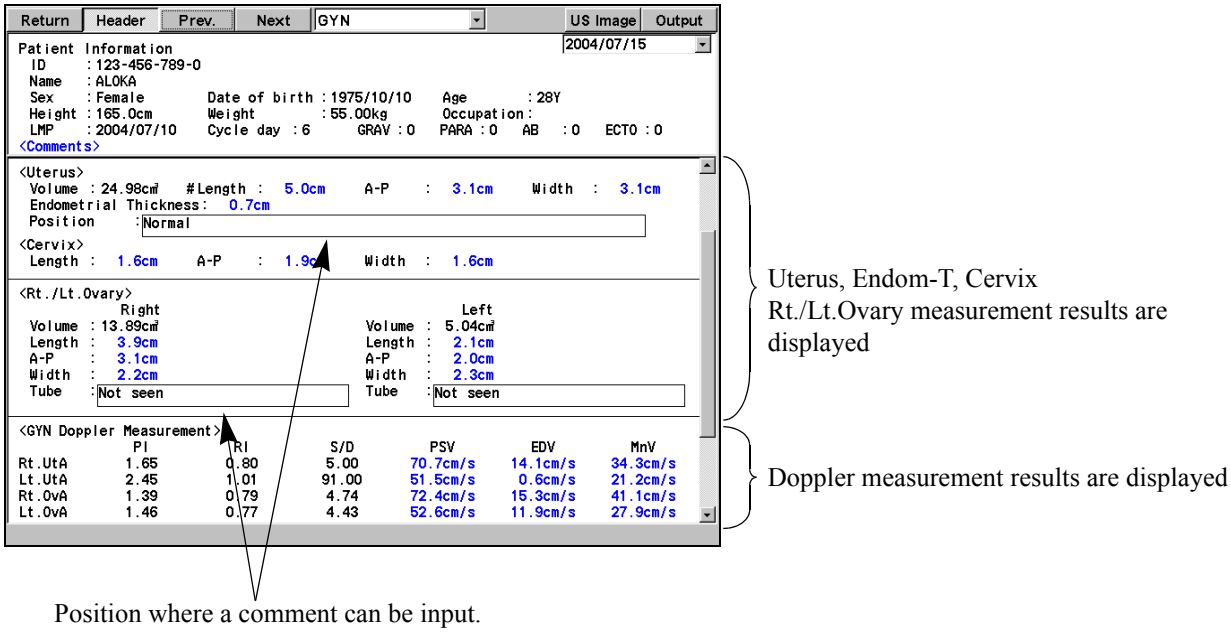


The meaning of Patient Information displayed in an gynecological measurement report is as follows.

LMP	: Date of the last menstruation period
Cycle day	: Dates from LMP till exam day
GRAV	: Number of gravida
PARA	: Number of para
AB	: Number of abortions or miscarriages
ECTO	: Number of ectopic pregnancies

6-4-3-2. GYN Report

This function enables you to display the measurement results of GYN Study.



[Remark]
In GYN Report, you can enter comments concerning the position of the uterus and the uterine tubes from your impressions of the ultrasound image.
The method of entering comments is the same as that of Section 6-4-2-2. "Comment input function".
Move the arrow to <Text box>, then press the ENTER switch and enter a comment.

6-4-3-3. Follicles Report

This function enables you to display the measurement results of Follicles Study.

Return | Header | Prev. | Next | Follicles | US Image | Output

2006/04/23

Patient Information
ID : 123-456-789-0
Name : ALOKA
Sex : Female Date of birth : 1975/10/10 Age : 30Y
Height : 165.0cm Weight : 55.00kg Occupation :
LMP : 2006/04/08 Cycle day : 16 GRAV : PARA : AB : ECTO :

<Comments>

<Ovary Follicles Diameter>

Right	1	2	3	4	5	6	7	8	9	10
Fol D1(cm)	2.44	2.27	2.08	1.92	1.58					
Left										
Fol D1(cm)	2.18	2.10	1.95	1.61						

Endometrial Thickness: 1.50cm

<Ovary Follicles Volume>

Right	1	2	3	4	5	6	7	8	9	10
Fol D1(cm)	2.44	2.27								
Fol D2(cm)	2.31	2.20								
Fol D3(cm)	2.37	2.05								
avg	2.37	2.17								
Vol.(cm³)	6.98	5.35								
Left										
Fol D1(cm)	2.18	2.10								
Fol D2(cm)	2.08	1.69								
Fol D3(cm)	2.35	2.08								
avg	2.20	1.96								
Vol.(cm³)	5.56	3.89								

<Rt.Ovary Follicles Diameter>

Exam.Date	Cycle day	Follicles(cm) 1	2	3	4	5	6	7	8	9	10
2006/04/18	11	1.90	1.46	1.20	1.04	0.95					
2006/04/23	16	2.44	2.27	2.08	1.92	1.58					

<Lt.Ovary Follicles Diameter>

Exam.Date	Cycle day	Follicles(cm) 1	2	3	4	5	6	7	8	9	10
2006/04/18	11	1.80	1.75	1.60	1.50	0.91					
2006/04/23	16	2.18	2.10	1.95	1.61						

<Rt.Ovary Follicles Volume> (Average)(cm)

Exam.Date	Cycle day	Follicles(Volume)(cm³) 1	2	3	4	5	6	7	8	9	10
2006/04/18	11	1.83	1.45								
		3.19	1.58								
2006/04/23	16	2.37	2.17								
		6.98	5.35								

<Lt.Ovary Follicles Volume> (Average)(cm)

Exam.Date	Cycle day	Follicles(Volume)(cm³) 1	2	3	4	5	6	7	8	9	10
2006/04/18	11	1.79	1.46								
		3.01	1.62								
2006/04/23	16	2.20	1.96								
		5.56	3.89								

<Endometrial Thickness>

Exam.Date	Cycle day	
2006/04/18	11	0.83cm
2006/04/23	16	1.50cm

<Drug Administration>

Exam.Date	Cycle day						
2006/04/18	11	hCG	150				
2006/04/23	16	Pergonal	120				

<Serum Levels>

Exam.Date	Cycle day						
2006/04/18	11	Estradiol	12				
2006/04/23	16	LH	15				

Pull down menu Text box for unit input

The current Rt./Lt.Fol and Endom-T measurement results are displayed here.

The current Rt./Lt.Fol. and Vol. measurement results are displayed here.

A history of the current and past measurement results is displayed here.
→ If you performed a measurement in the past, the date is added to the Exam. Date column.

The drug dosage, serum hormone value, and so on, for current and past measurements are input.
→ Drug & Serum input function

[Remark]
In the Follicles Report, you can display up to 10 follicles for each of the left and right ovaries in ascending order of size.
If you measure more than 10 follicles, the measurement results will be deleted in sequence from the smallest follicle.

[Remark]
When measuring the follicle diameter along two axes (2 Caliper method or Cross Caliper method), the measurement results for the two axes are displayed. In the case of 2-axis measurement, the larger of the two results is displayed in the history display of the current and past measurement results.
When measuring the follicle diameter by the two-axis mean (Either 2 Caliper (avg) or Cross Caliper (avg)), the mean value is displayed along with the values of the two axes. In the history display of current and past, the mean value (avg) is displayed.

[Remark]
There is no limit to the number of sets of past data that can be displayed. However, the LMP data entered in Patient Information is a reference, so data that is older than LMP is not displayed.

Also, note that you cannot display measurement data that is earlier than LMP unless you first enter LMP (last menstrual period) or BBT (basal body temperature).

<Drug & Serum input function>

Here, you can enter the results of ovary follicle measurement and also remarks such as drug dosage and serum hormone value for current and past measurements.

The following two patterns can be used as setting methods.

(1) Specify the drug and serum from the pull-down menu.

a. Move the arrow to ▼ of the specified text box, and press the ENTER switch.
→ A list of gynecological drugs and serum hormone names is displayed.

b. Using the trackball, select a name, and press the ENTER switch.
→ The specified name is transferred to the text box.

(2) Directly enter (register) the drug and serum names.

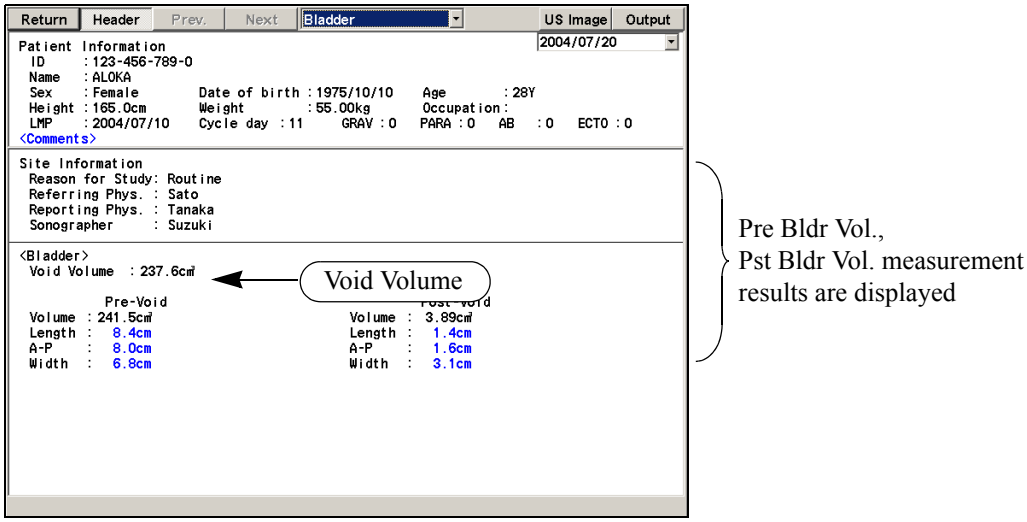
a. Move the arrow into the text box, and press the ENTER switch.
→ Enter the drug and serum names from the keyboard.
The entered information is registered as a user registration in the above list.

Pull down menu list

Drug Administration	No entry (Blank display)
	Pergonal
	Clomiphene
	Metrodin
	hCG
	Lepren
Serum Level	No entry
	Estradiol
	Pnojeslerene
	β HCG
	LH
	FSH

6-4-3-4. Bladder Report

This function enables you to display the measurement results of Bladder Study.



[Remark]
The Void Volume is calculated from (PreBldr Vol. - Pst Bldr Vol.).

6-4-3-5. Anatomy Check List Report

Anatomy Check List is a function that displays anatomical comments concerning the uterus, ovaries, and so on, and also comments concerning waveforms, as a checklist. It is displayed in the Anatomy Check List Block.
You can make a selection from the built-in checklist and user registration checklist.

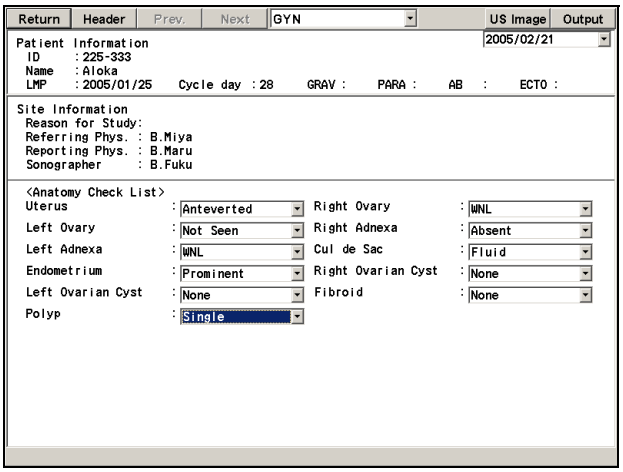
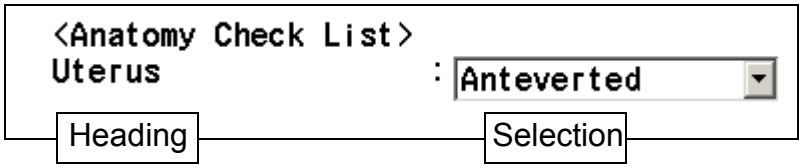


Fig. Report on Anatomy CL Study Display example

[Remark]
On the factory default, this study is not displayed.
(Refer to Section 6-5-2. "PRESET list" Study Assignment)

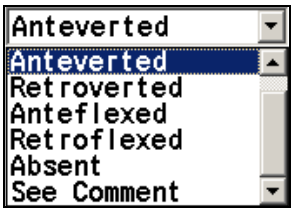
<Operation method>

A checklist consists of headings and selections.



Make a selection from the pull-down menu.

(1) Move the arrow to ▼ of the specified selection, and press the ENTER switch.
→ A selection list of opinions is displayed.



(2) Using the trackball, select a comment and press the ENTER switch.
→ The specified item is transferred to Selection.
The arrow moves to next Selection.

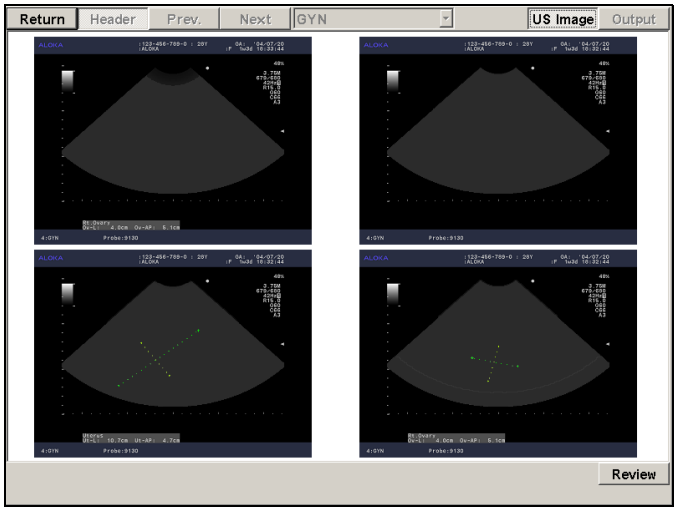
[Remark]
To register a number of items, repeat step (2).

[Remark]
The built-in choices can be registered by the user.
Refer to Section 6-5-2. "PRESET list"

6-4-4. Function that Attaches an Ultrasound Image to a Report

This function automatically displays the current ultrasound image acquired by the examiner in the US Image block of the report.
Also, by using the Review function at the bottom of the Report screen, it is possible to display all of the images stored in the connected medium (f.e. HDD and external media such as USB memory) as thumbnail images. You can also select one of these images, and display it in the report.

When you select US Image on the report screen, the US Image block (ultrasound image page) is displayed.



To return to a normal report, select US Image once again.

6-4-4-1. Images that can be attached to a report

Images that can be attached to a report are the various ultrasound images of the same patient that are stored in the connected medium (f.e. HDD and external media such as USB memory) at the storage destination.

6-4-4-2. Limit for holding attached images

Attached images are held until the New Patient function is executed.

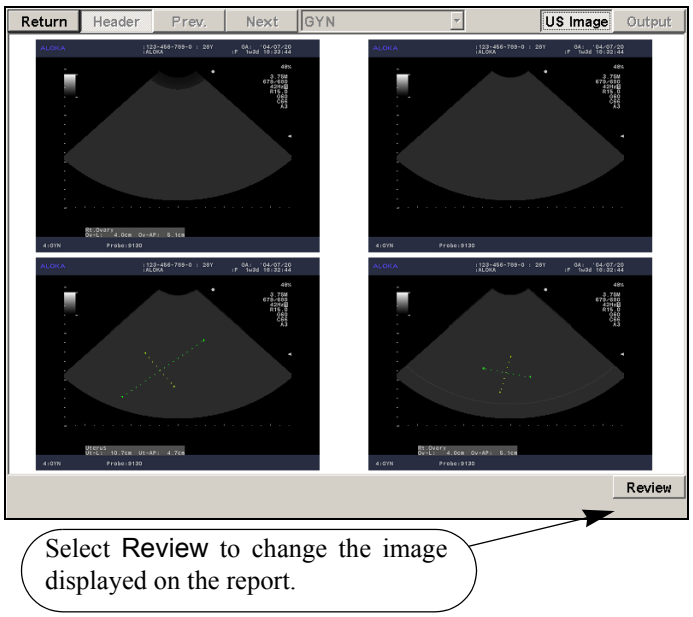
6-4-4-3. Method of attaching images

1) Auto Paste function

The number of images set using the Preset function is automatically selected from the latest images stored in the connected medium (f.e. HDD and external media such as USB memory) and displayed on the US Image block.

[Remark]
The number of displayed images and the display format can be set only by the Preset function.
The factory default settings are Display Pasted US Image Form on the Screen: 2 × 2, and Number of US Images to be Automatically Displayed is 4.

The figure at right shows examples of factory default settings.



Regarding the display sequence, the images are automatically pasted from the latest recorded image, from top left to bottom right.

[Remark]
You can set the format of an image displayed on the Report screen to 1 × 1, 2 × 2, 3 × 2 or 3 × 3.

2) Manual Paste function

<Operation method>

This function enables you to change the automatically attached image to another image, or to add an image.

(1) Select Review at bottom right of the US Image block screen.

→ All of the images of the patient concerned that are stored in the connected medium (f.e. HDD and external media such as USB memory) are displayed as thumbnail images.

(2) Move the arrow to the image that you wish to display, and press the ENTER switch.

→ The selected image is displayed with a blue border.

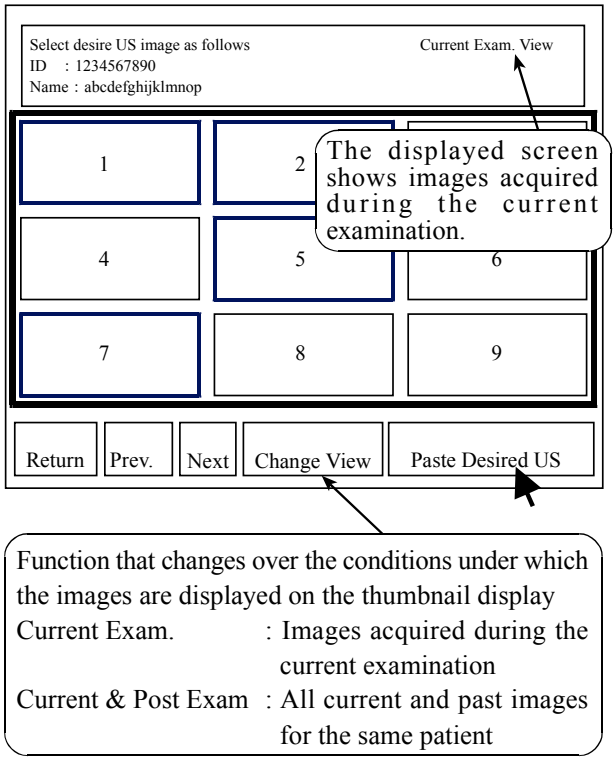


Fig. Thumbnail display

[Remark]
If you wish to select a number of images, repeat step (2). Pressing the ENTER switch on the selected image erases the blue border.

(3) Move the arrow to Paste Desired US, and press the ENTER switch.

→ The selected image is displayed in the US Image block.

[Remark]
Regarding the "Change View" function
By selecting Change View at the bottom of the thumbnail display, you can also display past images for the same patient as a thumbnail display.

[Remark]
Each time you select Change View, the display conditions switch over between "current image only" and "current and past images". The particular set of conditions displayed is indicated at top right of the thumbnail screen.

6-4-5. Printing Function

This function outputs the entire report data to a dedicated local printer via a USB interface.
The printed data is a text data, graphical data or ultrasound image.

6-4-5-1. Operation sequence

(1) Select Output.

→ A select device dialog box is displayed.

(2) Select to Printer, and press OK.

→ The Print Data Selection dialog box is displayed.

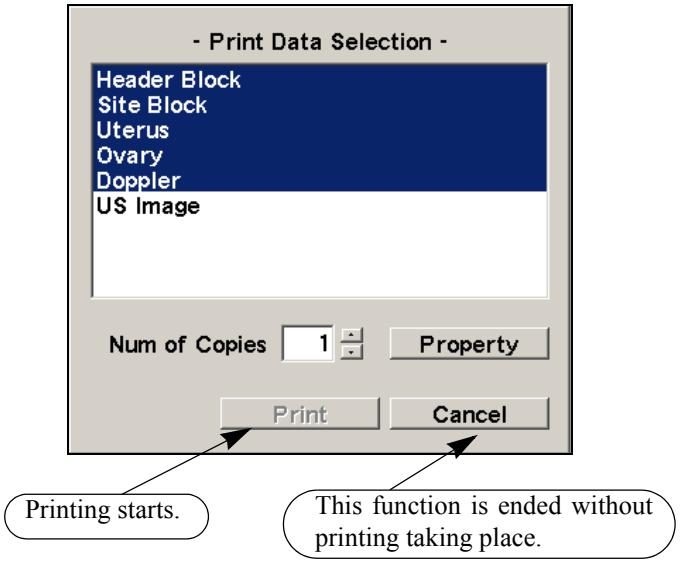
(3) Select the block that you wish to print.

→ The selected block name is highlighted in blue.

[Remark]
To cancel the selection, re-select the same block.

(4) Enter the number of copies, and select Print.

→ Printing starts, and the dialog box closes.



6-4-5-2. Property function

This function enables you to make the minimum necessary detailed settings for a local printer and a B/W digital printer.

(1) Printer name : Select the model of the printer to be used.

(2) Paper sizes : Set the size of the paper to be used. (US letter, A4 alternative selection)
The function does not operate when a digital black and white printer is selected

(3) Title Inform : Enter the Report Title information
You can enter up to 80 characters. The print position is always Center.

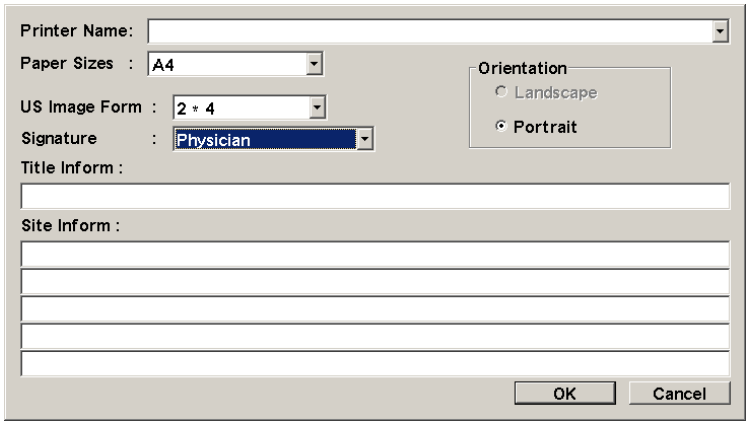
(4) Site Inform : Enter the facilities information (department, address, telephone No., FAX No., etc.).
You can enter up to 80 characters × 5 lines. The print position is always Center.

(5) Orientation : Set the orientation of the paper.
At present, the orientation is set to Portrait (vertical direction printing) only.

(6) US Image Form : When printing the US Image block, you can change the printing format to 1 × 2, 1 × 3, 2 × 2 or 2 × 4.
The function does not operate when a digital black and white printer is selected.

(7) Signature : Selects if the Signature field is set as Physician only, both Physician and Sonographer, or no field is displayed (None).

[Remark]
These settings are held subsequently so long as they are not renewed.



6-4-6. Output to a Personal Computer

This function outputs the entire report to a personal computer using an RS-232C interface.

6-4-6-1. Operation procedure

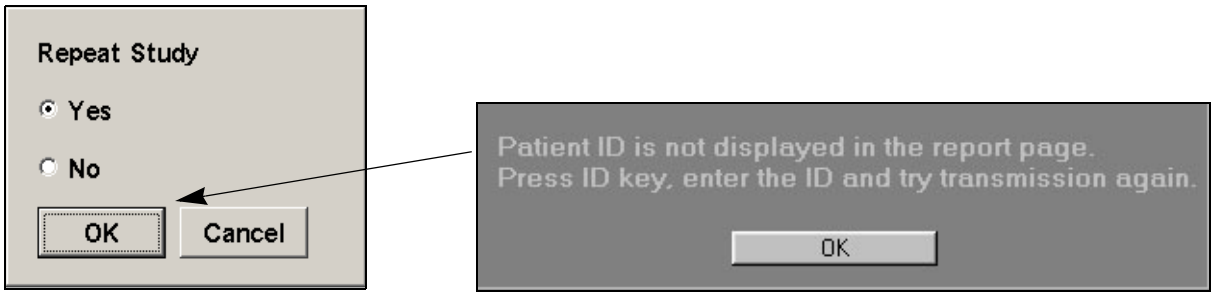
(1) Select Output.

→ The Select Device dialog box is displayed.s

(2) Select to PC.

→ The "Repeat study" dialog box is displayed.

[Remark]
If an ID is not input, a message to that effect will be displayed.
Press the ID key on the front panel.



(3) If you wish to repeat a study, select Yes and press OK.

→ Communication starts.

[Remark]
If you select Cancel, the system returns to the status that existed prior to the execution of this function.

[Remark]
The patient data and all of the data registered in the report (excluding the ultrasound image data) is output data to a personal computer.

6-4-7. Output to a CSV file

This function outputs the values registered in the report (measured values and calculated values) and the comment data to the connected medium(f.e. external media such as USB memory) as a CSV file.

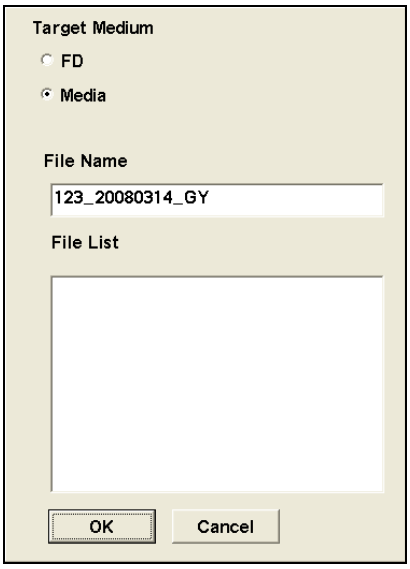
6-4-7-1. Operation procedure

(1) Select Output.

→ The "Select device" dialog box is displayed

(2) Select the Export CSV File.

→ The media selection dialog box appears.



[Remark]
The filename is automatically attached by means of [ID- Date Application], but can be changed by entering the desired name from the keyboard.

(3) Select the medium, enter the filename, and then press OK.

→ The data is written to the selected medium.

[Remark]
If you select Cancel, the equipment will return to the condition that existed prior to the execution of this function.

[Remark]
When you open the CSV file, the patient information, numerical values and comments appear in that sequence.

6-5. Preset function

6-5-1. Preset Settings

The gynecological measurement preset consists broadly of the following three functions.

(1) Create Measurement Tools= Settings related to the measurement procedure, mark size, and report display

(2) Study Assignment = Sets the menu, transfer list, report display configuration, and so on, for each study

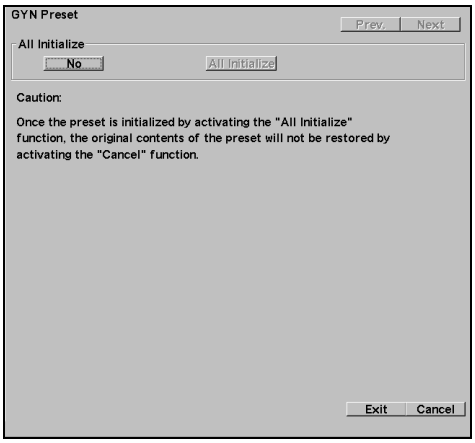
(3) SW Assignment = Settings for assigning various measurement functions to switches for shortcut operations

The preset functions related to obstetrical measurements and their configuration are shown below.

GYN Preset					
	Create Measurement Tools				Setting of the items that are common to GYN measurement and Basic measurements.
		Basic Measurement			Refer to Section 1-10. "PRESET FUNCTION"
		Application Measurement			Settings concerning GYN measurement to be used, Mark Style and result display.
			Measurement Method & Display Items		Selection and setting of each GYN measurement method, Mark Style and result display items.
				B.Mode	B mode measurement settings.
				M.Mode	M mode measurement settings.
				D.Mode	D mode measurement settings.
				F.Mode	Flow mode measurement settings.
			Caliper Mark Control		Setting of the measurement mark size and dot line. Substituted by Basic measurement preset.
			Unit Selection		Setting of the display unit for performing GYN measurement. Substituted by Basic measurement preset.
			Caliper Auto Off		Setting of the measurement mark for canceling a freeze condition, and also the automatic result erasure function.
			Report Data		Selection of the method of displaying measurement values on the report (mean value or not).
				Anatomy Check List	Setting of the Anatomy Check List.
			Display Form		Setting of GYN measurement result display style.
				Mark Display	Setting for displaying a caliper.
			User's Calculation		Function is for making the registration of calculation formulas voluntarily by user.
				Reserved Word	Function is for making the registration name (Reserved Word) voluntarily by user.
	Study Assignment				Setting of measurement menu registration, report display configuration, and transfer list for each Ultrasound Examination Study.
		Defined study name			GYN, Follicles, Bladder
		Menu Assignment			Function that enables a measurement menu to be created and edited.
		Anatomy Check List Assign			Setting of the check list to be displayed on the report.
		Combined Report Display			Function that enables the configuration of a report to be edited.
		Other			Function that enables a selection of whether or not to display a measurement operation guide message.
	SW Assignment				Setting of registration of the direct execution switches.
		+ Mark Key Assignment			Function that assigns the measurements to be executed when the + switch is pressed.
		Hot Key Assignment			Function that assigns the measurement function that operates when a specific alphabet key is pressed.
		Measure SW Assignment			Function that assigns the measurement function that operates when the User switch is pressed.
		Control Menu Assignment			Assigning the control menu on the touch panel.

6-5-2. PRESET list

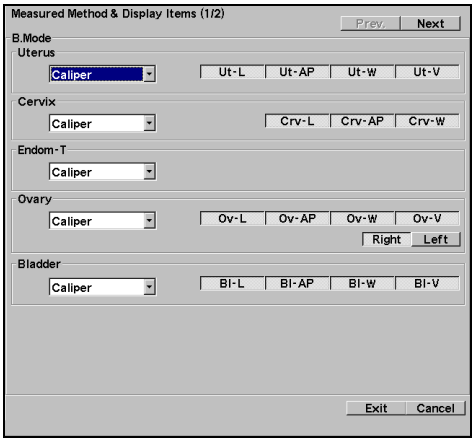
- GYN Preset
  Returns the registered contents to their default setting



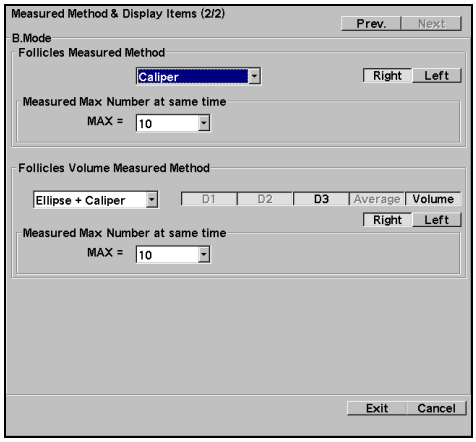
- Create Measurement Tools
  Basic Measurement

Refer to Section 1.

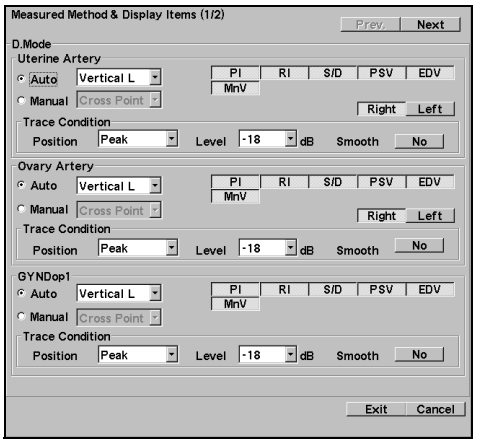
- Measured Method & Display Items (1/2)
  B mode measurement settings 1



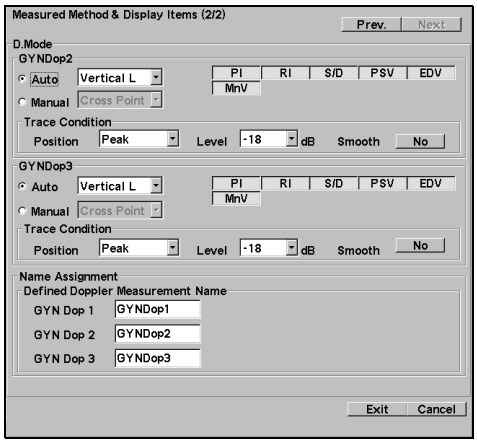
- Measured Method & Display Items (2/2)
  B mode measurement settings 2



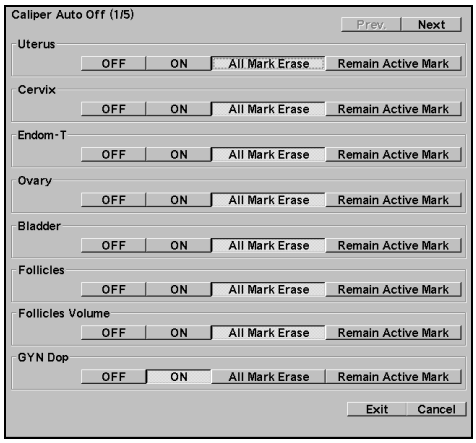
- Measured Method & Display Items (1/2)
  D mode measurement settings 1



- Measured Method & Display Items (2/2)
  D mode measurement settings 2

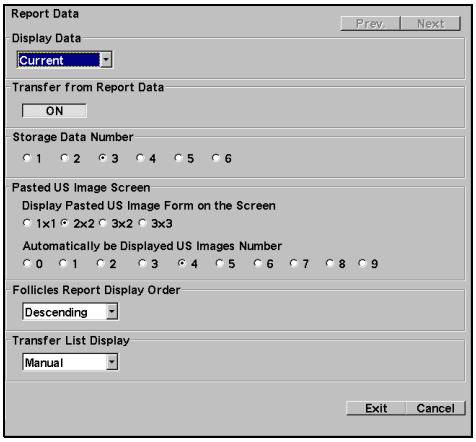


- Caliper Auto Off setting



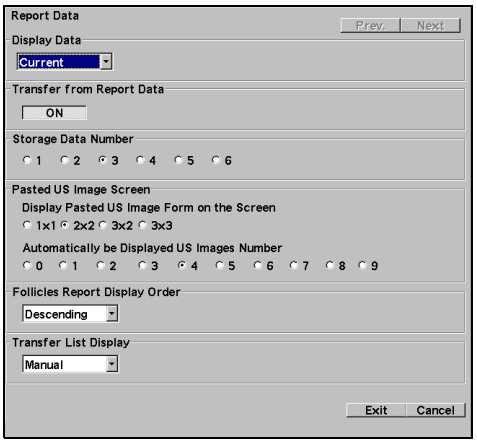
OFF : Results and marks not erased
ON : Results and marks all erased
All Mark Erase : Only marks erased
Remain Active Mark: Erases all marks other than for measurement during starting

- Report Data



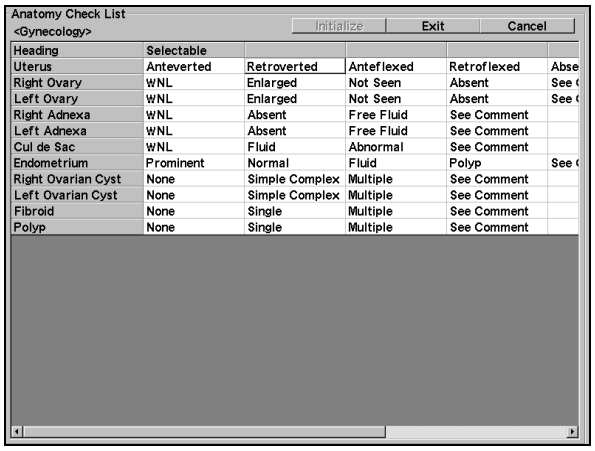
Selects either average values or the latest values, sets the number of data items registered, and sets measurement data reuse On/Off.
Pasting of Image
Setting the display sequence of the follicle measurement report
Auto display of Transfer List Display

- Anatomy Check List
  Built-in checklist items, list of choices, and user registration

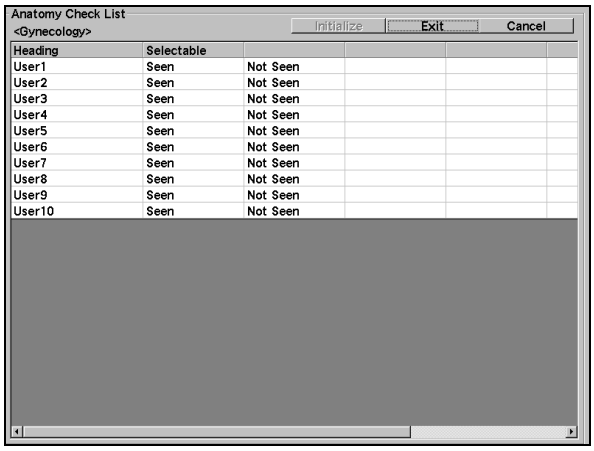


You can change (user selection) the built-in choices.

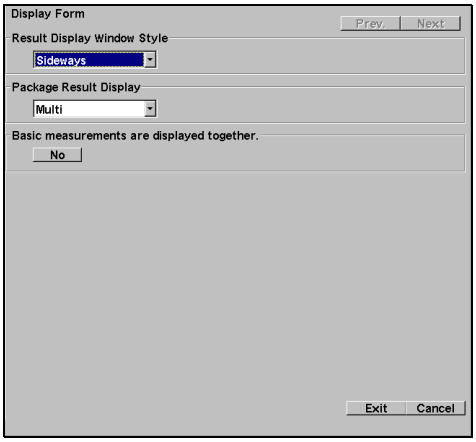
- Built-in
  The built-in choices can be registered by the user.



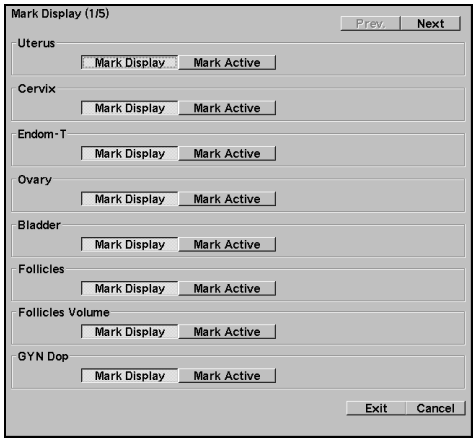
- User registration screen



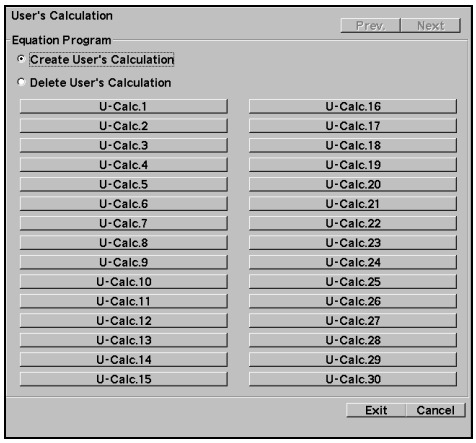
- Display Form
  Selects vertical or horizontal display and switches whether or not measurement item multiple displays display the measurements only during starting. Changing whether a simultaneous display with the Basic measurement or not



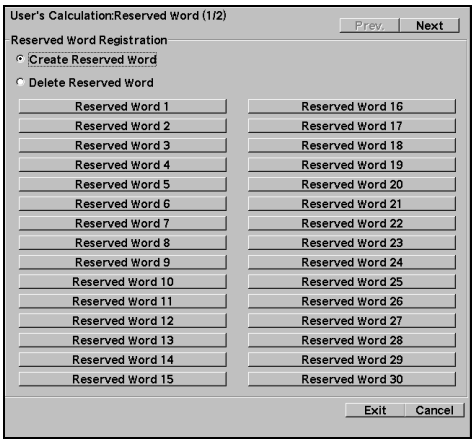
- Mark Display
  Setting for displaying caliper mark and measurement results



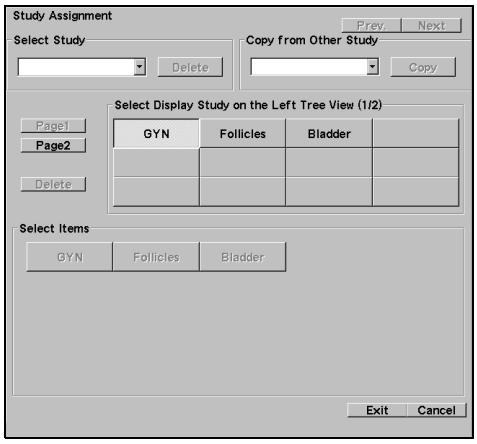
- User's Calculation
  Registers GYN measurement equation



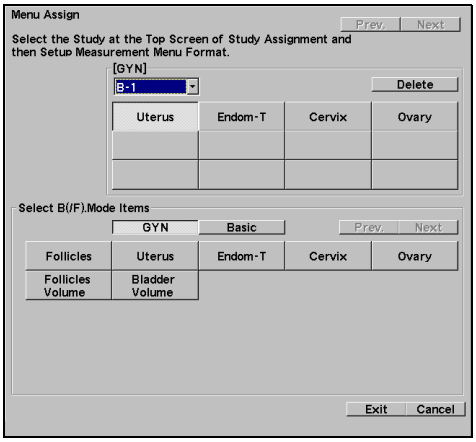
- Reserved Word
  Registers Cardiac reserved word.



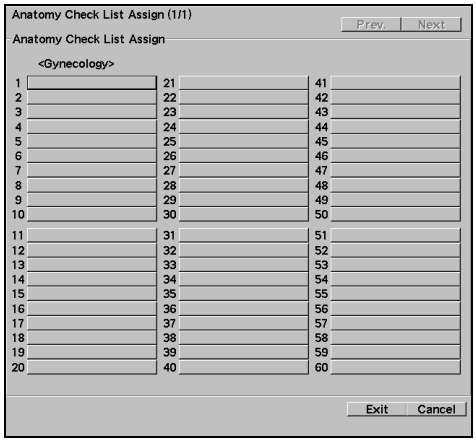
- Study Assignment
  Switches the display on/off for built-in studies and registers new studies.



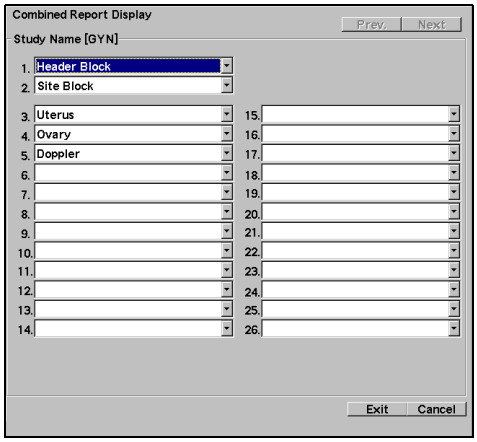
- Study Assignment
  Menu Assign
  Registers to the Menu Assign
  Gynecological measurement menu



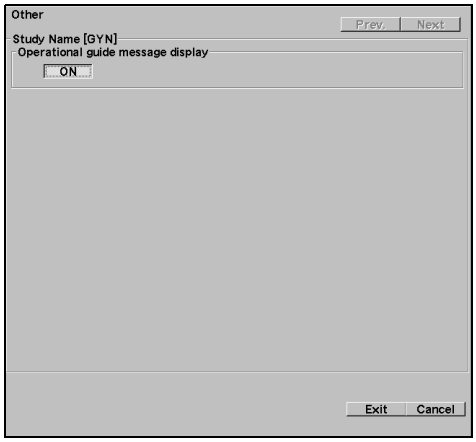
- Study Assignment
  Anatomy Check List Assign
  Selects the check list assign



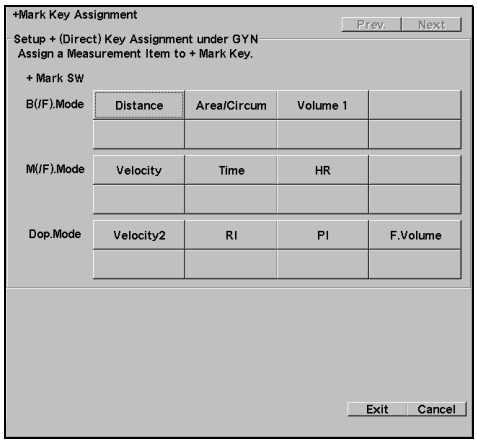
- Study Assignment
  Combined Report Display
  Combinations of measurement blocks displayed in reports



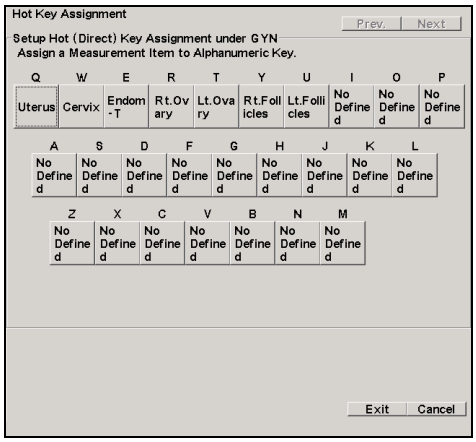
- Study Assignment
  Other
  Measurement guide message display setting



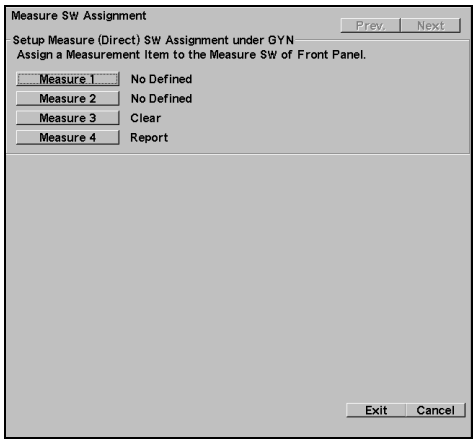
- SW Assignment
  + Mark Key Assignment
  Registers the measurement started with the + mark.



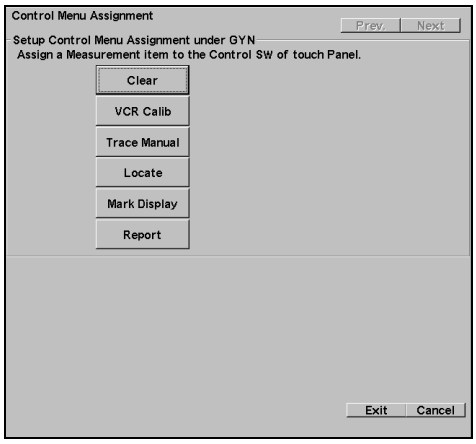
- SW Assignment
  Hot key Assignment
  Registers measurements to the Keyboard.



- SW Assignment
  Measure SW Assignment
  Registers measurements to the Measure SW



- Control Menu Assignment
  Registers to control menues on the touch panel.



6-6. Calculation Formula & Reference

6-6-1. Calculation

6-6-1-1. Calculation for B-mode

Measurement name	Calculation	
Uterus Volume	Volume(cm^3)	= 0.523 × Length × A – P × Width
Ovary Volume	Volume(cm^3)	= 0.523 × Length × A – P × Width
Bldr Volume	Volume(ml)	= π / 6 × Length × Width × A – P
		@@ – Volume is derived from @ – L, @ – AP, @ – W, their units are cm.
Follicles	Volume(cm^3)	= 4 / 3 × r^3 (r = radius r1 = d1/2)
Follicles Volume	Volume(cm^3)	= 4 / 3π×r1×r2×r3 =π/6×d1×d2×d3 (r = radius r1 = d1÷2, r2=d2÷2, r3=d3÷2)
	Average(cm^2)	=(d1+d2+d3)/3

6-6-2. Anatomy Check List

The Anatomy Check List built in equipment

Heading	Selection
Uterus	Anteverted, Retroverted, Anteflexed, Retroflexed, Absent, See Comment, NA
Right Ovary	WNL, Enlarged, Not Seen, Absent, See Comment, NA
Left Ovary	WNL, Enlarged, Not Seen, Absent, See Comment, NA
Right Adnexa	WNL, Absent, Free Fluid, See Comment, NA
Left Adnexa	WNL, Absent, Free Fluid, See Comment, NA
Cul de Sac	WNL, Fluid, Abnormal, See Comment, NA
Endometrium	Prominent, Normal, Fluid, Polyp, See Comment, NA
Right Ovarian Cyst	None, Simple Complex, Multiple, See Comment, NA
Left Ovarian Cyst	None, Simple Complex, Multiple, See Comment, NA
Fibroid	None, Single, Multiple, See Comment, NA
Polyp	None, Single, Multiple, See Comment, NA

[Remark]
NA : Not Available = Blank

6-6-3. Clinical References

6-6-3-1. B mode

(1) Uterus Volume

Barry B. Goldberg, M. D., Alfred B. Kurtz, M. D.
Atlas of Ultrasound Measurements.
Mosby Year Book Medical Publishers, INC. P194 ISBN 0-8151-3541-6

(2) Ovarian Volume

Pe Harris L. Chohen, MD et al. :
"Ovarian Volumes Measured by US: Bigger than We Think"
Radiology 1990; 177: 189-192

(3) Endometrial Thickness

Seth Granberg, MD et al. :
"Endometrial thickness as measured by endovaginal ultrasonography for identifying endometrial abnormality"
AM J OBSTET GYNECOL 1991; 164: 47-52

Theera Tongsong, MD et al. :
"Use of Vaginosonographic Measurements of Endometrial Thickness in the Identification of Abnormal Endometrium in Pre-and Postmenopausal Bleeding"
J Clin Ultrasound 22: 479-482, October 1994

Igal Wolman, MD et al. :
"The Sensitivity and Specificity of Vaginal Sonography in Detecting Endometrial Abnormalities in Women with Postmenopausal Bleeding"
J Clin Ultrasound 24: 79-82, February 1996

(4) Follicles measurement

Queenan et al. :
"Ultrasound scanning of ovaries to detect ovulation in women"
Fertility and SterilityVol.34, No.2, August1980

C.O'Herlihy, L. J. Ch.De Crespigny and H. P. Robinson:
"Monitoring ovarian follicular development with real-time ultrasound"
British Journal of Obstetrics and Gynecology Vol.87. pp613-618, July1980

6-6-3-2. D mode

(1) Uterine Artery

Kurjak, MD et al. :
"Transvaginal color flow Doppler in the assessment of ovarian and uterine blood flow in infertile women."
Fertility and Sterility Vol.56, No5, November 1991; 870-873

ZEE WEINER, DAN BECK et al. :
"Uterine artery flow velocity waveforms and color flow imaging in women with perimenopausal and postmenopausal bleeding: Correlation to endometrial histopathology"
Acta Obstet Gynecol

(2) Ovarian Artery

Kurjak, MD et al. :
"Transvaginal color flow Doppler in the assessment of ovarian and uterine blood flow in infertile women."
Fertility and Sterility Vol.56, No5, November 1991; 870-87

6-7. Abbreviation

Abbreviation	Meaning
AB	Abortus
AP	Antero posterior diameter
Bl	Bladder
BBT	Based on Basal Body Temperature
Crv	Cervix
Cycle day	Cycle day
ECTOP	Ectopic
EDV	End Diastolic Velocity
Endom-T	Endometrial Thickness
Fol.	Follicles
Grav	Gravida
GYN Dop 1 — 3	GYN Dop 1 — 3
L	Length
Lt	Left
LMP	Last Menstrual Period
MnV	Mean Velocity
Ov	Ovary
OvA	Ovarian Artery
Para	Para
PI	Pulsatility Index
Pre.Bldr Vol.	Pre Bladder Volume
Pst.Bldr Vol.	Post Bladder Volume
PSV	Peak Systolic Velocity
RI	Resistance Index
Rt	Right
Rt./Lt.	Right/Left
S/D	Systolic/Diastolic velocity Ratio
Ut	Uterus
UtA	Uterine Artery
V	Volume
W	Width

7. UROLOGICAL MEASUREMENT

7-1. Preface

The description concerning the Urological measurement functions is divided into the following six sub-sections.

This section describes the procedure for carrying out urology measurements, based on the assumption that products are on the factory default.

Descriptions of the basic operations of the measurement functions and each measurement method (mark type = Caliper, Trace, etc.) are given in the Section 1. "MEASUREMENT FUNCTIONS".

This section consists of 48 pages.

7-2. Urological Measurement Functional Outline

7-2-1. Urological Measurement Functional List

Urological measurements use studies consisting of various combinations of measurement menu, report display, and so on, depending upon the part being examined and the purpose of the examination.

[Remark]
On the factory default, it contains Prostate & SV Study, Bladder &Testis Study, and Kidney Study.

The urological measurement is divided as shown in the figure below for each mode.

: Items that are displayed on the factory default.

7-2-1-1. B mode

Measurement function	Measurement menu	Display items	Remark
PSA measurement (Prostate & SV Study)	PSA Volume	PSAD PSA mPSA Vol. PR-H PR-L PR-W COEF	Two cross-sections obtained using a per rectum biplane scan.
	PRS Slice Vol.	Vol. PCAR Area Circ	Multiple cross-sections obtained using a per rectum radial scan.
Seminal Vesicles measurement (Prostate & SV Study)	Seminal Vesicles	SV-AP SV-RL SV-SI	Measure at two cross-sections. Consists of Right/Left.
Bladder measurement (Bladder &Testis Study) (Prostate & SV Study)	Bladder Volume	Vol. Bl-L Bl-W Bl-AP Void Vol	Measure at two cross-sections. Void Vol=(Pre - Pst) Consists of Pre/Pst.
Testicle measurement (Bladder &Testis Study)	Testis Volume	Vol. Tst-L Tst-W Tst-AP	Measure at two cross-sections. Consists of Right/Left.
Renal measurement (Kidney Study)	Renal Volume	Vol. Rnl-L Rnl-W Rnl-AP	Measure at two cross-sections. Consists of Right/Left.
	Cortex Thickness	T1 T2 T3	Measure at one cross-section. Consists of Right/Left.
	Adrenal	L W AP	Measure at two cross-sections. Consists of Right/Left.

7-2-1-2. D mode

Measurement function	Measurement menu	Display items				Remark
Renal Artery measurement (Kidney Study)	Renal Artery	PI	RI	S/D	PSV	Diagnosis for the rate of stenosis Consists of Right/Left.
		EDV	MnV	ACC	AccT	
		FlowT	AccT/FT			
	Uro.Dop 1 Uro.Dop 2 Uro.Dop 3 Uro.Dop 4	PI	RI	S/D	PSV	Uro.Dop1 — 4: It is possible to freely define and use a name according to the purpose or application.
		EDV	MnV	ACC	AccT	
		FlowT	AccT/FT			

7-2-2. Items of Particular Note

The measured values of the blood flow values obtained using this equipment are the absolute values displayed on the observation monitor. They are controlled as positive and negative values for the purpose of calculating the arithmetic index.

If the display of each measured value in a report is set to “Average” in a preset, the positive and negative values are added together and displayed as a mean value. Consequently, when performing multiple measurements of blood flow on the blood flow waveform drawn using the color Doppler method as a guide, use identical recording conditions (forward and reverse flow directions) for all of the blood flow waveforms in order to correctly display each of the arithmetic values arranged in the report.

7-3. Measurement operation procedure

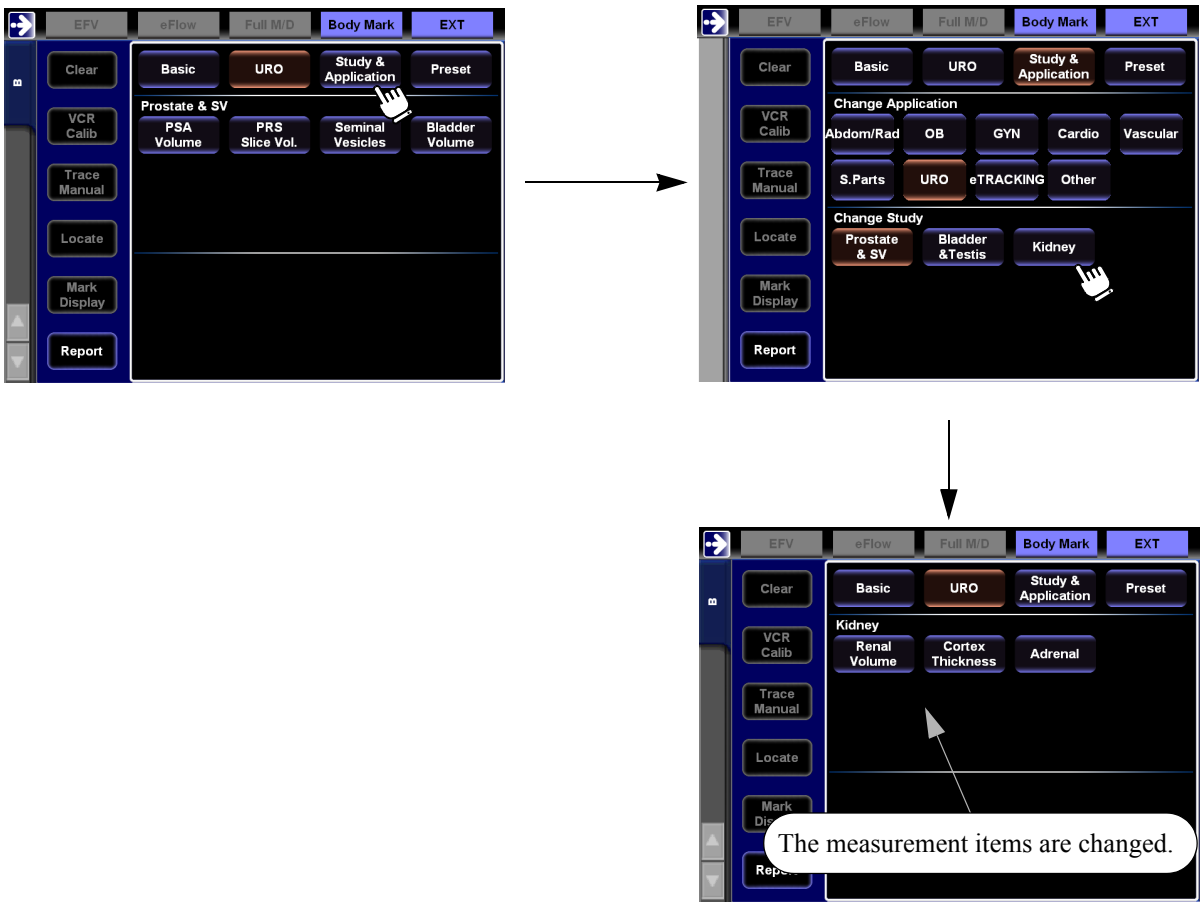
Urological measurements has the following studies.

Prostate & SV
Bladder &Testis
Kidney

Each measurement name displayed on the measurement menu is determined by the selected study.

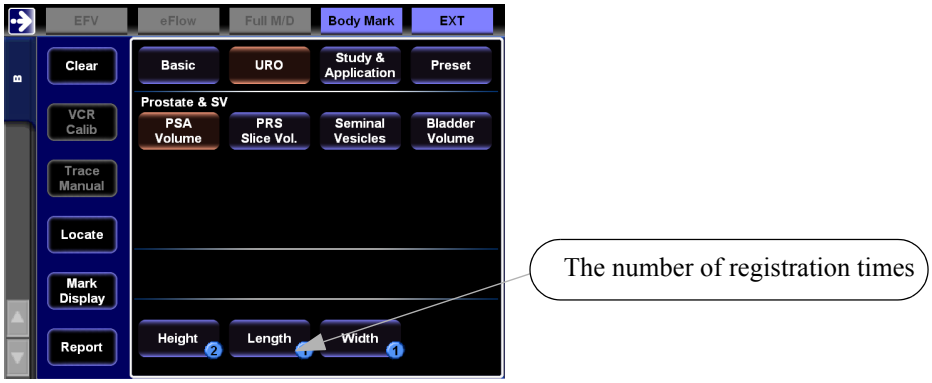
< Method of changing a study>

When a Study & Application of the touch panel is selected, the study names are displayed, so make a selection.



<Displaying marks of registered reports >

When the registration of report is made after the measurement of each measurement item, the number of registration times is displayed on the touch panel.

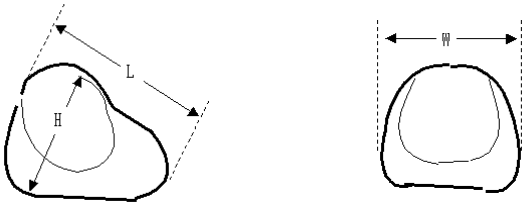


[Remark]
The display examples of measurement results in this chapter are displayed with a layout for a vertical display.

7-3-1. B mode

7-3-1-1. PSA Volume measurement

Measure the three dimensions (Height, Length, Width) from two orthogonally intersecting cross-sections drawn using a per rectum biplane probe, and obtain the volume of the prostate.



Also, calculate the prostate specific antigen density (PSA Density) with respect to the volume of the prostate, using the prostate specific antigen (PSA) value entered from the ID screen.

[Remark]
The PSA value used in this measurement is applicable to the case of the Tandem-R kit.
When using a kit manufactured by another pharmaceutical company, the PSA sensitivity and detection performance will be different, even for the same patient, so when carrying out this measurement, be sure to set the correction coefficient using a preset in order to convert the values obtained using this kit into the values normally obtained with the Tandem-R kit. The default is 1.00.
Contact the pharmaceutical company regarding the correction coefficient.

[Remark]
You can display the results of this measurement in Prostate & SV Study.

<Operation method>

(1) Display the longitudinal and transverse images of the prostate in the 2B mode.

(2) Select the PSA Volume on the touch panel.
→ The + mark is displayed, so measure the Height using the longitudinal image.

(3) Press the + switch.
→ Measure the Length using the longitudinal image.

(4) Press the + switch.
→ Measure the width using the transverse image.
The volume and the PSAD of the prostate are calculated and displayed.

(5) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

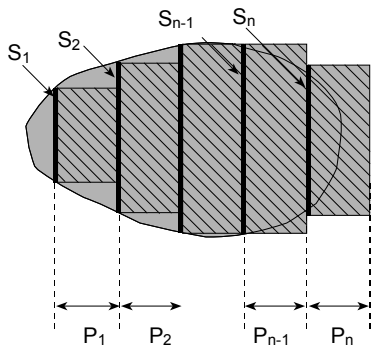
<Example of PSA Volume results display>

PRS Volume	
Vol.: . cm³	Volume of prostate
PR-H: . cm	Height of prostate
PR-L: . cm	Length of prostate
PR-W: . cm	Width of prostate
Predicted	
PSA Value	
PSA :	
. ng/ml	Serum PSA (Prostate Specific Antigen)
mPSA:	
. ng/ml	Prostate specific antigen estimated from the volume of the prostate
PSAD: .	PSA density
PSA COEF:	
.	Coefficient value for converting to Tandem-R value

7-3-1-2. PRS Slice Volume measurement

In this measurement, the transverse image is recorded at 5mm intervals using the Step Planimetry method, the area of each transverse image is measured, then each of these areas is integrated by multiplying it by the 5mm pitch, and the total volume of the prostate is obtained.
By tracing the circumference of the prostrate at each transverse image drawn with a per rectum radial probe, it is possible to obtain the presumed circle area ratio (PCAR).

Method of calculating volume

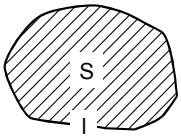


Calculation
Volume={S1 × P1+S2 × P2+.....+Sn × Pn}

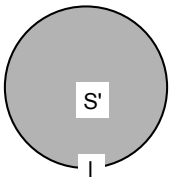
S1, S2, ... : Each slice transverse image area
(Measured using the same scanning method as employed for Area-Trace of the basic measurement.)
Number of slices is no limit.
P1, P2, ... : Slice pitch (mm)
The pitch can be changed between 1mm and 999mm, and is input from the keyboard.

PCAR:

This is an index of how close the transverse image of the prostate is to a circle. It is defined as the ratio S/S' where S' is a presumed circle that has the same circumference as the area S of the maximum transverse image of the prostate.
S: Maximum area of the prostate obtained using the Trace method
L: Circumference of the maximum area S of the prostate
S': Area S' is a presumed circle that has the same circumference $L = \pi (L/2\pi)^2$



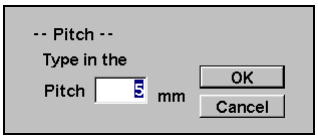
Transverse image corresponding to the maximum area



Presumed circuit of circumference 1

Calculation
Volume(cm^3)= Σ Si × Pitch
PCAR= S / S'

[Remark]
The pitch value used to calculate the volume is set to 5mm at the factory default.
If the value used at each hospital is different, when performing step (3) of the <Operation method> turn rotary encoder 1 on the right side of the trackball clockwise to display the dialog box for entering the Pitch value, and enter the pitch value.
Next, select OK.



[Remark]
You can display this measurement using Prostate & SV Study.

<Operation method>

(Save each transverse image of the prostate to the hard disk in the equipment.)

(1) Display a transverse image of the prostate, and freeze it.

a. Press the STORE switch on the panel, and save the image to the memory of the equipment.

b. Unfreeze the image, then display a transverse view image of the prostate when the per rectum radial probe is pulled out 5mm, and freeze it.

c. Press the STORE switch on the panel, and save the image to the memory of the equipment.

d. Subsequently, repeat b and c until you reach the edge of the prostate.

(2) Recall and display each transverse image of the prostate that is stored in the memory of the equipment.

a. Press the REVIEW switch on the operation panel.
→ All of the images stored in the memory are displayed.

b. Next, move the arrow to one of these images (any image at all), and rapidly press the ENTER switch twice in succession.
→ As a result, the image of “a” is displayed.

(3) Select the PRS Slice Vol. on the touch panel.
→ The + mark is displayed.

(4) Trace the circumference of the measurement area of the prostate, and press the ENTER switch.
→ The trace closes to form a loop.

(5) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

(6) Press the REVIEW switch on the operation panel, and select the Next Image on the touch panel.
→ The image that was saved second is displayed.

(7) Press the + switch.

→ Using the same operation as that of (4), obtain the area of the prostate.

Next, using the same operation as that of (4), (5), (6), (7), trace the circumference of the remaining measurement area of the prostate stored in the memory.

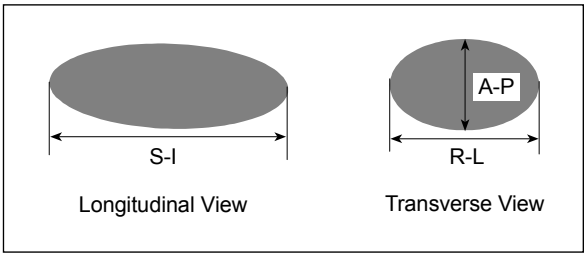
<Example of PRS Slice Volume results display>

`PRS Slice Vol`	Prostate Slice Volume
`Slice #`	Number of image slices during current measurement
`Pitch: . mm`	Pitch: Probe withdrawal distance
`Vol.(# ~# )`	Number of images used to calculate the volume of the prostate
`. cm³`	Volume of prostate
`PCAR: .`	Presumed circle area ratio (Presumed Circle Area Ratio)
`Area: . cm²`	Area of transverse view of prostate during current measurement
`Circ: . cm`	Circumference of prostate during current measurement

7-3-1-3. Seminal Vesicles measurement

Measure the size of the left and right seminal vesicles (A-P: Antero posterior diameter, R-L: Right-left diameter, S-I: Supero inferior diameter) from the longitudinal and transverse images of the seminal vesicles.
The switching between the Right and Left can be made on the touch panel.
The operation procedure for both kinds of measurement is the same.

[Remark]
You can display this measurement using Prostate & SV Study.



<Operation method>

The case of the Right of the Seminal Vesicles is explained.

(1) Display the longitudinal and transverse images of each seminal vesicle in the 2B mode.

(2) Select the Seminal Vesicles, and select the Right on the touch panel.
→ The + mark is displayed, so measure the antero posterior diameter (A-P) using the transverse image.

(3) Press the + switch.
→ Measure the right-left diameter (R-L) using the transverse image.

(4) Press the + switch.
→ Measure the supero inferior diameter (S-I) using the longitudinal image.

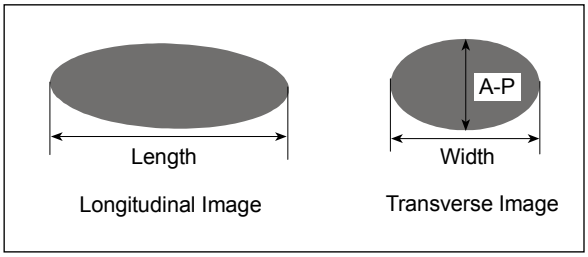
(5) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of Seminal Vesicles results display>

Rt.Seminal V	Right Seminal Vesicles
SV-AP: . cm	Anterior-posterior of Seminal Vesicle
SV-RL: . cm	Right left of Seminal Vesicle
SV-SI: . cm	Supero inferior of Seminal Vesicle

7-3-1-4. Bladder Volume measurement

Obtain the volume of the bladder before and after it is full, and calculate the amount of urine discharged from the difference between these figures.
Approximate the bladder to an ellipsoid, measure the major and minor axes of the transverse image (Width, A-P) and the length of the major axis of the longitudinal image (Length), and calculate the volume of the bladder.



[Remark]
Measure these three axes in such a way that they intersect each other.
The switching between the Pre Void and the Post Void can be made on the touch panel.
The operation procedure for measuring the bladder both before and after urination is the same.

[Remark]
You can display this measurement using Prostate & SV Study, Bladder & Testis Study.

<Operation method>

(1) Display the longitudinal and transverse images of the bladder before urination in the 2B mode.

(2) Select the Bladder Volume, and select the Pre Void on the touch panel.
→ The + mark is displayed, so measure the Length using the longitudinal image.

(3) Press the + switch.
→ Measure the Width using the transverse image.

(4) Press the + switch.
→ Measure the A-P using the transverse image.
Volume(PreBldr Vol.) is computed.

(5) Display the vertical and transverse images of the bladder after urination in the 2B mode.

(6) Select the Bladder Volume, and select the Post Void on the touch panel.
→ The + mark is displayed on the screen.

(7) Measure the three diameters using the same operation method as that for measuring Pre Void.
→ Calculate and display the amount of urine discharged (Pre - Pst) from the volume obtained by Pre Bldr Vol. measurement (PreBlrd Vol.) and the volume obtained by this measurement (Pst Bldr Vol.).

(8) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of Bladder results display>

Before urination

PreBldr Vol.	Pre Bladder Volume
Vol.: . ml	Volume of Bladder
Bl-L: . cm	Length of Bladder
Bl-W: . cm	Width of Bladder
Bl-AP: . cm	Anterior-posterior of Bladder

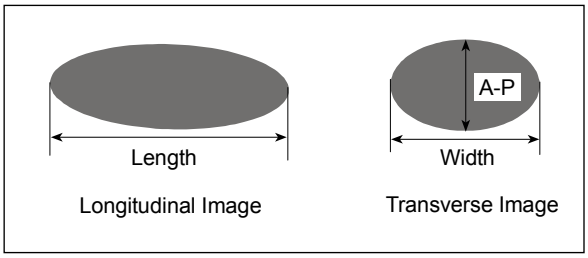
After urination

PstBldr Vol.	Post Bladder Volume
Vol.: . ml	Volume of Bladder
Bl-L: . cm	Length of Bladder
Bl-W: . cm	Width of Bladder
Bl-AP: . cm	Anterior-posterior of Bladder
Void Volume:	
ml	Void Volume

[Remark]
Calculate the amount of urine discharged (Void Volume) from the newest values of Pre and Pst Volume.

7-3-1-5. Testicle Volume measurement

Approximate each of the left and right testicles to an ellipsoid, measure the major and minor axes of the transverse image (Width, A-P) and the length of the major axis of the longitudinal image (Length), and calculate the volume of each testicle.



[Remark]
Measure these three axes in such a way that they intersect each other.
The switching between the Right and Left can be made with the touch panel.
The operation procedure for both kinds of measurement is the same.

[Remark]
You can display this measurement using Bladder & Testis Study.

<Operation method>

The case of the Right of the Testis Volume is explained.

(1) Display the longitudinal and transverse images of the right testicle in the 2B mode.

(2) Select the Testis Volume, and select the Right on the touch panel.
→ The + mark is displayed, so measure the Length using the longitudinal image.

(3) Press the + switch.
→ Measure the Width using the transverse image.

(4) Press the + switch.
→ Measure the A-P using the transverse image.
Volume(Rt.Testis Vol.) is computed.

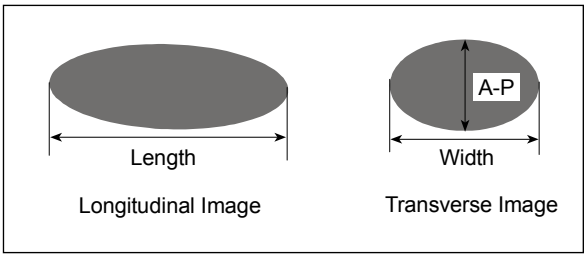
(5) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of Testicle Volume results display>

`Rt.Testis Vol`	Right Testicle Volume
`Vol.  :  .  cc`	Volume of Testicle
`Tst-L :  .  cm`	Length of Testicle
`Tst-W :  .  cm`	Width of Testicle
`Tst-AP:  .  cm`	Anterior-posterior of Testicle

7-3-1-6. Renal Volume measurement

Approximate each of the left and right renal volume to an ellipsoid, measure the major and minor axes of the transverse image (Width,A-P) and the length of the major axis of the longitudinal image (Length), and calculate the volume of each renal.



[Remark]
Measure these three axes in such a way that they intersect each other.
The switching between the Right and Left can be made with the touch panel.
The operation procedure for both kinds of measurement is the same.

[Remark]
You can display this measurement using Kidney Study.

<Operation method>

The case of the Right of the Renal Volume is explained.

(1) Display the longitudinal and transverse images of the right kidney in the B mode.

(2) Select the Renal Volume, and select the Right on the touch panel.
→ The + mark is displayed, so measure the Length using the longitudinal image.

(3) Press the + switch.
→ Measure the Width using the transverse image.

(4) Press the + switch.
→ Measure the A-P using the transverse image.
Volume (Rt.Renal Vol.) is computed.

(5) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of Renal Volume results display>

Rt.Renal Vol	Right Renal Volume
Vol. : . cc	Volume of Renal
Rnl-L : . cm	Lengthof Renal
Rnl-W : . cm	Width of Renal
Rnl-AP: . cm	Anterior-posterior of Renal

7-3-1-7. Cortex Thickness measurement

Measure the three points of maximum thickness (T1, T2, T3) for each of the left and right renal cortexes.
The switching between the Right and Left can be made with the touch panel.
The operation procedure for both kinds of measurement is the same.

[Remark]
You can display this measurement using Kidney Study.

<Operation method>

The case of the Right of the Cortex Thickness is explained.

(1) Display an image of the right kidney in the B mode.

(2) Select the Cortex Thickness, and select the Right on the touch panel.
→ The + mark is displayed, so measure the Thickness1 using the longitudinal image.

(3) Press the + switch.
→ Measure the Thickness 2.

(4) Press the + switch.
→ Measure the Thickness 3.

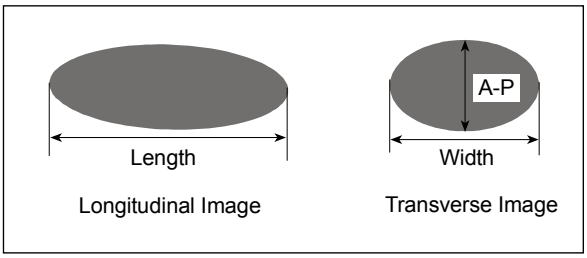
(5) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of Cortex Thickness results display>

```
Rt.Cortex T      ← Right Cortical Thickness
T1:      .   cm  ← Thickness1
T2:      .   cm  ← Thickness2
T3:      .   cm  ← Thickness3
```

7-3-1-8. Adrenal measurement

Measure the major and minor axes (Width, A-P) of the transverse image, and the length of the major diameter (Length) of the longitudinal image, of the adrenal gland.
The switching between the Right and Left can be made with the touch panel.
The operation procedure for both kinds of measurement is the same.



[Remark]
You can display this measurement using Kidney Study.

<Operation method>

The case of the Right of the Adrenal is explained.

(1) Display the longitudinal and transverse images of the right adrenal gland in the 2B mode.

(2) Select the Adrenal, and select the Right on the touch panel.
→ The + mark is displayed, so measure the Length using the longitudinal image.

(3) Press the + switch.
→ Measure the Width using the transverse image.

(4) Press the + switch.
→ Measure the A-P using the transverse image.

(5) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of Adrenal results display>

Rt.Adrenal	Right Adrenal
L : . cm	Length of Adrenal
W : . cm	Width of Adrenal
AP: . cm	Anterior-posterior of Adrenal

7-3-2. D mode

7-3-2-1. Renal Artery measurement

Trace the left and right renal artery flow Doppler waveforms (pulse method), and obtain the blood flow measurement data (PI, RI, S/D), and so on.
The switching between the Right and Left can be made with the touch panel.
The operation procedure for both kinds of measurement is the same.

[Remark]

Use the systolic peak blood flow velocity (PSV) and the end-diastolic blood flow velocity (EDV) for computing PI and RI.
There are reports to the effect that the end-diastolic minimum blood flow velocity is also used for these indexes.
The diastolic blood flow velocity and the end-diastolic minimum blood flow velocity do not necessarily match each other.
Consequently, when starting these measurements, move the phase of EDV to the end-diastole or minimum blood flow velocity point.
Calculate PI and RI at the blood flow velocity at these points.

[Remark]

You can display this measurement using Kidney Study.

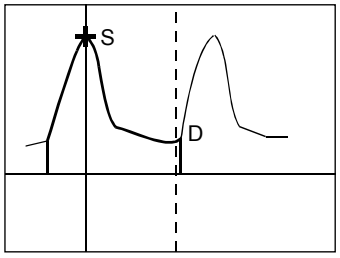
<Operation method>

The case of the Right of the Renal Artery is explained.

(1) Display the blood flow waveform of right renal artery.

(2) Select the Renal Artery, and select the Right on the touch panel.
→ The line cursor (vertical line) is displayed. (+ mark in the case of the Manual Trace method)

(3) Using the Dop Trace method, measure the blood flow waveform.
→ PI, RI, S/D, and so on, are measured, and line cursors accompanied by the letters “S” and “D” are displayed.



[Remark]

Adjust the positions of the line cursors marked with the letters “S” and “D” using the ENTER switch and the trackball.
“S”: Peak Systolic Velocity point “D”: End Diastolic Velocity point

[Remark]

The method of using Dop Trace method differs depending upon whether Auto Trace or Manual Trace is used.
For the operation method, refer to Section 1-7-4-5. "The measurement procedure of the Dop-Trace method".

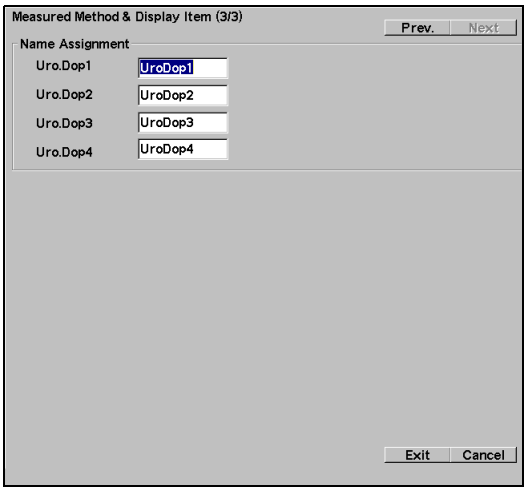
(4) Press the ENTER switch and keep it depressed momentarily.
→ Measurement is finalized.

<Example of Renal Arteries display>

Rt.Renal Art.	Right Renal Artery
PI : .	Pulsatility Index
RI : .	Resistance Index
S/D: .	PSV/EDV ratio
PSV: . cm/s	Peak systolic velocity
EDV: . cm/s	End diastolic velocity
MnV: . cm/s	Mean velocity

7-3-2-2. Uro. Dop 1(— 4) measurement

You can register (or create) up to four measurements of renal artery blood flow other than the blood flow through the uterus or the ovaries by using the Preset function.
The procedure for performing all of the blood flow measurements created here is the same as that for Section 7-3-2-1. "Renal Artery measurement".



<Example of Uro. Dop 1 display>

Uro.Dop1	Uro.Doppler 1
PI : .	Pulsatility Index
RI : .	Resistance Index
S/D: .	PSV / EDV Ratio
PSV: . cm/s	Peak systolic velocity
EDV: . cm/s	End diastolic velocity
MnV: . cm/s	Mean velocity

7-4. Report function

A report arranges and displays each index value and measurement value for Urological measurement and also related patient information. A report displays only the results of measurement. You can register up to six measurement values in a report.

[Remark]
You can set the number of values to be registered using the Report Display of Preset.

[Remark]
Be sure to enter patient data (Patient ID, Name, etc.) on the ID screen.

7-4-1. Basic Operation of a Report

7-4-1-1. Displaying a Report

In order to display a report, press Report on the touch panel.

7-4-1-2. Ending a Report

The following two patterns are used to end a report.

(1) Press Report on the operation panel.

(2) Select Return on the Report screen.

7-4-1-3. Function buttons on a Report

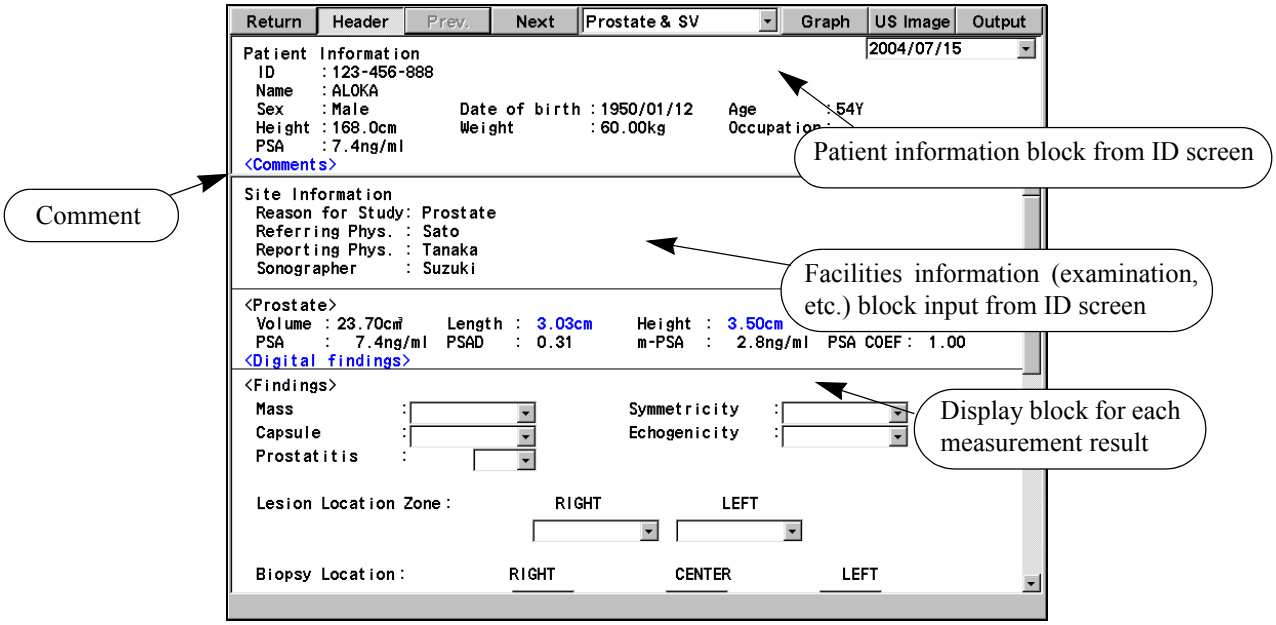
The following buttons are displayed on the top section of the Report screen.

Return	Closes the report.
Header	Switches the header block (patient data display) between Long Form and Short Form.
Prev., Next	Advances or returns the page in block units.
Study name	Switch the study of the displayed report.
Graph	Displays the transition of the operation index values (PSA, Volume, etc.) of each organ from the past to the present, in the form of a graph.
US Image	Displays an ultrasound image in the report.
Output	Outputs report data to a personal computer, Media or printer.

7-4-2. Report Block

A report block is the unit used to display data (each set of urological measurement data).

It arranges pertinent ultrasound information such as Header (patient information) block, Site information (facilities information) block, and Prostate block.

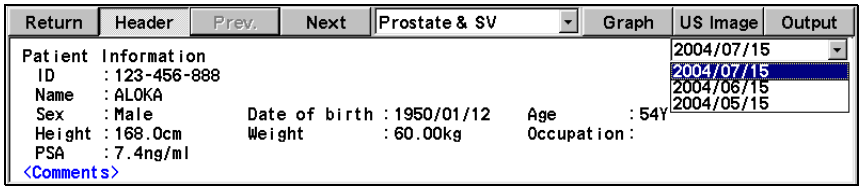


7-4-2-1. Function for displaying the past reports

It can display the past reports that are on the requested exam. dates.
However, it is not possible to Edit (revision / deletion) the past measurement records.

(1) Move the arrow to the ▼ of the combo box identifying the exam. date, and press the ENTER switch.

→ The exam. date of the past is displayed.



(2) Select the exam. date desired to display, and press the ENTER switch.

→ The report of the requested exam. date is displayed.

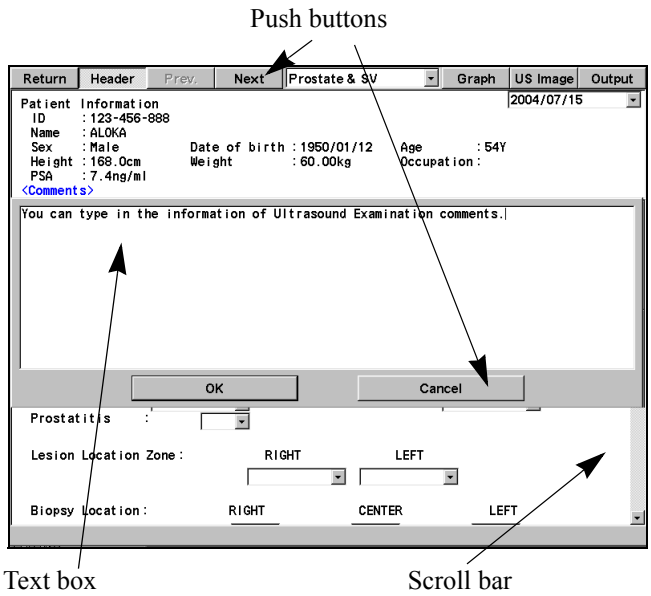
7-4-2-2. Comment input function

You can enter comments concerning an ultrasound examination as the results of an ultrasound examination.

(1) Move the arrow to <Comments>, and press the ENTER switch.
→ A text box for entering a comment is displayed.

(2) Enter a comment from the keyboard.

(3) Select OK.



[Remark]
If you select Cancel, the entered contents are canceled.

7-4-2-3. Edit (edits the data) function

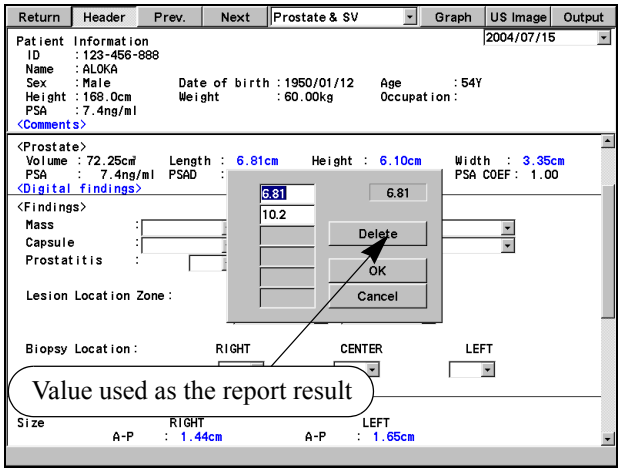
You can delete or modify the measurement results in a report.

[Remark]
You can only edit values displayed in yellow.

<Operation method>

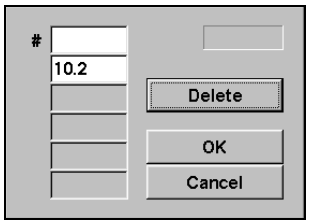
(1) Move the arrow to the measurement value, and press the ENTER switch.

→ The Edit dialog box is displayed.
All of the measured values are displayed.



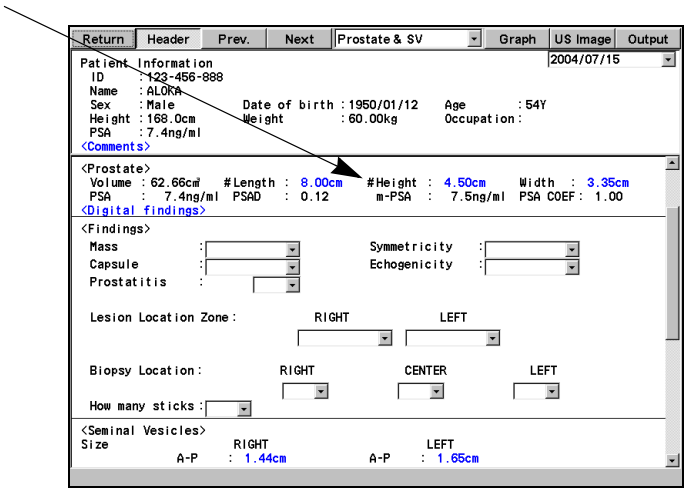
(2) Delete:
Select the measurement value to be deleted, and press Delete.

→ The specified measurement value is deleted, so select OK.



(3) Modify:
Select the measurement value to be modified, enter the new value from the keyboard, then select OK.

→ Displaying a modified measurement value
The mark "#" is attached to the beginning of a measurement item that was modified by entering a numerical value.



[Remark]
Like PI and RI measurement, there are two items of blood flow velocity data (PSV and EDV) within the period between two heartbeats that are mutually related.
Perform an editing operation so as to maintain the mutual time phase relationship.

(4) Change to a different measurement value:
You can change a measurement value displayed on a report to a different measurement value.

→ The displayed color of the selected part changes, so press OK.

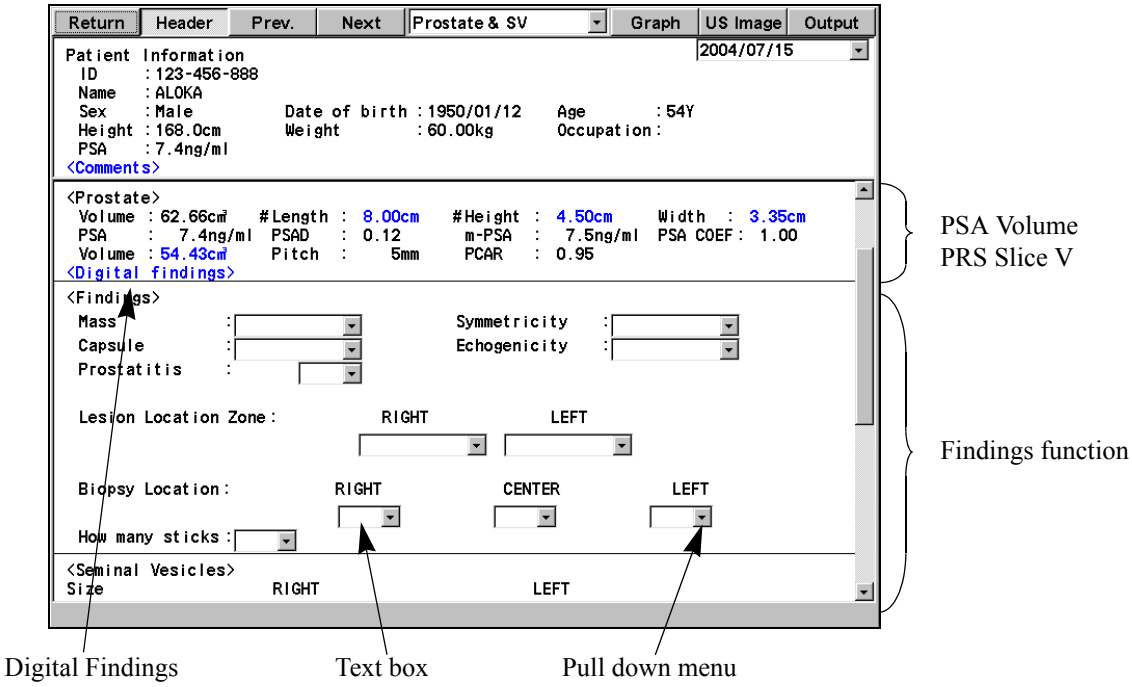
[Remark]
This function operates only when the setting "Always display the latest measurement value (last measurement value) on the report screen" is activated. If the result is set to the mean value, it remains unchanged regardless of what measurement value is selected.
(Refer to Section 7-5-2. "PRESET list" Report Data)

7-4-3. Description of Various Data Displayed in a Report

7-4-3-1. Prostate Report

Display the results of measuring Prostate & SV Study.

1) Prostate Report



2) Digital Findings function

Here, you can include comments in the results of a touch examination.
The method of entering a comment is the same as that described in Section 7-4-2-2. "Comment input function".

Move the arrow to <Digital findings>, then press the ENTER switch to enter the comment.

3) Findings function

Here, you can enter and set comments concerning the ultrasound wave image of the prostate.
The following two patterns are available for setting.

(1) Specifying a comment from the pull-down menu

a. Move the arrow to ▼ of the specified text box, and press the ENTER switch.
→ A list of image comments is displayed.

b. Using the trackball, select the specified comment, and press the ENTER switch.
→ The specified comment is transferred to the text box.

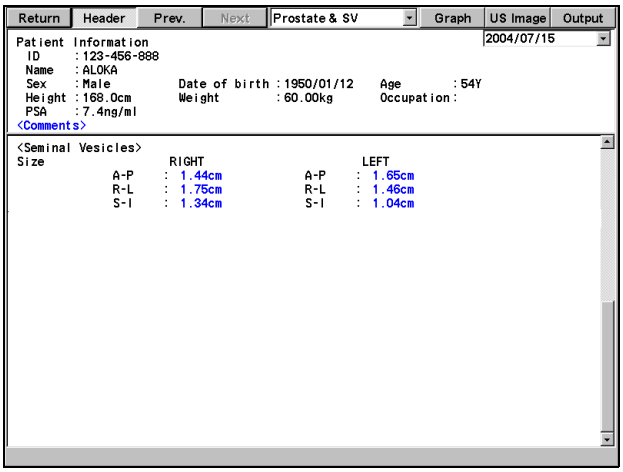
(2) Directly entering (registering) a comment

a. Move the arrow into the text box, and press the ENTER switch.

→ Enter a comment from the keyboard. The entered information is user-defined and registered in the abovementioned list.

Pull down menu list	List of comments		List of comments
Mass	No entry Cystic Solid Mixed	Symmetricity	No entry Symmetric Asymmetric R > L L < R
Capsule	No entry Intact Disrupted TURP	Echogenicity	No entry Normal Hypoechoic Isoechoic Hyperechoic Diffuse
Prostatitis	No entry Yes No	Lesion Location zone	No entry Peripheral Central Transition
Biopsy Location	No entry Yes No	How many sticks	1 — 10

4) Seminal Vesicles Report

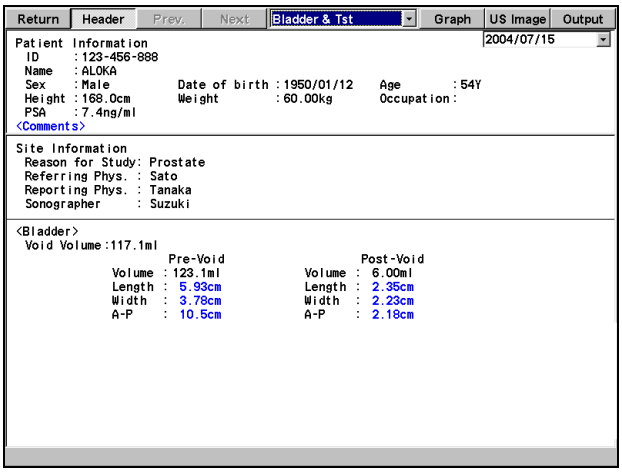


Rt./Lt. Seminal V

7-4-3-2. Bladder Report

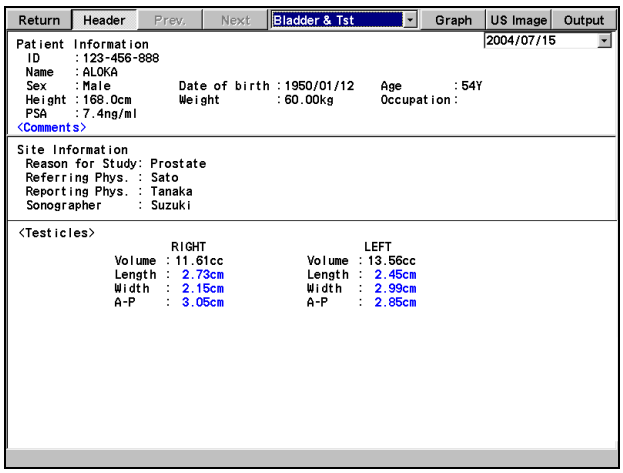
Display the results of measuring Bladder &Testis Study.

1) Bladder Report



Pre./Pst. Bladder Volume

2) Testicles Report

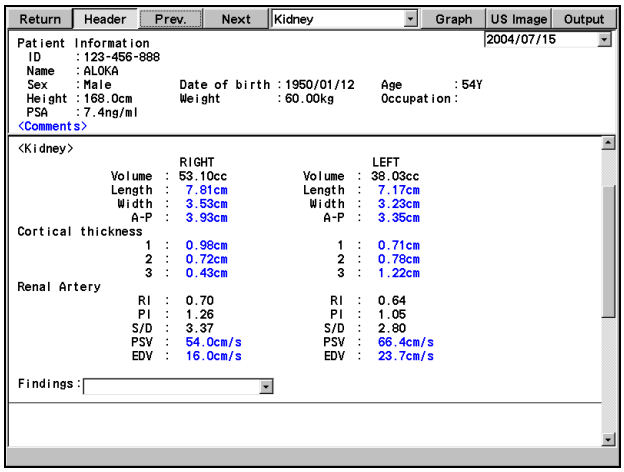


Rt./Lt. Testis Volume

7-4-3-3. Kidney Report

Display the results of measuring Kidney Study.

1) Kidney Report



Renal Volume

Cortical thickness

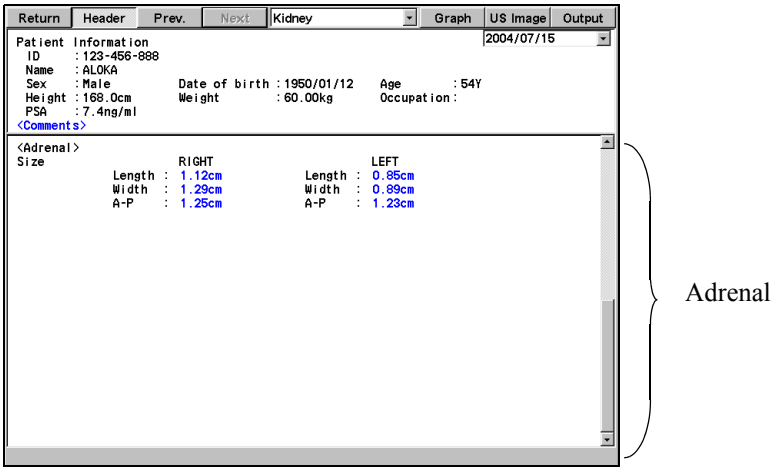
Renal Artery

2) Findings function

Here, you can enter and set comments concerning ultrasound images of the kidneys.
The setting method is the same as the procedure set out in 7-4-3-1.Prostate Report, 3)Findings function.

Pull down menu list	List of comments
Finding	
	Agenesis Kidney
	Supernumerary Kidney
	Horseshoe Kidney
	Cake Kidney
	Pelvic Kidney
	Hydronephrosis
	Polycystic Kidney
	Mass- Cystic
	Mass-Solid
	Mass-Mixed

3) Adrenal Report



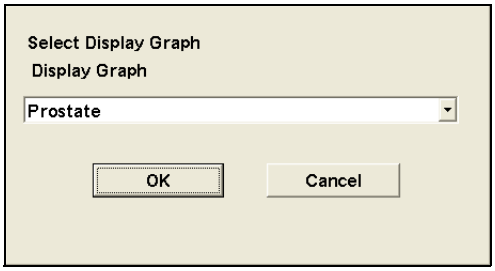
7-4-4. Graph function

This function displays the transition of the operation index values (PSA, Volume, etc.) of each organ from the past to the present, in the form of a graph.

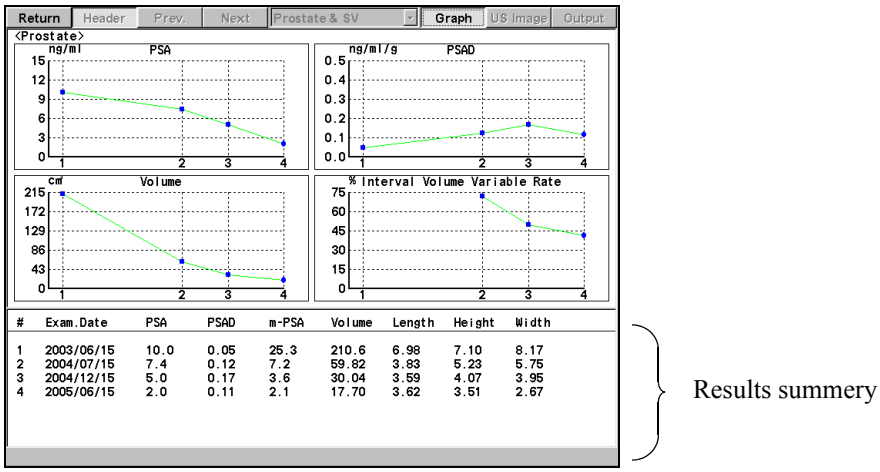
[Remark]
The graph function can be used in the measurement of the prostate, testicles, bladder and kidneys.

<Operation method>

(1) Move the arrow to the Graph on the Report, and press the ENTER switch.
→ The Graph menu is displayed.



(2) Select the Graph name to be displayed, and select OK.
→ A graph is displayed as shown below.

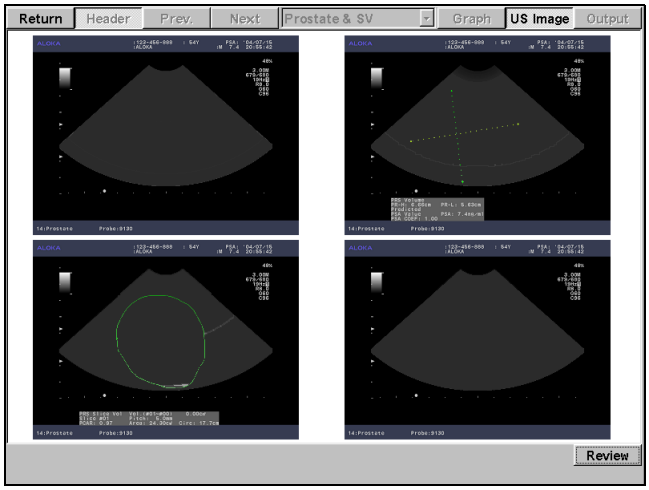


(3) To erase the Graph and return to the initial state, select the Graph once again.

7-4-5. Function that Attaches an Ultrasound Image to a Report

This function automatically display the current ultrasound image acquired by the examiner in the US Image block of the report.
Also, by using the Review function at the bottom of the Report screen, it is possible to display all of the images stored in the connected medium (f.e. HDD and external media such as USB memory) as thumbnail images. You can also select one of these images, and display it in the report.

When you select US Image on the report screen, the US Image block (ultrasound image page) is displayed.



To return to a normal report, select US Image once again.

7-4-5-1. Images that can be attached to a report

Images that can be attached to a report are the various ultrasound images of the same patient that are stored in the connected medium (f.e. HDD and external media such as USB memory) at the storage destination.

7-4-5-2. Limit for holding attached images

Attached images are held until the New Patient function is executed.

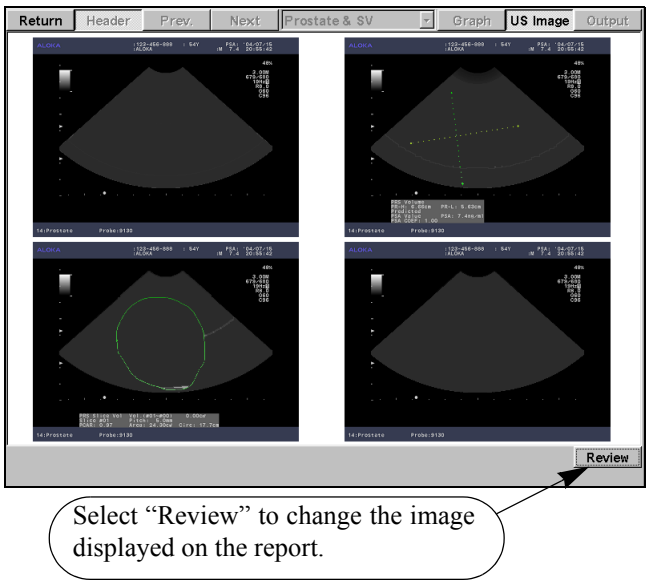
7-4-5-3. Method of attaching images

1) Auto Paste function

The number of images set using the Preset function is automatically selected from the latest images stored in the connected medium (f.e. HDD and external media such as USB memory) and displayed on the US Image block.

[Remark]
The number of displayed images and the display format can be set only by the Preset function.
The factory default settings are Display Pasted US Image Form on the Screen: 2 × 2, and Number of US Images to be Automatically Displayed: 4.

The figure at right shows examples of factory default settings.



Regarding the display sequence, the images are automatically pasted from the latest recorded image, from top left to bottom right.

[Remark]
You can set the format of an image displayed on the Report screen to 1 × 1, 2 × 2, 3 × 2 or 3 × 3.

2) Manual Paste function

<Operation method>

This function enables you to change the automatically attached image to another image, or to add an image.

(1) Select Review at bottom right of the US Image block screen.

→ All of the images of the patient concerned that are stored in the connected medium (f.e. HDD and external media such as USB memory) are displayed as thumbnail images.

(2) Move the arrow to the image that you wish to display, and press the ENTER switch.

→ The selected image is displayed with a blue border.

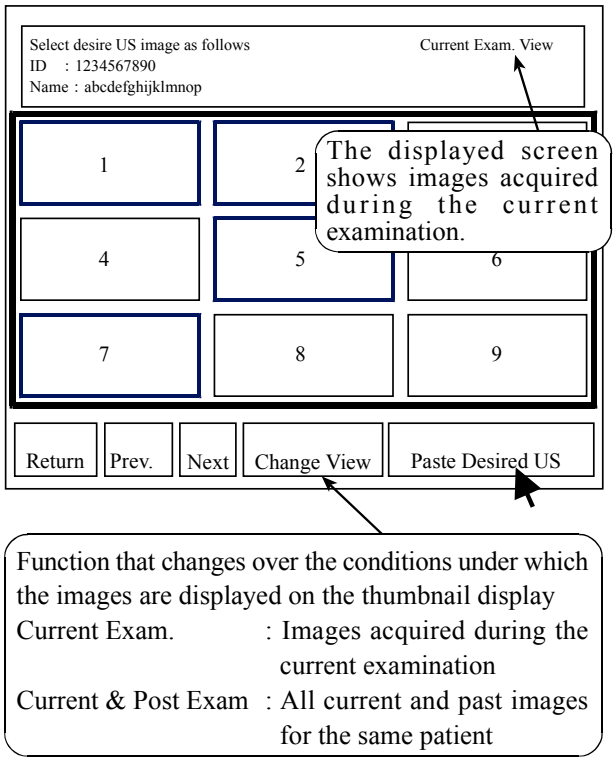


Fig. Thumbnail display

[Remark]
If you wish to select a number of images, repeat step (2).
Pressing the ENTER switch on the selected image erases the blue border.

(3) Move the arrow to Paste Desired US, and press the ENTER switch.

→ The selected image is displayed in the US Image block.

[Remark]
Regarding the "Change View" function
By selecting Change View at the bottom of the thumbnail display, you can also display past images for the same patient as thumbnail display.

[Remark]
Each time you select Change View, the display conditions switch over between "current image only" and "current and past images". The particular set of conditions displayed is indicated at top right of the thumbnail screen.

7-4-6. Printing Function

This function outputs the entire report data to a dedicated local printer via a USB interface.
The printed data is a text data, graphical data or ultrasound image.

7-4-6-1. Operation sequence

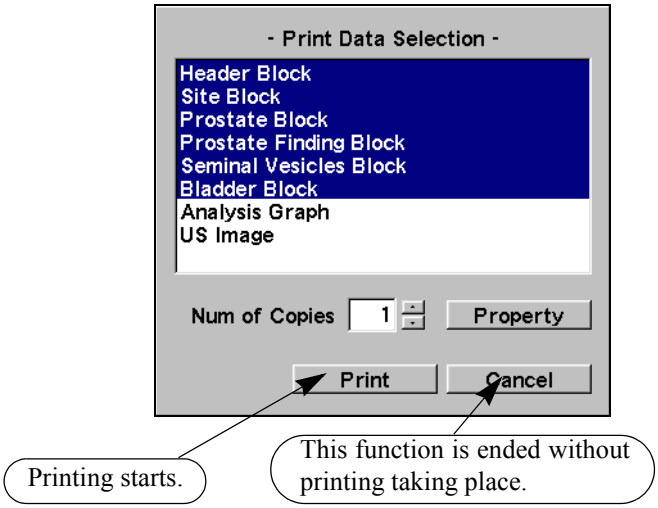
(1) Select Output.
→ A select device dialog box is displayed.

(2) Select to Printer, and press OK.
→ The Print Data Selection dialog box is displayed.

(3) Select the block that you wish to print.
→ The selected block name is highlighted in blue.

[Remark]
To cancel the selection, re-select the same block.

(4) Enter the number of copies, and select Print.
→ Printing starts, and the dialog box closes.



7-4-6-2. Property function

This function enables you to make the minimum necessary detailed settings for a local printe and a B/W digital printer.

(1) Printer name : Select the model of the printer to be used.

(2) Paper sizes : Set the size of the paper to be used. (US letter, A4 alternative selection)
The function does not operate when a digital black and white printer is selected.

(3) Title Inform : Enter the Report Title information
You can enter up to 80 characters. The print position is always Center.

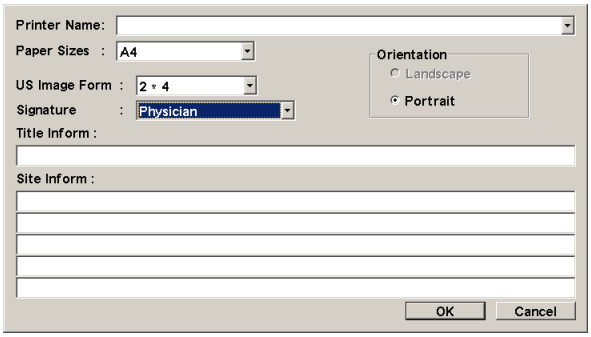
(4) Site Inform : Enter the facilities information (department, address, telephone No., FAX No., etc.).
You can enter up to 80 characters × 5 lines. The print position is always Center.

(5) Orientation : Set the orientation of the paper.
At present, the orientation is set to Portrait (vertical direction printing) only.

(6) US Image Form : When printing the US Image block, you can change the printing format to 1 × 2, 1 × 3, 2 × 2 or 2 × 4.
The function does not operate when a digital black and white printer is selected.

(7) Signature : Selects if the Signature field is set as Physician only, both Physician and Sonographer, or no field is displayed (None).

[Remark]
These settings are held subsequently so long as they are not renewed.



7-4-7. Output to a Personal Computer

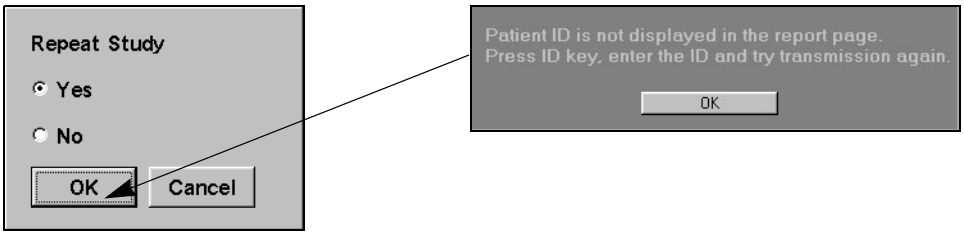
This function outputs the entire report to a personal computer using an RS-232C interface.

7-4-7-1. Operation procedure

(1) Select Output.

→ The “Repeat study” dialog box is displayed.

[Remark]
If an ID is not input, a message to that effect will be displayed.
Press the ID key on the front panel.



(2) If you wish to repeat a study, select Yes and press OK.

→ Communication starts.

[Remark]
If you select Cancel, the system returns to the status that existed prior to the execution of this function.

[Remark]
The patient data and all of the data registered in the report (excluding the ultrasound image data) is output to a personal computer as output data.

7-4-8. Output to a CSV file

This function outputs the values registered in the report (measured values and calculated values) and the comment data to the connected medium(f.e. external media such as USB memory) as a CSV file.

7-4-8-1. Operation procedure

(1) Select Output.

→ The “Select device” dialog box is displayed.

(2) Select the Export CSV File.

→ The media selection dialog box appears.

[Remark]
The filename is automatically attached by means of [ID- Date Application], but can be changed by entering the desired name from the keyboard.

(3) Select the medium, enter the filename, and then press OK.

→ The data is written to the selected medium.

[Remark]
If you select Cancel, the equipment will return to the condition that existed prior to the execution of this function.

[Remark]
When you open the CSV file, the patient information, numerical values and comments appear in that sequence.

7-5. Preset function

7-5-1. Preset Settings

The urological measurement preset consists broadly of the following three functions.

(1) Create Measurement Tools= Settings related to the measurement procedure, mark size, and report display

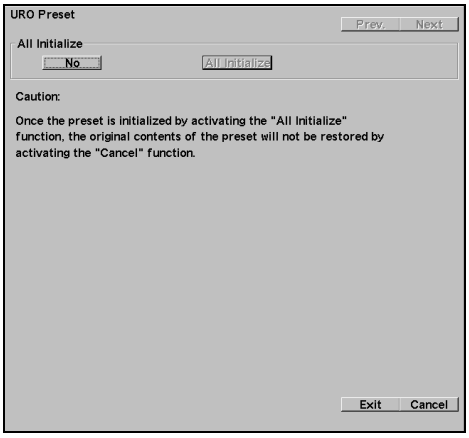
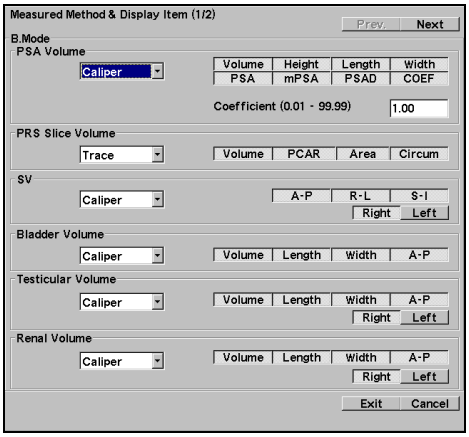
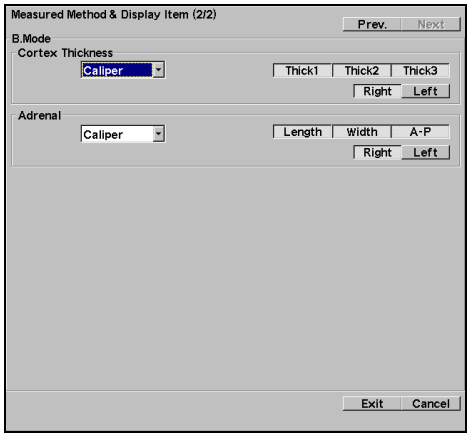
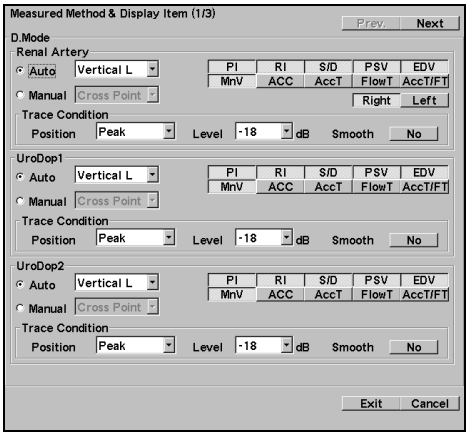
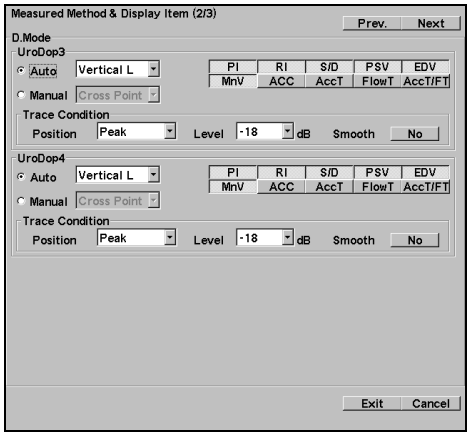
(2) Study Assignment = Sets the menu, transfer list, report display configuration, and so on, for each study

(3) SW Assignment = Settings for assigning various measurement functions to switches for shortcut operations

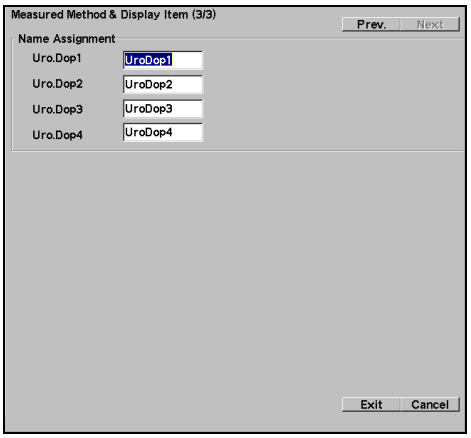
The preset functions related to urological measurements and their configuration are shown below.

Uro. Preset						
	Create Measurement Tools					Setting of the items that are common to Urological measurement and Basic measurements (hereafter called items).
		Basic Measurement				Refer to Section 1-10. "PRESET FUNCTION"
		Application Measurement				Settings concerning the Urological. measurement to be used, Mark Style and result display.
			Measurement Method & Display Items			Selection and setting of each Urological measurement method, Mark Style and result display items.
				B.Mode		B mode measurement settings.
				M.Mode		M mode measurement settings.
				D.Mode		D mode measurement settings.
				F.Mode		Flow mode measurement settings.
			Caliper Mark Control			Setting of the measurement mark size and dot line. Substituted by Basic measurement preset.
			Unit Selection			Setting of the display unit for performing Urological measurement. Substituted by Basic measurement preset.
			Caliper Auto Off			Setting of the measurement mark for canceling a freeze condition, and also the automatic result erasure function.
			Report Data			Selection of the method of displaying measurement values on the report (mean value or not).
			Display Form			Setting of Urological measurement result display style.
				Mark Display		Setting for displaying a caliper mark
			User's Calculation			Function is for making the registration of calculation formulas voluntarily by user.
				Reserved Word		Function is for making the registration name (Reserved Word) voluntarily by user.
	Study Assignment					Setting of measurement menu registration, report display configuration, and transfer list for each Ultrasound Examination Study.
		Defined study name				Prostate & SV, Bladder & Testis, Kidney
		Menu Assignment				Function that enables a measurement menu to be created and edited.
		Combined Report Display				Function that enables the configuration of a report to be edited.
		Other				Function that enables a selection of whether or not to display a measurement operation guide message.
	SW Assignment					Setting of registration of the direct execution switches.
		+ Mark Key Assignment				Function that assigns the basic measurements to be executed when the + switch is pressed.
		Hot Key Assignment				Function that assigns the measurement function that operates when a specific alphabet key is pressed.
		Measure SW Assignment				Function that assigns the measurement function that operates when the User switch is pressed.
		Control Menu Assignment				Assigning the control menu on the touch panel.

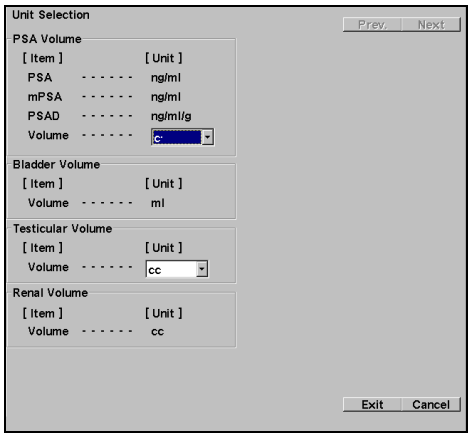
7-5-2. PRESET list

URO Preset Returns the registered contents to their default settings  	Create Measurement Tools Basic Measurement Refer to Section 1.
Measured Method & Display Items (1/2) B mode measurement settings 1  	Measured Method & Display Items (2/2) B mode measurement settings 2 
Measured Method & Display Items (1/3) D mode measurement settings 1  	Measured Method & Display Items (2/3) D mode measurement settings 2 

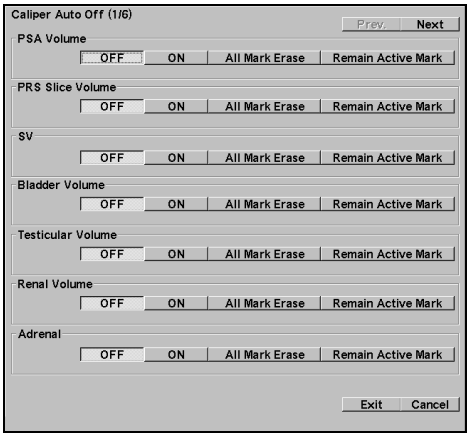
Measured Method & Display Items (3/3)
D mode measurement settings 3



Unit Selection
Volume unit settings

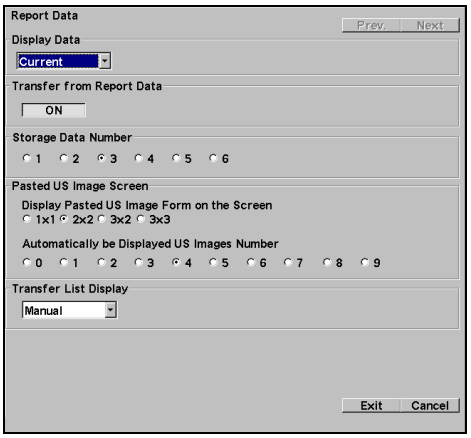


Caliper Auto Off

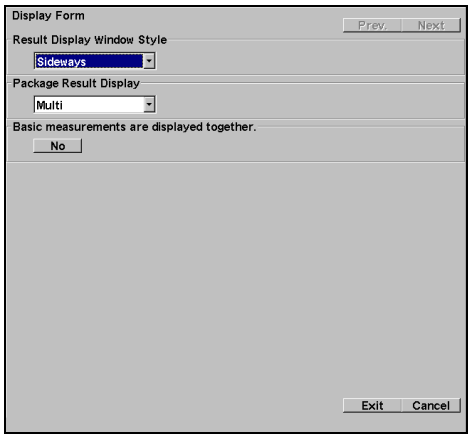


Off: Results and marks not erased
On: Results and marks all erased
All Mark Erase: Only marks erased
Remain Active Mark: Erases all marks other than for measurement during starting

Report Data
Selects either average values or the latest values and sets the number of data items registered.
Measurement data reuse On/Off
Pasting of Image

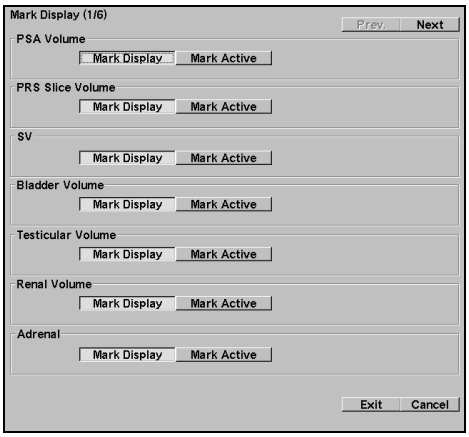


Display Form
Result display window style and switches whether or not measurement item multiple displays display the measurements only during starting.
Changing whether a simultaneous display with the Basic measurement or not



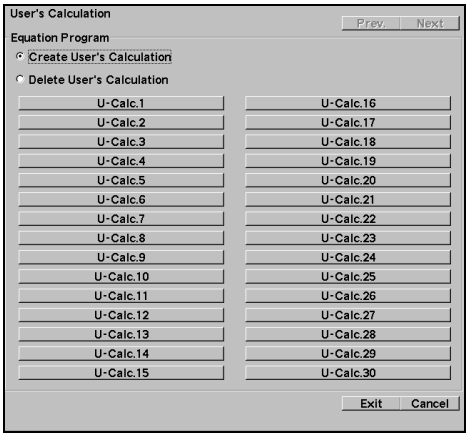
Mark Display

Setting for displaying a caliper mark



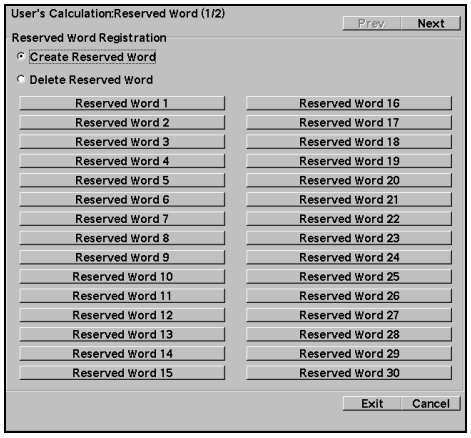
User's Calculation

Registers URO measurement equation.



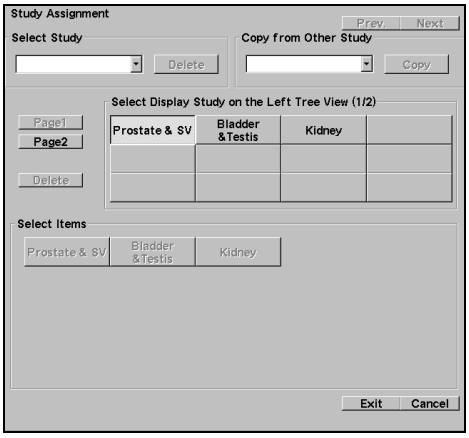
Reserved Word

Registers user's Reserved Word.



Study Assignment

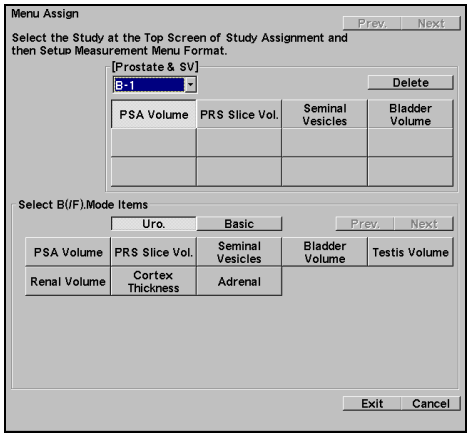
Switches the display on/off for built-in studies and registers new studies.



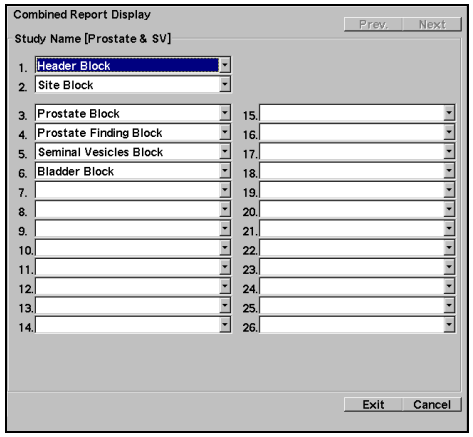
Study Assignment

Menu Assign

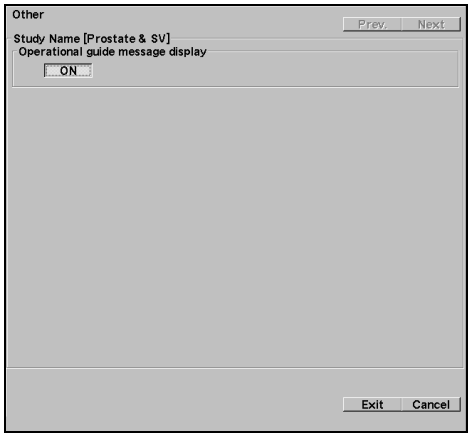
Urological measurement menu setting



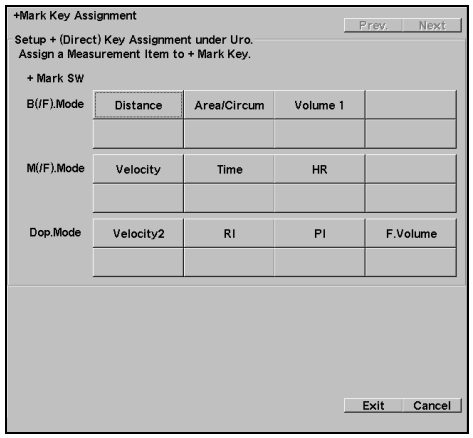
Combined Report Display
Combinations of measurement blocks displayed in reports



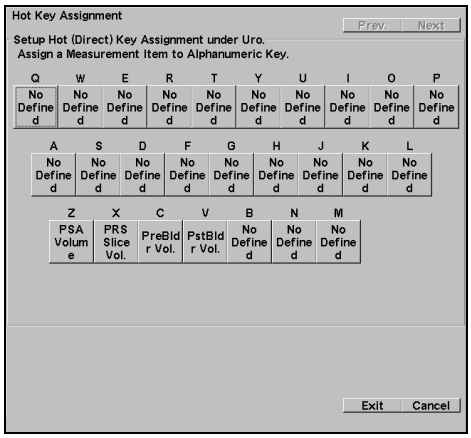
Other
Measurement guide message display setting



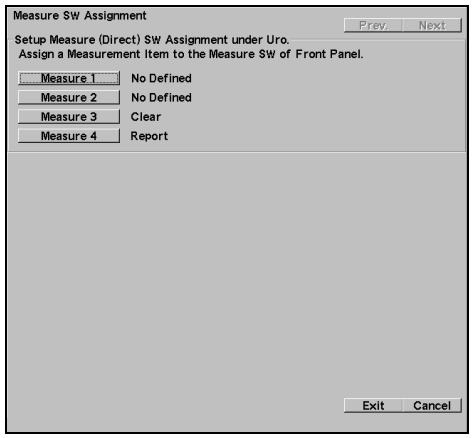
SW Assignment
+ Mark Key Assignment
Registers the measurement started with the + mark



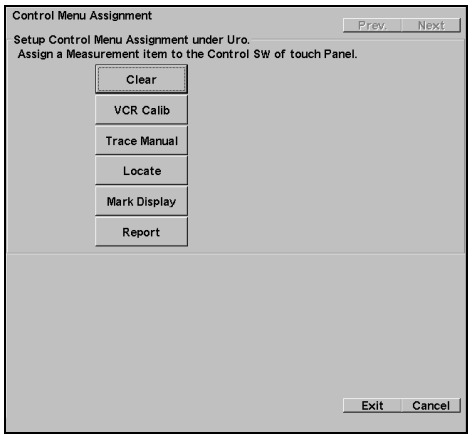
SW Assignment
Hot key Assignment
Registers measurements to the Keyboard.



SW Assignment
Measure SW Assignment
Registers measurements to measure switches.



Control Menu Assignment
Registers to control menus on the touch panel.



7-6. Calculation Formula & Reference

7-6-1. Calculation

7-6-1-1. Calculation for B-mode

Measurement name	Calculation
PSA Volume	
	Volume(cm^3)= 0.52 × Height × Width × Length mPSA(ng/ml)= 0.12 × Volume × PSA Coefficient PSAD(ng/ml/g)= PSA × PSA Coefficient / Volume
PRS Slice Vol.	Volume(cm^3)= Σ Si × Pitch PCAR= S / S’

PCAR:
This is an index of how close the transverse image of the prostate is to a circle. It is defined as the ratio S/S’ where S’ is a presumed circle that has the same circumference as the area S of the maximum transverse image of the prostate.
S: Maximum area of the prostate obtained using the Trace method
L: Circumference of the maximum area S of the prostate
S’: Area S’ is a presumed circle that has the same circumference $L = \pi (L/2\pi)^2$

Bladder Volume	Volume(ml)= π / 6 × Length × Width × A – P
Testis Volume	Volume(cc)= 0.65 × Length × Width × A – P
Renal Volume	Volume(cc)= 0.49 × Length × Width × A – P

7-6-2. References

7-6-2-1. B mode

(1) PSA Volume

Mitchell C.Benson et al. :
THE USE OF PROSTATE SPECIFIC ANTIGEN DENSITY TO ENHANCE THE PREDICTED VALUE OF INTERMEDIATE LEVELS OF SERUM PROSTATE SPECIFIC ANTIGEN
The Journal of Urology, Vol. 147, 817 - 821, March 1992

(2) mPSA

Peter J.Littrup MD et al. :
Prostate Cancer Screening: Current Trends and Future Implications.
CA - A CANCER JOURNAL FOR CLINICIANS VOL.42, No.4 199 - 211 JULY / AUGUST 1992

(3) PRS Slice Volume

Watanabe, J., Igari, D. et al. :
Transrectal ultrasonotomography of the prostate.
Journal of Urology, 114, 734 - 739

(4) PCAR

H.Ohe, D. et al:
Journal of the Japan Society of Ultrasonics Medicine 1977 Vol.32 November P.121-122

(5) Seminal Vesicles

Barry B. Goldberg, M.D., Alfred B. Kurtz, M. D.
Atlas of Ultrasound Measurements.
Mosby Year Book Medical Publishers, INC. P177 - 178 ISBN 0 - 8151 - 3541 - 6

(6) Bladder Volume

Barry B. Goldberg, M. D., Alfred B. Kurtz, M. D.
Atlas of Ultrasound Measurements.
Mosby Year Book Medical Publishers, INC. P165 - 170 ISBN 0 - 8151 - 3541 - 6

(7) Testis Volume

Barry B. Goldberg, M. D., Alfred B. Kurtz, M. D.
Atlas of Ultrasound Measurements.
Mosby Year Book Medical Publishers, INC. P185 - 187 ISBN 0 - 8151 - 3541 - 6

V.Dornberger, G. Dornberger,M.Eggstein:
Volumetrie des Hodens mittels Real-time-Sonograhie

Ultrascall 7: 300 - 303, 1986

(8) Renal Volume

Barry B. Goldberg, M. D., Alfred B. Kurtz, M. D.
Atlas of Ultrasound Measurements.
Mosby Year Book Medical Publishers, INC. P156 - 158 ISBN 0 - 8151 - 3541 - 6

Hedvig Hricak, M. D., Ralph P. Lieto, M. S. E. :
Sonographic Determination of Renal Volume1Radiology 148: 311 - 312, July 1983

7-6-2-2. D mode

(1) Renal Artery

Larry Burdick, Flavio Airoldi et al. :
Superiority of acceleration and acceleration time over pulsatility and resistance indices as screening tests for renal artery stenosis.
Journal of Hypertension 1996, 14: 1229 - 1235

(2) Renal Artery

Munier M. S. Nazzal, MD et al. :
Renal Hilar Doppler Analysis Is of Value in the Management of Patients with Renovascular Disease.
The American Journal of Surgery Vol.174: 164 - 168

7-7. Abbreviation

Abbreviation	Meaning
ACC	Acceleration
AccT	Acceleration Time
AccT/FT	AccT/FT
Adrenal	Adrenal
AP	Antero posterior diameter
Area	Area
Bl	Bladder
Circ	Circumference
Cortex	Cortical
EDV	End Diastolic Velocity
FlowT	Flow time
L	Length
MnV	Mean Velocity
mPSA	monoclonal PSA
PCAR	Presumed Circle Area Ratio
PI	Pulsatility Index
Pitch	Slice Pitch (interval)
PRS	Prostate
Pre.Bldr Vol.	Pre Bladder Volume
PRS Slice Volume	Prostate Slice Volume by stepper method
PSA	Prostate Specific Antigen
PSA COEF.	PSA Coefficient
PSA Volume	Prostate Specific Antigen Volume
PSAD	PSA Density
Pst.Bldr Vol.	Post Bladder Volume
PSV	Peak Systolic Velocity
Renal Art	Renal Artery
Renal Vol.	Renal Volume
RI	Resistance Index
RL	Right-Left diameter
Rnl	Renal
Rt./Lt.	Right/Left
S/D	Systolic/Diastolic velocity Ratio
SI	Supero inferior diameter

Abbreviation	Meaning
Slice #@@	Slice Number=@@
SV	Seminal Vesicles
T1	Cortex Thickness1
T2	Cortex Thickness2
T3	Cortex Thickness3
Testis Vol.	Testicular Volume
Tst	Testis
Uro Dop1 — 4	Uro Dop1 — 4
Vol.	Volume
W	Width

8. eTRACKING MEASUREMENT

8-1. Preface

The description concerning the eTRACKING measurement functions is divided into the following four sub-sections.

This section describes the procedure for carrying out eTRACKING measurements, based on the assumption that products are on the factory default.

8-2. eTRACKING Measurement Functional Outline

8-2-1. Outline of Function

Using eTRACKING technology, calculate index of arteriosclerosis, such as the Elastic modulus (Ep) and the Stiffness Parameter (β), which indicates the elastic characteristics of the vessel obtain by measuring from the blood vessel diameter of the carotid artery and the blood pressure.Also calculate FMD (Flow Mediated Dilation) from changes in blood vessel diameter in the brachial artery.

8-2-2. Measurement operation procedure

For operating instructions on eTRACKING and FMD, refer to How to Use 12.eTRACKING, 13.Flow Mediated Dilation analysis (FMD) and 14.Wave Intensity.

This section consists of 18 pages.

8-3. Report function

The Arterial Stiffness Report collates the various arteriosclerosis indexes, blood vessel diameter, blood pressure and ensemble-averaged distention waveform and ECG waveform for each observed blood vessel. The data is presented on the Report screen.
The FMD Report collates the left and right FMD analysis results (index of arteriosclerosis, vessel diameter, blood pressure, etc.) for the observed blood vessel stored on the HDD, and presents them on the Report screen.
In the WI report, the index etc. that show the influence of the reflected wave from the index and the tip that shows the contractility, the extendibility of the heart, and the hardness of the artery are arranged and it is displayed on the report screen.

[Remark]
Be sure to enter patient data (Patient ID, Name, etc.) on the ID screen.

8-3-1. Basic Operation of a Report

8-3-1-1. Displaying a Report

In order to display a report, press Report on the touch panel.

8-3-1-2. Ending a Report

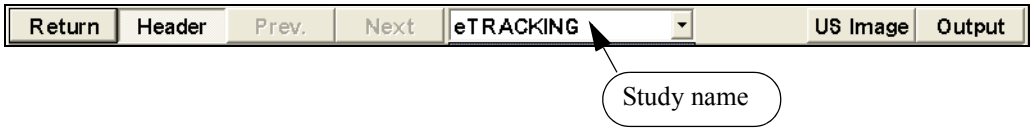
The following two patterns are used to end a report.

(1) Press Report on the operation panel.

(2) Select Return on the Report screen.

8-3-1-3. Function buttons on a Report

The following buttons are displayed on the top section of the Report screen.

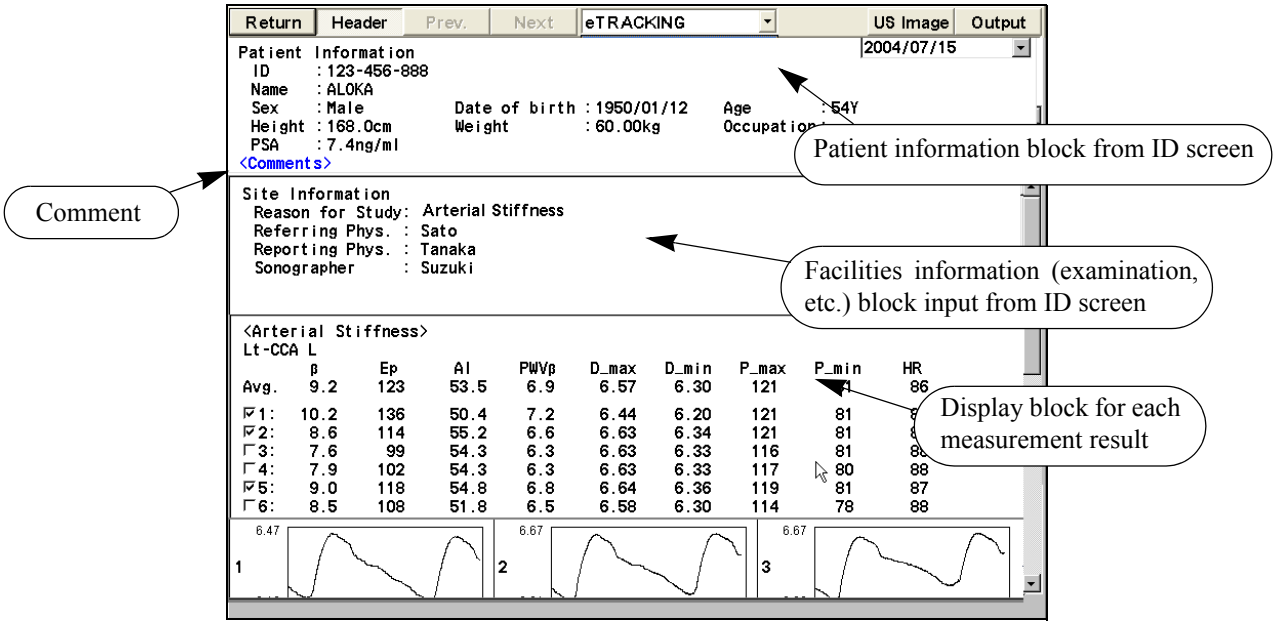


Return	Closes the report.
Header	Switches the header block (patient data display) between Long Form and Short Form.
Prev., Next	Advances or returns the page in block units.
Study name	Switch the study of the displayed report.
US Image	Displays an ultrasound image in the report.
Output	Outputs report data to a personal computer, Media or printer.

8-3-2. Report Block

A report block is the unit used to display data (each set of eTRACKING measurement data).

It arranges pertinent ultrasound information such as Header (patient information) block, Site information (facilities information) block, and Arterial Stiffness block.

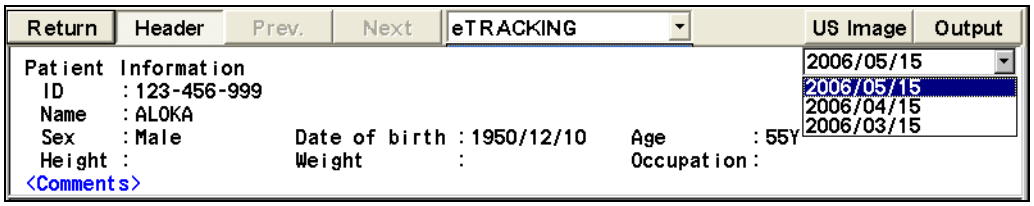


8-3-2-1. Function for displaying the past reports

It can display the past reports that are on the requested exam. dates.
However, it is not possible to Edit (revision / deletion) the past measurement records.

(1) Move the arrow to the ▼ of the combo box identifying the exam. date, and press the ENTER switch.

→ The exam. date of the past is displayed.



(2) Select the exam. date desired to display, and press the ENTER switch.

→ The report of the requested exam. date is displayed.

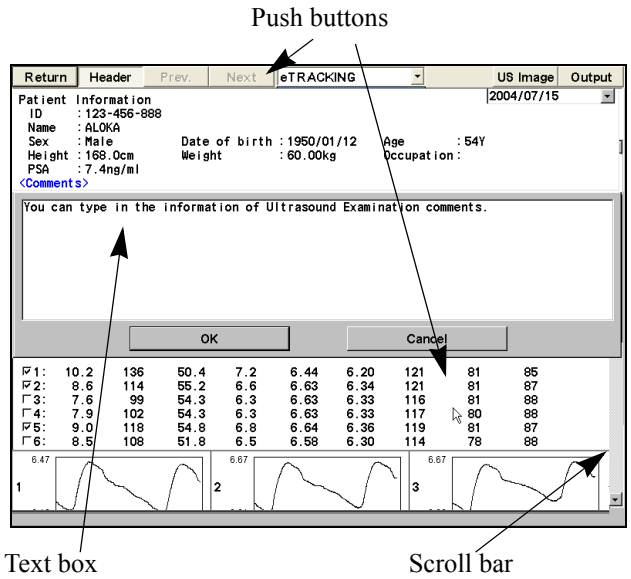
8-3-2-2. Comment input function

You can enter comments concerning an ultrasound examination as the results of an ultrasound examination.

(1) Move the arrow to <Comments>, and press the ENTER switch.
→ A text box for entering a comment is displayed.

(2) Enter a comment from the keyboard.

(3) Select OK.



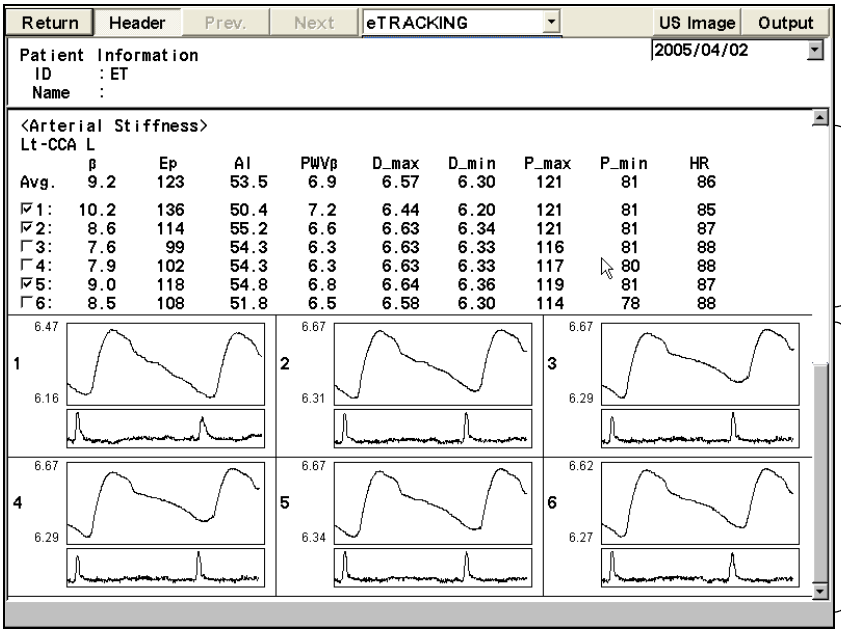
[Remark]
If you select Cancel, the entered contents are canceled.

8-3-3. Description of Various Data Displayed in a Report

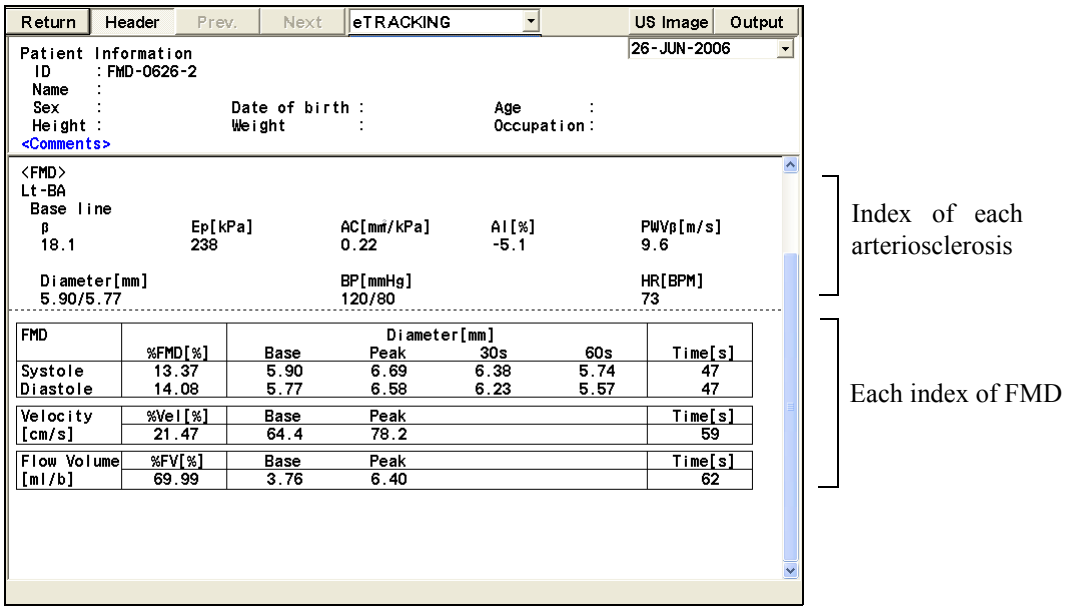
8-3-3-1. Arterial Stiffness Report

Display the results of measuring eTRACKING.

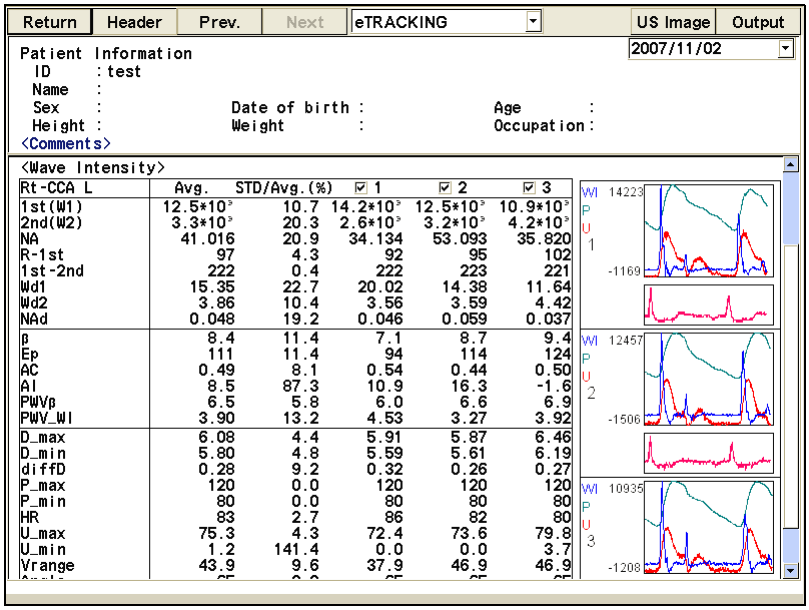
1) Arterial Stiffness Report



2) FMD Report



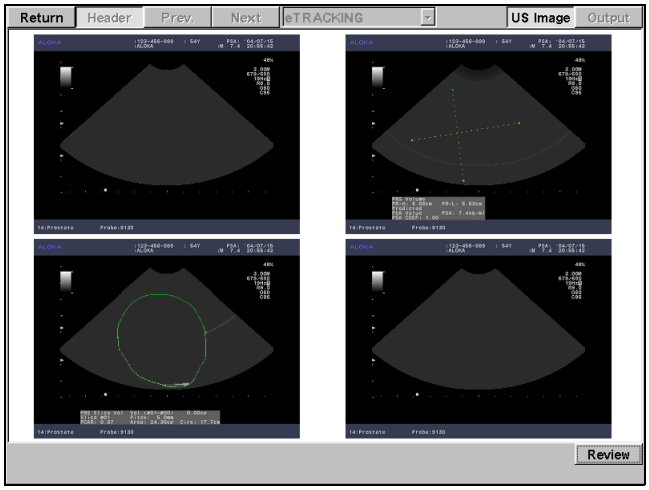
3) Wave Intensity Report



8-3-4. Function that Attaches an Ultrasound Image to a Report

This function automatically display the current ultrasound image acquired by the examiner in the US Image block of the report.
Also, by using the Review function at the bottom of the Report screen, it is possible to display all of the images stored in the connected medium (f.e. HDD and external media such as USB memory) as thumbnail images. You can also select one of these images, and display it in the report.

When you select US Image on the report screen, the US Image block (ultrasound image page) is displayed.



To return to a normal report, select US Image once again.

8-3-4-1. Images that can be attached to a report

Images that can be attached to a report are the various ultrasound images of the same patient that are stored in the connected medium (f.e. HDD and external media such as USB memory) at the storage destination.

8-3-4-2. Limit for holding attached images

Attached images are held until the New Patient function is executed.

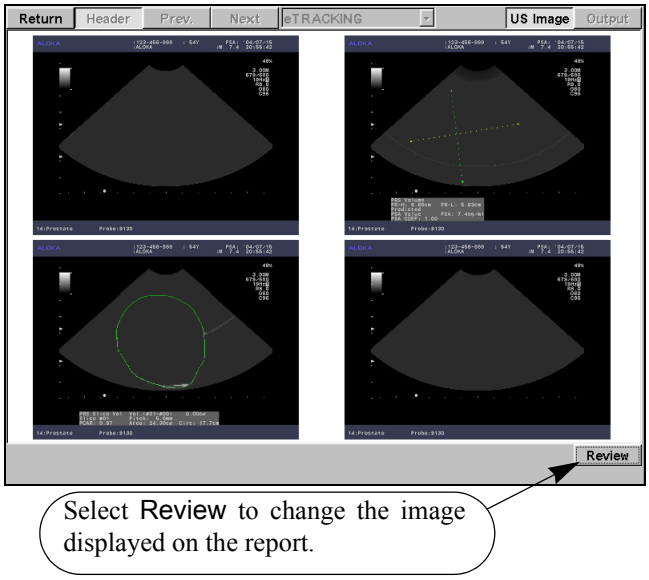
8-3-4-3. Method of attaching images

1) Auto Paste function

The number of images set using the Preset function is automatically selected from the latest images stored in the connected medium (f.e. HDD and external media such as USB memory) and displayed on the US Image block.

[Remark]
The number of displayed images and the display format can be set only by the Preset function.
The factory default settings are Display Pasted US Image Form on the Screen: 2 × 2, and Number of US Images to be Automatically Displayed: 4.

The figure at right shows examples of factory default settings.



Regarding the display sequence, the images are automatically pasted from the latest recorded image, from top left to bottom right.

[Remark]
You can set the format of an image displayed on the Report screen to 1 × 1, 2 × 2, 3 × 2 or 3 × 3.

2) Manual Paste function

<Operation method>

This function enables you to change the automatically attached image to another image, or to add an image.

(1) Select Review at bottom right of the US Image block screen.

→ All of the images of the patient concerned that are stored in the connected medium (f.e. HDD and external media such as USB memory) are displayed as thumbnail images.

(2) Move the arrow to the image that you wish to display, and press the ENTER switch.

→ The selected image is displayed with a blue border.

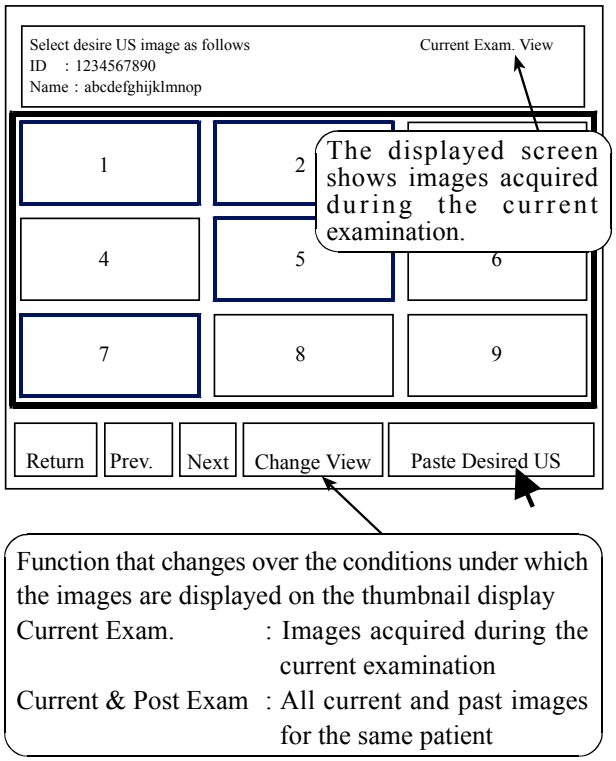


Fig. Thumbnail display

[Remark]
If you wish to select a number of images, repeat step (2).
Pressing the ENTER switch on the selected image erases the blue border.

(3) Move the arrow to Paste Desired US, and press the ENTER switch.

→ The selected image is displayed in the US Image block.

[Remark]
Regarding the "Change View" function
By selecting Change View at the bottom of the thumbnail display, you can also display past images for the same patient as thumbnail display.

[Remark]
Each time you select Change View, the display conditions switch over between "current image only" and "current and past images". The particular set of conditions displayed is indicated at top right of the thumbnail screen.

8-3-5. Printing Function

This function outputs the entire report data to a dedicated local printer via a USB interface.
The printed data is a text data, graphical data or ultrasound image.

8-3-5-1. Operation sequence

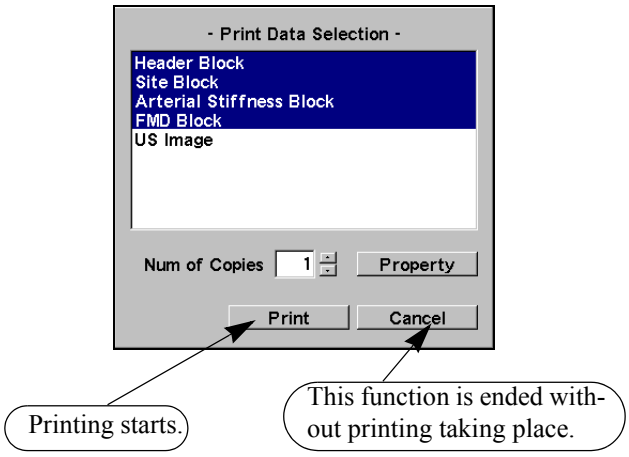
(1) Select Output.
→ A select device dialog box is displayed.

(2) Select to Printer, and press OK.
→ The Print Data Selection dialog box is displayed.

(3) Select the block that you wish to print.
→ The selected block name is highlighted in blue.

[Remark]
To cancel the selection, re-select the same block.

(4) Enter the number of copies, and select Print.
→ Printing starts, and the dialog box closes.



8-3-5-2. Property function

This function enables you to make the minimum necessary detailed settings for a local printer and a B/W digital printer.

(1) Printer name : Select the model of the printer to be used.

(2) Paper sizes : Set the size of the paper to be used. (US letter, A4 alternative selection)
The function does not operate when a digital black and white printer is selected.

(3) Title Inform : Enter the Report Title information
You can enter up to 80 characters. The print position is always Center.

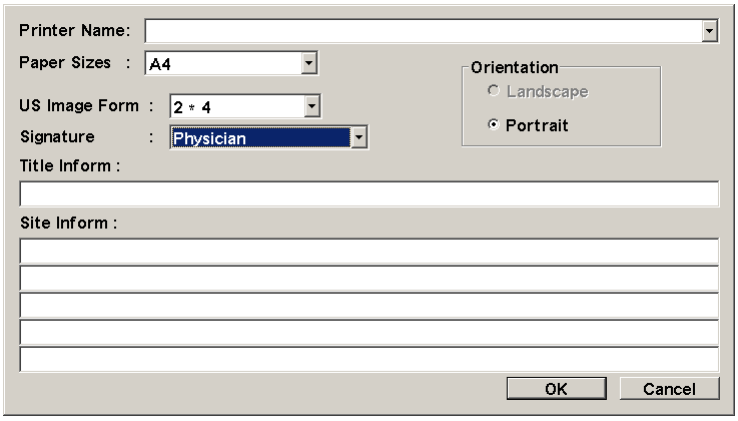
(4) Site Inform : Enter the facilities information (department, address, telephone No., FAX No., etc.).
You can enter up to 80 characters × 5 lines. The print position is always Center.

(5) Orientation : Set the orientation of the paper.
At present, the orientation is set to Portrait (vertical direction printing) only.

(6) US Image Form : When printing the US Image block, you can change the printing format to 1 × 2, 1 × 3, 2 × 2 or 2 × 4.
The function does not operate when a digital black and white printer is selected.

(7) Signature : Selects if the Signature field is set as Physician only, both Physician and Sonographer, or no field is displayed (None).

[Remark]
These settings are held subsequently so long as they are not renewed.



8-3-6. Output to a Personal Computer

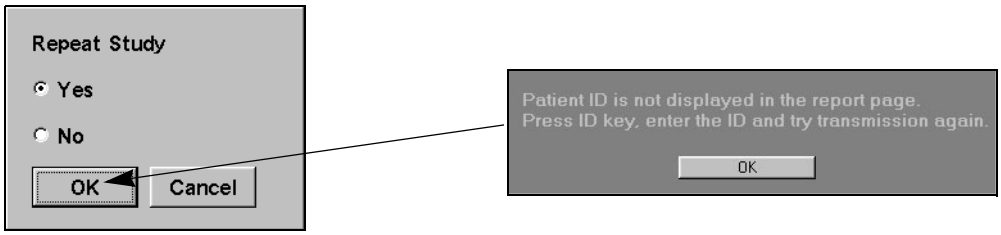
This function outputs the entire report to a personal computer using an RS-232C interface.

8-3-6-1. Operation procedure

(1) Select Output.

→ The "Repeat study" dialog box is displayed.

[Remark]
If an ID is not input, a message to that effect will be displayed.
Press the ID key on the front panel.



(2) If you wish to repeat a study, select Yes and press OK.

→ Communication starts.

[Remark]
If you select Cancel, the system returns to the status that existed prior to the execution of this function.

[Remark]
The patient data and all of the data registered in the report (excluding the ultrasound image data) is output to a personal computer as output data.

8-3-7. Output to a CSV file

This function outputs the values registered in the report (measured values only) and the comment data to the connected medium(f.e. external media such as USB memory) as a CSV file.

8-3-7-1. Operation procedure

(1) Select Output.

→ The “Select device” dialog box is displayed.

(2) Select the Export CSV File.

→ The media selection dialog box appears.

[Remark]
The filename is automatically attached by means of [ID- Date Application], but can be changed by entering the desired name from the keyboard.

(3) Select the medium, enter the filename, and then press OK.

→ The data is written to the selected medium.

[Remark]
If you select Cancel, the equipment will return to the condition that existed prior to the execution of this function.

[Remark]
When you open the CSV file, the patient information, numerical values and comments appear in that sequence.

8-4. Preset function

8-4-1. Preset Settings

The eTRACKING measurement preset consists broadly of the following three functions.

(1) Create Measurement Tools= Settings related to the measurement procedure, mark size, and report display

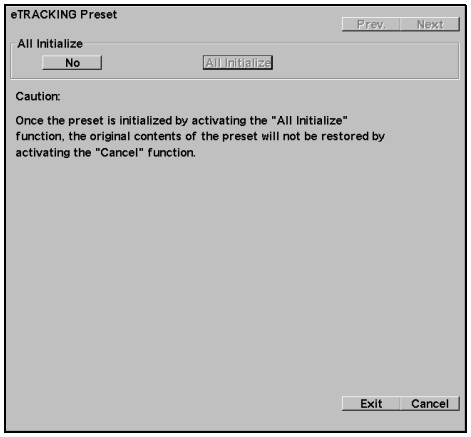
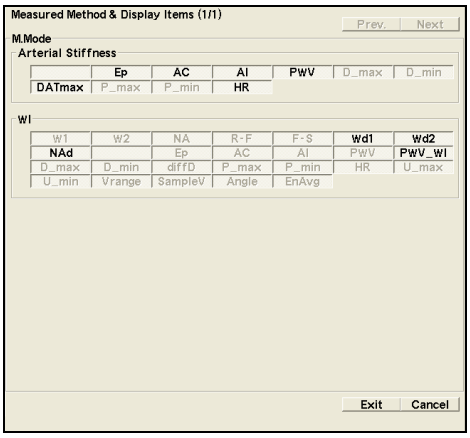
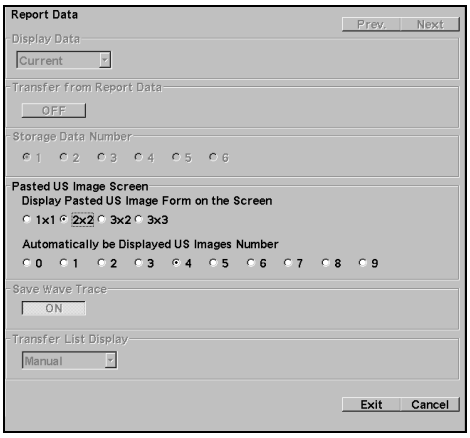
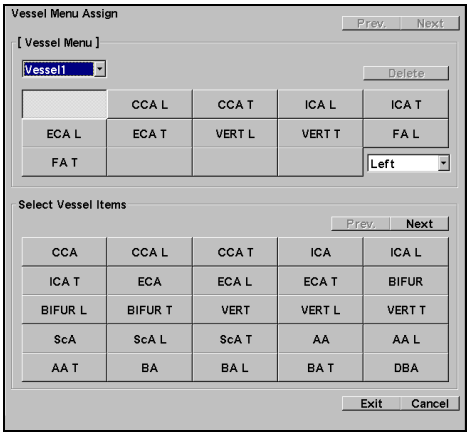
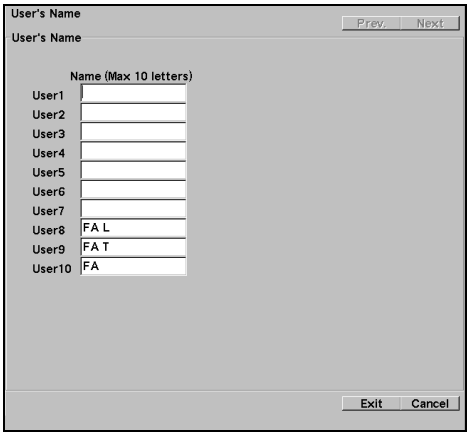
(2) Study Assignment = Sets the menu, transfer list, report display configuration, and so on, for each study

(3) SW Assignment = Settings for assigning various measurement functions to switches for shortcut operations

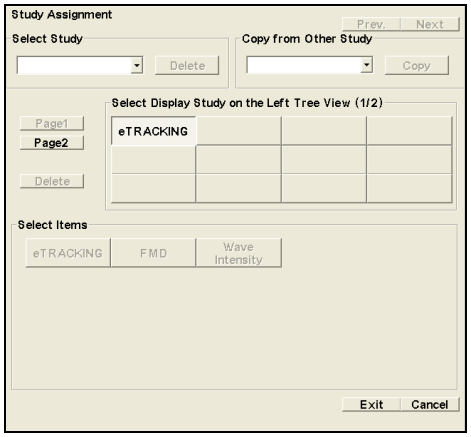
The preset functions related to eTRACKING measurements and their configuration are shown below.

eTRACKING Preset				
	Create Measurement Tools			Setting of the items that are common to eTRACKING measurement and Basic measurements (hereafter called items).
		Basic Measurement		Refer to Section 1-10. "PRESET FUNCTION"
		Application Measurement		Settings concerning the eTRACKING measurement to be used, Mark Style and result display.
			Measurement Method & Display Items	Selection and setting of each eTRACKING measurement method, Mark Style and result display items.
			M.Mode	Setting of Arterial Stiffness measurement.
			Report Data	Setting of the number of the image on the report.
			eTRACKING	Assignment of the Vessel Menu and user registration of the vessel name for eTRACKING.
			Vessel Menu Assign	Setting the assignment of the Vessel Menu as user chooses.
			User's Name	Setting the registration of the vessel name for eTRACKING as user chooses.
	Study Assignment			Setting of measurement menu registration, report display configuration, and transfer list for each Ultrasound Examination Study.
		Defined study name		eTRACKING, FMD, Wave Intensity
		Menu Assignment		Function that enables a measurement menu to be created and edited.
		Combined Report Display		Function that enables the configuration of a report to be edited.
		Other		Function that enables a selection of whether or not to display a measurement operation guide message.
	SW Assignment			Setting of registration of the direct execution switches.
		+ Mark Key Assignment		Function that assigns the basic measurements to be executed when the + switch is pressed.
		Hot Key Assignment		Function that assigns the measurement function that operates when a specific alphabet key is pressed.
		Measure SW Assignment		Function that assigns the measurement function that operates when the User switch is pressed.
		Control Menu Assignment		Assigning the control menu on the touch panel.

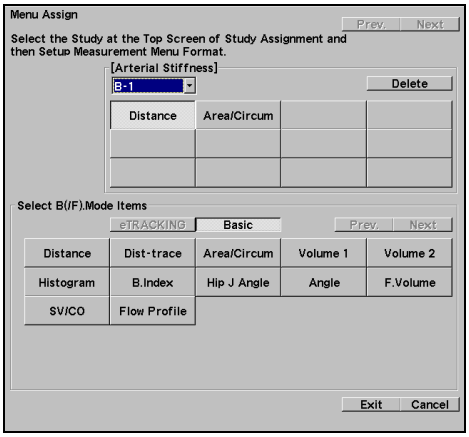
8-4-2. PRESET list

eTRACKING Preset Returns the registered contents to their default settings  	Create Measurement Tools Basic Measurement Refer to Section 1.
Measured Method&Display Items (1/1) M mode measurement setting  	Report Data Pasting of Image 
eTRACKING Vessel Menu Assign Assignment of the Vessel Menu for eTRACKING  	eTRACKING User's Name User registration of the vessel name for eTRACKING 

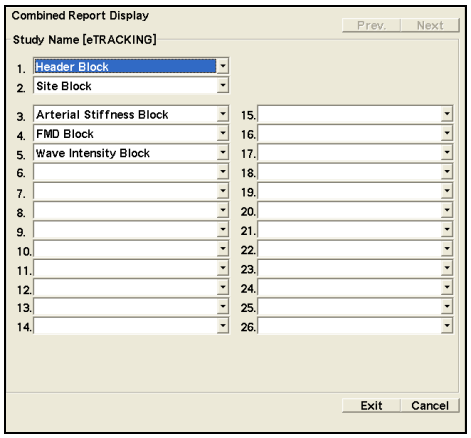
Study Assingment
Switches the display on/off for built-in studies and registers new studies.



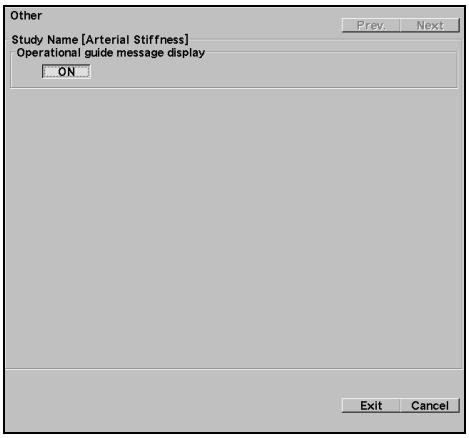
Study Assignment
Menu Assign
eTRACKING measurement menu setting



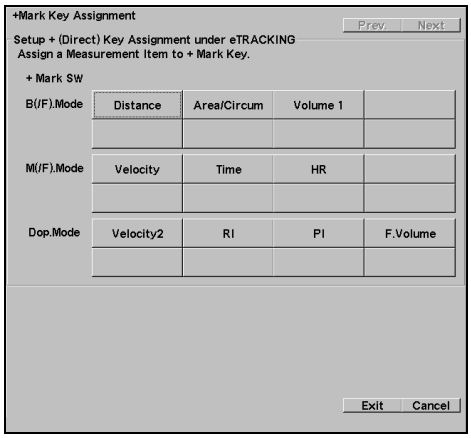
Combined Report Display
Combinations of measurement blocks displayed in reports



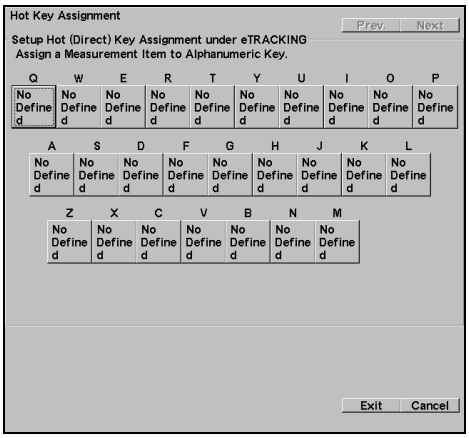
Other
Measurement guide message display setting

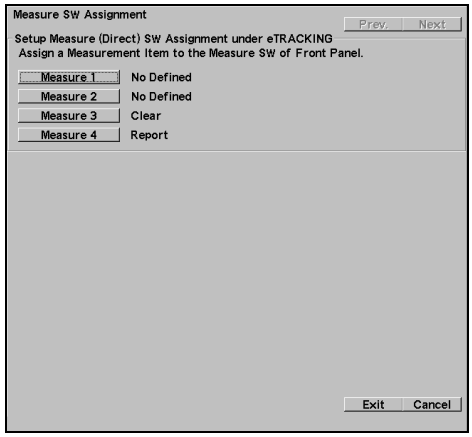
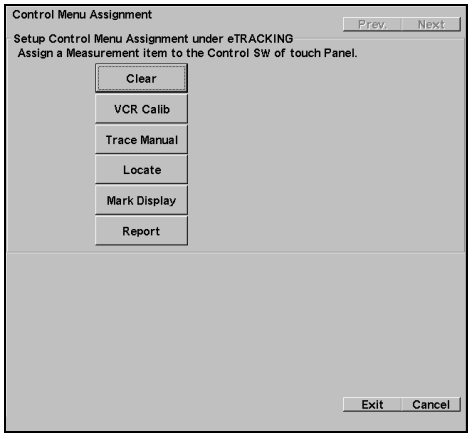


SW Assignment
+ Mark Key Assignment
Registers the measurement started with the + mark



SW Assignment
Hot key Assignment
Registers measurements to the keyboard.



SW Assignment Measure SW Assignment Registers measurements to measure switches.  	Control Menu Assignment Registers to control menus on the touch panel. 

INDEX(Measurement)

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MANUFACTURER ALOKA CO.,LTD.

Aloka Co., Ltd.

22-1, Mure 6-chome, Mitaka-Shi, Tokyo, 181-8622 Japan

Tel : +81-422-45-6049
URL:http:// www.aloka.com

Overseas Offices:

ALOKA EUROPE Technical Center
Carl-Zeiss-Strasse 5, D-72555 Metzingen, Germany

Aloka Co., Ltd. Singapore Office
1, Maritime Square, #10-32/32A, HarbourFront Centre, Singapore, 099253

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