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## OB Reference

### Estimated Fetal Weight Formula

#### Methods using (BPD, AC)

##### Shepard Method [grams]

[Equation]

$$1000 \times 10^{(-1.7492 + 0.166 \times (BPD) + 0.046 \times (AC) - 0.002646 \times (AC) \times (BPD))}$$

[Input Range]

AC : 15.5~40.0 cm

BPD : 3.1~10.0 cm

EFW : 224~4925 g

[Reference]

Shepard MJ, et al, "An Evaluation of Two Equations for Predicting Fetal Weight by Ultrasound," *American Journal of Ob & Gyn*, January 1982; 142(1):47-54

##### Hadlock Method [grams]

[Equation]

$$10^{(1.11 + (0.05845 \times AC) - (0.000604 \times AC^2) - (0.007365 \times BPD^2) + (0.000595 \times BPD \times AC) + (0.1694 \times BPD))}$$

[Reference]

Hadlock F, et al, "Sonographic Estimated of Fetal Weight," *Radiology* 1984;150:535-540

##### Merz Method [grams]

[Equation]

$$-3200.4 + 157.07 \times AC + 15.9 \times BPD^2$$

[Reference]

E. Merz, W. Goldhofer, E. Timor-Tritsch "Ultrasound in Gynecology and Obstetrics" *Textbook and Atlas*, 1991, Georg Thieme Verlag, 308-338

#### Method using (BPD, FL, FTA)

##### Osaka university [grams]

$$FW(BPD, FL, FTA) = 1.256 \times BPD^3 + 3.5065 \times FTA \times FL + 6.3$$

#### Method using (BPD, APTD, TTD, FL)

##### Tokyo 2 university Method [grams]

[Equation]

$$1.07 \times BPD^3 + 3.42 \times APTD \times TTD \times FL$$

[Reference]

*Jpn J Med Ultrasonics* Vol.23. No.12 (1996)

#### Method using (BPD, APTD, TTD, SL)

##### Shinozuka 2 Method [grams]

[Equation]

$$1.07 \times BPD^3 + 2.91 \times APTD \times TTD \times SL$$

[Reference]

Shinozuka, N et, al, Am J Obstet Gynecol 157:1140, 1987

## Method using (BPD, TTD)

### Hansmann's fetal weight [grams]

[Equation]

$$((-1.05775 \times BPD) + (0.649145 \times TTD) + (0.0930707 \times BPD^2) - (0.020562 \times TTD^2) + (0.515263)) \times 1000.0$$

[Low Range]

BPD : 5.9cm ~ ∞

TTD : 5.6cm ~ ∞

EFW : 500g ~ ∞

[Reference]

Hansmann, Hackeloer, Staudach, Wittman, "Ultrasound Diagnosis in Obstetrics and Gynecology," Springer-Verlag, New York, 1986

## Method using (AC, FL)

### Hadlock 1 Method [grams]

[Equation]

$$10^{(1.304 + 0.05281 \times AC + 0.1938 \times FL - 0.004 \times AC \times FL)}$$

±2SD=16%

[Reference]

Hadlock, F., Harris, R.B., Sharman, R.S., Deter, R.L., Park, S.K. "Estimation of Fetal Weight with the use of Head, Body, and Femur Measurement-A Prospective Study." American Journal of Obstetrics and Gynecology, Vol.151, No.3:333-337, Feb 1, 1985

## Method using (BPD, AC, FL)

### Hadlock 2 Method [grams]

[Equation]

$$10^{(1.335 - 0.0034 \times AC \times FL + 0.0316 \times BPD + 0.0457 \times AC + 0.1623 \times FL)}$$

±2SD=15%

[Reference]

Hadlock, F., Harris, R.B., Sharman, R.S., Deter, R.L., Park, S.K. "Estimation of Fetal Weight with the use of Head, Body, and Femur Measurement-A Prospective Study." American Journal of Obstetrics and Gynecology, Vol.151, No.3:333-337, Feb 1, 1985

### Shinozuka 1 Method [grams]

[Equation]

$$1.07 \times BPD^3 + 0.30 \times AC^2 \times FL$$

[Reference]

Shinozuka, N et, al, Am J Obstet Gynecol 157:1140, 1987

**Method using (HC, AC, FL)****Hadlock 3 Method [grams]***[Equation]*

$$10^{(1.326 - 0.00326 \times AC \times FL + 0.0107 \times HC + 0.0438 \times AC + 0.158 \times FL)}$$

 $\pm 2SD = 15\%$ *[Reference]*

Hadlock, F., Harris, R.B., Sharman, R.S., Deter, R.L., Park, S.K. "Estimation of Fetal Weight with the use of Head, Body, and Femur Measurement-A Prospective Study." *American Journal of Obstetrics and*

**Method using (BPD, HC, AC, FL)****Hadlock 4 Method [grams]***[Equation]*

$$10^{(1.3596 - 0.00386 \times AC \times FL + 0.0064 \times HC + 0.00061 \times BPD \times AC + 0.0424 \times AC + 0.174 \times FL)}$$

 $\pm 2SD = 14.8\%$ *[Reference]*

Hadlock, F., Harris, R.B., Sharman, R.S., Deter, R.L., Park, S.K. "Estimation of Fetal Weight with the use of Head, Body, and Femur Measurement-A Prospective Study." *American Journal of Obstetrics and*

**Method using (AC)****Campbell's fetal weight [grams]***[Equation]*

$$1000 \times 10^{(0.282 \times AC - 0.00331 \times AC^2 - 4.564)}$$

*[Input Range]*

AC : 21.0 ~ 40.0cm

EFW : 903 ~ 4137g

*[Reference]*

Campbell, S., Wilkin, D. "Ultrasonic Measurement of Fetal Abdomen Circumference in the Estimation of Fetal Weight." *British Journal of OB & GYN*, 82, 9: 689-697, September 1975

**Method using (BPD, APTD, TTD)****Tokyo 1 university Method [grams]***[Equation]*

$$1.73 \times BPD^3 + 28 \times APTD \times TTD - 217$$

*[Reference]*

*Jpn J Med Ultrasonics* Vol.23. No.12 (1996)



## Gestational Age Formula and Table List

### Abdominal Circumference(AC) : KOREAN

#### GA Table

Y.G Park. "The Standardization of Fetal body parts according to the normal Korean Gestational Age in Ultrasound" Korean Ultrasound Institute, Vol. 14, No.2, 1995

$$GA = 7.403506 + 0.76191 \times AC + 0.004492304 \times AC^2$$

Output Unit : w(weeks)

Input Unit : cm

Min Range : 5.9 cm

Max Range : 35.2 cm

#### Fetal Growth Table

Y.G Park. "The Standardization of Fetal body parts according to the normal Korean Gestational Age in Ultrasound" Korean Ultrasound Institute, Vol. 14, No.2, 1995

$$AC = 13.554085 \times MA - 0.059973 \times MA^2 - 94.588168 \text{ (Unit: mm)}$$

Output Unit : cm

Input Unit : w(week)

Min Range : 12w

Max Range : 40w

Age (W)	Growth (cm)	±SD (cm)
12	5.932	0.794
16	10.793	0.728
20	15.086	0.742
24	19.300	1.258
28	23.988	0.870

Age (W)	Growth (cm)	±SD (cm)
32	27.738	0.799
34	29.578	0.771
36	31.731	0.583
38	33.514	0.370
40	34.490	1.608

### Abdominal Circumference (AC) : HADLOCK

#### GA Table

Hadlock, F., Deter, R.L., Harrist, R.B., Park, S.K. "Estimating Fetal Age: Computer-Assisted Analysis of Multiple Fetal Growth Parameters" Radiology, 1984, 152: 497-501. (Biometric Age and Growth Equations)

$$GA = 8.14 + 0.753 \times AC + 0.0036 \times AC^2$$

Output Unit : w(weeks)

Input Unit : cm

Min Range : 4.83cm

Max Range : 38.04 cm

Standard Deviation :

Min Range(w)	Max Range(w)	±2SD
12	18	1.66
18	24	2.06
24	30	2.18

Min Range(w)	Max Range(w)	±2SD
30	36	2.96
36	42	3.04

#### Fetal Growth Table

Hadlock, F., Deter, R.L., Harrist, R.B., Park, S.K. "Estimating Fetal Age: Computer-Assisted Analysis of Multiple Fetal Growth Parameters" Radiology, 1984, 152: 497-501. (Biometric Age and Growth Equations)

$$\text{Graph} = 1.61 \times MA - 0.00998 \times MA^2 - 13.3$$

Output Unit : cm

Input Unit : w(weeks)

Min Range : 12 w

Max Range : 40 w

Standard Deviation: 2SD = 2.68 cm

Min Range (cm)	Max Range (cm)	SD (cm)
0	100	1.34

**Abdominal Circumference (AC) : HANSMANN**

**GA Table**

*Hansmann, Hackeloer, Staudach, Wittman "Ultrasound Diagnosis in Obstetrics and Gynecology" Springer- Verlag, New York, 1986, p.431.*

AC (cm)	GA (W)	AC (cm)	GA (W)	AC (cm)	GA (W)	AC (cm)	GA (W)
5.30	12w	13.50	20w	20.20	27w	26.80	34w
6.30	13w	14.50	21w	21.10	28w	27.70	35w
7.50	14w	15.50	22w	22.20	29w	28.70	36w
8.50	15w	16.50	23w	23.00	30w	29.60	37w
9.70	16w	17.30	24w	24.00	31w	30.60	38w
10.70	17w	18.30	25w	24.90	32w	31.50	39w
11.60	18w	19.10	26w	25.80	33w	32.00	40w
12.60	19w						

**Fetal Growth Table**

*Hansmann, Hackeloer, Staudach, Wittman "Ultrasound Diagnosis in Obstetrics and Gynecology" Springer- Verlag, New York, 1986, p.431.*

GA (W)	Growth (cm)	GA (W)	Growth (cm)
12	5.30	27	20.20
13	6.30	28	21.10
14	7.50	29	22.20
15	8.50	30	23.00
16	9.70	31	24.00
17	10.70	32	24.90
18	11.60	33	25.80
19	12.60	34	26.80
20	13.50	35	27.70
21	14.50	36	28.70
22	15.50	37	29.60
23	16.50	38	30.60
24	17.30	39	31.50
25	18.30	40	32.00
26	19.10		

## Abdominal Circumference (AC) : MERZ

### GA Table

E. Merz, W. Goldhofer, E. Timor-Tritsch "Ultrasound in Gynecology and Obstetrics"

Text book and Atlas, 1991 Georg Thieme Verlag, 308-338

Age (w)	GA (wd)	Min (wd)	Max (wd)
5.60	12w1d	10w6d	13w2d
5.80	12w2d	11w1d	13w4d
6.00	12w4d	11w2d	13w5d
6.20	12w5d	11w4d	13w6d
6.40	12w6d	11w5d	14w1d
6.60	13w1d	11w6d	14w2d
6.80	13w2d	12w0d	14w4d
7.00	13w4d	12w1d	14w5d
7.20	13w4d	12w3d	14w6d
7.40	13w6d	12w4d	15w1d
7.60	14w0d	12w6d	15w2d
7.80	14w1d	12w6d	15w4d
8.00	14w3d	13w1d	15w5d
8.20	14w4d	13w2d	15w6d
8.40	14w6d	13w4d	16w1d
8.60	15w0d	13w5d	16w2d
8.80	15w1d	13w6d	16w4d
9.00	15w3d	14w0d	16w5d

Age (w)	GA (wd)	Min (wd)	Max (wd)
20.40	26w1d	24w3d	27w6d
20.60	26w3d	24w4d	28w1d
20.80	26w4d	24w6d	28w2d
21.00	26w6d	25w0d	28w4d
21.20	27w0d	25w1d	28w5d
21.40	27w1d	25w2d	28w6d
21.60	27w2d	25w4d	29w1d
21.80	27w4d	25w5d	29w2d
22.00	27w5d	25w6d	29w4d
22.20	27w6d	26w1d	29w5d
22.40	28w1d	26w2d	29w6d
22.60	28w2d	26w3d	30w1d
22.80	28w4d	26w4d	30w2d
23.00	28w5d	26w6d	30w4d
23.20	28w6d	27w0d	30w5d
23.40	29w0d	27w1d	30w6d
23.60	29w1d	27w3d	31w1d
23.80	29w3d	27w4d	31w2d

9.20	15w4d	14w1d	16w6d
9.40	15w5d	14w3d	17w1d
9.60	15w6d	14w4d	17w2d
9.80	16w1d	14w6d	17w4d
10.00	16w2d	14w6d	17w5d
10.20	16w4d	15w1d	17w6d
10.40	16w5d	15w2d	18w1d
10.60	16w6d	15w4d	18w2d
10.80	17w1d	15w5d	18w3d
11.00	17w2d	15w6d	18w4d
11.20	17w3d	16w0d	18w6d
11.40	17w4d	16w1d	19w0d
11.60	17w6d	16w3d	19w1d
11.80	18w0d	16w4d	19w3d
12.00	18w1d	16w6d	19w4d
12.20	18w3d	17w0d	19w6d
12.40	18w4d	17w1d	20w0d
12.60	18w6d	17w2d	20w1d
12.80	19w0d	17w4d	20w3d
13.00	19w1d	17w5d	20w4d
13.20	19w2d	17w6d	20w6d
13.40	19w4d	18w0d	21w0d
13.60	19w5d	18w1d	21w1d
13.80	19w6d	18w3d	21w3d

24.00	29w4d	27w5d	31w4d
24.20	29w6d	27w6d	31w5d
24.40	30w0d	28w1d	31w6d
24.60	30w1d	28w2d	32w1d
24.80	30w3d	28w3d	32w2d
25.00	30w4d	28w4d	32w4d
25.20	30w6d	28w6d	32w5d
25.40	30w6d	29w0d	32w6d
25.60	31w1d	29w1d	33w1d
25.80	31w2d	29w3d	33w2d
26.00	31w4d	29w4d	33w4d
26.20	31w5d	29w5d	33w5d
26.40	31w6d	29w6d	33w6d
26.60	32w1d	30w1d	34w1d
26.80	32w2d	30w2d	34w2d
27.00	32w4d	30w4d	34w4d
27.20	32w5d	30w4d	34w5d
27.40	32w6d	30w6d	34w6d
27.60	33w0d	31w0d	35w1d
27.80	33w1d	31w1d	35w2d
28.00	33w3d	31w3d	35w4d
28.20	33w4d	31w4d	35w5d
28.40	33w6d	31w5d	35w6d
28.60	34w0d	31w6d	36w1d

14.00	20w1d	18w4d	21w4d
14.20	20w2d	18w6d	21w6d
14.40	20w4d	19w0d	22w0d
14.60	20w5d	19w1d	22w1d
14.80	20w6d	19w2d	22w3d
15.00	21w1d	19w4d	22w4d
15.20	21w1d	19w5d	22w6d
15.40	21w3d	19w6d	23w0d
15.60	21w4d	20w1d	23w1d
15.80	21w6d	20w1d	23w3d
16.00	22w0d	20w3d	23w4d
16.20	22w1d	20w4d	23w6d
16.40	22w3d	20w6d	24w0d
16.60	22w4d	21w0d	24w1d
16.80	22w6d	21w1d	24w3d
17.00	23w0d	21w2d	24w4d
17.20	23w1d	21w4d	24w6d
17.40	23w2d	21w5d	25w0d
17.60	23w4d	21w6d	25w1d
17.80	23w5d	22w1d	25w3d
18.00	23w6d	22w1d	25w4d
18.20	24w1d	22w3d	25w6d
18.40	24w2d	22w4d	26w0d
18.60	24w4d	22w6d	26w1d

28.80	34w1d	32w1d	36w2d
29.00	34w3d	32w2d	36w4d
29.20	34w4d	32w4d	36w5d
29.40	34w5d	32w4d	36w6d
29.60	34w6d	32w6d	37w1d
29.80	35w1d	33w0d	37w1d
30.00	35w2d	33w1d	37w3d
30.20	35w4d	33w3d	37w4d
30.40	35w5d	33w4d	37w6d
30.60	35w6d	33w5d	38w0d
30.80	36w1d	33w6d	38w1d
31.00	36w2d	34w1d	38w3d
31.20	36w4d	34w2d	38w4d
31.40	36w4d	34w4d	38w6d
31.60	36w6d	34w4d	39w0d
31.80	37w0d	34w6d	39w1d
32.00	37w1d	35w0d	39w3d
32.20	37w3d	35w1d	39w4d
32.40	37w4d	35w3d	39w6d
32.60	37w6d	35w4d	40w0d
32.80	38w0d	35w5d	40w1d
33.00	38w1d	35w6d	40w3d
33.20	38w3d	36w1d	40w4d
33.40	38w4d	36w2d	40w6d

18.80	24w5d	23w0d	26w3d
19.00	24w6d	23w1d	26w4d
19.20	25w0d	23w2d	26w6d
19.40	25w1d	23w4d	27w0d
19.60	25w3d	23w5d	27w1d
19.80	25w4d	23w6d	27w3d
20.00	25w6d	24w1d	27w4d
20.20	26w0d	24w2d	27w6d

33.60	38w5d	36w4d	41w0d
33.80	38w6d	36w5d	41w1d
34.00	39w1d	36w6d	41w3d
34.20	39w2d	37w0d	41w4d
34.40	39w4d	37w1d	41w6d
34.60	39w5d	37w3d	42w0d
34.80	39w6d	37w4d	42w1d

**Fetal Growth Table**

*E. Merz, W. Goldhofer, E. Timor-Tritsch "Ultrasound in Gynecology and Obstetrics"  
Textbook and Atlas, 1991 Georg Thieme Verlag, 308-338*

Age (w)	Growth (cm)	Min (cm)	Max (cm)
12	5.80	4.00	7.60
13	6.80	5.00	8.70
14	7.90	6.00	9.80
15	8.90	6.90	10.90
16	9.90	7.90	11.90
17	11.00	8.90	13.00
18	12.00	9.90	14.10
19	13.00	10.80	15.20
20	14.00	11.80	16.20
21	15.10	12.80	17.30

Age (w)	Growth (cm)	Min (cm)	Max (cm)
27	21.20	18.70	23.80
28	22.30	19.70	24.80
29	23.30	20.70	25.90
30	24.30	21.70	27.00
31	25.30	22.70	28.00
32	26.40	23.70	29.10
33	27.40	24.60	30.20
34	28.40	25.60	31.20
35	29.50	26.60	32.30
36	30.50	27.60	33.40

22	16.10	13.80	18.40
23	17.10	14.80	19.50
24	18.20	15.80	20.50
25	19.20	16.70	21.60
26	20.20	17.70	22.70

37	31.50	28.60	34.40
38	32.50	29.60	35.50
39	33.60	30.60	36.50
40	34.60	31.60	37.60

## Abdominal Circumference (AC) : JEANTY

### Fetal Growth Table

*Hansmann, Hackeloer, Staudach, Wittman. "Ultrasound Diagnosis in Obstetrics and Gynecology." Springer-Verlag, New York, 1986, p179*

Age (W)	Growth (cm)	Min (cm)	Max (cm)
12	5.70	3.50	8.00
13	6.70	4.50	9.00
14	7.70	5.50	10.00
15	8.80	6.50	11.00
16	9.80	7.60	12.00
17	10.90	8.60	13.10
18	11.90	9.70	14.20
19	13.00	10.80	15.20
20	14.10	11.90	16.30
21	15.20	12.90	17.40
22	16.30	14.00	18.50
23	17.30	15.10	19.60
24	18.40	16.20	20.60
25	19.50	17.20	21.70
26	20.50	18.30	22.70

Age (W)	Growth (cm)	Min (cm)	Max (cm)
27	21.50	19.30	23.80
28	22.50	20.30	24.80
29	23.50	21.30	25.70
30	24.40	22.20	26.70
31	25.40	23.10	27.60
32	26.20	24.00	28.50
33	27.10	24.80	29.30
34	27.90	25.60	30.10
35	28.60	26.40	30.90
36	29.30	27.10	31.60
37	30.00	27.80	32.20
38	30.60	28.30	32.80
39	31.10	28.90	33.30
40	31.60	29.40	33.80

**Abdominal Circumference (AC) : SHINOZUKA**

**GA Table**

Norio Shinozuka, Takashi Okai, et al. "Standard Values of Ultrasonographic Fetal Biometry" Japanese Journal of Medical Ultrasonics, Vol.23, No.12, 1996, pp877-888

AC (cm)	GA (wd)	±SD (wd)	AC (cm)	GA (wd)	±SD (wd)
10.0	15w3d	1w1d	22.0	27w3d	1w5d
10.5	16w0d	1w1d	22.5	28w0d	1w5d
11.0	16w4d	1w1d	23.0	28w4d	1w5d
11.5	17w0d	1w1d	23.5	29w0d	1w5d
12.0	17w4d	1w2d	24.0	29w4d	1w6d
12.5	18w0d	1w2d	24.5	30w1d	1w6d
13.0	18w4d	1w2d	25.0	30w5d	1w6d
13.5	19w0d	1w2d	25.5	31w2d	1w6d
14.0	19w4d	1w2d	26.0	31w6d	1w6d
14.5	20w0d	1w2d	26.5	32w3d	1w6d
15.0	20w3d	1w3d	27.0	33w1d	1w6d
15.5	21w0d	1w3d	27.5	33w5d	2w0d
16.0	21w3d	1w3d	28.0	34w2d	2w0d
16.5	22w0d	1w3d	28.5	35w0d	2w0d
17.0	22w3d	1w3d	29.0	35w4d	2w0d
17.5	22w6d	1w3d	29.5	36w2d	2w0d
18.0	23w3d	1w4d	30.0	37w0d	2w0d
18.5	23w6d	1w4d	30.5	37w5d	2w0d
19.0	24w3d	1w4d	31.0	38w2d	2w1d
19.5	24w6d	1w4d	31.5	39w0d	2w1d

20.0	25w3d	1w4d
20.5	25w6d	1w4d
21.0	26w3d	1w5d
21.5	27w0d	1w5d

32.0	39w6d	2w1d
32.5	40w4d	2w1d
33.0	41w2d	2w1d

**Fetal Growth Table**

Norio Shinozuka, Takashi Okai, et al. "Standard Values of Ultrasonographic Fetal Biometry" Japanese Journal of Medical Ultrasonics, Vol.23, No.12, 1996, pp877-888

Age (W)	Growth (cm)	Min (cm)	Max (cm)	Age (W)	Growth (cm)	Min (cm)	Max (cm)
16w3d	10.90	9.50	12.40	30w3d	24.70	22.20	27.10
17w3d	12.00	10.40	13.50	31w3d	25.60	23.00	28.10
18w3d	13.00	11.40	14.60	32w3d	26.50	23.80	29.00
19w3d	14.00	12.30	15.70	33w3d	27.30	24.50	29.90
20w3d	15.10	13.30	16.80	34w3d	28.10	25.30	30.70
21w3d	16.10	14.20	17.80	35w3d	28.90	26.00	31.60
22w3d	17.10	15.10	18.90	36w3d	29.70	26.60	32.40
23w3d	18.10	16.10	20.00	37w3d	30.40	27.30	33.20
24w3d	19.10	17.00	21.10	38w3d	31.10	27.90	34.00
25w3d	20.10	17.90	22.10	39w3d	31.80	28.50	34.70
26w3d	21.00	18.80	23.10	40w3d	32.40	29.10	35.40
27w3d	22.00	19.70	24.20	41w3d	33.00	29.60	36.10
28w3d	22.90	20.50	25.20	42w3d	33.60	30.10	36.70
29w3d	23.80	21.40	26.10				

**Abdominal Circumference (AC) : CHITTY (D)****Fetal Growth Table**

Chitty LS, Altman DG, et al. : Charts of fetal size: 3. Abdominal measurements Bri.  
J Obstet & Gyn. Vol 101, 125-131, 1994

Age (W)	Growth (cm)	Min (cm)	Max (cm)	Age (W)	Growth (cm)	Min (cm)	Max (cm)
12	5.58	5.05	6.11	28	23.06	21.29	24.82
13	6.74	6.13	7.35	29	24.06	22.22	25.90
14	7.89	7.20	8.57	30	25.04	23.13	26.96
15	9.03	8.27	9.79	31	26.01	24.02	28.01
16	10.16	9.33	11.00	32	26.97	24.90	29.04
17	11.29	10.38	12.21	33	27.91	25.76	30.06
18	12.41	11.42	13.40	34	28.84	26.61	31.06
19	13.52	12.45	14.59	35	29.75	27.45	32.05
20	14.62	13.48	15.77	36	30.64	28.26	33.02
21	15.72	14.49	16.94	37	31.52	29.06	33.97
22	16.80	15.50	18.10	38	32.38	29.84	34.91
23	17.87	16.49	19.25	39	33.22	30.61	35.83
24	18.93	17.48	20.39	40	34.04	31.35	36.73
25	19.98	18.45	21.51	41	34.84	32.08	37.61
26	21.02	19.41	22.63	42	35.63	32.78	38.47
27	22.04	20.36	23.73				

**Abdominal Circumference (AC) : CHITTY (M)****Fetal Growth Table**

Chitty LS, Altman DG, et al. : Charts of fetal size: 3. Abdominal measurements  
Bri. J Obstet & Gyn. Vol 101, 125-131, 1994

Age (W)	Growth (cm)	Min (cm)	Max (cm)	Age (W)	Growth (cm)	Min (cm)	Max (cm)
12	5.89	5.13	6.66	28	23.90	22.20	25.61
13	7.08	6.26	7.91	29	24.93	23.17	26.70
14	8.27	7.38	9.15	30	25.95	24.13	27.77
15	9.44	8.50	10.38	31	26.95	25.07	28.83
16	10.61	9.61	11.61	32	27.94	26.00	29.88
17	11.77	10.71	12.83	33	28.91	26.92	30.91
18	12.93	11.81	14.04	34	29.87	27.81	31.92
19	14.07	12.90	15.25	35	30.81	28.69	32.92
20	15.21	13.97	16.44	36	31.73	29.56	33.90
21	16.33	15.04	17.63	37	32.63	30.40	34.86
22	17.45	16.10	18.80	38	33.52	31.23	35.81
23	18.55	17.14	19.97	39	34.39	32.04	36.74
24	19.65	18.18	21.12	40	35.24	32.83	37.64
25	20.73	19.20	22.26	41	36.07	33.60	38.53
26	21.80	20.22	23.39	42	36.88	34.36	39.40
27	22.86	21.21	24.50				

**Abdominal Circumference (AC) : CAMPBELL**

**GA Table**

*Campbell Professor Campbell's Group at Harris Birthright Centre, King's College Hospital*

AC (cm)	GA (wd)	±SD (wd)	AC (cm)	GA (wd)	±SD (wd)
9.00	14w0d	02w0d	24.20	28w0d	02w6d
10.10	15w0d	02w1d	25.30	29w0d	02w6d
11.20	16w0d	02w1d	26.40	30w0d	03w0d
12.30	17w0d	02w1d	27.50	31w0d	03w1d
13.40	18w0d	02w1d	28.60	32w0d	03w1d
14.50	19w0d	02w1d	29.70	33w0d	03w4d
15.60	20w0d	02w2d	30.80	34w0d	04w0d
16.70	21w0d	02w2d	31.70	35w0d	04w2d
17.80	22w0d	02w2d	32.50	36w0d	04w2d
18.80	23w0d	02w3d	33.10	37w0d	04w2d
19.90	24w0d	02w4d	33.80	38w0d	04w2d
21.00	25w0d	02w5d	34.40	39w0d	04w2d
22.10	26w0d	02w5d	35.00	40w0d	04w2d
23.10	27w0d	02w6d			

**Fetal Growth Table**

*Chitty, L., Campbell, S., "Charts of Fetal Size : Abdominal measurements," British J of OB and Gyn., February 1994, vol. 101, ppl 125-131, Table1.*

Age (wd)	Growth (cm)	Age (wd)	Growth (cm)	Age (wd)	Growth (cm)
12w0d	6.00	22w0d	17.03	32w0d	27.98
13w0d	7.02	23w0d	18.51	33w0d	29.21
14w0d	8.43	24w0d	19.54	34w0d	30.14
15w0d	9.43	25w0d	20.46	35w0d	31.09
16w0d	10.96	26w0d	21.54	36w0d	31.85
17w0d	11.75	27w0d	22.62	37w0d	32.94
18w0d	13.06	28w0d	24.12	38w0d	33.10
19w0d	14.44	29w0d	25.35	39w0d	34.26
20w0d	15.20	30w0d	26.22	40w0d	36.04
21w0d	16.53	31w0d	27.30	41w0d	36.89



## Abdominal Circumference (AC) : ASUM(SCW)

### Fetal Growth Table

*Australasian Society for Ultrasound in Medicine*

*Policies and Statements - [D7] Statement On Normal Ultrasonic Fetal Measurements (Revised May 2001)*

Age (w)	Growth (mm)	±SD (mm)	Age (w)	Growth (mm)	±SD (mm)
11	52.00	10.00	27	230.00	25.00
12	63.00	10.00	28	242.00	25.00
13	74.00	10.00	29	259.00	25.00
14	84.00	10.00	30	262.00	25.00
15	96.00	10.00	31	272.00	30.00
16	106.00	10.00	32	283.00	30.00
17	120.00	15.00	33	294.00	30.00
18	131.00	15.00	34	305.00	30.00
19	140.00	15.00	35	315.00	30.00
20	151.00	15.00	36	325.00	35.00
21	164.00	20.00	37	333.00	35.00
22	176.00	20.00	38	342.00	35.00
23	186.00	20.00	39	356.00	35.00
24	201.00	20.00	40	362.00	35.00
25	212.00	20.00	41	367.00	35.00
26	223.00	25.00			

## Abdominal Circumference (AC) : CFEF

### Fetal Growth Table

*J. Créquat, M. Duyme, G. Brodaty*

*Biométrie 2000. Tables de croissance foetale par le Collège Français d'Echographie Foetale (CFEF) et l'Inserm U155*

*Gynecol Obstet Fertil 2000 Jun;28(6):435-45*

Age (W)	Growth (cm)	Min (cm)	Max (cm)	Age (W)	Growth (cm)	Min (cm)	Max (cm)
15	9.50	8.53	10.44	28	23.44	21.51	25.36
16	10.64	9.61	11.68	29	24.40	22.40	26.40
17	11.80	10.68	12.90	30	25.36	23.28	27.42
18	12.92	11.74	14.10	31	26.30	24.16	28.42
19	14.04	12.80	15.30	32	27.22	25.00	29.43
20	15.14	13.80	16.47	33	28.12	25.84	30.40
21	16.23	14.82	17.63	34	29.02	26.67	31.38
22	17.30	15.82	18.78	35	29.88	27.47	32.33
23	18.36	16.82	19.90	36	30.74	28.26	33.25
24	19.40	17.78	21.03	37	31.60	29.03	34.17
25	20.44	18.73	22.13	38	32.47	29.80	35.07
26	21.45	19.67	23.23	39	33.24	30.53	35.96
27	22.45	20.60	24.30	40	33.90	31.10	36.70

**Biparietal Diameter (BPD) : KOREAN**

**GA Table**

Y.G Park. "The Standardization of Fetal body parts according to the normal Korean Gestational Age in Ultrasound" Korean Ultrasound Institute, Vol. 14, No.2, 1995

$$GA = 1.20007 \times BPD + 0.2076 \times BPD^2 + 9.209216$$

Output Unit : w(weeks)

Input Unit : cm

Min Range : 1.9 cm

Max Range : 9.4 cm

**Fetal Growth Table**

Y.G Park. "The Standardization of Fetal body parts according to the normal Korean Gestational Age in Ultrasound" Korean Ultrasound Institute, Vol. 14, No.2, 1995

$$BPD = 5.106104 \times MA - 0.046719 \times MA^2 - 35.053334 \text{ (Unit: mm)}$$

Output Unit : cm

Input Unit : w(week)

Min Range : 12w

Max Range : 40w

Age (W)	Growth (cm)	±SD (cm)
12	1.970	0.219
16	3.483	0.213
20	4.783	0.231
24	5.978	0.287
28	7.164	0.256

Age (W)	Growth (cm)	±SD (cm)
32	8.122	0.263
34	8.496	0.244
36	8.849	0.225
38	9.093	0.121
40	9.401	0.188

**Biparietal Diameter (BPD) : HANSMANN**

**GA Table**

Hansmann, Hackeloer, Stauch, Wittman "Ultrasound Diagnosis in Obstetrics and Gynecology" Springer-Verlag, New York, 1986. p.440

BPD (cm)	GA (wd)	Min (wd)	Max (wd)
2.90	13w3d	12w2d	14w3d
3.00	13w5d	12w5d	14w5d
3.10	14w0d	12w6d	15w1d
3.20	14w2d	13w2d	15w3d
3.30	14w4d	13w3d	15w6d
3.40	15w0d	13w5d	16w2d
3.50	15w2d	14w1d	16w3d
3.60	15w4d	14w3d	16w6d
3.70	16w0d	14w6d	17w1d
3.80	16w2d	15w0d	17w4d
3.90	16w4d	15w3d	17w6d
4.00	17w0d	15w5d	18w1d
4.10	17w2d	16w0d	18w4d
4.20	17w4d	16w3d	18w6d
4.30	17w6d	16w4d	19w1d
4.40	18w1d	16w6d	19w3d
4.50	18w4d	17w2d	19w6d
4.60	18w6d	17w4d	20w1d
4.70	19w1d	17w6d	20w4d
4.80	19w3d	18w0d	20w6d
4.90	19w5d	18w1d	21w1d
5.00	20w0d	18w4d	21w1d

BPD (cm)	GA (wd)	Min (wd)	Max (wd)
6.80	25w6d	24w3d	27w2d
6.90	26w1d	24w6d	27w4d
7.00	26w3d	25w0d	27w6d
7.10	26w5d	25w2d	28w3d
7.20	27w1d	25w4d	28w4d
7.30	27w3d	26w0d	29w2d
7.40	27w6d	26w1d	29w4d
7.50	28w1d	26w3d	29w6d
7.60	28w4d	26w5d	30w2d
7.70	28w6d	27w1d	30w5d
7.80	29w2d	27w2d	31w3d
7.90	29w5d	27w3d	32w0d
8.00	30w0d	27w6d	32w1d
8.10	30w3d	28w2d	32w4d
8.20	31w0d	28w6d	33w1d
8.30	31w2d	29w0d	33w5d
8.40	31w6d	29w3d	34w2d
8.50	32w2d	29w6d	34w4d
8.60	32w5d	30w1d	35w1d
8.70	33w2d	30w2d	36w1d
8.80	33w5d	31w0d	36w3d
8.90	34w2d	31w4d	37w0d

5.10	20w3d	19w0d	21w6d
5.20	20w5d	19w2d	22w1d
5.30	21w0d	19w3d	22w4d
5.40	21w3d	20w0d	22w6d
5.50	21w5d	20w2d	23w0d
5.60	22w0d	20w5d	23w2d
5.70	22w2d	21w0d	23w4d
5.80	22w5d	21w3d	23w6d
5.90	23w0d	21w4d	24w3d
6.00	23w2d	21w6d	24w4d
6.10	23w4d	22w1d	25w0d
6.20	24w0d	22w4d	25w3d
6.30	24w2d	22w6d	25w4d
6.40	24w4d	23w1d	26w0d
6.50	24w6d	23w4d	26w2d
6.60	25w1d	23w6d	26w5d
6.70	25w3d	24w1d	27w1d

9.00	34w5d	32w0d	37w3d
9.10	35w1d	32w1d	38w5d
9.20	35w6d	33w2d	39w2d
9.30	36w5d	33w5d	39w5d
9.40	37w3d	34w5d	40w1d
9.50	38w3d	35w2d	41w0d
9.60	38w6d	35w2d	41w3d
9.70	39w0d	35w6d	42w0d
9.80	39w2d	36w3d	42w0d
9.90	39w3d	36w4d	42w4d
10.00	39w4d	36w5d	42w2d
10.10	39w5d	37w1d	42w4d
10.20	39w6d	37w1d	42w2d
10.30	40w0d	37w2d	42w2d
10.40	40w1d	37w3d	42w2d
10.50	40w2d	37w6d	42w2d

16	3.50	3.10	3.90
17	3.80	3.40	4.20
18	4.20	3.80	4.60
19	4.60	4.10	5.00
20	4.90	4.40	5.30
21	5.20	4.80	5.70
22	5.60	5.10	6.00
23	5.90	5.40	6.40
24	6.20	5.70	6.70
25	6.50	6.00	7.10
26	6.80	6.30	7.40

31	8.20	7.50	8.80
32	8.50	7.80	9.10
33	8.70	8.00	9.30
34	8.90	8.20	9.50
35	9.10	8.40	9.70
36	9.30	8.60	9.90
37	9.50	8.80	10.10
38	9.60	8.90	10.20
39	9.80	9.00	10.40
40	9.90	9.20	10.50
41	10.00	9.30	10.60

**Biparietal Diameter (BPD) : HADLOCK**

**GA Table**

Hadlock, F., Deter, R.L., Harrist, R.B., Park, S.K. "Estimating Fetal Age: Computer-Assisted Analysis of Multiple Fetal Growth Parameters" Radiology, 1984, 152: 497-501. (Biometric Age and Growth Equations)

$$GA = 9.54 + 1.482 \times BPD + 0.1676 \times BPD^2$$

Output Unit : w(weeks)

Input Unit : cm

Min Range : 1.36 cm

Max Range : 10.18 cm

Standard Deviation :

**Fetal Growth Table**

Hansmann, Hackeloer, Stauch, Wittman "Ultrasound Diagnosis in Obstetrics and Gynecology" Springer-Verlag, New York, 1986. p.176

Age (W)	Growth (cm)	Min (cm)	Max (cm)
12	2.00	2.00	2.00
13	2.40	1.90	2.90
14	2.80	2.30	3.20
15	3.20	2.70	3.50

Age (W)	Growth (cm)	Min (cm)	Max (cm)
27	7.10	6.60	7.70
28	7.40	6.80	8.00
29	7.70	7.10	8.30
30	8.00	7.30	8.60

Min Range(w)	Max Range(w)	±2SD
12	18	1.19
18	24	1.73
24	30	2.18

30	36	3.08
36	42	3.20

**Fetal Growth Table**

Hadlock, F., Deter, R.L., Harrist, R.B., Park, S.K. "Estimating Fetal Age: Computer-Assisted Analysis of Multiple Fetal Growth Parameters" *Radiology*, 1984, 152: 497-501.

Equation =  $0.41 \times MA - 0.000061 \times MA^3 - 3.08$

Output Unit : cm

Input Unit : w(weeks)

Min Range : 12 w

Max Range : 40 w

Standard Deviation : 2SD = 0.6 cm

Min Range (cm)	Max Range (cm)	SD (cm)
0	100	0.6

**Biparietal Diameter (BPD) : MERZ**

**GA Table**

E. Merz, W. Goldhofer, E. Timor-Tritsch "Ultrasound in Gynecology and Obstetrics" *Textbook and Atlas*, 1991 Georg Thieme Verlag, 308-338

BPD (cm)	GA (wd)	Min (wd)	Max (wd)
2.10	12w1d	10w5d	13w5d
2.20	12w3d	10w6d	13w6d
2.30	12w5d	11w1d	14w1d
2.40	13w0d	11w4d	14w4d

BPD (cm)	GA (wd)	Min (wd)	Max (wd)
6.20	24w1d	22w1d	26w1d
6.30	24w4d	22w4d	26w4d
6.40	24w6d	22w6d	26w6d
6.50	25w1d	23w1d	27w1d

2.50	13w1d	11w5d	14w5d
2.60	13w4d	12w0d	15w0d
2.70	13w6d	12w1d	15w3d
2.80	14w1d	12w4d	15w5d
2.90	14w2d	12w5d	15w6d
3.00	14w4d	13w0d	16w1d
3.10	14w6d	13w2d	16w4d
3.20	15w1d	13w4d	16w6d
3.30	15w3d	13w6d	17w0d
3.40	15w5d	14w0d	17w3d
3.50	16w0d	14w2d	17w5d
3.60	16w2d	14w4d	18w0d
3.70	16w4d	14w6d	18w1d
3.80	16w6d	15w1d	18w4d
3.90	17w1d	15w3d	18w6d
4.00	17w3d	15w5d	19w1d
4.10	17w5d	15w6d	19w4d
4.20	18w0d	16w1d	19w6d
4.30	18w2d	16w4d	20w1d
4.40	18w4d	16w6d	20w3d
4.50	18w6d	17w1d	20w5d
4.60	19w1d	17w3d	21w0d
4.70	19w3d	17w4d	21w1d
4.80	19w5d	17w6d	21w4d
4.90	20w0d	18w1d	21w6d
5.00	20w3d	18w4d	22w1d
5.10	20w5d	18w6d	22w4d

6.60	25w4d	23w4d	27w4d
6.70	25w6d	23w6d	27w6d
6.80	26w1d	24w1d	28w2d
6.90	26w4d	24w3d	28w4d
7.00	26w6d	24w5d	28w6d
7.10	27w1d	25w1d	29w2d
7.20	27w4d	25w4d	29w5d
7.30	27w6d	25w6d	30w0d
7.40	28w2d	26w1d	30w3d
7.50	28w4d	26w4d	30w5d
7.60	29w0d	26w6d	31w1d
7.70	29w3d	27w1d	31w4d
7.80	29w6d	27w4d	32w0d
7.90	30w1d	27w6d	32w2d
8.00	30w4d	28w2d	32w5d
8.10	30w6d	28w5d	33w1d
8.20	31w2d	29w1d	33w4d
8.30	31w5d	29w4d	33w6d
8.40	32w1d	29w6d	34w2d
8.50	32w4d	30w2d	34w5d
8.60	32w6d	30w5d	35w1d
8.70	33w2d	31w0d	35w4d
8.80	33w6d	31w4d	36w1d
8.90	34w1d	31w6d	36w4d
9.00	34w4d	32w2d	36w6d
9.10	35w1d	32w6d	37w3d
9.20	35w4d	33w1d	37w6d

5.20	21w0d	19w1d	22w6d
5.30	21w2d	19w3d	23w1d
5.40	21w4d	19w5d	23w4d
5.50	21w6d	20w0d	23w6d
5.60	22w1d	20w2d	24w1d
5.70	22w4d	20w4d	24w3d
5.80	22w6d	20w6d	24w5d
5.90	23w1d	21w1d	25w1d
6.00	23w4d	21w4d	25w4d
6.10	23w6d	21w6d	25w6d

9.30	35w6d	33w4d	38w1d
9.40	36w3d	34w0d	38w6d
9.50	36w6d	34w4d	39w2d
9.60	37w2d	34w6d	39w5d
9.70	37w6d	35w3d	40w1d
9.80	38w2d	35w6d	40w5d
9.90	38w6d	36w3d	41w1d
10.00	39w2d	36w6d	41w6d
10.10	39w6d	37w2d	42w2d
10.20	40w2d	37w6d	42w6d

22	5.60	5.10	6.20
23	6.00	5.40	6.50
24	6.30	5.70	6.80
25	6.60	6.00	7.10
26	6.90	6.30	7.40

37	9.40	8.80	10.10
38	9.60	9.00	10.30
39	9.80	9.10	10.40
40	9.90	9.30	10.60

**Biparietal Diameter (BPD) : JEANTY**

**GA Table**

Jeanty, P., Romero, R. "Obstetrical Ultrasound" McGraw-Hill Book Company, pages 57-61, 1984.

**Fetal Growth Table**

E. Merz, W. Goldhofer, E. Timor-Tritsch "Ultrasound in Gynecology and Obstetrics" Textbook and Atlas, 1991 Georg Thieme Verlag, 308-338

Age (w)	Growth (cm)	Min (cm)	Max (cm)
12	2.00	1.50	2.40
13	2.40	1.90	2.80
14	2.80	2.30	3.20
15	3.10	2.70	3.60
16	3.50	3.00	4.00
17	3.90	3.40	4.40
18	4.30	3.80	4.80
19	4.60	4.10	5.10
20	5.00	4.50	5.50
21	5.30	4.80	5.80

Age (w)	Growth (cm)	Min (cm)	Max (cm)
27	7.20	6.60	7.70
28	7.40	6.90	8.00
29	7.70	7.10	8.30
30	7.90	7.40	8.50
31	8.20	7.60	8.80
32	8.40	7.80	9.00
33	8.60	8.00	9.20
34	8.90	8.20	9.50
35	9.10	8.40	9.70
36	9.30	8.60	9.90

BPD (cm)	GA (wd)	Min (wd)	Max (wd)
1.00	09w1d	06w4d	11w6d
1.10	09w4d	06w6d	12w1d
1.20	09w5d	07w0d	12w3d
1.30	10w0d	07w2d	12w5d
1.40	10w2d	07w4d	12w6d
1.50	10w4d	07w6d	13w1d
1.60	10w6d	08w1d	13w3d
1.70	11w1d	08w3d	13w5d
1.80	11w2d	08w4d	14w0d
1.90	11w4d	08w6d	14w1d
2.00	11w6d	09w1d	14w4d
2.10	12w1d	09w3d	14w6d
2.20	12w3d	09w5d	15w0d
2.30	12w4d	09w6d	15w2d
2.40	12w6d	10w1d	15w4d

BPD (cm)	GA (wd)	Min (wd)	Max (wd)
5.30	21w1d	18w4d	23w6d
5.40	21w4d	18w6d	24w1d
5.50	21w6d	19w1d	24w4d
5.60	22w1d	19w4d	24w6d
5.70	22w4d	19w6d	25w1d
5.80	22w6d	20w1d	25w4d
5.90	23w1d	20w4d	25w6d
6.00	23w4d	20w6d	26w1d
6.10	23w6d	21w1d	26w4d
6.20	24w1d	21w4d	26w6d
6.30	24w4d	21w6d	27w1d
6.40	24w6d	22w1d	27w4d
6.50	25w2d	22w4d	27w6d
6.60	25w4d	22w6d	28w2d
6.70	26w0d	23w2d	28w4d

2.50	13w1d	10w4d	15w6d
2.60	13w3d	10w5d	16w1d
2.70	13w5d	11w0d	16w3d
2.80	14w0d	11w2d	16w4d
2.90	14w1d	11w4d	16w6d
3.00	14w4d	11w6d	17w1d
3.10	14w6d	12w1d	17w3d
3.20	15w1d	12w2d	17w5d
3.30	15w2d	12w4d	18w0d
3.40	15w4d	12w6d	18w2d
3.50	15w6d	13w1d	18w4d
3.60	16w1d	13w4d	18w6d
3.70	16w3d	13w5d	19w1d
3.80	16w5d	14w0d	19w3d
3.90	17w0d	14w2d	19w5d
4.00	17w2d	14w4d	19w6d
4.10	17w4d	14w6d	20w1d
4.20	17w6d	15w1d	20w4d
4.30	18w1d	15w3d	20w6d
4.40	18w3d	15w5d	21w1d
4.50	18w5d	16w0d	21w3d
4.60	19w0d	16w2d	21w5d
4.70	19w2d	16w4d	22w0d
4.80	19w4d	16w6d	22w2d
4.90	19w6d	17w1d	22w4d
5.00	20w2d	17w4d	22w6d
5.10	20w4d	17w6d	23w1d
5.20	20w6d	18w1d	23w4d

6.80	26w3d	23w5d	29w0d
6.90	26w5d	24w0d	29w3d
7.00	27w1d	24w3d	29w6d
7.10	27w4d	24w6d	31w0d
7.20	27w6d	25w1d	30w4d
7.30	28w2d	25w4d	30w6d
7.40	28w5d	26w0d	31w2d
7.50	29w1d	26w3d	31w5d
7.60	29w4d	26w6d	32w1d
7.70	29w6d	27w1d	32w4d
7.80	30w2d	27w4d	33w0d
7.90	30w5d	28w0d	33w3d
8.00	31w1d	28w4d	33w6d
8.10	31w4d	28w6d	34w2d
8.20	32w0d	29w2d	34w5d
8.30	32w4d	29w6d	35w1d
8.40	32w6d	30w1d	35w4d
8.50	33w3d	30w5d	36w0d
8.60	33w6d	31w1d	36w4d
8.70	34w2d	31w4d	37w0d
8.80	34w6d	32w1d	37w3d
8.90	35w2d	32w4d	37w6d
9.00	35w5d	33w0d	38w3d
9.10	36w1d	33w4d	38w6d
9.20	36w5d	34w0d	39w3d
9.30	37w1d	34w4d	39w6d
9.40	37w5d	35w0d	40w3d
9.50	38w2d	35w4d	40w6d

**Biparietal Diameter (BPD) : SABBAGHA**

**GA Table**

Sabbagha, R.E., et. al. "Standardization of Sonar Cephalometry and Gestational Age" *Obstetrics and Gynecology*, Vol. 52, No.4: 403, October, 1978

BPD (cm)	GA (wd)	Min (wd)	Max (wd)
3.70	16w0d	15w0d	17w0d
4.00	17w0d	15w4d	18w3d
4.30	18w0d	16w4d	19w3d
4.50	19w0d	17w4d	20w3d
4.70	20w0d	18w4d	21w3d
5.00	21w0d	19w4d	22w3d
5.30	22w0d	20w4d	23w3d
5.60	23w0d	21w4d	24w3d
5.90	24w0d	22w4d	25w3d
6.20	25w0d	23w4d	26w3d
6.60	26w0d	24w4d	27w3d
6.90	27w0d	25w0d	29w0d
7.20	28w0d	26w0d	30w0d

BPD (cm)	GA (wd)	Min (wd)	Max (wd)
7.50	29w0d	26w0d	32w0d
7.80	30w0d	27w0d	33w0d
8.00	31w0d	28w0d	34w0d
8.30	32w0d	29w0d	35w0d
8.50	33w0d	30w0d	36w0d
8.70	34w0d	31w0d	37w0d
8.80	35w0d	32w0d	38w0d
9.00	36w0d	33w0d	39w0d
9.20	37w0d	34w0d	40w0d
9.30	38w0d	35w0d	41w0d
9.40	39w0d	36w0d	42w0d
9.50	40w0d	37w0d	43w0d

## Biparietal Diameter (BPD) : SHINOZUKA

### GA Table

Norio Shinozuka, Takashi Okai, et al. "Standard Values of Ultrasonographic Fetal Biometry" Japanese Journal of Medical Ultrasonics, Vol.23, No.12, 1996, pp877-888

BPD (cm)	GA (wd)	Min (wd)	Max (wd)
1.30	10w1d	09w4d	10w5d
1.40	10w3d	09w6d	11w0d
1.50	10w5d	10w1d	11w2d
1.60	11w0d	10w3d	11w4d
1.70	11w2d	10w5d	11w6d
1.80	11w4d	11w0d	12w1d
1.90	11w6d	11w2d	12w3d
2.00	12w1d	11w4d	12w5d
2.10	12w3d	11w6d	13w0d
2.20	12w6d	12w2d	13w3d
2.30	13w1d	12w3d	13w6d
2.40	13w3d	12w5d	14w1d
2.50	13w5d	13w0d	14w3d
2.60	14w0d	13w2d	14w5d
2.70	14w2d	13w4d	15w0d
2.80	14w4d	13w6d	15w2d
2.90	14w6d	14w1d	15w4d
3.00	15w1d	14w3d	15w6d
3.10	15w3d	14w5d	16w1d

BPD (cm)	GA (wd)	Min (wd)	Max (wd)
5.20	21w6d	20w6d	22w6d
5.30	22w1d	21w0d	23w2d
5.40	22w3d	21w2d	23w4d
5.50	22w5d	21w4d	23w6d
5.60	23w1d	22w0d	24w2d
5.70	23w3d	22w2d	24w4d
5.80	23w5d	22w4d	24w6d
5.90	24w1d	23w0d	25w2d
6.00	24w3d	23w1d	25w5d
6.10	24w5d	23w3d	26w0d
6.20	25w1d	23w6d	26w3d
6.30	25w3d	24w1d	26w5d
6.40	25w5d	24w3d	27w0d
6.50	26w1d	24w6d	27w3d
6.60	26w3d	25w0d	27w6d
6.70	26w6d	25w3d	28w2d
6.80	27w2d	25w6d	28w5d
6.90	27w4d	26w1d	29w0d
7.00	28w0d	26w4d	29w3d

3.20	15w5d	15w0d	16w3d
3.30	16w0d	15w2d	16w5d
3.40	16w2d	15w4d	17w0d
3.50	16w4d	15w6d	17w2d
3.60	16w6d	16w0d	17w5d
3.70	17w1d	16w2d	18w0d
3.80	17w4d	16w5d	18w3d
3.90	17w6d	17w0d	18w5d
4.00	18w1d	17w2d	19w0d
4.10	18w3d	17w4d	19w2d
4.20	18w5d	17w6d	19w4d
4.30	19w0d	18w1d	19w6d
4.40	19w2d	18w3d	20w1d
4.50	19w4d	18w5d	20w3d
4.60	20w0d	19w0d	21w0d
4.70	20w2d	19w2d	21w2d
4.80	20w4d	19w4d	21w4d
4.90	20w6d	19w6d	21w6d
5.00	21w1d	20w1d	22w1d
5.10	21w3d	20w3d	22w3d

7.10	28w3d	27w0d	29w6d
7.20	28w5d	27w1d	30w2d
7.30	29w1d	27w4d	30w5d
7.40	29w4d	28w0d	31w1d
7.50	30w0d	28w3d	31w4d
7.60	30w3d	28w6d	32w0d
7.70	30w6d	29w1d	32w4d
7.80	31w2d	29w4d	33w0d
7.90	31w5d	30w0d	33w3d
8.00	32w1d	30w3d	33w6d
8.10	32w5d	31w0d	34w3d
8.20	33w1d	31w2d	35w0d
8.30	33w5d	31w6d	35w4d
8.40	34w2d	32w3d	36w1d
8.50	34w6d	33w0d	36w5d
8.60	35w3d	33w3d	37w3d
8.70	36w0d	34w0d	38w0d
8.80	36w5d	34w5d	38w5d
8.90	37w4d	35w4d	39w4d
9.00	38w3d	36w2d	40w4d

**Fetal Growth Table**

Norio Shinozuka, Takashi Okai, et al. "Standard Values of Ultrasonographic Fetal Biometry" Japanese Journal of Medical Ultrasonics, Vol.23, No.12, 1996, pp877-888

Age (W)	Growth (cm)	Min (cm)	Max (cm)
10w3d	1.43	1.08	1.77
11w3d	1.76	1.41	2.12
12w3d	2.10	1.74	2.47
13w3d	2.44	2.07	2.82
14w3d	2.78	2.40	3.16
15w3d	3.12	2.73	3.51
16w3d	3.46	3.06	3.86
17w3d	3.80	3.39	4.20
18w3d	4.13	3.72	4.55
19w3d	4.46	4.04	4.88
20w3d	4.79	4.36	5.22
21w3d	5.11	4.67	5.55
22w3d	5.42	4.97	5.87
23w3d	5.73	5.27	6.18
24w3d	6.03	5.56	6.49
25w3d	6.32	5.85	6.79
26w3d	6.60	6.12	7.08

Age (W)	Growth (cm)	Min (cm)	Max (cm)
27w3d	6.87	6.38	7.36
28w3d	7.14	6.64	7.63
29w3d	7.39	6.88	7.89
30w3d	7.63	7.11	8.14
31w3d	7.85	7.33	8.38
32w3d	8.06	7.53	8.60
33w3d	8.26	7.72	8.80
34w3d	8.45	7.90	8.99
35w3d	8.61	8.06	9.17
36w3d	8.76	8.20	9.33
37w3d	8.90	8.32	9.47
38w3d	9.01	8.43	9.59
39w3d	9.11	8.52	9.70
40w3d	9.18	8.59	9.78
41w3d	9.24	8.63	9.85
42w3d	9.28	8.66	9.89

**Biparietal Diameter (BPD) : OSAKA**

**GA Table**

Osaka University Method 1989, 3 by Univ. Of Osaka

BPD (cm)	G.A (wd)	BPD (cm)	G.A (wd)	BPD (cm)	G.A (wd)	BPD (cm)	G.A (wd)
1.30	10w0d	3.40	15w4d	5.50	22w0d	7.60	29w3d
1.40	10w1d	3.50	16w0d	5.60	22w3d	7.70	29w6d
1.50	10w3d	3.60	16w2d	5.70	22w5d	7.80	30w2d
1.60	10w5d	3.70	16w4d	5.80	23w0d	7.90	30w4d
1.70	11w0d	3.80	16w6d	5.90	23w3d	8.00	31w0d
1.80	11w1d	3.90	17w1d	6.00	23w5d	8.10	31w3d
1.90	11w3d	4.00	17w3d	6.10	24w0d	8.20	32w0d
2.00	11w5d	4.10	17w5d	6.20	24w3d	8.30	32w3d
2.10	12w0d	4.20	18w0d	6.30	24w5d	8.40	32w6d
2.20	12w2d	4.30	18w2d	6.40	25w0d	8.50	33w3d
2.30	12w4d	4.40	18w4d	6.50	25w3d	8.60	33w6d
2.40	12w6d	4.50	18w6d	6.60	25w5d	8.70	34w0d
2.50	13w1d	4.60	19w2d	6.70	26w0d	8.80	35w0d
2.60	13w3d	4.70	19w4d	6.80	26w3d	8.90	35w4d
2.70	13w5d	4.80	19w6d	6.90	26w5d	9.00	36w2d
2.80	14w0d	4.90	20w1d	7.00	27w1d	9.10	37w0d
2.90	14w1d	5.00	20w3d	7.10	27w4d	9.20	37w6d
3.00	14w3d	5.10	20w5d	7.20	27w6d	9.30	39w0d
3.10	14w5d	5.20	21w1d	7.30	28w2d	9.40	40w0d
3.20	15w0d	5.30	21w3d	7.40	28w4d		
3.30	15w2d	5.40	21w5d	7.50	29w0d		



**Fetal Growth Table***Osaka University Method 1989, 3 by Univ. Of Osaka*

GA (wd)	Growth (cm)	±SD (cm)
10w0d	1.33	0.19
10w1d	1.38	0.19
10w2d	1.44	0.19
10w3d	1.50	0.19
10w4d	1.55	0.19
10w5d	1.61	0.19
10w6d	1.66	0.20
11w0d	1.72	0.20
11w1d	1.77	0.20
11w2d	1.83	0.20
11w3d	1.88	0.20
11w4d	1.93	0.20
11w5d	1.99	0.21
11w6d	2.04	0.21
12w0d	2.09	0.21
12w1d	2.15	0.21
12w2d	2.20	0.21
12w3d	2.25	0.21
12w4d	2.31	0.21
12w5d	2.36	0.22
12w6d	2.41	0.22
13w0d	2.46	0.22
13w1d	2.52	0.22
13w2d	2.57	0.22
13w3d	2.62	0.22
13w4d	2.67	0.23
13w5d	2.72	0.23
13w6d	2.77	0.23

GA (wd)	Growth (cm)	±SD (cm)
25w1d	6.43	0.32
25w2d	6.47	0.33
25w3d	6.51	0.33
25w4d	6.55	0.33
25w5d	6.59	0.33
25w6d	6.63	0.33
26w0d	6.67	0.33
26w1d	6.71	0.33
26w2d	6.75	0.33
26w3d	6.80	0.33
26w4d	6.84	0.33
26w5d	6.88	0.33
26w6d	6.92	0.34
27w0d	6.95	0.34
27w1d	6.99	0.34
27w2d	7.03	0.34
27w3d	7.07	0.34
27w4d	7.11	0.34
27w5d	7.15	0.34
27w6d	7.19	0.34
28w0d	7.23	0.34
28w1d	7.27	0.34
28w2d	7.30	0.34
28w3d	7.34	0.34
28w4d	7.38	0.35
28w5d	7.42	0.35
28w6d	7.45	0.35
29w0d	7.49	0.35

14w0d	2.82	0.23
14w1d	2.87	0.23
14w2d	2.93	0.23
14w3d	2.98	0.23
14w4d	3.03	0.24
14w5d	3.08	0.24
14w6d	3.13	0.24
15w0d	3.18	0.24
15w1d	3.23	0.24
15w2d	3.28	0.24
15w3d	3.33	0.24
15w4d	3.38	0.25
15w5d	3.42	0.25
15w6d	3.47	0.25
16w0d	3.52	0.25
16w1d	3.57	0.25
16w2d	3.62	0.25
16w3d	3.67	0.25
16w4d	3.72	0.25
16w5d	3.77	0.26
16w6d	3.81	0.26
17w0d	3.86	0.26
17w1d	3.91	0.26
17w2d	3.96	0.26
17w3d	4.01	0.26
17w4d	4.05	0.26
17w5d	4.10	0.27
17w6d	4.15	0.27
18w0d	4.20	0.27
18w1d	4.24	0.27
18w2d	4.29	0.27
18w3d	4.34	0.27
18w4d	4.39	0.27

29w1d	7.53	0.35
29w2d	7.56	0.35
29w3d	7.60	0.35
29w4d	7.64	0.35
29w5d	7.67	0.35
29w6d	7.71	0.35
30w0d	7.74	0.35
30w1d	7.78	0.35
30w2d	7.81	0.35
30w3d	7.85	0.36
30w4d	7.88	0.36
30w5d	7.92	0.36
30w6d	7.95	0.36
31w0d	7.98	0.36
31w1d	8.02	0.36
31w2d	8.05	0.36
31w3d	8.08	0.36
31w4d	8.12	0.36
31w5d	8.15	0.36
31w6d	8.18	0.36
32w0d	8.21	0.36
32w1d	8.24	0.36
32w2d	8.27	0.36
32w3d	8.31	0.36
32w4d	8.34	0.37
32w5d	8.37	0.37
32w6d	8.40	0.37
33w0d	8.43	0.37
33w1d	8.46	0.37
33w2d	8.48	0.37
33w3d	8.51	0.37
33w4d	8.54	0.37
33w5d	8.57	0.37

18w5d	4.43	0.27
18w6d	4.48	0.28
19w0d	4.53	0.28
19w1d	4.57	0.28
19w2d	4.62	0.28
19w3d	4.67	0.28
19w4d	4.71	0.28
19w5d	4.76	0.28
19w6d	4.80	0.28
20w0d	4.85	0.29
20w1d	4.90	0.29
20w2d	4.94	0.29
20w3d	4.99	0.29
20w4d	5.03	0.29
20w5d	5.08	0.29
20w6d	5.12	0.29
21w0d	5.17	0.29
21w1d	5.21	0.29
21w2d	5.26	0.30
21w3d	5.30	0.30
21w4d	5.35	0.30
21w5d	5.39	0.30
21w6d	5.44	0.30
22w0d	5.48	0.30
22w1d	5.52	0.30
22w2d	5.57	0.30
22w3d	5.61	0.30
22w4d	5.66	0.31
22w5d	5.70	0.31
22w6d	5.74	0.31
23w0d	5.79	0.31
23w1d	5.83	0.31
23w2d	5.87	0.31

33w6d	8.60	0.37
34w0d	8.62	0.37
34w1d	8.65	0.37
34w2d	8.68	0.37
34w3d	8.70	0.37
34w4d	8.73	0.37
34w5d	8.75	0.37
34w6d	8.78	0.37
35w0d	8.80	0.37
35w1d	8.83	0.38
35w2d	8.85	0.38
35w3d	8.87	0.38
35w4d	8.90	0.38
35w5d	8.92	0.38
35w6d	8.94	0.38
36w0d	8.96	0.38
36w1d	8.98	0.38
36w2d	9.00	0.38
36w3d	9.02	0.38
36w4d	9.04	0.38
36w5d	9.06	0.38
36w6d	9.08	0.38
37w0d	9.10	0.38
37w1d	9.12	0.38
37w2d	9.14	0.38
37w3d	9.15	0.38
37w4d	9.17	0.38
37w5d	9.18	0.38
37w6d	9.20	0.38
38w0d	9.21	0.38
38w1d	9.23	0.38
38w2d	9.24	0.38
38w3d	9.26	0.39

23w3d	5.92	0.31
23w4d	5.96	0.31
23w5d	6.00	0.31
23w6d	6.05	0.32
24w0d	6.09	0.32
24w1d	6.13	0.32
24w2d	6.17	0.32
24w3d	6.22	0.32
24w4d	6.26	0.32
24w5d	6.30	0.32
24w6d	6.34	0.32
25w0d	6.39	0.32

38w4d	9.27	0.39
38w5d	9.28	0.39
38w6d	9.29	0.39
39w0d	9.30	0.39
39w1d	9.31	0.39
39w2d	9.32	0.39
39w3d	9.33	0.39
39w4d	9.34	0.39
39w5d	9.35	0.39
39w6d	9.36	0.39
40w0d	9.36	0.39

**Biparietal Diameter (BPD) : CHITTY (OUT-IN)**

**GA Table**

*Altman DG, Chitty LS: New Charts for ultrasound dating of pregnancy. Ultrasound in Obstetrics and Gynecology, Vol. 10: 174-191, 1997*

BPD (cm)	G.A (wd)	Min (wd)	Max (wd)
2.10	12w5d	11w6d	13w5d
2.20	13w0d	12w1d	14w0d
2.30	13w2d	12w3d	14w2d
2.40	13w4d	12w4d	14w4d
2.50	13w6d	12w6d	14w6d
2.60	14w1d	13w1d	15w1d
2.70	14w3d	13w3d	15w3d
2.80	14w5d	13w4d	15w5d
2.90	14w6d	13w6d	16w0d
3.00	15w1d	14w1d	16w2d

BPD (cm)	G.A (wd)	Min (wd)	Max (wd)
5.60	23w1d	21w2d	25w2d
5.70	23w4d	21w4d	25w4d
5.80	23w6d	21w6d	26w0d
5.90	24w1d	22w1d	26w3d
6.00	24w4d	22w3d	26w6d
6.10	24w6d	22w5d	27w1d
6.20	25w2d	23w1d	27w4d
6.30	25w4d	23w3d	28w0d
6.40	26w0d	23w5d	28w3d
6.50	26w2d	24w0d	28w6d

3.10	15w3d	14w3d	16w5d
3.20	15w5d	14w4d	17w0d
3.30	16w0d	14w6d	17w2d
3.40	16w2d	15w1d	17w4d
3.50	16w4d	15w3d	17w6d
3.60	16w6d	15w5d	18w2d
3.70	17w1d	15w6d	18w4d
3.80	17w3d	16w1d	18w6d
3.90	17w6d	16w3d	19w2d
4.00	18w1d	16w5d	19w4d
4.10	18w3d	17w0d	19w6d
4.20	18w5d	17w2d	20w2d
4.30	19w0d	17w4d	20w4d
4.40	19w2d	17w6d	20w6d
4.50	19w4d	18w1d	21w2d
4.60	19w6d	18w3d	21w4d
4.70	20w2d	18w5d	22w0d
4.80	20w4d	19w0d	22w2d
4.90	20w6d	19w2d	22w5d
5.00	21w1d	19w4d	23w0d
5.10	21w4d	19w6d	23w3d
5.20	21w6d	20w1d	23w5d
5.30	22w1d	20w3d	24w1d
5.40	22w4d	20w5d	24w4d
5.50	22w6d	21w0d	24w6d

6.60	26w5d	24w2d	29w1d
6.70	27w0d	24w4d	29w4d
6.80	27w3d	25w0d	30w0d
6.90	27w5d	25w2d	30w3d
7.00	28w1d	25w4d	30w6d
7.10	28w3d	25w6d	31w2d
7.20	28w6d	26w2d	31w5d
7.30	29w2d	26w4d	32w1d
7.40	29w4d	26w6d	32w4d
7.50	30w0d	27w2d	33w0d
7.60	30w2d	27w4d	33w3d
7.70	30w5d	27w6d	33w6d
7.80	31w1d	28w2d	34w2d
7.90	31w4d	28w4d	34w5d
8.00	31w6d	28w6d	35w1d
8.10	32w2d	29w2d	35w5d
8.20	32w5d	29w4d	36w1d
8.30	33w1d	30w0d	36w4d
8.40	33w3d	30w2d	37w0d
8.50	33w6d	30w5d	37w3d
8.60	34w2d	31w0d	38w0d
8.70	34w5d	31w2d	38w3d
8.80	35w1d	31w5d	38w6d
8.90	35w4d	32w0d	39w3d

**Fetal Growth Table**

Chitty LS, Altman DG, et al: Charts of fetal size: 2. Head measurements. Brit. J Obstet. & GYN Vol. 101, 35-43, 1994

Age (W)	Growth (cm)	Min (cm)	Max (cm)
12	1.83	1.57	2.09
13	2.20	1.93	2.47
14	2.57	2.29	2.85
15	2.93	2.64	3.22
16	3.28	2.99	3.58
17	3.64	3.33	3.94
18	3.98	3.67	4.30
19	4.32	4.00	4.65
20	4.65	4.32	4.99
21	4.98	4.64	5.32
22	5.30	4.95	5.65
23	5.61	5.25	5.97
24	5.92	5.55	6.29
25	6.22	5.84	6.59
26	6.50	6.12	6.89
27	6.78	6.39	7.18

Age (W)	Growth (cm)	Min (cm)	Max (cm)
28	7.05	6.65	7.46
29	7.32	6.90	7.73
30	7.57	7.15	7.99
31	7.81	7.38	8.24
32	8.04	7.60	8.48
33	8.26	7.82	8.71
34	8.47	8.02	8.93
35	8.67	8.21	9.14
36	8.86	8.39	9.33
37	9.03	8.55	9.52
38	9.20	8.71	9.69
39	9.35	8.85	9.85
40	9.48	8.98	9.99
41	9.61	9.09	10.13
42	9.72	9.19	10.25

**Biparietal Diameter (BPD) : CHITTY (OUT-OUT)**

**GA Table**

Altman DG, Chitty LS: *New Charts for ultrasound dating of pregnancy. Ultrasound in Obstetrics and Gynecology, Vol. 10: 174-191, 1997*

BPD (cm)	G.A (wd)	Min (wd)	Max (wd)
2.20	12w4d	11w5d	13w4d
2.30	12w6d	12w0d	13w6d
2.40	13w1d	12w1d	14w1d
2.50	13w3d	12w3d	14w3d
2.60	13w4d	12w5d	14w5d
2.70	13w6d	12w6d	15w0d
2.80	14w1d	13w1d	15w2d
2.90	14w3d	13w3d	15w4d
3.00	14w5d	13w4d	15w6d
3.10	15w0d	13w6d	16w1d
3.20	15w2d	14w1d	16w3d
3.30	15w4d	14w3d	16w5d
3.40	15w5d	14w4d	17w0d
3.50	16w0d	14w6d	17w2d
3.60	16w2d	15w1d	17w5d
3.70	16w4d	15w3d	18w0d
3.80	16w6d	15w4d	18w2d
3.90	17w1d	15w6d	18w4d
4.00	17w3d	16w1d	19w0d
4.10	17w5d	16w3d	19w2d

BPD (cm)	G.A (wd)	Min (wd)	Max (wd)
5.70	22w5d	20w5d	24w5d
5.80	23w0d	21w0d	25w1d
5.90	23w2d	21w2d	25w4d
6.00	23w5d	21w4d	25w6d
6.10	24w0d	21w6d	26w2d
6.20	24w2d	22w1d	26w5d
6.30	24w5d	22w4d	27w0d
6.40	25w0d	22w6d	27w3d
6.50	25w2d	23w1d	27w6d
6.60	25w5d	23w3d	28w2d
6.70	26w0d	23w5d	28w4d
6.80	26w3d	24w0d	29w0d
6.90	26w5d	24w2d	29w3d
7.00	27w1d	24w4d	29w6d
7.10	27w3d	25w0d	30w2d
7.20	27w6d	25w2d	30w4d
7.30	28w1d	25w4d	31w0d
7.40	28w4d	25w6d	31w3d
7.50	28w6d	26w2d	31w6d
7.60	29w2d	26w4d	32w2d

4.20	18w0d	16w4d	19w4d
4.30	18w2d	16w6d	19w6d
4.40	18w4d	17w1d	20w2d
4.50	19w0d	17w3d	20w4d
4.60	19w2d	17w5d	20w6d
4.70	19w4d	18w0d	21w2d
4.80	19w6d	18w2d	21w4d
4.90	20w1d	18w4d	22w0d
5.00	20w3d	18w5d	22w2d
5.10	20w5d	19w0d	22w4d
5.20	21w1d	19w2d	23w0d
5.30	21w3d	19w4d	23w2d
5.40	21w5d	19w6d	23w5d
5.50	22w0d	20w1d	24w0d
5.60	22w2d	20w3d	24w3d

7.70	29w5d	26w6d	32w5d
7.80	30w0d	27w1d	33w1d
7.90	30w3d	27w4d	33w4d
8.00	30w5d	27w6d	34w0d
8.10	31w1d	28w1d	34w3d
8.20	31w4d	28w3d	34w6d
8.30	31w6d	28w6d	35w2d
8.40	32w2d	29w1d	35w6d
8.50	32w5d	29w4d	36w2d
8.60	33w1d	29w6d	36w5d
8.70	33w3d	30w1d	37w1d
8.80	33w6d	30w4d	37w4d
8.90	34w2d	30w6d	38w1d
9.00	34w5d	31w1d	38w4d
9.10	35w1d	31w4d	39w0d

**Fetal Growth Table**

Chitty LS, Altman DG, et al: *Charts of fetal size: 2. Head measurements. Brit. J Obstet. & GYN Vol. 101, 35-43, 1994*

Age (W)	Growth (cm)	Min (cm)	Max (cm)
12	1.97	1.68	2.25
13	2.35	2.06	2.65
14	2.73	2.43	3.03
15	3.10	2.80	3.41
16	3.47	3.16	3.79
17	3.83	3.51	4.16

Age (W)	Growth (cm)	Min (cm)	Max (cm)
28	7.34	6.93	7.74
29	7.60	7.19	8.01
30	7.86	7.43	8.28
31	8.10	7.67	8.53
32	8.33	7.90	8.77
33	8.55	8.11	9.00

18	4.19	3.86	4.52
19	4.54	4.20	4.88
20	4.88	4.54	5.23
21	5.22	4.86	5.57
22	5.55	5.19	5.91
23	5.87	5.50	6.23
24	6.18	5.80	6.55
25	6.48	6.10	6.86
26	6.78	6.38	7.17
27	7.06	6.66	7.46

34	8.76	8.31	9.21
35	8.96	8.50	9.42
36	9.14	8.68	9.61
37	9.32	8.84	9.79
38	9.47	8.99	9.96
39	9.62	9.13	10.11
40	9.75	9.25	10.25
41	9.87	9.36	10.37
42	9.97	9.46	10.48

6.10	23w0d	01w2d
6.40	24w0d	01w2d
6.70	25w0d	01w2d
7.00	26w0d	01w3d

9.50	37w0d	03w0d
9.70	38w0d	03w0d
9.90	39w0d	03w0d
10.00	40w0d	03w0d

### ■ Biparietal Diameter (BPD) : KURTZ

#### GA Table

*Biometric in der Fruhgraviditat (I. Trmenon) Der Frauenarzt, 32, 4/1991*

$$GA = 5.6546870 + 4.3971500 \times BPD + (-0.9223110 \times BPD^2) + 0.2162220 \times BPD^3 + (-0.0222450 \times BPD^4) + 0.000921 \times BPD^5$$

Output Unit : w (weeks)

Input Unit : cm

Min Range : 2.7 cm

Max Range : 9.5 cm

### ■ Biparietal Diameter (BPD) : ASUM(SCW)

#### Fetal Growth Table

*Australasian Society for Ultrasound in Medicine*

*Policies and Statements - [D7] Statement On Normal Ultrasonic Fetal Measurements (Revised May 2001)*

Age (W)	Growth (mm)	±SD (mm)
11	16.00	2.00
12	20.00	4.00
13	24.00	4.00
14	28.00	4.00
15	31.00	4.00

Age (W)	Growth (mm)	±SD (mm)
27	68.00	5.00
28	72.00	4.00
29	75.00	4.00
30	76.00	4.00
31	80.00	6.00

### ■ Biparietal Diameter (BPD) : CAMPBELL

#### GA Table

*Professor Campbell's Group at Harris birthright Centre, King's College Hospital*

BPD (cm)	GA (wd)	±SD (wd)
2.40	13w0d	01w0d
2.80	14w0d	01w0d
3.20	15w0d	01w0d
3.70	16w0d	01w0d
4.10	17w0d	01w0d
4.40	18w0d	01w0d
4.70	19w0d	01w1d
5.10	20w0d	01w1d
5.40	21w0d	01w1d
5.80	22w0d	01w1d

BPD (cm)	GA (wd)	±SD (wd)
7.30	27w0d	01w3d
7.50	28w0d	01w4d
7.80	29w0d	01w4d
8.00	30w0d	01w5d
8.30	31w0d	01w6d
8.50	32w0d	02w0d
8.70	33w0d	02w1d
8.90	34w0d	02w3d
9.10	35w0d	02w5d
9.30	36w0d	02w6d

16	36.00	5.00	32	81.00	4.00
17	39.00	5.00	33	84.00	6.00
18	42.00	4.00	34	86.00	6.00
19	45.00	5.00	35	88.00	6.50
20	47.00	4.00	36	90.00	6.00
21	49.00	4.00	37	92.00	6.50
22	52.00	5.00	38	93.00	6.00
23	57.00	5.00	39	95.00	8.00
24	60.00	6.00	40	96.00	8.00
25	64.00	6.00	41	98.00	8.00
26	67.00	4.00			

### Biparietal Diameter (BPD) : BESSIS

#### GA Table

The data are those provided by Dr. Bessis to M. Le Bel. (Same as SIGMA 20, see memo from Ch. Gahwiler dated , June 23, 1983)

BPD (cm)	GA (wd)	±SD (wd)
1.90	11w4d	0w6d
2.35	13w0d	0w6d
3.65	17w0d	0w6d
4.90	21w0d	1w0d
6.05	25w0d	1w2d
7.20	29w0d	1w5d
8.15	33w0d	2w4d
8.75	37w0d	4w4d
9.70	39w6d	4w4d

### Biparietal Diameter (BPD) : CFEF

#### Fetal Growth Table

J. Créquat, M. Duyme, G. Brodaty

Biométrie 2000. Tables de croissance foetale par le Collège Français d'Echographie Foetale ( CFEF ) et l'Inserm U155

Gynecol Obstet Fertil 2000 Jun;28(6):435-45

Age (W)	Growth (cm)	Min (cm)	Max (cm)	Age (W)	Growth (cm)	Min (cm)	Max (cm)
11	1.54	1.31	1.76	27	6.86	6.42	7.29
12	1.94	1.70	2.18	28	7.10	6.66	7.55
13	2.33	2.07	2.59	29	7.35	6.90	7.80
14	2.71	2.44	2.99	30	7.58	7.12	8.04
15	3.09	2.79	3.38	31	7.80	7.34	8.26
16	3.45	3.14	3.76	32	8.02	7.55	8.48
17	3.81	3.49	4.14	33	8.21	7.75	8.68
18	4.16	3.82	4.50	34	8.41	7.94	8.88
19	4.50	4.15	4.85	35	8.59	8.11	9.06
20	4.82	4.46	5.19	36	8.76	8.29	9.24
21	5.14	4.77	5.52	37	8.92	8.45	9.40
22	5.45	5.06	5.84	38	9.07	8.60	9.54
23	5.75	5.35	6.15	39	9.21	8.74	9.69
24	6.04	5.63	6.46	40	9.35	8.88	9.81
25	6.33	5.90	6.75	41	9.40	8.90	9.90
26	6.59	6.16	7.02				

### Crown-Rump Length (CRL) : KOREAN

#### GA Table

Y.G Park. " The Standardization of Fetal body parts according to the normal Korean Gestational Age in Ultrasound" Korean Ultrasound Institute, Vol. 14, No.2, 1995

$$GA = CRL \times 1.08815 + 6.321988$$

Output Unit : w(weeks)

Input Unit : cm

Min Range : 0.9 cm

Max Range : 5.4 cm

#### Fetal Growth Table

Y.G Park. "The Standardization of Fetal body parts according to the normal Korean Gestational Age in Ultrasound" Korean Ultrasound Institute, Vol. 14, No.2, 1995

Output Unit : cm

Input Unit : w(week)

Min Range : 7w

Max Range : 11w

Age (W)	Growth (cm)	±SD (cm)	Age (W)	Growth (cm)	Min (cm)
7	1.045	0.287	10	3.307	0.297
8	1.589	0.304	11	4.286	0.346
9	2.339	0.291			

#### Crown-Rump Length (CRL) : ROBINSON

##### GA Table

Robinson HP, Fleming JEE British Journal of Obstetrics and Gynecology 82:702-710, September 1975

$$GA_{days} = 8.052 \times \sqrt{CRL_{mm}} + 23.73$$

Output Unit : d(days)

Input Unit : mm

Min Range : 0.70 cm

Max Range : 7.96 ≅

#### Crown-Rump Length (CRL) : HANSMANN

##### GA Table

Hansmann, Hackeloer, Staudach, Wittman. "Ultrasound Diagnosis in Obstetrics and Gynecology." Springer-Verlag, New York, 1986, p.439.

Conversion: This table is converted from German age to American age notation by the following equation.

$$America\ age_{days} = (German\ weeks - 1) \times 7 + (German\ days - 1)$$

CRL (cm)	GA (wd)	Min (wd)	Max (wd)	CRL (cm)	GA (wd)	Min (wd)	Max (wd)
0.60	06w1d	05w1d	07w0d	5.40	12w3d	11w0d	13w5d
0.70	06w2d	05w3d	07w2d	5.60	12w4d	11w1d	13w6d
0.80	06w4d	05w4d	07w3d	5.80	12w5d	11w2d	14w0d
0.90	06w6d	05w6d	07w6d	6.00	12w6d	11w3d	14w1d
1.00	07w0d	06w1d	08w0d	6.30	13w0d	11w4d	14w3d
1.10	07w2d	06w2d	08w1d	6.60	13w2d	11w5d	14w5d
1.20	07w3d	06w3d	08w3d	7.00	13w3d	12w0d	15w0d
1.30	07w4d	06w5d	08w4d	7.30	13w5d	12w1d	15w1d
1.40	07w6d	06w6d	08w6d	7.60	13w6d	12w2d	15w3d
1.50	08w0d	07w0d	09w0d	8.00	14w1d	12w4d	15w5d
1.60	08w2d	07w2d	09w1d	8.30	14w2d	12w5d	16w0d
1.70	08w3d	07w3d	09w2d	8.60	14w4d	12w6d	16w2d
1.80	08w4d	07w4d	09w4d	9.00	14w6d	13w1d	16w4d
1.90	08w5d	07w5d	09w5d	9.30	15w1d	13w3d	16w6d
2.00	08w6d	07w6d	09w6d	9.60	15w3d	13w4d	17w1d
2.10	09w0d	08w0d	10w0d	10.00	15w5d	13w6d	17w3d
2.20	09w1d	08w1d	10w1d	10.30	16w0d	14w1d	17w6d

2.40	09w3d	08w3d	10w3d
2.60	09w5d	08w5d	10w5d
2.80	10w0d	08w6d	11w1d
3.00	10w2d	09w1d	11w2d
3.20	10w3d	09w2d	11w4d
3.40	10w5d	09w4d	11w5d
3.60	10w6d	09w5d	12w0d
3.80	11w1d	09w6d	12w2d
4.00	11w2d	10w1d	12w3d
4.20	11w3d	10w2d	12w4d
4.40	11w4d	10w3d	12w6d
4.60	11w6d	10w5d	13w0d
4.80	12w0d	10w6d	13w2d
5.00	12w1d	10w6d	13w3d
5.20	12w2d	11w0d	13w4d

10.60	16w2d	14w3d	18w1d
11.00	16w4d	14w5d	18w4d
11.30	17w0d	15w0d	19w0d
11.60	17w2d	15w2d	19w2d
12.00	17w4d	15w4d	19w4d
12.30	18w0d	16w0d	20w0d
12.60	18w2d	16w2d	20w3d
13.00	18w6d	16w5d	20w6d
13.30	19w1d	17w0d	21w2d
13.60	19w4d	17w3d	21w6d
14.00	20w0d	17w6d	22w2d
14.30	20w3d	18w1d	22w5d
14.60	20w6d	18w4d	23w1d
15.00	21w3d	19w0d	23w5d

07w1d	1.14	0.50	1.78
07w2d	1.21	0.54	1.87
07w3d	1.27	0.58	1.96
07w4d	1.33	0.62	2.05
07w5d	1.40	0.66	2.14
07w6d	1.47	0.70	2.24
08w0d	1.54	0.75	2.34
08w1d	1.62	0.80	2.44
08w3d	1.78	0.91	2.65
08w5d	1.96	1.03	2.88
09w0d	2.15	1.17	3.12
09w2d	2.36	1.33	3.39
09w4d	2.59	1.51	3.66
09w6d	2.83	1.70	3.96
10w2d	3.24	2.03	4.44
10w4d	3.53	2.27	4.79
10w6d	3.83	2.52	5.14
11w2d	4.32	2.93	5.71
11w4d	4.66	3.22	6.13
11w6d	5.02	3.53	6.51

14w4d	8.54	6.56	10.52
14w6d	8.89	6.86	10.92
15w2d	9.39	7.28	11.50
15w4d	9.71	7.55	11.87
15w6d	10.01	7.80	12.22
16w2d	10.44	8.15	12.73
16w4d	10.70	8.36	13.04
16w6d	10.95	8.56	13.34
17w2d	11.30	8.83	13.77
17w4d	11.51	8.99	14.04
17w6d	11.72	9.15	14.29
18w2d	12.00	9.35	14.65
18w4d	12.19	9.48	14.89
18w6d	12.37	9.62	15.12
19w1d	12.55	9.75	15.36
19w3d	12.74	9.89	15.60
19w5d	12.94	10.03	15.85
20w0d	13.16	10.20	16.12
20w1d	13.28	10.29	16.26
20w2d	13.40	10.40	16.41

**Fetal Growth Table**

Hansmann, Hackeloer, Staudach, Wittmann. "Ultrasound Diagnosis in Obstetrics and Gynecology." Springer-Verlag, New York, 1986

Age (wd)	Growth (cm)	Min (cm)	Max (cm)
06w1d	0.69	0.23	1.15
06w2d	0.76	0.28	1.25
06w3d	0.83	0.32	1.34
06w4d	0.90	0.36	1.43
06w5d	0.96	0.39	1.52
06w6d	1.02	0.43	1.61
07w0d	1.08	0.47	1.69

Age (wd)	Growth (cm)	Min (cm)	Max (cm)
12w2d	5.56	4.00	7.13
12w4d	5.94	4.32	7.55
12w6d	6.31	4.64	7.98
13w2d	6.88	5.13	8.63
13w4d	7.26	5.56	9.06
13w6d	7.63	5.78	9.48
14w2d	8.18	6.25	10.11



## ■ Crown-Rump Length (CRL) : SHINOZUKA

### GA Table

N.Shinozuka. "Fetal biometry standard values" <http://www.shinozuka.com>, 1996

CRL (cm)	Age (wd)	±SD (wd)	CRL (cm)	Age (wd)	±SD (wd)
0.50	06w3d	00w3d	3.00	10w2d	01w0d
1.00	07w3d	00w4d	3.50	10w6d	01w1d
1.50	08w1d	00w5d	4.00	11w3d	01w1d
2.00	08w6d	00w6d	4.50	11w6d	01w2d
2.50	09w4d	00w6d	5.00	12w2d	01w3d

### Fetal Growth Table

N.Shinozuka. "Fetal biometry standard values" <http://www.shinozuka.com>, 1996

Age (wd)	Growth (cm)	Min (cm)	Max (cm)	Age (wd)	Growth (cm)	Min (cm)	Max (cm)
07w0d	0.79	0.51	1.07	10w1d	2.93	2.09	3.76
07w1d	0.86	0.55	1.17	10w2d	3.05	2.19	3.91
07w2d	0.93	0.60	1.27	10w3d	3.18	2.29	4.06
07w3d	1.01	0.65	1.37	10w4d	3.31	2.40	4.22
07w4d	1.09	0.71	1.47	10w5d	3.44	2.51	4.38
07w5d	1.17	0.76	1.58	10w6d	3.58	2.62	4.54
07w6d	1.25	0.82	1.69	11w0d	3.71	2.73	4.70
08w0d	1.34	0.88	1.80	11w1d	3.85	2.84	4.86
08w1d	1.43	0.95	1.91	11w2d	4.00	2.96	5.03
08w2d	1.52	1.01	2.03	11w3d	4.14	3.08	5.20
08w3d	1.61	1.08	2.15	11w4d	4.29	3.20	5.37

08w4d	1.71	1.15	2.27	11w5d	4.44	3.33	5.55
08w5d	1.81	1.22	2.39	11w6d	4.59	3.45	5.73
08w6d	1.91	1.30	2.52	12w0d	4.74	3.58	5.91
09w0d	2.01	1.38	2.65	12w1d	4.90	3.72	6.09
09w1d	2.12	1.46	2.78	12w2d	5.06	3.85	6.27
09w2d	2.23	1.54	2.91	12w3d	5.22	3.99	6.46
09w3d	2.34	1.63	3.05	12w4d	5.39	4.13	6.65
09w4d	2.45	1.72	3.18	12w5d	5.55	4.27	6.84
09w5d	2.57	1.81	3.32	12w6d	5.72	4.41	7.03
09w6d	2.68	1.90	3.47	13w0d	5.89	4.56	7.23
10w0d	2.80	1.99	3.61				

## ■ Crown-Rump Length (CRL) : NELSON

### GA Table

Nelson, L. "Comparison of Methods for Determining Crown-Rump Measurement by Real-Time Ultrasound." *Journal of Clinical Ultrasound*, 9:67-70, February, 1981.

$$GA_{days} = 51.0008 + 0.6 \times CRL_{mm}$$

Output Unit : d(days)

Input Unit : mm

Min Range : 0.67 cm

Max Range : 8.24 cm

**Crown-Rump Length (CRL) : HADLOCK**

**GA Table**

Frank P. Hadlock, Yogesh P. Shah, Donna J. Kanon, Joshua V. Lindsey. "Fetal Crown-Rump Length: Reevaluation of Relation to Menstrual Age(5-18 weeks) with High-Resolution Real-Time US" Radiology, 1992; 182:501-505

CRL (cm)	GA (wd)	Min (wd)	Max (wd)
0.2	5w5d	5w2d	6w1d
0.3	5w6d	5w3d	6w3d
0.4	6w1d	5w4d	6w4d
0.5	6w1d	5w5d	6w5d
0.6	6w3d	5w6d	6w6d
0.7	6w4d	6w1d	7w1d
0.8	6w5d	6w1d	7w2d
0.9	6w6d	6w2d	7w3d
1.0	7w1d	6w4d	7w5d
1.1	7w1d	6w4d	7w5d
1.2	7w3d	6w6d	8w0d
1.3	7w4d	6w6d	8w1d
1.4	7w5d	7w1d	8w2d
1.5	7w6d	7w2d	8w4d
1.6	8w0d	7w3d	8w4d
1.7	8w1d	7w3d	8w5d
1.8	8w2d	7w4d	9w0d
1.9	8w3d	7w5d	9w1d
2.0	8w4d	7w6d	9w2d
2.1	8w5d	8w0d	9w3d

CRL (cm)	GA (wd)	Min (wd)	Max (wd)
6.2	12w4d	11w4d	13w4d
6.3	12w5d	11w5d	13w5d
6.4	12w6d	11w5d	13w6d
6.5	12w6d	11w5d	13w6d
6.6	12w6d	11w6d	14w0d
6.7	13w0d	12w0d	14w0d
6.8	13w1d	12w0d	14w1d
6.9	13w1d	12w0d	14w1d
7.0	13w1d	12w1d	14w2d
7.1	13w2d	12w2d	14w3d
7.2	13w3d	12w2d	14w3d
7.3	13w3d	12w2d	14w3d
7.4	13w4d	12w3d	14w4d
7.5	13w4d	12w4d	14w5d
7.6	13w5d	12w4d	14w6d
7.7	13w6d	12w5d	14w6d
7.8	13w6d	12w5d	14w6d
7.9	13w6d	12w6d	15w0d
8.0	14w0d	12w6d	15w1d
8.1	14w1d	13w0d	15w2d

2.2	8w6d	8w1d	9w4d
2.3	9w0d	8w2d	9w5d
2.4	9w1d	8w3d	9w6d
2.5	9w1d	8w3d	10w0d
2.6	9w3d	8w5d	10w1d
2.7	9w4d	8w5d	10w2d
2.8	9w4d	8w6d	10w3d
2.9	9w5d	8w6d	10w3d
3.0	9w6d	9w1d	10w5d
3.1	10w0d	9w1d	10w6d
3.2	10w1d	9w2d	10w6d
3.3	10w1d	9w3d	11w0d
3.4	10w2d	9w3d	11w1d
3.5	10w3d	9w4d	11w2d
3.6	10w4d	9w5d	11w2d
3.7	10w4d	9w5d	11w3d
3.8	10w5d	9w6d	11w4d
3.9	10w6d	10w0d	11w5d
4.0	10w6d	10w0d	11w5d
4.1	11w0d	10w1d	11w6d
4.2	11w1d	10w1d	12w0d
4.3	11w1d	10w2d	12w1d
4.4	11w1d	10w2d	12w1d
4.5	11w2d	10w3d	12w1d
4.6	11w3d	10w3d	12w2d
4.7	11w4d	10w4d	12w3d
4.8	11w4d	10w5d	12w4d

8.2	14w1d	13w0d	15w2d
8.3	14w1d	13w0d	15w2d
8.4	14w2d	13w1d	15w3d
8.5	14w3d	13w2d	15w4d
8.6	14w4d	13w2d	15w5d
8.7	14w4d	13w3d	15w5d
8.8	14w5d	13w4d	15w6d
8.9	14w6d	13w4d	16w0d
9.0	14w6d	13w5d	16w1d
9.1	15w0d	13w6d	16w1d
9.2	15w1d	13w6d	16w2d
9.3	15w1d	14w0d	16w3d
9.4	15w2d	14w1d	16w4d
9.5	15w2d	14w1d	16w4d
9.6	15w3d	14w1d	16w4d
9.7	15w4d	14w2d	16w5d
9.8	15w4d	14w2d	16w6d
9.9	15w5d	14w3d	17w0d
10.0	15w6d	14w4d	17w1d
10.1	16w0d	14w5d	17w2d
10.2	16w1d	14w6d	17w3d
10.3	16w1d	14w6d	17w3d
10.4	16w2d	15w0d	17w4d
10.5	16w3d	15w1d	17w5d
10.6	16w4d	15w1d	17w6d
10.7	16w4d	15w2d	17w6d
10.8	16w5d	15w3d	18w0d

4.9	11w5d	10w5d	12w4d	10.9	16w6d	15w3d	18w1d
5.0	11w5d	10w5d	12w4d	11.0	16w6d	15w4d	18w2d
5.1	11w6d	10w6d	12w5d	11.1	17w0d	15w4d	18w3d
5.2	11w6d	11w0d	12w6d	11.2	17w1d	15w5d	18w3d
5.3	12w0d	11w0d	13w0d	11.3	17w1d	15w6d	18w4d
5.4	12w0d	11w0d	13w0d	11.4	17w2d	15w6d	18w5d
5.5	12w1d	11w1d	13w0d	11.5	17w3d	16w0d	18w6d
5.6	12w1d	11w2d	13w1d	11.6	17w4d	16w1d	18w6d
5.7	12w2d	11w2d	13w2d	11.7	17w4d	16w1d	19w0d
5.8	12w2d	11w2d	13w2d	11.8	17w5d	16w2d	19w1d
5.9	12w3d	11w3d	13w3d	11.9	17w6d	16w3d	19w2d
6.0	12w4d	11w4d	13w4d	12.0	17w6d	16w3d	19w2d
6.1	12w4d	11w4d	13w4d	12.1	18w0d	16w4d	19w3d

1.60	08w3d	3.00	10w0d	4.40	11w2d	5.80	12w3d
1.70	08w4d	3.10	10w1d	4.50	11w2d	5.90	12w3d
1.80	08w5d	3.20	10w1d	4.60	11w3d	6.00	12w4d
1.90	08w6d	3.30	10w2d	4.70	11w3d	6.10	12w5d
2.00	09w0d	3.40	10w3d	4.80	11w4d	6.20	12w5d
2.10	09w0d	3.50	10w3d	4.90	11w5d	6.30	12w6d
2.20	09w1d	3.60	10w4d	5.00	11w6d		

**Crown-Rump Length (CRL) : OSAKA**

**GA Table**

Osaka University Method 1989, 3 by Univ. Of Osaka

CRL (cm)	GA (wd)	CRL (cm)	GA (wd)	CRL (cm)	GA (wd)	CRL (cm)	GA (wd)
0.90	07w1d	2.30	09w2d	3.70	10w4d	5.10	11w6d
1.00	07w3d	2.40	09w3d	3.80	10w5d	5.20	11w6d
1.10	07w4d	2.50	09w3d	3.90	10w6d	5.30	12w0d
1.20	07w6d	2.60	09w4d	4.00	10w6d	5.40	12w1d
1.30	08w0d	2.70	09w5d	4.10	11w0d	5.50	12w1d
1.40	08w1d	2.80	09w6d	4.20	11w0d	5.60	12w2d
1.50	08w2d	2.90	09w6d	4.30	11w1d	5.70	12w2d

**Fetal Growth Table**

Osaka University Method 1989, 3 by Univ. Of Osaka

Age (w)	Growth (cm)	Min (cm)	Age (w)	Growth (cm)	Min (cm)
6	0.52	0.10	10	2.99	0.28
7	0.90	0.14	11	4.06	0.31
8	1.41	0.19	12	5.32	0.31
9	2.11	0.24			

**Crown-Rump Length (CRL) : ASUM(SCW)**

**Fetal Growth Table**

Australasian Society for Ultrasound in Medicine

Policies and Statements - [D7] Statement On Normal Ultrasonic Fetal Measurements (Revised May 2001)

Age (wd)	Growth (mm)	Age (wd)	Growth (mm)	Age (wd)	Growth (mm)	Age (wd)	Growth (mm)
05w2d	1.00	07w5d	14.00	10w1d	36.00	12w4d	63.00
05w3d	2.00	07w6d	15.00	10w2d	37.00	12w5d	64.00

05w4d	3.00	08w0d	17.00	10w3d	38.00	12w6d	65.00
05w5d	3.00	08w1d	18.00	10w4d	39.00	13w0d	68.00
05w6d	4.00	08w2d	19.00	10w5d	39.00	13w1d	70.00
06w0d	4.00	08w3d	20.00	10w6d	40.00	13w2d	72.00
06w1d	5.00	08w4d	21.00	11w0d	44.00	13w3d	74.00
06w2d	6.00	08w5d	22.00	11w1d	45.00	13w4d	76.00
06w3d	7.00	08w6d	22.00	11w2d	47.00	13w5d	77.00
06w4d	8.00	09w0d	23.00	11w3d	48.00	13w6d	80.00
06w5d	9.00	09w1d	24.00	11w4d	52.00	14w0d	81.00
06w6d	10.00	09w2d	26.00	11w5d	55.00	14w1d	84.00
07w0d	11.00	09w3d	27.00	11w6d	56.00	14w2d	85.00
07w1d	11.00	09w4d	28.00	12w0d	57.00	14w3d	86.00
07w2d	12.00	09w5d	29.00	12w1d	58.00	14w4d	87.00
07w3d	12.00	09w6d	31.00	12w2d	60.00		
07w4d	13.00	10w0d	34.00	12w3d	61.00		

0.90	7w0d	2.40	8w6d	3.90	10w4d	5.40	12w1d
1.00	7w1d	2.50	9w0d	4.00	10w5d	5.50	12w2d
1.10	7w2d	2.60	9w1d	4.10	10w5d	5.60	12w2d
1.20	7w3d	2.70	9w2d	4.20	10w6d	5.70	12w3d
1.30	7w4d	2.80	9w2d	4.30	11w0d	5.80	12w4d
1.40	7w5d	2.90	9w3d	4.40	11w1d	5.90	12w5d
1.50	7w6d	3.00	9w4d	4.50	11w1d	6.00	12w5d
1.60	8w0d	3.10	9w5d	4.60	11w2d		

**Femur Length (FL) : KOREAN**

**GA Table**

Y.G Park. "The Standardization of Fetal body parts according to the normal Korean Gestational Age in Ultrasound" Korean Ultrasound Institute, Vol. 14, No.2, 1995

$$GA = FL \times 2.36855 + 0.2089 \times FL^2 + 10.513242$$

Output Unit : w(weeks)

Input Unit : cm

Min Range : 0.7 cm

Max Range : 7.3 cm

**Fetal Growth Table**

Y.G Park. "The Standardization of Fetal body parts according to the normal Korean Gestational Age in Ultrasound" Korean Ultrasound Institute, Vol. 14, No.2, 1995

$$FL = 4.221513 \times MA - 0.035314 \times MA^2 - 38.929993 \text{ (Unit: mm)}$$

Output Unit : cm

Input Unit : w(week)

Min Range : 12 w

Max Range : 40 w

**Crown-Rump Length (CRL) : REMPEN**

**GA Table**

CRL (cm)	GA (wd)	CRL (cm)	GA (wd)	CRL (cm)	GA (wd)	CRL (cm)	GA (wd)
0.20	6w0d	1.70	8w0d	3.20	9w6d	4.70	11w3d
0.30	6w1d	1.80	8w1d	3.30	9w6d	4.80	11w4d
0.40	6w2d	1.90	8w2d	3.40	10w0d	4.90	11w4d
0.50	6w3d	2.00	8w3d	3.50	10w1d	5.00	11w5d
0.60	6w4d	2.10	8w4d	3.60	10w2d	5.10	11w6d
0.70	6w5d	2.20	8w5d	3.70	10w2d	5.20	11w6d
0.80	6w6d	2.30	8w5d	3.80	10w3d	5.30	12w0d

Age (W)	Growth (cm)	±SD (cm)	Age (W)	Growth (cm)	±SD (cm)
12	0.790	0.142	32	6.100	0.205
16	1.900	0.133	34	6.461	0.226
20	3.000	0.204	36	6.710	0.222
24	4.100	0.198	38	7.013	0.245
28	5.100	0.209	40	7.287	0.216

### Femur Length (FL) : HADLOCK

#### GA Table

Hadlock, F., Deter, R.L., Harrist, R.B., Park, S.K. "Estimating Fetal Age: Computer-Assisted Analysis of Multiple Fetal Growth Parameters" Radiology, 1984, 152: 497-501. (Biometric Age and Growth Equations)

$$GA = 10.35 + 2.460 \times FL + 0.170 \times FL^2$$

Output Unit : w(weeks)

Input Unit : cm

Min Range : 0.64 cm

Max Range : 8.20 cm

Standard Deviation:

Min Range(w)	Max Range(w)	±2SD
12	18	1.38
18	24	1.80
24	30	2.08
30	36	2.96
36	42	3.12

#### Fetal Growth Table

Hadlock, F., Deter, R.L., Harrist, R.B., Park, S.K. "Estimating Fetal Age: Computer-Assisted Analysis of Multiple Fetal Growth Parameters" Radiology, 1984, 152: 497-501. (Biometric Age and Growth Equations)

$$\text{Equation} = 0.427 \times MA - 0.0034 \times MA^2 - 3.91$$

Output Unit : cm

Input Unit : w(weeks)

Min Range : 12 w

Max Range : 40 w

Standard Deviation : 2SD = 0.6 cm

### Femur Length (FL) : MERZ

#### GA Table

E. Merz, W. Goldhofer, E. Timor-Tritsch "Ultrasound in Gynecology and Obstetrics" Textbook and Atlas, 1991 Georg Thieme Verlag, 308-338

FL (cm)	GA (wd)	±SD (wd)	FL (cm)	GA (wd)	±SD (wd)	FL (cm)	GA (wd)	±SD (wd)
1.00	12w2d	01w1d	3.40	20w6d	01w5d	5.80	30w1d	02w0d
1.10	12w5d	01w1d	3.50	21w1d	01w4d	5.90	30w4d	02w0d
1.20	13w0d	01w1d	3.60	21w4d	01w4d	6.00	31w0d	02w0d
1.30	13w2d	01w1d	3.70	21w6d	01w4d	6.10	31w4d	02w0d
1.40	13w5d	01w2d	3.80	22w2d	01w4d	6.20	31w6d	02w0d
1.50	14w0d	01w2d	3.90	22w5d	01w5d	6.30	32w2d	02w0d
1.60	14w3d	01w2d	4.00	23w1d	01w5d	6.40	32w6d	02w0d
1.70	14w5d	01w2d	4.10	23w3d	01w5d	6.50	33w1d	02w0d
1.80	15w1d	01w2d	4.20	23w6d	01w5d	6.60	33w4d	02w0d
1.90	15w3d	01w2d	4.30	24w1d	01w4d	6.70	34w1d	02w1d

2.00	15w6d	01w2d	4.40	24w4d	01w5d	6.80	34w4d	02w1d
2.10	16w1d	01w2d	4.50	25w0d	01w6d	6.90	35w0d	02w1d
2.20	16w4d	01w3d	4.60	25w3d	01w6d	7.00	35w3d	02w1d
2.30	16w6d	01w3d	4.70	25w6d	01w6d	7.10	35w6d	02w0d
2.40	17w1d	01w2d	4.80	26w1d	01w5d	7.20	36w2d	02w1d
2.50	17w4d	01w3d	4.90	26w4d	01w6d	7.30	36w6d	02w2d
2.60	17w6d	01w3d	5.00	26w6d	01w5d	7.40	37w2d	02w1d
2.70	18w2d	01w3d	5.10	27w2d	01w5d	7.50	37w5d	02w1d
2.80	18w4d	01w3d	5.20	27w5d	01w6d	7.60	38w1d	02w1d
2.90	19w0d	01w3d	5.30	28w1d	02w0d	7.70	38w5d	02w1d
3.00	19w3d	01w4d	5.40	28w4d	02w0d	7.80	39w1d	02w1d
3.10	19w5d	01w4d	5.50	29w0d	02w0d	7.90	39w4d	02w1d
3.20	20w1d	01w4d	5.60	29w3d	02w0d	8.00	40w1d	02w1d
3.30	20w4d	01w5d	5.70	29w6d	02w0d			

18	2.70	2.20	3.10	33	6.50	6.00	7.00
19	3.00	2.50	3.40	34	6.70	6.20	7.20
20	3.20	2.80	3.70	35	6.90	6.40	7.40
21	3.50	3.10	4.00	36	7.10	6.60	7.60
22	3.80	3.40	4.20	37	7.30	6.80	7.80
23	4.10	3.60	4.50	38	7.50	6.90	8.00
24	4.30	3.90	4.80	39	7.60	7.10	8.20
25	4.60	4.10	5.10	40	7.80	7.30	8.40
26	4.90	4.40	5.30				

**Femur Length (FL) : HANSMANN**

**GA Table**

Hansmann, Hackeloer, Staudach, Wittman "Ultrasound Diagnosis in Obstetrics and Gynecology" Springer- Verlag, New York, 1986, p.431

FL (cm)	GA (wd)	±SD (wd)	FL (cm)	GA (wd)	±SD (wd)
1.00	13w0d	1w0d	4.90	27w0d	2w1d
1.20	14w0d	1w0d	5.10	28w0d	2w2d
1.60	15w0d	1w0d	5.40	29w0d	2w2d
1.80	16w0d	1w1d	5.60	30w0d	2w4d
2.20	17w0d	1w2d	5.90	31w0d	2w4d
2.50	18w0d	1w3d	6.10	32w0d	2w5d
2.80	19w0d	1w3d	6.30	33w0d	2w6d
3.10	20w0d	1w4d	6.50	34w0d	3w0d
3.40	21w0d	1w4d	6.70	35w0d	3w1d
3.60	22w0d	1w5d	6.90	36w0d	3w2d
3.90	23w0d	1w6d	7.10	37w0d	3w2d

**Fetal Growth Table**

Merz, E., Grupner, A., Kern, F. "Mathematical Modeling of Fetal Limb Growth." *Journal of Clinical Ultrasound*. 17: 179-185, March/April, 1989

Age (W)	Growth (cm)	Min (cm)	Max (cm)	Age (W)	Growth (cm)	Min (cm)	Max (cm)
12	0.90	0.50	1.30	27	5.10	4.60	5.60
13	1.20	0.80	1.60	28	5.30	4.90	5.80
14	1.50	1.10	1.90	29	5.60	5.10	6.10
15	1.80	1.40	2.20	30	5.80	5.30	6.30
16	2.10	1.70	2.50	31	6.00	5.60	6.50
17	2.40	2.00	2.80	32	6.30	5.80	6.80

4.10	24w0d	2w0d	7.30	38w0d	3w2d
4.40	25w0d	2w0d	7.40	39w0d	3w2d
4.70	26w0d	2w1d	7.50	40w0d	3w2d

### Fetal Growth Table

Hansmann, Hackeloer, Staudach, Wittman "Ultrasound Diagnosis in Obstetrics and Gynecology" Springer- Verlag, New York, 1986, p.176.

Age (W)	Growth (cm)	Min (cm)	Max (cm)
13	1.00	1.00	1.00
14	1.20	1.20	1.20
15	1.60	1.30	2.10
16	1.80	1.50	2.30
17	2.20	1.80	2.60
18	2.50	2.10	2.90
19	2.80	2.40	3.20
20	3.10	2.70	3.50
21	3.40	2.90	3.80
22	3.60	3.20	4.10
23	3.90	3.40	4.40
24	4.10	3.70	4.70
25	4.40	3.90	4.90
26	4.70	4.20	5.20
27	4.90	4.40	5.50
28	5.10	4.60	5.70
29	5.40	4.90	5.90
30	5.60	5.10	6.20
31	5.90	5.30	6.40

32	6.10	5.50	6.60
33	6.30	5.70	6.80
34	6.50	5.90	7.00
35	6.70	6.10	7.20
36	6.90	6.30	7.40
37	7.10	6.50	7.70
38	7.30	6.70	7.90
39	7.40	6.80	8.10
40	7.50	7.00	8.40

### Femur Length (FL) : HOHLER

#### GA Table

Hohler, C.W., Quetel, T.A. "Fetal Femur Length: Equations for Computer Calculation of Gestational Age from Ultrasound Measurements." American Journal of Obstetrics and Gynecology, Vol. 143, No. 4: 479-481, June 15, 1982

$$GA = 9.18 + 2.67 \times FL + 0.16 \times FL^2$$

Output Unit : w(weeks)

Input Unit : cm

Min Range : 1.0 cm

Max Range : 8.0 cm

### Femur Length (FL) : JEANTY

#### GA Table

Jeanty, P., Rodesch, F., Delbeke, D., Dumont, J. "Estimation of Gestational Age from Measurements of Fetal Long Bones" Journal of Ultrasound Medicine, 3: 75-79, February, 1984

$$GA = 9.5411757 + 2.977451 \times FL + 0.10388013 \times FL^2$$

Output Unit : w(weeks)

Input Unit : cm

Min Range : 1.0 cm

Max Range : 8.0 cm

Standard Deviation : 1.4 weeks

**Fetal Growth Table**

Jeanty, P. and Romero, R. (1983) Normal values for the leg. In Romero, R., Pilu, G., Jeanty, P., Chidini, A. and Hobbins, J.C. (eds.) Prenatal Diagnosis of congenital Anomalies, Table 10-4, p.324, (Norwalk: Appleton & Lange)

Age (W)	Growth (cm)	Min (cm)	Max (cm)	Age (W)	Growth (cm)	Min (cm)	Max (cm)
14	1.20	0.60	1.90	28	4.50	3.80	5.30
15	1.50	0.90	2.10	29	4.70	4.10	5.40
16	1.80	1.30	2.30	30	4.90	4.30	5.60
17	2.10	1.30	2.80	31	5.10	4.20	5.90
18	2.30	1.50	3.10	32	5.20	4.20	6.30
19	2.60	1.90	3.30	33	5.40	4.60	6.20
20	2.80	2.10	3.60	34	5.50	4.60	6.50
21	3.10	2.40	3.70	35	5.70	5.10	6.20
22	3.30	2.70	3.90	36	5.80	5.40	6.30
23	3.50	2.80	4.20	37	5.90	5.40	6.50
24	3.70	2.90	4.50	38	6.10	5.60	6.50
25	4.00	3.40	4.50	39	6.20	5.60	6.70
26	4.20	3.60	4.70	40	6.30	5.90	6.70
27	4.40	3.70	5.00				

**Femur Length (FL) : SHINOZUKA**

**GA Table**

Norio Shinozuka, Takashi Okai, et al. "Standard Values of Ultrasonographic Fetal Biometry" Japanese Journal of Medical Ultrasonics, Vol.23, No.12, 1996, pp877-888

FL (cm)	GA (wd)	Min (wd)	Max (wd)	FL (cm)	GA (wd)	Min (wd)	Max (wd)
2.00	16w1d	15w2d	17w0d	4.60	26w2d	24w6d	27w5d
2.10	16w3d	15w4d	17w2d	4.70	26w5d	25w2d	28w1d
2.20	16w6d	16w0d	17w5d	4.80	27w2d	25w6d	28w5d
2.30	17w1d	16w1d	18w1d	4.90	27w5d	26w2d	29w1d
2.40	17w3d	16w3d	18w3d	5.00	28w2d	26w6d	29w5d
2.50	17w6d	16w6d	18w6d	5.10	28w5d	27w2d	30w1d
2.60	18w1d	17w1d	19w1d	5.20	29w2d	27w5d	30w6d
2.70	18w3d	17w3d	19w3d	5.30	29w5d	28w1d	31w2d
2.80	18w6d	17w6d	19w6d	5.40	30w2d	28w5d	31w6d
2.90	19w1d	18w1d	20w1d	5.50	30w5d	29w1d	32w2d
3.00	19w4d	18w3d	20w5d	5.60	31w2d	29w5d	32w6d
3.10	20w0d	18w6d	21w1d	5.70	31w6d	30w2d	33w3d
3.20	20w2d	19w1d	21w3d	5.80	32w3d	30w6d	34w0d
3.30	20w5d	19w4d	21w6d	5.90	33w0d	31w2d	34w5d
3.40	21w1d	20w0d	22w2d	6.00	33w3d	31w5d	35w1d
3.50	21w3d	20w2d	22w4d	6.10	34w0d	32w2d	35w5d
3.60	21w6d	20w5d	23w0d	6.20	34w4d	32w6d	36w2d
3.70	22w2d	21w0d	23w4d	6.30	35w1d	33w3d	36w6d
3.80	22w5d	21w3d	24w0d	6.40	35w5d	34w0d	37w3d
3.90	23w1d	21w6d	24w3d	6.50	36w2d	34w4d	38w0d
4.00	23w3d	22w1d	24w5d	6.60	37w0d	35w2d	38w5d
4.10	24w0d	22w5d	25w2d	6.70	37w4d	35w5d	39w3d



4.20	24w3d	23w1d	25w5d
4.30	24w6d	23w4d	26w1d
4.40	25w3d	24w1d	26w5d
4.50	25w6d	24w3d	27w2d

6.80	38w1d	36w2d	40w0d
6.90	38w5d	36w6d	40w4d
7.00	39w3d	37w4d	41w2d

**Fetal Growth Table**

Norio Shinozuka, Takashi Okai, et al. "Standard Values of Ultrasonographic Fetal Biometry" Japanese Journal of Medical Ultrasonics, Vol.23, No.12, 1996, pp877-888

Age (W)	Growth (cm)	Min (cm)	Max (cm)
16w3d	2.14	1.74	2.54
17w3d	2.40	1.99	2.80
18w3d	2.65	2.25	3.06
19w3d	2.91	2.50	3.32
20w3d	3.16	2.74	3.58
21w3d	3.41	2.99	3.84
22w3d	3.66	3.23	4.09
23w3d	3.91	3.47	4.34
24w3d	4.15	3.71	4.59
25w3d	4.39	3.94	4.83
26w3d	4.62	4.17	5.07
27w3d	4.84	4.39	5.30
28w3d	5.06	4.61	5.52
29w3d	5.28	4.81	5.74

Age (W)	Growth (cm)	Min (cm)	Max (cm)
30w3d	5.48	5.01	5.95
31w3d	5.68	5.21	6.16
32w3d	5.87	5.39	6.35
33w3d	6.05	5.57	6.54
34w3d	6.22	5.73	6.71
35w3d	6.38	5.89	6.88
36w3d	6.53	6.03	7.03
37w3d	6.67	6.17	7.18
38w3d	6.80	6.29	7.31
39w3d	6.91	6.40	7.43
40w3d	7.01	6.49	7.53
41w3d	7.10	6.57	7.62
42w3d	7.17	6.64	7.70

**Femur Length (FL) : OSAKA****GA Table**

Osaka University Method 1989, 3 by Univ. Of Osaka

FL (cm)	GA (wd)	FL (cm)	GA (wd)	FL (cm)	GA (wd)	FL (cm)	GA (wd)
0.90	13w0d	2.50	18w1d	4.10	24w1d	5.70	31w3d
1.00	13w2d	2.60	18w4d	4.20	24w4d	5.80	31w6d
1.10	13w4d	2.70	18w6d	4.30	25w0d	5.90	32w3d
1.20	13w6d	2.80	19w2d	4.40	25w3d	6.00	32w6d
1.30	14w1d	2.90	19w4d	4.50	25w6d	6.10	33w4d
1.40	14w4d	3.00	20w0d	4.60	26w2d	6.20	34w1d
1.50	14w6d	3.10	20w2d	4.70	26w4d	6.30	34w4d
1.60	15w1d	3.20	20w5d	4.80	27w1d	6.40	35w2d
1.70	15w3d	3.30	21w0d	4.90	27w4d	6.50	35w5d
1.80	15w5d	3.40	21w3d	5.00	28w0d	6.60	36w3d
1.90	16w1d	3.50	21w5d	5.10	28w3d	6.70	36w6d
2.00	16w3d	3.60	22w1d	5.20	28w6d	6.80	37w1d
2.10	16w6d	3.70	22w4d	5.30	29w2d	6.90	38w3d
2.20	17w1d	3.80	23w1d	5.40	29w6d	7.00	39w1d
2.30	17w3d	3.90	23w2d	5.50	30w2d	7.10	39w6d
2.40	18w0d	4.00	23w5d	5.60	30w6d		

**Fetal Growth Table***Osaka University Method 1989, 3 by Univ. Of Osaka*

Age (wd)	Growth (cm)	±SD (cm)
13w0d	0.94	0.21
13w1d	0.98	0.21
13w2d	1.03	0.21
13w3d	1.07	0.21
13w4d	1.12	0.21
13w5d	1.17	0.21
13w6d	1.21	0.22
14w0d	1.26	0.22
14w1d	1.30	0.22
14w2d	1.35	0.22
14w3d	1.39	0.22
14w4d	1.44	0.22
14w5d	1.48	0.22
14w6d	1.53	0.22
15w0d	1.57	0.22
15w1d	1.61	0.22
15w2d	1.66	0.22
15w3d	1.70	0.22
15w4d	1.75	0.22
15w5d	1.79	0.22
15w6d	1.83	0.22

Age (wd)	Growth (cm)	±SD (cm)
26w4d	4.69	0.26
26w5d	4.72	0.27
26w6d	4.75	0.27
27w0d	4.78	0.27
27w1d	4.82	0.27
27w2d	4.85	0.27
27w3d	4.88	0.27
27w4d	4.91	0.27
27w5d	4.91	0.27
27w6d	4.97	0.27
28w0d	5.01	0.27
28w1d	5.04	0.27
28w2d	5.07	0.27
28w3d	5.10	0.27
28w4d	5.13	0.27
28w5d	5.16	0.27
28w6d	5.19	0.27
29w0d	5.22	0.27
29w1d	5.25	0.27
29w2d	5.28	0.28
29w3d	5.31	0.28

16w0d	1.88	0.22
16w1d	1.92	0.22
16w2d	1.96	0.22
16w3d	2.01	0.23
16w4d	2.05	0.23
16w5d	2.09	0.23
16w6d	2.13	0.23
17w0d	2.18	0.23
17w1d	2.22	0.23
17w2d	2.26	0.23
17w3d	2.30	0.23
17w4d	2.34	0.23
17w5d	2.39	0.23
17w6d	2.43	0.23
18w0d	2.47	0.23
18w1d	2.51	0.23
18w2d	2.55	0.23
18w3d	2.59	0.23
18w4d	2.63	0.23
18w5d	2.67	0.23
18w6d	2.71	0.23
19w0d	2.75	0.24
19w1d	2.79	0.24
19w2d	2.83	0.24
19w3d	2.87	0.24
19w4d	2.91	0.24

29w4d	5.34	0.28
29w5d	5.37	0.28
29w6d	5.40	0.28
30w0d	5.43	0.28
30w1d	5.46	0.28
30w2d	5.49	0.28
30w3d	5.52	0.28
30w4d	5.54	0.28
30w5d	5.57	0.28
30w6d	5.60	0.28
31w0d	5.63	0.28
31w1d	5.66	0.28
31w2d	5.69	0.28
31w3d	5.71	0.28
31w4d	5.74	0.28
31w5d	5.77	0.28
31w6d	5.80	0.29
32w0d	5.82	0.29
32w1d	5.85	0.29
32w2d	5.88	0.29
32w3d	5.90	0.29
32w4d	5.93	0.29
32w5d	5.96	0.29
32w6d	5.98	0.29
33w0d	6.01	0.29
33w1d	6.04	0.29

19w5d	2.95	0.24
19w6d	2.99	0.24
20w0d	3.03	0.24
20w1d	3.07	0.24
20w2d	3.11	0.24
20w3d	3.15	0.24
20w4d	3.19	0.24
20w5d	3.23	0.24
20w6d	3.27	0.24
21w0d	3.30	0.24
21w1d	3.34	0.24
21w2d	3.38	0.24
21w3d	3.42	0.24
21w4d	3.46	0.25
21w5d	3.49	0.25
21w6d	3.53	0.25
22w0d	3.57	0.25
22w1d	3.61	0.25
22w2d	3.64	0.25
22w3d	3.68	0.25
22w4d	3.72	0.25
22w5d	3.75	0.25
22w6d	3.79	0.25
23w0d	3.83	0.25
23w1d	3.86	0.25
23w2d	3.90	0.25

33w2d	6.06	0.29
33w3d	6.09	0.29
33w4d	6.11	0.29
33w5d	6.14	0.29
33w6d	6.16	0.29
34w0d	6.19	0.29
34w1d	6.21	0.29
34w2d	6.24	0.29
34w3d	6.26	0.30
34w4d	6.29	0.30
34w5d	6.31	0.30
34w6d	6.34	0.30
35w0d	6.36	0.30
35w1d	6.39	0.30
35w2d	6.41	0.30
35w3d	6.43	0.30
35w4d	6.46	0.30
35w5d	6.48	0.30
35w6d	6.50	0.30
36w0d	6.53	0.30
36w1d	6.55	0.30
36w2d	6.57	0.30
36w3d	6.60	0.30
36w4d	6.62	0.30
36w5d	6.64	0.30
36w6d	6.66	0.30

23w3d	3.93	0.25
23w4d	3.97	0.25
23w5d	4.01	0.25
23w6d	4.04	0.25
24w0d	4.08	0.25
24w1d	4.11	0.26
24w2d	4.15	0.26
24w3d	4.18	0.26
24w4d	4.22	0.26
24w5d	4.25	0.26
24w6d	4.28	0.26
25w0d	4.32	0.26
25w1d	4.35	0.26
25w2d	4.39	0.26
25w3d	4.42	0.26
25w4d	4.45	0.26
25w5d	4.49	0.26
25w6d	4.52	0.26
26w0d	4.56	0.26
26w1d	4.59	0.26
26w2d	4.62	0.26
26w3d	4.65	0.26

37w0d	6.69	0.31
37w1d	6.71	0.31
37w2d	6.73	0.31
37w3d	6.75	0.31
37w4d	6.77	0.31
37w5d	6.79	0.31
37w6d	6.82	0.31
38w0d	6.84	0.31
38w1d	6.86	0.31
38w2d	6.88	0.31
38w3d	6.90	0.31
38w4d	6.92	0.31
38w5d	6.94	0.31
38w6d	6.96	0.31
39w0d	6.98	0.31
39w1d	7.00	0.31
39w2d	7.02	0.31
39w3d	7.04	0.31
39w4d	7.06	0.32
39w5d	7.08	0.32
39w6d	7.10	0.32
40w0d	7.12	0.32

**Femur Length (FL) : CHITTY**

**GA Table**

*Altman DG, Chitty LS: New Charts for ultrasound dating of pregnancy. Ultrasound in Obstetrics and Gynecology, Vol. 10: 174-191, 1997*

FL (cm)	GA (wd)	Min (wd)	Max (wd)	FL (cm)	GA (wd)	Min (wd)	Max (wd)
1.00	13w0d	12w1d	13w6d	3.90	22w4d	20w5d	24w3d
1.10	13w2d	12w3d	14w1d	4.00	22w6d	21w1d	24w6d
1.20	13w4d	12w5d	14w4d	4.10	23w2d	21w3d	25w2d
1.30	13w6d	13w0d	14w6d	4.20	23w5d	21w6d	25w5d
1.40	14w1d	13w1d	15w1d	4.30	24w1d	22w1d	26w1d
1.50	14w3d	13w4d	15w3d	4.40	24w3d	22w4d	26w4d
1.60	14w5d	13w5d	15w6d	4.50	24w6d	22w6d	27w1d
1.70	15w0d	14w0d	16w1d	4.60	25w2d	23w2d	27w4d
1.80	15w2d	14w2d	16w3d	4.70	25w5d	23w4d	28w0d
1.90	15w5d	14w4d	16w6d	4.80	26w1d	24w0d	28w3d
2.00	16w0d	14w6d	17w1d	4.90	26w4d	24w3d	29w0d
2.10	16w2d	15w1d	17w3d	5.00	27w0d	24w5d	29w3d
2.20	16w4d	15w3d	17w6d	5.10	27w3d	25w1d	30w0d
2.30	16w6d	15w5d	18w1d	5.20	27w6d	25w4d	30w3d
2.40	17w2d	16w0d	18w4d	5.30	28w2d	26w0d	31w0d
2.50	17w4d	16w2d	18w6d	5.40	28w5d	26w2d	31w3d
2.60	17w6d	16w4d	19w2d	5.50	29w2d	26w5d	32w0d
2.70	18w2d	16w6d	19w5d	5.60	29w5d	27w1d	32w3d
2.80	18w4d	17w1d	20w0d	5.70	30w1d	27w4d	33w0d
2.90	18w6d	17w4d	20w3d	5.80	30w4d	28w0d	33w4d

3.00	19w2d	17w6d	20w5d	5.90	31w1d	28w3d	34w1d
3.10	19w4d	18w1d	21w1d	6.00	31w4d	28w6d	34w4d
3.20	20w0d	18w3d	21w4d	6.10	32w1d	29w2d	35w1d
3.30	20w2d	18w5d	22w0d	6.20	32w4d	29w5d	35w5d
3.40	20w5d	19w1d	22w2d	6.30	33w1d	30w1d	36w2d
3.50	21w0d	19w3d	22w5d	6.40	33w4d	30w4d	36w6d
3.60	21w3d	19w5d	23w1d	6.50	34w1d	31w0d	37w3d
3.70	21w5d	20w1d	23w4d	6.60	34w4d	31w3d	38w0d
3.80	22w1d	20w3d	24w0d	6.70	35w1d	32w0d	38w5d

**Fetal Growth Table**

*Chitty LS, Altman DG, et al. : Charts of fetal size:4. Femur Length Bri. J Obstet & Gyn. Vol 101, 132-135, 1994*

Age (W)	Growth (cm)	Min (cm)	Max (cm)	Age (W)	Growth (cm)	Min (cm)	Max (cm)
12	0.77	0.55	1.00	28	5.27	4.93	5.61
13	1.09	0.86	1.33	29	5.49	5.14	5.85
14	1.41	1.17	1.65	30	5.71	5.35	6.07
15	1.72	1.47	1.97	31	5.92	5.55	6.29
16	2.03	1.77	2.28	32	6.12	5.74	6.49
17	2.33	2.07	2.59	33	6.31	5.93	6.69
18	2.63	2.36	2.90	34	6.49	6.10	6.88
19	2.92	2.64	3.20	35	6.66	6.26	7.06
20	3.21	2.92	3.49	36	6.82	6.41	7.22
21	3.49	3.19	3.78	37	6.97	6.56	7.38
22	3.76	3.46	4.06	38	7.11	6.69	7.53

23	4.03	3.72	4.34
24	4.29	3.98	4.61
25	4.55	4.23	4.87
26	4.80	4.47	5.13
27	5.04	4.70	5.37

39	7.24	6.81	7.66
40	7.35	6.92	7.79
41	7.46	7.02	7.90
42	7.55	7.11	8.00

### Femur Length (FL) : CAMPBELL

#### GA Table

Professor Campbell's Group at Harris birthright Centre, King's College Hospital

FL (cm)	GA (wd)	±SD (wd)
1.80	15w0d	00w6d
2.20	16w0d	00w6d
2.50	17w0d	00w6d
2.80	18w0d	01w0d
3.00	19w0d	01w0d
3.30	20w0d	01w0d
3.60	21w0d	01w0d
3.90	22w0d	01w1d
4.20	23w0d	01w1d
4.40	24w0d	01w1d
4.70	25w0d	01w2d
4.90	26w0d	01w3d
5.20	27w0d	01w3d

FL (cm)	GA (wd)	±SD (wd)
5.40	28w0d	01w4d
5.60	29w0d	01w5d
5.80	30w0d	01w6d
6.10	31w0d	02w0d
6.30	32w0d	02w1d
6.50	33w0d	02w3d
6.60	34w0d	02w4d
6.80	35w0d	02w6d
6.90	36w0d	03w1d
7.10	37w0d	03w1d
7.20	38w0d	03w1d
7.40	39w0d	03w1d
7.50	40w0d	03w1d

#### Fetal Growth Table

Chitty, I., Campbell, Stuart, "Charts of Fetal Size : 4 Femur Length,"

British J of OB and Gyn., February 1994, Vol. 101, pp. 132-135, Table1.

Age (wd)	Growth (cm)	Age (wd)	Growth (cm)
12w0d	0.85	28w0d	5.24
13w0d	1.10	29w0d	5.63
14w0d	1.41	30w0d	5.80
15w0d	1.71	31w0d	5.97
16w0d	2.05	32w0d	6.13
17w0d	2.27	33w0d	6.28
18w0d	2.69	34w0d	6.43
19w0d	2.98	35w0d	6.62
20w0d	3.22	36w0d	6.83
21w0d	3.54	37w0d	6.99
22w0d	3.72	38w0d	7.08
23w0d	4.06	39w0d	7.17
24w0d	4.35	40w0d	7.47
25w0d	4.61	41w0d	7.48
26w0d	4.69	42w0d	7.60
27w0d	5.02		

**Femur Length (FL) : ASUM(SCW)**

**Fetal Growth Table**

*Australasian Society for Ultrasound in Medicine*

*Policies and Statements - [D7] Statement On Normal Ultrasonic Fetal Measurements (Revised May 2001)*

Age (w)	Growth (mm)	±SD (mm)
11	8.00	2.00
12	10.00	2.50
13	11.00	2.50
14	15.00	3.00
15	17.00	3.50
16	22.00	4.00
17	25.00	4.00
18	28.00	5.00
19	30.00	5.00
20	32.00	6.00
21	34.00	6.00

Age (w)	Growth (mm)	±SD (mm)
22	37.00	5.00
23	43.00	5.00
24	45.00	4.00
25	48.00	5.00
26	49.00	5.00
27	50.00	5.00
28	54.00	4.00
29	55.00	5.50
30	58.00	6.00
31	59.00	5.50
32	62.00	6.00

Age (w)	Growth (mm)	±SD (mm)
33	65.00	4.00
34	66.00	4.00
35	67.00	6.00
36	69.00	6.00
37	72.00	5.00
38	73.00	5.50
39	75.00	6.00
40	76.00	4.00
41	77.00	5.00

**Femur Length (FL) : BESSIS**

**GA Table**

*The data are those provided by Dr. Bessis to M. Le Bel. (Same as SIGMA 20, see memo from Ch. Gahwiler dated , June 23, 1983)*

FL (cm)	GA (wd)	±SD (wd)
1.04	13w0d	1w0d
2.22	17w0d	1w1d
3.37	21w0d	1w1d
4.45	25w0d	1w3d
5.42	29w0d	1w4d
6.42	33w0d	2w1d
6.90	37w0d	2w6d
7.34	41w0d	4w0d

**Femur Length (FL) : CFEF**

**Fetal Growth Table**

*J. Créquat, M. Duyme, G. Brodaty*

*Biométrie 2000. Tables de croissance foetale par le Collège Français d'Echographie Foetale (CFEF) et l'Inserm U155*

*Gynecol Obstet Fertil 2000 Jun;28(6):435-45*

Age (W)	Growth (cm)	Min (cm)	Max (cm)
12	0.63	0.39	0.88
13	0.99	0.73	1.24
14	1.33	1.07	1.60
15	1.67	1.39	1.94
16	2.00	1.70	2.28
17	2.31	2.01	2.61
18	2.62	2.31	2.93
19	2.93	2.61	3.24

Age (W)	Growth (cm)	Min (cm)	Max (cm)
27	5.05	4.67	5.43
28	5.28	4.89	5.66
29	5.49	5.11	5.89
30	5.71	5.31	6.11
31	5.92	5.51	6.31
32	6.11	5.70	6.52
33	6.30	5.89	6.71
34	6.48	6.06	6.89

20	3.22	2.89	3.55	35	6.65	6.23	7.07
21	3.51	3.17	3.84	36	6.81	6.39	7.23
22	3.79	3.44	4.13	37	6.96	6.54	7.39
23	4.05	3.70	4.40	38	7.11	6.68	7.54
24	4.32	3.96	4.68	39	7.25	6.82	7.68
25	4.57	4.20	4.94	40	7.38	6.95	7.81
26	4.82	4.44	5.19	41	7.40	7.00	7.90

**Anterior Posterior Thoracic Diameter (APTD) : HANSMANN**

**GA Table**

*Hansmann, Hackeloer, Staudach, Wittman "Ultrasound Diagnosis in Obstetrics and Gynecology" Springer-Verlag, New York, 1986*

APTD (cm)	GA (W)	APTD (cm)	GA (W)	APTD (cm)	GA (W)	APTD (cm)	GA (W)
2.25	14w	4.65	22w	7.01	30w	9.30	38w
2.58	15w	4.90	23w	7.25	31w	9.53	39w
2.85	16w	5.15	24w	7.62	32w	9.68	40w
3.11	17w	5.48	25w	7.93	33w	9.84	41w
3.46	18w	5.80	26w	8.15	34w	9.91	42w
3.75	19w	6.15	27w	8.40	35w		
4.00	20w	6.39	28w	8.75	36w		
4.34	21w	6.70	29w	9.02	37w		

**Fetal Growth Table**

*Hansmann, Hackeloer, Staudach, Wittman "Ultrasound Diagnosis in Obstetrics and Gynecology" Springer-Verlag, New York, 1986*

Age (W)	Growth (cm)	Min (cm)	Max (cm)	Age (W)	Growth (cm)	Min (cm)	Max (cm)
14	2.25	2.25	2.25	29	6.70	5.70	7.70
15	2.58	2.21	2.95	30	7.01	6.01	8.01
16	2.85	2.45	3.25	31	7.25	6.10	8.40
17	3.11	2.61	3.61	32	7.62	6.52	8.72
18	3.46	3.02	3.90	33	7.93	6.81	9.05
19	3.75	3.25	4.25	34	8.15	6.90	9.40
20	4.00	3.40	4.60	35	8.40	7.08	9.72
21	4.34	3.76	4.92	36	8.75	7.40	10.10
22	4.65	4.04	5.26	37	9.02	7.62	10.42
23	4.90	4.20	5.60	38	9.30	7.90	10.70
24	5.15	4.35	5.95	39	9.53	8.06	11.00
25	5.48	4.68	6.28	40	9.68	8.16	11.20
26	5.80	4.95	6.65	41	9.84	8.32	11.35
27	6.15	5.30	7.00	42	9.91	8.41	11.40
28	6.39	5.43	7.35				

**Anterior Posterior Thoracic Diameter (APTD) and Thorax Transverse Diameter (TTD) : SHINOZUKA**

**GA Table**

Norio Shinozuka, Haruo Masuda, Hideyuki Kagawa, and Yuji Taketani. Department of Obstetrics and Gynecology, Faculty of Medicine, University of Tokyo. *Jpn J Med Ultrasonics* 23(12) 877-888,1996

APTD x TTD (cm <sup>2</sup> )	GA (wd)	±SD (wd)	APTD x TTD (cm <sup>2</sup> )	GA (wd)	±SD (wd)
10.00	16w1d	01w1d	52.00	29w3d	01w6d
12.00	17w0d	01w1d	54.00	30w0d	01w6d
14.00	17w6d	01w1d	56.00	30w3d	01w6d
16.00	18w4d	01w1d	58.00	31w0d	02w0d
18.00	19w3d	01w1d	60.00	31w3d	02w0d
20.00	20w1d	01w1d	62.00	31w6d	02w0d
22.00	20w6d	01w2d	64.00	32w3d	02w1d
24.00	21w4d	01w2d	66.00	32w6d	02w1d
26.00	22w2d	01w2d	68.00	33w3d	02w1d
28.00	22w6d	01w2d	70.00	33w6d	02w2d
30.00	23w4d	01w2d	72.00	34w2d	02w2d
32.00	24w1d	01w3d	74.00	34w6d	02w3d
34.00	24w5d	01w3d	76.00	35w3d	02w3d
36.00	25w2d	01w3d	78.00	35w6d	02w3d
38.00	25w6d	01w3d	80.00	36w3d	02w4d
40.00	26w3d	01w4d	82.00	37w0d	02w4d
42.00	27w0d	01w4d	84.00	37w4d	02w4d
44.00	27w3d	01w4d	86.00	38w1d	02w4d

46.00	28w0d	01w5d
48.00	28w4d	01w5d
50.00	29w0d	01w5d

88.00	38w5d	02w5d
90.00	39w2d	02w5d

**Fetal Growth Table**

Norio Shinozuka, Haruo Masuda, Hideyuki Kagawa, and Yuji Taketani. Department of Obstetrics and Gynecology, Faculty of Medicine, University of Tokyo. *Jpn J Med Ultrasonics* 23(12) 877-888,1996

Age (wd)	Min (cm <sup>2</sup> )	Growth (cm <sup>2</sup> )	Max (cm <sup>2</sup> )
16w3d	7.90	11.20	14.60
17w3d	9.70	13.30	17.00
18w3d	11.60	15.60	19.60
19w3d	13.70	18.10	22.40
20w3d	16.10	20.80	25.50
21w3d	18.50	23.60	28.80
22w3d	21.20	26.70	32.20
23w3d	23.90	29.90	35.90
24w3d	26.80	33.20	39.70
25w3d	29.80	36.70	43.60
26w3d	33.00	40.30	47.70
27w3d	36.20	44.10	52.00
28w3d	39.40	47.90	56.30
29w3d	42.80	51.80	60.80

Age (wd)	Min (cm <sup>2</sup> )	Growth (cm <sup>2</sup> )	Max (cm <sup>2</sup> )
30w3d	46.20	55.70	65.30
31w3d	49.60	59.70	69.90
32w3d	53.00	63.80	74.50
33w3d	56.50	67.80	79.20
34w3d	59.90	71.90	83.90
35w3d	63.30	75.90	88.60
36w3d	66.60	79.90	93.30
37w3d	69.80	83.90	97.90
38w3d	72.90	87.70	102.50
39w3d	76.00	91.50	107.00
40w3d	78.90	95.10	111.40
41w3d	81.60	98.60	115.70
42w3d	84.10	102.00	119.80



## Thorax Transverse Diameter (TTD) : HANSMANN

GA Table

TTD (cm)	GA (wd)	±SD (wd)	TTD (cm)	GA (wd)	±SD (wd)
1.70	12w0d	01w0d	6.50	27w0d	02w3d
2.00	13w0d	01w0d	6.90	28w0d	02w3d
2.40	14w0d	01w0d	7.20	29w0d	02w4d
2.70	15w0d	01w1d	7.40	30w0d	02w5d
3.10	16w0d	01w1d	7.80	31w0d	02w6d
3.40	17w0d	01w2d	8.10	32w0d	03w0d
3.70	18w0d	01w2d	8.30	33w0d	03w1d
4.00	19w0d	01w3d	8.60	34w0d	03w4d
4.40	20w0d	01w4d	8.90	35w0d	04w0d
4.70	21w0d	01w5d	9.20	36w0d	04w3d
5.00	22w0d	01w6d	9.40	37w0d	04w3d
5.30	23w0d	02w0d	9.70	38w0d	04w3d
5.60	24w0d	02w1d	9.90	39w0d	04w3d
5.90	25w0d	02w1d	10.10	40w0d	04w3d
6.20	26w0d	02w2d			

Fetal Growth Table

Hansmann, Hackeloer, Staudach, Wittman "Ultrasound Diagnosis in Obstetrics and Gynecology" Springer-Verlag, New York, 1986

Age (W)	Growth (cm)	Min (cm)	Max (cm)	Age (W)	Growth (cm)	Min (cm)	Max (cm)
12	1.70	1.70	1.70	27	6.50	5.90	7.30
13	2.00	2.00	2.00	28	6.90	6.20	7.70
14	2.40	2.00	2.80	29	7.20	6.40	8.00
15	2.70	2.30	3.10	30	7.40	6.70	8.30
16	3.10	2.70	3.50	31	7.80	7.00	8.60
17	3.40	3.00	3.80	32	8.10	7.30	8.90
18	3.70	3.30	4.20	33	8.30	7.50	9.30
19	4.00	3.60	4.60	34	8.60	7.80	9.60
20	4.40	3.90	4.90	35	8.90	8.00	9.90
21	4.70	4.20	5.30	36	9.20	8.30	10.20
22	5.00	4.50	5.60	37	9.40	8.50	10.50
23	5.30	4.80	6.00	38	9.70	8.70	10.80
24	5.60	5.00	6.30	39	9.90	8.90	11.10
25	5.90	5.30	6.70	40	10.10	9.10	11.40
26	6.20	5.60	7.00	41	10.20	9.20	11.70

**Gestational Sac (GS) : KOREAN**

**GA Table**

Y.G Park. "The Standardization of Fetal body parts according to the normal Korean Gestational Age in Ultrasound" Korean Ultrasound Institute, Vol. 14, No.2, 1995

$$GA = GS \times 0.71887 + 6.156004$$

Output Unit : w(weeks)

Input Unit : cm

Min Range : 2.5 cm

Max Range : 6.1 cm

**Gestational Sac (GS) : HANSMANN**

**GA Table**

Hansmann M., Hackeloer BJ, Staudach A, Wittman. "Ultrasound Diagnosis in Obstetrics and Gynecology." Springer- Verlag, New York, 1986.

GS (cm)	Age (wd)
0.70	04w6d
0.90	05w5d
1.00	06w0d
1.30	06w2d
1.50	06w5d
2.40	07w3d
2.80	08w2d
3.40	09w0d

**Gestational Sac (GS) : HELLMAN**

**GA Table**

Hellman LM, Kobayashi M, Fillisti I, et al. Growth and development of the human fetus prior to the 20th week of gestation. American Journal of Obstetrics and Gynecology

GS (cm)	Age (wd)	GS (cm)	Age (wd)	GS (cm)	Age (wd)	GS (cm)	Age (wd)
0.40	04w1d	1.90	06w2d	3.40	08w3d	4.90	10w4d
0.50	04w2d	2.00	06w3d	3.50	08w4d	5.00	10w5d
0.60	04w3d	2.10	06w4d	3.60	08w5d	5.10	11w0d
0.70	04w4d	2.20	06w5d	3.70	08w6d	5.20	11w1d
0.80	04w5d	2.30	06w6d	3.80	09w0d	5.30	11w2d
0.90	04w6d	2.40	07w0d	3.90	09w1d	5.40	11w3d
1.00	05w0d	2.50	07w1d	4.00	09w2d	5.50	11w4d
1.10	05w1d	2.60	07w2d	4.10	09w3d	5.60	11w5d
1.20	05w2d	2.70	07w3d	4.20	09w4d	5.70	11w6d
1.30	05w3d	2.80	07w4d	4.30	09w5d	5.80	11w6d
1.40	05w4d	2.90	07w5d	4.40	09w6d	5.90	12w0d
1.50	05w5d	3.00	07w6d	4.50	10w0d	6.00	12w1d
1.60	05w6d	3.10	08w0d	4.60	10w1d		
1.70	06w0d	3.20	08w1d	4.70	10w2d		
1.80	06w1d	3.30	08w2d	4.80	10w3d		

**Gestational Sac (GS) : NYBERG****GA Table**

Nyberg, David, A., Hill, Lyndon, M., Bohm-Vele, Marcela., Mendelson, Ellen, B.

"Transvaginal Ultrasound." Mosby Yearbook, 76. 1992

$$GA = 0.132 \times GS_{mm} + 4.299$$

Output Unit : w(weeks)

Input Unit : mm

Min Range : 0.14 cm

Max Range : 5.54 cm

**Gestational Sac (GS) : TOKYO****GA Table**

Tokyo University Takashi Okai, et al. Japan Society of Obstetrics and Gynecology,

Vol.38, No.8

OFD (cm)	G.A (wd)	±SD (wd)
1.00	4w0d	1w0d
1.60	5w0d	1w1d
2.20	6w0d	1w4d
2.70	7w0d	1w5d
3.40	8w0d	1w6d
4.10	9w0d	2w0d
4.80	10w0d	2w1d
5.70	11w0d	2w2d
6.70	12w0d	2w3d

**Occipital Frontal Diameter (OFD) : HANSMANN****GA Table**

OFD (cm)	G.A (wd)	±SD (wd)	OFD (cm)	G.A (wd)	±SD (wd)
3.10	14w0d	01w3d	9.10	28w0d	02w3d
3.80	15w0d	01w2d	9.50	29w0d	02w5d
4.10	16w0d	01w1d	9.80	30w0d	03w0d
4.60	17w0d	01w1d	10.00	31w0d	03w2d
5.00	18w0d	01w1d	10.30	32w0d	03w5d
5.40	19w0d	01w2d	10.50	33w0d	04w4d
5.80	20w0d	01w2d	10.70	34w0d	04w4d
6.30	21w0d	01w3d	10.90	35w0d	04w4d
6.70	22w0d	01w3d	11.10	36w0d	04w4d
7.20	23w0d	01w4d	11.20	37w0d	04w4d
7.60	24w0d	01w5d	11.30	38w0d	04w4d
8.00	25w0d	02w0d	11.40	39w0d	05w0d
8.40	26w0d	02w1d	11.50	40w0d	05w4d
8.80	27w0d	02w2d			

**Fetal Growth Table**

Hansmann, Hackeloer, Staudach, Wittman "Ultrasound Diagnosis in Obstetrics and Gynecology" Springer- Verlag, New York, 1986, p.431.

Age (W)	Growth (cm)	Min (cm)	Max (cm)
14	3.10	3.10	3.10
15	3.80	3.20	4.20
16	4.10	3.60	4.60
17	4.60	4.10	5.10
18	5.00	4.50	5.50
19	5.40	4.90	6.00
20	5.80	5.30	6.40
21	6.30	5.70	6.90
22	6.70	6.10	7.30
23	7.20	6.50	7.80
24	7.60	6.90	8.20
25	8.00	7.30	8.70
26	8.40	7.60	9.10
27	8.80	8.00	9.50

Age (W)	Growth (cm)	Min (cm)	Max (cm)
28	9.10	8.30	9.80
29	9.50	8.70	10.10
30	9.80	8.90	10.50
31	10.00	9.20	10.70
32	10.30	9.50	11.00
33	10.50	9.70	11.20
34	10.70	9.90	11.50
35	10.90	10.10	11.70
36	11.10	10.30	11.80
37	11.20	10.40	12.00
38	11.30	10.50	12.10
39	11.40	10.60	12.30
40	11.50	10.70	12.40

**Occipital Frontal Diameter (OFD) : ASUM(SCW)**

**Fetal Growth Table**

Australasian Society for Ultrasound in Medicine

Policies and Statements - [D7] Statement On Normal Ultrasonic Fetal Measurements (Revised May 2001)

Age (W)	Growth (mm)	±SD (mm)	Age (W)	Growth (mm)	±SD (mm)
11	21.00	2.00	27	86.00	4.50
12	24.00	2.00	28	95.00	5.00
13	29.00	3.00	29	97.00	5.50
14	34.00	3.00	30	98.00	5.50
15	38.00	3.00	31	101.00	5.00
16	46.00	3.00	32	102.00	5.00
17	50.00	3.00	33	107.00	5.50
18	54.00	3.50	34	108.00	5.50
19	57.00	3.50	35	109.00	5.50
20	61.00	3.50	36	112.00	5.50
21	63.00	4.00	37	113.00	6.00
22	68.00	3.50	38	116.00	5.50
23	76.00	4.00	39	119.00	6.00
24	79.00	4.00	40	120.00	6.00
25	82.00	4.50	41	122.00	6.00
26	84.00	4.50			

**Occipital Frontal Diameter (OFD) : KOREAN**

**GA Table**

Y.G Park. "The Standardization of Fetal body parts according to the normal Korean Gestational Age in Ultrasound" Korean Ultrasound Institute, Vol. 14, No.2, 1995

$$GA = OFD \times 1.55941 + 0.07730580 \times OFD^2 + 7.937391$$

Output Unit : w(weeks)

Input Unit : cm

Min Range : 2.4 cm

Max Range : 12.4 cm

**Fetal Growth Table**

Y.G Park. "The Standardization of Fetal body parts according to the normal Korean Gestational Age in Ultrasound" Korean Ultrasound Institute, Vol. 14, No.2, 1995

$$OFD = 5.956658 \times MA - 0.045874 \times MA^2 - 40.707331 \text{ (Unit: mm)}$$

Output Unit : cm

Input Unit : w(week)

Min Range : 12w

Max Range : 40w

Age (W)	Growth (cm)	±SD (wd)	Age (W)	Growth (cm)	±SD (wd)
12	2.503	0.391	32	10.283	0.357
16	4.250	0.269	34	10.716	0.390
20	5.918	0.303	36	11.553	0.365
24	7.479	0.564	38	12.053	0.233
28	9.173	0.393	40	12.059	0.598

**Occipital Frontal Diameter (OFD) : MERZ**

**GA Table**

OFD (cm)	GA (wd)	OFD (cm)	GA (wd)	OFD (cm)	GA (wd)	OFD (cm)	GA (wd)
3.00	12w5d	5.60	19w0d	8.20	25w5d	10.20	32w0d
3.20	13w0d	5.80	19w5d	8.40	26w0d	10.40	32w5d
3.40	13w5d	6.00	20w0d	8.60	26w5d	10.50	33w0d
3.50	14w0d	6.30	20w5d	8.80	27w0d	10.60	33w5d
3.70	14w5d	6.50	21w0d	9.00	27w5d	10.70	34w0d
3.90	15w0d	6.70	21w5d	9.10	28w0d	10.80	34w5d
4.10	15w5d	6.90	22w0d	9.30	28w5d	10.90	35w0d

4.30	16w0d	7.10	22w5d	9.40	29w0d	11.00	35w5d
4.50	16w5d	7.30	23w0d	9.60	29w5d	11.10	36w5d
4.70	17w0d	7.50	23w5d	9.70	30w0d	11.20	37w0d
5.00	17w5d	7.70	24w0d	9.90	30w5d	11.30	38w0d
5.20	18w0d	7.90	24w5d	10.00	31w0d	11.40	39w0d
5.40	18w5d	8.10	25w0d	10.10	31w5d	11.50	41w5d

**Fetal Growth Table**

Age (w)	Growth (cm)	Min (cm)	Max (cm)	Age (w)	Growth (cm)	Min (cm)	Max (cm)
13	3.20	2.80	3.60	28	9.10	8.60	9.70
14	3.50	3.10	4.00	29	9.40	8.90	10.00
15	3.90	3.50	4.30	30	9.70	9.20	10.30
16	4.30	3.90	4.80	31	10.00	9.40	10.60
17	4.70	4.30	5.20	32	10.20	9.70	10.80
18	5.20	4.70	5.60	33	10.50	9.90	11.10
19	5.60	5.10	6.10	34	10.70	10.10	11.30
20	6.00	5.60	6.50	35	10.90	10.30	11.50
21	6.50	6.00	6.90	36	11.00	10.40	11.60
22	6.90	6.40	7.40	37	11.20	10.50	11.80
23	7.30	6.80	7.80	38	11.30	10.60	11.90
24	7.70	7.20	8.20	39	11.40	10.70	12.00
25	8.10	7.50	8.60	40	11.40	10.80	12.10
26	8.40	7.90	9.00	41	11.50	10.80	12.10
27	8.80	8.20	9.30				

**Outer Ocular Distance (OOD) : JENATY**

**GA Table**

Jeanty, P., Rodesch, F., Delbeke, D., Dumont, J. "Estimation of Gestational Age from Measurements of Fetal Long Bones" *Journal of Ultrasound Medicine*, 3: 75-79, February, 1984

OOD (cm)	GA (wd)	Min (wd)	Max (wd)	OOD (cm)	GA (wd)	Min (wd)	Max (wd)
1.50	10w3d	07w1d	13w6d	4.10	25w6d	23w1d	29w1d
1.60	11w0d	07w5d	14w3d	4.20	26w4d	23w1d	29w6d
1.70	11w4d	08w2d	15w0d	4.30	27w1d	23w6d	30w3d
1.80	12w1d	08w6d	15w4d	4.40	27w5d	24w3d	31w0d
1.90	12w6d	09w4d	16w1d	4.50	28w2d	25w0d	31w4d
2.00	13w3d	10w1d	16w5d	4.60	28w6d	25w4d	32w1d
2.10	14w0d	10w5d	17w2d	4.70	29w4d	26w1d	32w6d
2.20	14w4d	11w2d	17w6d	4.80	30w1d	26w6d	33w3d
2.30	15w1d	11w6d	18w4d	4.90	30w5d	27w2d	34w0d
2.40	15w6d	12w4d	19w1d	5.00	31w2d	27w6d	34w4d
2.50	16w3d	13w1d	19w5d	5.10	31w6d	28w4d	35w1d
2.60	17w0d	13w5d	20w2d	5.20	32w4d	29w1d	35w6d
2.70	17w4d	14w2d	20w6d	5.30	33w0d	29w5d	36w3d
2.80	18w1d	14w6d	21w4d	5.40	33w4d	30w2d	37w0d
2.90	18w6d	15w4d	22w1d	5.50	34w1d	30w6d	37w4d
3.00	19w3d	16w1d	22w5d	5.60	34w6d	31w4d	38w1d
3.10	20w0d	16w4d	23w2d	5.70	35w3d	32w1d	38w5d
3.20	20w4d	17w1d	23w6d	5.80	36w0d	32w5d	39w2d
3.30	21w1d	17w6d	24w4d	5.90	36w4d	33w2d	39w6d
3.40	21w5d	18w3d	25w1d	6.00	37w1d	33w6d	40w4d

3.50	22w2d	19w0d	25w5d	6.10	37w6d	34w4d	41w1d
3.60	22w6d	19w4d	26w2d	6.20	38w3d	35w1d	41w4d
3.70	23w4d	20w1d	26w6d	6.30	39w0d	35w5d	42w2d
3.80	24w1d	20w6d	27w3d	6.40	39w4d	36w2d	42w6d
3.90	24w5d	21w3d	28w0d	6.50	40w1d	36w6d	43w4d
4.00	25w2d	22w0d	28w4d				

**Humerus (HUM) : JENATY**

**GA Table**

Jeanty P, Rodesch F, Delbeke D, Mumont J, "Estimation of Gestational Age from Measurements of Fetal Long Bones." *J Ultrasound Med* 3:75-79, 1984

Humerus (cm)	GA (wd)	±SD (wd)	Humerus (cm)	GA (wd)	±SD (wd)
1.00	12w4d	02w5d	4.00	24w2d	02w6d
1.10	12w6d	02w5d	4.10	24w6d	02w5d
1.20	13w1d	02w5d	4.20	25w2d	02w5d
1.30	13w4d	02w5d	4.30	25w5d	02w6d
1.40	13w6d	02w5d	4.40	26w1d	02w6d
1.50	14w1d	02w5d	4.50	26w5d	02w6d
1.60	14w4d	02w5d	4.60	27w1d	02w6d
1.70	14w6d	02w5d	4.70	27w5d	02w6d
1.80	15w1d	02w6d	4.80	28w1d	02w6d
1.90	15w4d	02w5d	4.90	28w6d	02w5d
2.00	15w6d	02w6d	5.00	29w2d	02w5d
2.10	16w2d	02w6d	5.10	29w6d	02w5d
2.20	16w5d	02w6d	5.20	30w2d	02w6d
2.30	17w1d	02w6d	5.30	30w6d	02w5d

2.40	17w3d	02w5d	5.40	31w3d	02w5d
2.50	17w6d	02w5d	5.50	32w0d	02w5d
2.60	18w1d	02w6d	5.60	32w4d	02w5d
2.70	18w4d	02w6d	5.70	33w1d	02w5d
2.80	19w0d	02w6d	5.80	33w4d	02w6d
2.90	19w3d	02w5d	5.90	34w1d	02w5d
3.00	19w6d	02w5d	6.00	34w6d	02w5d
3.10	20w2d	02w5d	6.10	35w2d	02w6d
3.20	20w5d	02w6d	6.20	35w6d	02w6d
3.30	21w1d	02w5d	6.30	36w4d	02w5d
3.40	21w4d	02w5d	6.40	37w1d	02w5d
3.50	22w0d	02w6d	6.50	37w5d	02w6d
3.60	22w4d	02w4d	6.60	38w2d	02w6d
3.70	22w6d	02w6d	6.70	38w6d	02w6d
3.80	23w3d	02w5d	6.80	39w4d	02w5d
3.90	23w6d	02w5d	6.90	40w1d	02w5d

**Fetal Growth Table**

Jeanty, P., Romero, R. "Obstetrical Ultrasound." New York, McGraw-hill, 1983, p.190

Age (W)	Growth (cm)	Min (cm)	Max (cm)	Age (W)	Growth (cm)	Min (cm)	Max (cm)
13	1.10	0.60	1.60	27	4.60	4.10	5.10
14	1.40	0.90	1.90	28	4.80	4.30	5.30
15	1.70	1.20	2.20	29	5.00	4.50	5.50
16	2.00	1.50	2.50	30	5.10	4.70	5.60
17	2.20	1.80	2.70	31	5.30	4.80	5.80
18	2.50	2.00	3.00	32	5.50	5.00	6.00

19	2.80	2.30	3.30	33	5.60	5.10	6.10
20	3.00	2.50	3.50	34	5.80	5.30	6.30
21	3.30	2.80	3.80	35	5.90	5.40	6.40
22	3.50	3.00	4.00	36	6.10	5.60	6.50
23	3.80	3.30	4.20	37	6.20	5.70	6.70
24	4.00	3.50	4.50	38	6.30	5.90	6.80
25	4.20	3.70	4.70	39	6.50	6.00	7.00
26	4.40	3.90	4.90	40	6.60	6.10	7.10

**Humerus (HUM) : KOREAN****GA Table**

Y.G Park. "The Standardization of Fetal body parts according to the normal Korean Gestational Age in Ultrasound" Korean Ultrasound Institute, Vol. 14, No.2, 1995

$$GA = HUM \times 3.02718 + 0.2005 \times HUM^2 + 9.907522$$

Output Unit : w(weeks)

Input Unit : cm

Min Range : 0.7 cm

Max Range : 7.3 cm

**Fetal Growth Table**

Y.G Park. "The Standardization of Fetal body parts according to the normal Korean Gestational Age in Ultrasound" Korean Ultrasound Institute, Vol. 14, No.2, 1995

$$HUM = 3.679948 \times MA - 0.029359 \times MA^2 - 33.413660 \text{ (Unit: mm)}$$

Output Unit : cm

Input Unit : w(week)

Min Range : 12w

Max Range : 40w

Age (W)	Growth (cm)	±SD (cm)	Age (W)	Growth (cm)	±SD (cm)
12	0.690	0.118	32	5.495	0.212
16	1.796	0.122	34	5.800	0.253
20	2.803	0.129	36	6.114	0.249
24	3.802	0.169	38	6.396	0.256
28	4.605	0.178	40	6.579	0.316

**Humerus (HUM) : MERZ**

**GA Table**

Merz, Eberband, "Ultrasonic Mensuration of Fetal Limb Bones in the Second and Third Trimesters." *J Clin Ultrasound* 15: 175-183, Table 1, March/April 1987

Humerus (cm)	G.A (wd)	Humerus (cm)	G.A (wd)	Humerus (cm)	G.A (wd)
1.00	13w0d	3.70	23w0d	5.60	33w0d
1.20	14w0d	3.80	24w0d	5.80	34w0d
1.40	15w0d	4.20	25w0d	5.90	35w0d
1.70	16w0d	4.30	26w0d	6.00	36w0d
2.00	17w0d	4.50	27w0d	6.10	37w0d
2.30	18w0d	4.70	28w0d	6.40	38w0d
2.60	19w0d	4.80	29w0d	6.50	39w0d
2.90	20w0d	5.00	30w0d	6.60	40w0d
3.20	21w0d	5.30	31w0d		
3.30	22w0d	5.40	32w0d		

**Fetal Growth Table**

Merz, Eberband, "Ultrasonic Mensuration of Fetal Limb Bones in the Second and Third Trimesters." *J Clin Ultrasound* 15: 175-183, Table 1, March/April 1987

Age (W)	Growth (cm)	Min (cm)	Max (wd)	Age (W)	Growth (cm)	Min (cm)	Max (wd)
12	0.80	0.40	1.10	27	4.60	4.20	5.00
13	1.10	0.70	1.40	28	4.80	4.40	5.20
14	1.40	1.00	1.70	29	5.00	4.60	5.40
15	1.60	1.30	2.00	30	5.20	4.80	5.60
16	1.90	1.60	2.30	31	5.40	4.90	5.80
17	2.20	1.80	2.60	32	5.50	5.10	6.00
18	2.50	2.10	2.80	33	5.70	5.30	6.20
19	2.70	2.40	3.10	34	5.90	5.40	6.30
20	3.00	2.60	3.40	35	6.00	5.50	6.50
21	3.20	2.90	3.60	36	6.10	5.70	6.60
22	3.50	3.10	3.90	37	6.30	5.80	6.70
23	3.70	3.30	4.10	38	6.40	5.90	6.90
24	4.00	3.60	4.40	39	6.50	6.00	7.00
25	4.20	3.80	4.60	40	6.60	6.20	7.10
26	4.40	4.00	4.80				



## ■ Humerus (HUM) : OSAKA

### GA Table

Osaka University Method 1989, 3 by Univ. Of Osaka

Humerus (cm)	G.A (wd)	Humerus (cm)	G.A (wd)	Humerus (cm)	G.A (wd)
1.00	13w0d	2.80	19w4d	4.60	28w0d
1.10	13w2d	2.90	20w0d	4.70	28w4d
1.20	13w5d	3.00	20w3d	4.80	29w1d
1.30	14w0d	3.10	20w5d	4.90	29w5d
1.40	14w2d	3.20	21w2d	5.00	30w3d
1.50	14w5d	3.30	21w4d	5.10	31w0d
1.60	15w0d	3.40	22w1d	5.20	31w5d
1.70	15w3d	3.50	22w4d	5.30	32w3d
1.80	15w5d	3.60	23w0d	5.40	33w1d
1.90	16w1d	3.70	23w3d	5.50	33w6d
2.00	16w3d	3.80	23w6d	5.60	34w4d
2.10	16w5d	3.90	24w2d	5.70	35w3d
2.20	17w2d	4.00	24w6d	5.80	36w2d
2.30	17w4d	4.10	25w3d	5.90	37w1d
2.40	18w0d	4.20	26w0d	6.00	38w1d
2.50	18w3d	4.30	26w3d	6.10	39w2d
2.60	18w6d	4.40	26w6d	6.20	40w0d
2.70	19w1d	4.50	27w3d		

### Fetal Growth Table

Osaka University Method 1989, 3 by Univ. Of Osaka

Age (W)	Growth (cm)	±SD (cm)	Age (W)	Growth (cm)	±SD (cm)
13	1.12	0.21	27	4.48	0.42
14	1.33	0.24	28	4.67	0.41
15	1.56	0.27	29	4.86	0.40
16	1.81	0.30	30	5.03	0.39
17	2.06	0.33	31	5.19	0.38
18	2.32	0.36	32	5.34	0.37
19	2.57	0.38	33	5.48	0.36
20	2.83	0.40	34	5.61	0.34
21	3.09	0.41	35	5.72	0.33
22	3.34	0.42	36	5.83	0.32
23	3.59	0.43	37	5.93	0.31
24	3.83	0.43	38	6.03	0.29
25	4.05	0.43	39	6.11	0.28
26	4.27	0.47	40	6.19	0.28

**Humerus (HUM) : ASUM(SCW)**

**Fetal Growth Table**

*Australasian Society for Ultrasound in Medicine*

*Policies and Statements - [D7] Statement On Normal Ultrasonic Fetal Measurements (Revised May 2001)*

Age (W)	Growth (mm)	±SD (mm)	Age (W)	Growth (mm)	±SD (mm)
11	8.00	3.00	27	47.00	4.00
12	9.00	2.00	28	50.00	5.00
13	11.00	3.00	29	51.00	5.00
14	14.00	4.00	30	52.00	5.00
15	17.00	5.50	31	54.00	5.00
16	21.00	4.00	32	56.00	5.00
17	25.00	5.00	33	57.00	6.00
18	27.00	5.50	34	59.00	5.50
19	29.00	5.00	35	60.00	6.00
20	31.00	5.00	36	62.00	5.00
21	32.00	6.00	37	63.00	6.00
22	35.00	6.00	38	64.00	6.00
23	38.00	4.00	39	65.00	5.50
24	40.00	6.00	40	66.00	6.00
25	43.00	5.00	41	68.00	6.00
26	44.00	4.00			

**Tibia (TIB) : JENATY**

**GA Table**

*Jeanty P, Rodesch F, Delbeke D, Mumont J, "Estimation of Gestational Age from Measurements of Fetal Long Bones." J Ultrasound Med 3:75-79, 1984*

Tibia (cm)	G.A (wd)	Min (wd)	Max (wd)	Tibia (cm)	G.A (wd)	Min (wd)	Max (wd)
1.00	13w3d	10w4d	16w2d	4.00	25w2d	22w3d	28w1d
1.10	13w5d	10w6d	16w4d	4.10	25w5d	22w6d	28w4d
1.20	14w1d	11w1d	17w0d	4.20	26w1d	23w2d	29w1d
1.30	14w3d	11w4d	17w2d	4.30	26w4d	23w5d	29w4d
1.40	14w6d	11w6d	17w5d	4.40	27w1d	24w1d	30w0d
1.50	15w1d	12w1d	18w0d	4.50	27w4d	24w4d	30w4d
1.60	15w4d	12w4d	18w3d	4.60	28w0d	25w1d	30w6d
1.70	15w6d	13w0d	18w6d	4.70	28w4d	25w4d	31w3d
1.80	16w1d	13w2d	19w1d	4.80	29w0d	26w1d	31w6d
1.90	16w4d	13w5d	19w4d	4.90	29w3d	26w4d	32w2d
2.00	17w0d	14w1d	19w6d	5.00	29w6d	27w0d	32w6d
2.10	17w3d	14w4d	20w2d	5.10	30w3d	27w4d	33w2d
2.20	17w6d	14w6d	20w5d	5.20	30w6d	28w0d	33w6d
2.30	18w1d	15w1d	21w1d	5.30	31w3d	28w4d	34w2d
2.40	18w4d	15w4d	21w3d	5.40	31w6d	29w0d	34w6d
2.50	18w6d	16w0d	21w6d	5.50	32w3d	29w4d	35w2d
2.60	19w2d	16w3d	22w1d	5.60	32w6d	30w0d	35w6d
2.70	19w5d	16w6d	22w4d	5.70	33w3d	30w4d	36w2d
2.80	20w1d	17w1d	23w0d	5.80	33w6d	31w0d	36w6d
2.90	20w4d	17w4d	23w4d	5.90	34w3d	31w4d	37w2d
3.00	21w0d	18w1d	23w6d	6.00	34w6d	32w0d	37w6d
3.10	21w3d	18w4d	24w2d	6.10	35w3d	32w4d	38w2d

3.20	21w6d	18w6d	24w5d
3.30	22w1d	19w2d	25w1d
3.40	22w4d	19w5d	25w4d
3.50	23w1d	20w1d	26w0d
3.60	23w4d	20w4d	26w3d
3.70	23w6d	21w0d	26w6d
3.80	24w3d	21w4d	27w2d
3.90	24w6d	21w6d	27w5d

6.20	35w6d	33w0d	38w6d
6.30	36w4d	33w4d	39w3d
6.40	37w0d	34w1d	39w6d
6.50	37w4d	34w4d	40w3d
6.60	38w0d	35w1d	41w0d
6.70	38w4d	35w5d	41w4d
6.80	39w1d	36w1d	42w0d
6.90	39w5d	36w6d	42w4d

**Fetal Growth Table**

Jeanty, P., Romero, R. "Obstetrical Ultrasound." New York, McGraw-hill, 1983, p.192

Age (W)	Growth (cm)	Min (cm)	Max (cm)
14	1.20	0.70	1.70
15	1.50	0.90	2.00
16	1.70	1.20	2.20
17	2.00	1.50	2.50
18	2.20	1.70	2.70
19	2.50	2.00	3.00
20	2.70	2.20	3.30
21	3.00	2.50	3.50
22	3.20	2.70	3.80
23	3.50	3.00	4.00
24	3.70	3.20	4.20
25	4.00	3.40	4.50
26	4.20	3.70	4.70
27	4.40	3.90	4.90

Age (W)	Growth (cm)	Min (cm)	Max (cm)
28	4.60	4.10	5.10
29	4.80	4.30	5.30
30	5.00	4.50	5.50
31	5.20	4.70	5.70
32	5.40	4.80	5.90
33	5.50	5.00	6.00
34	5.70	5.20	6.20
35	5.80	5.30	6.40
36	6.00	5.50	6.50
37	6.10	5.60	6.70
38	6.30	5.80	6.80
39	6.40	5.90	6.90
40	6.60	6.10	7.10

**Tibia (TIB) : MERZ**

**GA Table**

Merz, E., et al. "Ultrasonic Mensuration of Fetal Limb Bones in the Second and Third Trimesters." J Clin Ultrasound 15: 175-183, Table 1, March/April 1987

Tibia (cm)	GA (wd)	Tibia (cm)	GA (wd)	Tibia (cm)	GA (wd)	Tibia (cm)	GA (wd)
0.90	13w0d	3.00	21w0d	4.60	29w0d	6.10	37w0d
1.00	14w0d	3.20	22w0d	4.80	30w0d	6.20	38w0d
1.30	15w0d	3.60	23w0d	5.10	31w0d	6.40	39w0d
1.60	16w0d	3.70	24w0d	5.20	32w0d	6.50	40w0d
1.80	17w0d	4.00	25w0d	5.40	33w0d	6.60	41w0d
2.20	18w0d	4.20	26w0d	5.70	34w0d	6.80	42w0d
2.50	19w0d	4.40	27w0d	5.80	35w0d		
2.70	20w0d	4.50	28w0d	6.00	36w0d		

**Fetal Growth Table**

Merz, E., Grupner, A., Kern, F. "Mathematical Modeling of Fetal Limb Growth." Journal of Clinical Ultrasound. 17: 179-185, March/April, 1989.

Age (W)	Growth (cm)	Min (cm)	Max (cm)	Age (W)	Growth (cm)	Min (cm)	Max (cm)
12	0.70	0.40	1.00	27	4.50	4.00	4.90
13	1.00	0.60	1.30	28	4.70	4.20	5.10
14	1.20	0.90	1.60	29	4.90	4.40	5.30
15	1.50	1.20	1.90	30	5.00	4.60	5.50
16	1.80	1.40	2.10	31	5.20	4.80	5.70
17	2.10	1.70	2.40	32	5.40	5.00	5.80

18	2.30	2.00	2.70
19	2.60	2.20	3.00
20	2.80	2.50	3.20
21	3.10	2.70	3.50
22	3.30	2.90	3.70
23	3.60	3.20	4.00
24	3.80	3.40	4.20
25	4.00	3.60	4.40
26	4.20	3.80	4.60

33	5.60	5.10	6.00
34	5.70	5.30	6.20
35	5.90	5.40	6.30
36	6.00	5.60	6.50
37	6.20	5.70	6.60
38	6.30	5.90	6.80
39	6.40	6.00	6.90
40	6.60	6.10	7.00

2.40	22w1d	01w6d
2.50	22w5d	01w6d
2.60	23w4d	01w6d
2.70	24w1d	02w0d
2.80	24w6d	02w0d
2.90	25w4d	02w0d
3.00	26w1d	02w0d
3.10	26w6d	02w0d
3.20	27w4d	02w0d
3.30	28w1d	02w0d
3.40	28w5d	02w0d
3.50	29w3d	02w0d

4.60	35w2d	02w3d
4.70	35w5d	02w3d
4.80	36w1d	03w1d
4.90	36w4d	03w1d
5.00	36w5d	03w1d
5.10	37w1d	03w1d
5.20	37w4d	03w1d
5.30	37w5d	03w1d
5.40	38w0d	03w1d
5.50	38w2d	03w1d
5.60	38w4d	03w1d

**Cerebellum : HILL**

**GA Table**

Hill L M, Guzick D, Fries J, Hixson J, Rivello D, "The Transverse Cerebellar Diameter in Estimation Gestational Age in the Large-for-Gestational-Age-Fetus." *Obstetrics and Gynecology* 1990. 75:938

CEREB (cm)	G.A (wd)	±SD (wd)
1.40	15w1d	01w0d
1.50	15w5d	01w0d
1.60	16w4d	01w0d
1.70	17w1d	01w0d
1.80	17w6d	01w0d
1.90	18w4d	01w6d
2.00	19w2d	01w6d
2.10	20w0d	01w6d
2.20	20w5d	01w6d
2.30	21w3d	01w6d

CEREB (cm)	G.A (wd)	±SD (wd)
3.60	30w0d	02w3d
3.70	30w4d	02w3d
3.80	31w1d	02w3d
3.90	31w5d	02w3d
4.00	32w2d	02w3d
4.10	32w5d	02w3d
4.20	33w3d	02w3d
4.30	33w6d	02w3d
4.40	34w3d	02w3d
4.50	34w5d	02w3d

**Cerebellum : CHITTY**

**GA Table**

Chitty LS, Altman DG, et al. : *Charts of fetal size:2. Head Measurements Bri. J Obstet & Gyn. Vol 101, 35-43, 1994*

CEREB (cm)	GA (wd)	Min (wd)	Max (wd)
1.30	14w3d	13w1d	16w0d
1.40	15w2d	14w0d	16w6d
1.50	16w2d	14w6d	17w5d
1.60	17w0d	15w4d	18w4d
1.70	17w6d	16w3d	19w3d
1.80	18w5d	17w2d	20w2d
1.90	19w4d	18w0d	21w1d

CEREB (cm)	GA (wd)	Min (wd)	Max (wd)
2.50	24w2d	22w2d	26w3d
2.60	25w0d	23w0d	27w3d
2.70	25w6d	23w4d	28w2d
2.80	26w4d	24w1d	29w2d
2.90	27w2d	24w5d	30w2d
3.00	28w0d	25w1d	31w2d
3.10	28w6d	25w5d	32w2d

2.00	20w3d	18w6d	22w0d
2.10	21w1d	19w4d	22w6d
2.20	22w0d	20w2d	23w5d
2.30	22w5d	21w0d	24w4d
2.40	23w4d	21w5d	25w4d

3.20	29w4d	26w1d	33w3d
3.30	30w2d	26w4d	34w4d
3.40	31w0d	26w6d	35w5d
3.50	31w5d	27w2d	36w6d
3.60	32w3d	27w4d	38w1d

### Cerebellum : GOLDSTEIN

#### Fetal Growth Table

*Cerebellar measurements with ultrasonography in the evaluation of fetal growth and development*

*AM J. Obstet. Gynecol. 156:1065-1069, 1987*

Age (W)	Growth (cm)	Min (cm)	Max (cm)
15	1.40	1.00	1.60
16	1.60	1.40	1.70
17	1.70	1.60	1.80
18	1.80	1.70	1.90
19	1.90	1.80	2.20
20	2.00	1.80	2.20
21	2.20	1.90	2.40
22	2.30	2.10	2.40
23	2.40	2.20	2.60
24	2.50	2.20	2.80
25	2.80	2.30	2.90
26	2.90	2.50	3.20
27	3.00	2.60	3.20

Age (W)	Growth (cm)	Min (cm)	Max (cm)
28	3.10	2.70	3.40
29	3.40	2.90	3.80
30	3.50	3.10	4.00
31	3.80	3.20	4.30
32	3.80	3.30	4.20
33	4.00	3.20	4.40
34	4.00	3.30	4.40
35	4.05	3.10	4.70
36	4.30	3.60	5.50
37	4.50	3.70	5.50
38	4.85	4.00	5.50
39	5.20	5.20	5.50

### Ulna : JEANTY

#### GA Table

*Jeanty P, Rodesch F, Delbeke D, Mumont J, "Estimation of Gestational Age from Measurements of Fetal Long Bones." J Ultrasound Med 3:75-79, 1984*

Ulna (cm)	GA (wd)	Min (wd)	Max (wd)
1.00	13w1d	10w1d	16w1d
1.10	13w4d	10w4d	16w4d
1.20	13w6d	10w6d	16w6d
1.30	14w1d	11w1d	17w2d
1.40	14w4d	11w4d	17w5d
1.50	15w0d	11w6d	18w0d
1.60	15w3d	12w2d	18w3d
1.70	15w5d	12w5d	18w6d
1.80	16w1d	13w1d	19w1d
1.90	16w4d	13w4d	19w4d
2.00	16w6d	13w6d	20w0d
2.10	17w2d	14w2d	20w3d
2.20	17w5d	14w5d	20w6d
2.30	18w1d	15w1d	21w1d
2.40	18w4d	15w4d	21w4d
2.50	19w0d	16w0d	22w1d
2.60	19w3d	16w3d	22w4d
2.70	19w6d	16w6d	22w6d
2.80	20w2d	17w2d	23w2d
2.90	20w6d	17w5d	23w6d
3.00	21w1d	18w1d	24w2d
3.10	21w5d	18w4d	24w6d

Ulna (cm)	GA (wd)	Min (wd)	Max (wd)
3.80	25w1d	22w1d	28w1d
3.90	25w4d	22w4d	28w5d
4.00	26w1d	23w1d	29w1d
4.10	26w5d	23w4d	29w5d
4.20	27w1d	24w1d	30w2d
4.30	27w5d	24w5d	30w6d
4.40	28w2d	25w1d	31w2d
4.50	28w6d	25w6d	31w6d
4.60	29w3d	26w2d	32w3d
4.70	29w6d	26w6d	33w0d
4.80	30w4d	27w3d	33w4d
4.90	31w1d	28w0d	34w1d
5.00	31w4d	28w4d	34w5d
5.10	32w1d	29w1d	35w2d
5.20	32w6d	29w5d	35w6d
5.30	33w3d	30w2d	36w2d
5.40	34w0d	30w6d	37w0d
5.50	34w4d	31w4d	37w5d
5.60	35w1d	32w1d	38w2d
5.70	35w6d	32w6d	38w6d
5.80	36w3d	33w3d	39w4d
5.90	37w1d	34w0d	40w1d

3.20	22w1d	19w1d	25w1d
3.30	22w5d	19w4d	25w5d
3.40	23w1d	20w1d	26w1d
3.50	23w4d	20w4d	26w5d
3.60	24w1d	21w1d	27w1d
3.70	24w4d	21w4d	27w5d

6.00	37w5d	34w4d	40w6d
6.10	38w2d	35w2d	41w3d
6.20	39w0d	35w6d	42w0d
6.30	39w4d	36w4d	42w5d
6.40	40w2d	37w1d	43w2d

**Fetal Growth Table**

Jeanty P, Rodesch F, Delbeke D, Mumont J, "Estimation of Gestational Age from Measurements of Fetal Long Bones." *J Ultrasound Med* 3:75-79, 1984

Age (W)	Growth (cm)	Min (cm)	Max (cm)
13	1.10	0.30	1.80
14	1.30	0.40	1.70
15	1.60	1.00	2.20
16	1.90	0.80	2.40
17	2.10	1.10	3.20
18	2.40	1.30	3.00
19	2.60	2.00	3.20
20	2.90	2.10	3.20
21	3.10	2.50	3.60
22	3.30	2.40	3.70
23	3.50	2.70	4.30
24	3.70	2.90	4.10
25	3.90	3.40	4.40
26	4.10	3.40	4.40

Age (W)	Growth (cm)	Min (cm)	Max (cm)
27	4.30	3.70	4.80
28	4.40	3.70	4.80
29	4.60	4.00	5.10
30	4.70	3.80	5.40
31	4.90	3.90	5.90
32	5.00	4.00	5.80
33	5.20	4.30	6.00
34	5.30	4.40	5.90
35	5.40	4.70	6.10
36	5.50	4.70	6.10
37	5.60	4.90	6.20
38	5.70	4.80	6.30
39	5.70	4.90	6.60
40	5.80	5.00	6.50

**Ulna : MERZ**

**Fetal Growth Table**

Merz, Eberband, "Ultrasonic Mensuration of Fetal Limb Bones in the Second and Third Trimesters."

*J Clin Ultrasound* 15:175-183, Table 1, March/April 1987

Age (W)	Growth (cm)	Min (cm)	Max (cm)
13	0.80	0.50	1.10
14	1.10	0.80	1.40
15	1.50	1.20	1.80
16	1.80	1.50	2.10
17	2.10	1.70	2.40
18	2.30	2.00	2.70
19	2.60	2.30	2.90
20	2.80	2.50	3.20
21	3.10	2.70	3.40
22	3.30	3.00	3.70
23	3.50	3.20	3.90
24	3.70	3.40	4.10
25	3.90	3.60	4.30
26	4.10	3.80	4.50
27	4.30	4.00	4.70

Age (W)	Growth (cm)	Min (cm)	Max (cm)
28	4.50	4.20	4.90
29	4.70	4.30	5.10
30	4.90	4.50	5.20
31	5.00	4.60	5.40
32	5.20	4.80	5.60
33	5.30	4.90	5.70
34	5.50	5.10	5.90
35	5.60	5.20	6.00
36	5.70	5.30	6.10
37	5.80	5.40	6.30
38	5.90	5.50	6.40
39	6.00	5.60	6.50
40	6.10	5.70	6.60
41	6.20	5.80	6.60

## Head Circumference (HC) : KOREAN

### GA Table

Y.G Park. "The Standardization of Fetal body parts according to the normal Korean Gestational Age in Ultrasound" Korean Ultrasound Institute, Vol. 14, No.2, 1995

$$GA = HC \times 1.43245 - 0.010208 \times HC^2 - 0.342015$$

Output Unit : w(weeks)

Input Unit : cm

Min Range : 7.4 cm

Max Range : 35.4 cm

### Fetal Growth Table

Y.G Park. "The Standardization of Fetal body parts according to the normal Korean Gestational Age in Ultrasound" Korean Ultrasound Institute, Vol. 14, No.2, 1995

$$HC = 15.843955 \times MA - 0.112149 \times MA^2 - 99.924727 \text{ (Unit: mm)}$$

Output Unit : cm

Input Unit : w(week)

Min Range : 12w

Max Range : 40w

Age (W)	Growth (cm)	±SD (cm)
12	7.246	0.791
16	12.505	0.746
20	17.188	0.743
24	21.522	1.250

Age (W)	Growth (cm)	±SD (cm)
28	25.989	0.870
32	29.231	0.798
34	30.578	0.771
36	32.239	0.577

Age (W)	Growth (cm)	±SD (cm)
38	33.522	0.297
40	37.283	1.389

## Head Circumference (HC) : HANSMANN

### GA Table

HC (cm)	GA (wd)	±SD (wd)	HC (cm)	GA (wd)	±SD (wd)
10.60	14w0d	01w1d	27.40	28w0d	02w0d
11.50	15w0d	01w1d	28.40	29w0d	02w1d
12.70	16w0d	01w1d	29.30	30w0d	02w3d
14.00	17w0d	01w1d	30.30	31w0d	02w6d
15.20	18w0d	01w1d	31.10	32w0d	03w1d
16.40	19w0d	01w2d	31.80	33w0d	03w2d
17.60	20w0d	01w2d	32.50	34w0d	03w6d
19.00	21w0d	01w2d	33.20	35w0d	04w3d
20.30	22w0d	01w2d	33.70	36w0d	04w3d
21.50	23w0d	01w3d	34.00	37w0d	04w3d
22.60	24w0d	01w3d	34.40	38w0d	04w3d
24.00	25w0d	01w4d	34.70	39w0d	04w3d
25.10	26w0d	01w5d	34.90	40w0d	05w0d
26.30	27w0d	01w6d			

### Fetal Growth Table

Hansmann, Hackeloer, Staudach, Wittman "Ultrasound Diagnosis in Obstetrics and Gynecology" Springer-Verlag, New York, 1986, p.176.

Age (W)	Growth (cm)	Min (cm)	Max (cm)	Age (W)	Growth (cm)	Min (cm)	Max (cm)
14	10.60	10.60	10.60	28	27.40	25.40	29.00
15	11.50	10.30	12.90	29	28.40	26.30	30.10

16	12.70	11.40	14.10
17	14.00	12.50	15.30
18	15.20	13.80	16.60
19	16.40	14.90	18.00
20	17.60	16.10	19.30
21	19.00	17.30	20.60
22	20.30	18.50	21.90
23	21.50	19.80	23.20
24	22.60	21.00	24.40
25	24.00	22.30	25.70
26	25.10	23.40	26.80
27	26.30	24.40	28.00

30	29.30	27.30	31.00
31	30.30	28.20	32.00
32	31.10	29.00	32.80
33	31.80	29.70	33.50
34	32.50	30.30	34.30
35	33.20	31.00	34.90
36	33.70	31.50	35.50
37	34.00	32.10	36.00
38	34.40	32.50	36.40
39	34.70	32.90	36.90
40	34.90	33.30	37.20

**Head Circumference (HC) : HADLOCK**

**GA Table**

Hadlock, F., Deter, R.L., Harrist, R.B., Park, S.K. "Estimating Fetal Age: Computer-Assisted Analysis of Multiple Fetal Growth Parameters" Radiology, 1984, 152: 497-501. (Biometric Age and Growth Equations)

$$GA = 8.96 + 0.54 \times HC + 0.0003 \times HC^3$$

Output Unit : w(weeks)

Input Unit : cm

Min Range : 5.5 cm

Max Range : 35.7 cm

Standard Deviation:

Min Range(w)	Max Range(w)	±2SD(w)
12	18	1.19
18	24	1.48
24	30	2.06
30	36	2.98
36	42	2.70

**Fetal Growth Table**

Hadlock, F., Deter, R.L., Harrist, R.B., Park, S.K. "Estimating Fetal Age: Computer-Assisted Analysis of Multiple Fetal Growth Parameters" Radiology, 1984, 152: 497-501.

$$Equation = 1.56 \times MA - 0.0002548 \times MA^3 - 11.48$$

Output Unit : cm

Input Unit : w(weeks)

Min Range : 12 w

Max Range : 40 w

Standard Deviation: 2SD = 2.00 cm



## Head Circumference (HC) : MERZ

### GA Table

*E. Merz, W. Goldhofer, E. Timor-Tritsch "Ultrasound in Gynecology and Obstetrics"  
Text book and Atlas, 1991 Georg Thieme Verlag, 308-338*

HC (cm)	GA (wd)	Min (wd)	Max (wd)
7.20	12w1d	11w0d	13w1d
7.40	12w2d	11w1d	13w4d
7.60	12w3d	11w1d	13w4d
7.80	12w4d	11w2d	13w5d
8.00	12w5d	11w4d	13w6d
8.20	12w6d	11w4d	14w0d
8.40	12w6d	11w5d	14w1d
8.60	13w1d	11w6d	14w2d
8.80	13w1d	12w0d	14w3d
9.00	13w2d	12w1d	14w4d
9.20	13w4d	12w2d	14w5d
9.40	13w4d	12w3d	14w6d
9.60	13w5d	12w4d	14w6d
9.80	13w6d	12w5d	15w1d
10.00	14w0d	12w6d	15w1d
10.20	14w1d	12w6d	15w4d
10.40	14w2d	13w0d	15w4d
10.60	14w3d	13w1d	15w5d
10.80	14w4d	13w2d	15w6d
11.00	14w5d	13w3d	16w0d

HC (cm)	GA (wd)	Min (wd)	Max (wd)
22.00	23w2d	21w4d	25w0d
22.20	23w4d	21w6d	25w1d
22.40	23w4d	21w6d	25w2d
22.60	23w6d	22w1d	25w4d
22.80	24w0d	22w1d	25w6d
23.00	24w1d	22w3d	26w0d
23.20	24w3d	22w4d	26w1d
23.40	24w4d	22w5d	26w2d
23.60	24w5d	22w6d	26w4d
23.80	24w6d	23w1d	26w5d
24.00	25w1d	23w2d	26w6d
24.20	25w2d	23w4d	27w1d
24.40	25w4d	23w5d	27w2d
24.60	25w5d	23w6d	27w4d
24.80	25w6d	24w1d	27w5d
25.00	26w0d	24w1d	27w6d
25.20	26w1d	24w3d	28w0d
25.40	26w3d	24w4d	28w1d
25.60	26w4d	24w6d	28w3d
25.80	26w6d	25w0d	28w4d

11.20	14w6d	13w4d	16w1d
11.40	15w0d	13w5d	16w2d
11.6	15w1d	13w6d	16w3d
11.80	15w2d	14w0d	16w4d
12.00	15w3d	14w1d	16w5d
12.20	15w4d	14w1d	17w0d
12.40	15w5d	14w2d	17w1d
12.60	15w6d	14w3d	17w1d
12.80	16w0d	14w4d	17w3d
13.00	16w1d	14w5d	17w4d
13.20	16w2d	14w6d	17w5d
13.40	16w3d	15w0d	17w6d
13.60	16w4d	15w1d	18w0d
13.80	16w5d	15w2d	18w1d
14.00	16w6d	15w4d	18w2d
14.20	17w0d	15w4d	18w3d
14.40	17w1d	15w6d	18w4d
14.60	17w2d	15w6d	18w5d
14.80	17w4d	16w0d	19w0d
15.00	17w4d	16w1d	19w1d
15.20	17w6d	16w2d	19w2d
15.40	17w6d	16w3d	19w3d
15.60	18w1d	16w4d	19w4d
15.80	18w1d	16w5d	19w5d
16.00	18w3d	16w6d	19w6d
16.20	18w4d	17w0d	20w0d
16.40	18w5d	17w1d	20w1d

26.00	27w0d	25w1d	28w6d
26.20	27w1d	25w3d	29w0d
26.40	27w3d	25w4d	29w1d
26.60	27w4d	25w6d	29w3d
26.80	27w6d	26w0d	29w4d
27.00	28w1d	26w1d	30w0d
27.20	28w2d	26w3d	30w1d
27.40	28w4d	26w4d	30w3d
27.60	28w5d	26w6d	30w4d
27.80	28w6d	27w0d	30w6d
28.00	29w1d	27w1d	31w0d
28.20	29w2d	27w3d	31w1d
28.40	29w4d	27w5d	31w4d
28.60	29w6d	27w6d	31w5d
28.80	30w0d	28w1d	31w6d
29.00	30w1d	28w2d	32w1d
29.20	30w4d	28w4d	32w3d
29.40	30w5d	28w6d	32w4d
29.60	30w6d	29w0d	32w6d
29.80	31w1d	29w1d	33w0d
30.00	31w3d	29w3d	33w3d
30.20	31w4d	29w4d	33w4d
30.40	31w6d	29w6d	33w6d
30.60	32w1d	30w1d	34w1d
30.80	32w2d	30w2d	34w2d
31.00	32w4d	30w4d	34w4d
31.20	32w6d	30w6d	34w6d

16.60	18w6d	17w2d	20w2d
16.80	19w0d	17w4d	20w4d
17.00	19w1d	17w4d	20w4d
17.20	19w2d	17w6d	20w6d
17.40	19w3d	17w6d	20w6d
17.60	19w4d	18w0d	21w1d
17.80	19w6d	18w1d	21w3d
18.00	19w6d	18w2d	21w4d
18.20	20w1d	18w4d	21w5d
18.40	20w1d	18w4d	21w6d
18.60	20w3d	18w6d	22w0d
18.80	20w4d	19w0d	22w1d
19.00	20w5d	19w1d	22w2d
19.20	20w6d	19w2d	22w4d
19.40	21w1d	19w4d	22w5d
19.60	21w1d	19w4d	22w6d
19.80	21w3d	19w5d	23w0d
20.00	21w4d	19w6d	23w2d
20.20	21w5d	20w0d	23w3d
20.40	21w6d	20w1d	23w4d
20.60	22w1d	20w3d	23w6d
20.80	22w1d	20w4d	23w6d
21.00	22w3d	20w5d	24w1d
21.20	22w4d	20w6d	24w2d
21.40	22w5d	21w0d	24w3d
21.60	22w6d	21w1d	24w4d
21.80	23w1d	21w3d	24w6d

31.40	33w1d	31w1d	35w1d
31.60	33w3d	31w3d	35w3d
31.80	33w4d	31w4d	35w4d
32.00	33w6d	31w6d	36w0d
32.20	34w1d	32w0d	36w1d
32.40	34w3d	32w2d	36w4d
32.60	34w5d	32w4d	36w6d
32.80	34w6d	32w6d	37w0d
33.00	35w1d	33w1d	37w2d
33.20	35w4d	33w2d	37w5d
33.40	35w6d	33w4d	38w0d
33.60	36w1d	33w6d	38w2d
33.80	36w3d	34w1d	38w4d
34.00	36w4d	34w3d	38w6d
34.20	36w6d	34w5d	39w1d
34.40	37w1d	35w0d	39w3d
34.60	37w4d	35w2d	39w5d
34.80	37w6d	35w4d	40w1d
35.00	38w1d	35w6d	40w4d
35.20	38w4d	36w1d	40w6d
35.40	38w6d	36w4d	41w1d
35.60	39w1d	36w6d	41w3d
35.80	39w4d	37w1d	41w6d
36.00	39w6d	37w4d	42w1d
36.20	40w1d	37w6d	42w3d
36.40	40w4d	38w1d	42w6d

**Fetal Growth Table**

*E. Merz, W. Goldhofer, E. Timor-Tritsch "Ultrasound in Gynecology and Obstetrics" Textbook and Atlas, 1991 Georg Thieme Verlag, 308-338*

Age (w)	Growth (cm)	Min (cm)	Max (cm)
12	7.60	6.30	9.00
13	9.00	7.70	10.40
14	10.40	9.00	11.80
15	11.70	10.40	13.20
16	13.10	11.70	14.60
17	14.40	13.00	15.90
18	15.70	14.20	17.20
19	16.90	15.50	18.50
20	18.20	16.70	19.70
21	19.40	17.90	21.00
22	20.50	19.00	22.20
23	21.70	20.10	23.30
24	22.80	21.20	24.50
25	23.90	22.30	25.60
26	24.90	23.30	26.60

Age (w)	Growth (cm)	Min (cm)	Max (cm)
27	25.90	24.30	27.70
28	26.90	25.30	28.70
29	27.90	26.20	29.60
30	28.80	27.10	30.60
31	29.60	27.90	31.50
32	30.50	28.80	32.30
33	31.30	29.60	33.20
34	32.10	30.30	34.00
35	32.80	31.10	34.70
36	33.60	31.80	35.50
37	34.20	32.40	36.20
38	34.90	33.10	36.80
39	35.50	33.70	37.50
40	36.10	34.30	38.10

## Head Circumference (HC) : CHITTY (D)

### GA Table

Chitty LS, Altman DG, et al.: Charts of fetal size: 2. Head measurements. Brit. J. Obstetrics and Gyn Vol 101, 35-43, 1994

HC (cm)	GA (wd)	Min (wd)	Max (wd)	HC (cm)	GA (wd)	Min (wd)	Max (wd)
8.00	12w4d	11w3d	13w5d	20.50	22w5d	21w3d	24w2d
8.50	12w6d	11w6d	14w1d	21.00	23w1d	21w5d	24w5d
9.00	13w2d	12w2d	14w4d	21.50	23w4d	22w1d	25w1d
9.50	13w5d	12w4d	15w0d	22.00	24w0d	22w4d	25w5d
10.00	14w1d	13w0d	15w3d	22.50	24w3d	22w6d	26w1d
10.50	14w4d	13w3d	15w5d	23.00	24w6d	23w2d	26w5d
11.00	15w0d	13w6d	16w1d	23.50	25w3d	23w5d	27w1d
11.50	15w3d	14w2d	16w4d	24.00	25w6d	24w1d	27w5d
12.00	15w6d	14w5d	17w0d	24.50	26w2d	24w3d	28w2d
12.50	16w2d	15w1d	17w3d	25.00	26w5d	24w6d	28w6d
13.00	16w4d	15w4d	17w6d	25.50	27w2d	25w2d	29w3d
13.50	17w0d	15w6d	18w2d	26.00	27w5d	25w5d	30w0d
14.00	17w3d	16w2d	18w5d	26.50	28w2d	26w1d	30w4d
14.50	17w6d	16w5d	19w1d	27.00	28w6d	26w4d	31w2d
15.00	18w2d	17w1d	19w3d	27.50	29w3d	27w0d	32w0d
15.50	18w5d	17w4d	19w6d	28.00	30w0d	27w3d	32w4d
16.00	19w1d	17w6d	20w2d	28.50	30w4d	27w6d	33w3d
16.50	19w3d	18w2d	20w5d	29.00	31w1d	28w3d	34w1d
17.00	19w6d	18w5d	21w1d	29.50	31w5d	28w6d	35w0d
17.50	20w2d	19w1d	21w4d	30.00	32w3d	29w3d	35w6d

18.00	20w5d	19w3d	22w0d	30.50	33w1d	30w0d	36w5d
18.50	21w1d	19w6d	22w3d	31.00	33w6d	30w3d	37w4d
19.00	21w4d	20w2d	22w6d	31.50	34w4d	31w0d	38w4d
19.50	22w0d	20w4d	23w2d	32.00	35w3d	31w5d	39w4d
20.00	22w2d	21w0d	23w5d				

### Fetal Growth Table

Chitty LS, Altman DG, et al.: Charts of fetal size: 2. Head measurements. Brit. J. Obstetrics and Gyn Vol 101, 35-43, 1994

Age (W)	Growth (cm)	Min (cm)	Max (cm)	Age (W)	Growth (cm)	Min (cm)	Max (cm)
12	6.81	5.95	7.67	28	26.24	24.90	27.57
13	8.21	7.32	9.10	29	27.17	25.80	28.54
14	9.60	8.68	10.52	30	28.06	26.67	29.46
15	10.96	10.02	11.91	31	28.91	27.49	30.34
16	12.31	11.33	13.29	32	29.72	28.26	31.17
17	13.63	12.62	14.64	33	30.48	28.99	31.96
18	14.93	13.89	15.96	34	31.19	29.67	32.70
19	16.20	15.13	17.26	35	31.85	30.31	33.40
20	17.44	16.34	18.54	36	32.46	30.89	34.04
21	18.65	17.53	19.78	37	33.03	31.42	34.63
22	19.84	18.68	21.00	38	33.53	31.90	35.17
23	20.99	19.81	22.18	39	33.99	32.33	35.65
24	22.11	20.90	23.33	40	34.39	32.69	36.08
25	23.20	21.95	24.44	41	34.73	33.00	36.45
26	24.25	22.97	25.52	42	35.01	33.26	36.76
27	25.26	23.96	26.57				

**Head Circumference (HC) : CHITTY (M)**

**GA Table**

*Chitty LS, Altman DG, et al.: Charts of fetal size: 2. Head measurements. Brit. J. Obstetrics and Gyn Vol 101, 35-43, 1994*

HC (cm)	GA (wd)	Min (wd)	Max (wd)	HC (cm)	GA (wd)	Min (wd)	Max (wd)
8.50	12w6d	12w1d	13w4d	21.00	22w6d	21w2d	24w4d
9.00	13w2d	12w4d	14w0d	21.50	23w2d	21w5d	25w0d
9.50	13w5d	12w6d	14w3d	22.00	23w5d	22w0d	25w4d
10.00	14w0d	13w2d	14w6d	22.50	24w1d	22w3d	26w0d
10.50	14w3d	13w4d	15w2d	23.00	24w4d	22w6d	26w3d
11.00	14w6d	14w0d	15w6d	23.50	25w0d	23w1d	27w0d
11.50	15w2d	14w3d	16w2d	24.00	25w3d	23w4d	27w3d
12.00	15w5d	14w5d	16w5d	24.50	25w6d	24w0d	28w0d
12.50	16w1d	15w1d	17w1d	25.00	26w3d	24w3d	28w3d
13.00	16w3d	15w3d	17w4d	25.50	26w6d	24w6d	29w0d
13.50	16w6d	15w6d	18w0d	26.00	27w3d	25w2d	29w4d
14.00	17w2d	16w1d	18w3d	26.50	27w6d	25w5d	30w1d
14.50	17w5d	16w4d	18w6d	27.00	28w3d	26w2d	30w5d
15.00	18w1d	17w0d	19w2d	27.50	29w0d	26w5d	31w2d
15.50	18w3d	17w2d	19w5d	28.00	29w4d	27w2d	32w0d
16.00	18w6d	17w5d	20w1d	28.50	30w1d	27w5d	32w4d
16.50	19w2d	18w0d	20w4d	29.00	30w5d	28w2d	33w2d
17.00	19w5d	18w3d	21w0d	29.50	31w2d	28w6d	34w0d
17.50	20w0d	18w5d	21w3d	30.00	32w0d	29w3d	34w5d
18.00	20w3d	19w1d	21w6d	30.50	32w5d	30w0d	35w3d
18.50	20w6d	19w3d	22w2d	31.00	33w3d	30w5d	36w2d

19.00	21w2d	19w6d	22w6d
19.50	21w5d	20w1d	23w2d
20.00	22w0d	20w4d	23w5d
20.50	22w3d	20w6d	24w1d

31.50	34w1d	31w2d	37w1d
32.00	34w6d	32w0d	38w0d
32.50	35w5d	32w5d	38w6d

**Fetal Growth Table**

*Chitty LS, Altman DG, et al.: Charts of fetal size: 2. Head measurements. Brit. J. Obstetrics and Gyn Vol 101, 35-43, 1994*

Age (W)	Growth (cm)	Min (cm)	Max (cm)	Age (W)	Growth (cm)	Min (cm)	Max (cm)
12	6.95	6.13	7.77	28	26.60	25.31	27.90
13	8.36	7.51	9.22	29	27.55	26.23	28.88
14	9.76	8.88	10.64	30	28.46	27.11	29.81
15	11.14	10.23	12.05	31	29.32	27.94	30.71
16	12.50	11.56	13.44	32	30.15	28.73	31.56
17	13.83	12.87	14.80	33	30.92	29.48	32.36
18	15.15	14.15	16.14	34	31.65	30.18	33.12
19	16.43	15.40	17.46	35	32.33	30.83	33.83
20	17.69	16.63	18.75	36	32.96	31.43	34.49
21	18.92	17.83	20.00	37	33.54	31.98	35.10
22	20.12	19.00	21.23	38	34.06	32.47	35.65
23	21.28	20.14	22.43	39	34.53	32.91	36.16
24	22.42	21.24	23.60	40	34.95	33.30	36.60
25	23.52	22.31	24.73	41	35.31	33.63	36.99
26	24.58	23.35	25.82	42	35.61	33.90	37.32
27	25.61	24.35	26.88				

## Head Circumference (HC) : CAMPBELL

### GA Table

Professor Campbell's Group at Harris birthright Centre, King's College Hospital

HC (cm)	GA (wd)	±SD (wd)	HC (cm)	GA (wd)	±SD (wd)
11.50	14w0d	01w3d	27.10	28w0d	02w5d
12.60	15w0d	01w3d	28.10	29w0d	02w6d
13.70	16w0d	01w4d	29.00	30w0d	03w0d
14.80	17w0d	01w5d	29.90	31w0d	03w1d
15.90	18w0d	01w6d	30.80	32w0d	03w4d
17.00	19w0d	02w0d	31.50	33w0d	03w6d
18.10	20w0d	02w1d	32.00	34w0d	04w1d
19.20	21w0d	02w2d	32.50	35w0d	04w1d
20.40	22w0d	02w3d	33.00	36w0d	04w2d
21.50	23w0d	02w3d	33.50	37w0d	04w2d
22.70	24w0d	02w3d	34.00	38w0d	05w0d
23.80	25w0d	02w3d	34.30	39w0d	05w0d
24.90	26w0d	02w4d	34.50	40w0d	05w0d
26.00	27w0d	02w5d			

## Head Circumference (HC) : ASUM(SCW)

### Fetal Growth Table

Australasian Society for Ultrasound in Medicine

Policies and Statements - [D7] Statement On Normal Ultrasonic Fetal Measurements (Revised May 2001)

Age (W)	Growth (mm)	±SD (mm)	Age (W)	Growth (mm)	±SD (mm)
11	59.00	15.00	27	250.00	20.00
12	70.00	15.00	28	263.00	20.00
13	84.00	15.00	29	269.00	25.00
14	96.00	15.00	30	274.00	25.00
15	108.00	15.00	31	284.00	25.00
16	128.00	15.00	32	288.00	25.00
17	141.00	15.00	33	300.00	25.00
18	151.00	20.00	34	305.00	25.00
19	160.00	20.00	35	310.00	25.00
20	170.00	20.00	36	317.00	25.00
21	176.00	20.00	37	321.00	25.00
22	188.00	20.00	38	328.00	25.00
23	210.00	20.00	39	336.00	25.00
24	220.00	20.00	40	340.00	25.00
25	231.00	20.00	41	344.00	25.00
26	238.00	20.00			

## Head Circumference (HC) : CFEF

### Fetal Growth Table

J. Créquat, M. Duyme, G. Brodaty

*Biométrie 2000. Tables de croissance foetale par le Collège Français d'Echographie Foetale (CFEF) et l'Inserm U155*

*Gynecol Obstet Fertil 2000 Jun;28(6):435-45*

Age (W)	Growth (cm)	Min (cm)	Max (cm)
16	12.09	11.06	13.13
17	13.45	12.38	14.54
18	14.76	13.64	15.89
19	16.03	14.85	17.21
20	17.25	16.02	18.49
21	18.42	17.15	19.71
22	19.57	18.24	20.89
23	20.66	19.23	22.03
24	21.72	20.30	23.14
25	22.73	21.24	24.19
26	23.67	22.16	25.20
27	24.60	23.03	26.18
28	25.48	23.86	27.10

Age (W)	Growth (cm)	Min (cm)	Max (cm)
29	26.30	24.64	27.97
30	27.08	25.37	28.81
31	27.83	26.08	29.60
32	28.53	26.72	30.35
33	29.20	27.34	31.04
34	29.81	27.90	31.70
35	30.36	28.42	32.30
36	30.88	28.90	32.88
37	31.35	29.33	33.40
38	31.79	29.73	33.86
39	32.19	30.08	34.30
40	32.40	30.30	34.60

## Fetal Age Table (FTA) : OSAKA

### GA Table

*Osaka University Method 1989, 3 by Univ. Of Osaka*

Fetal (cm <sup>2</sup> )	GA (wd)	Fetal (cm <sup>2</sup> )	GA (wd)	Fetal (cm <sup>2</sup> )	GA (wd)	Fetal (cm <sup>2</sup> )	GA (wd)
5.60	14w0d	26.00	22w5d	47.00	29w0d	68.00	34w4d
6.00	14w2d	27.00	23w1d	48.00	29w2d	69.00	34w6d
7.00	14w5d	28.00	23w3d	49.00	29w4d	70.00	35w1d
8.00	15w3d	29.00	23w5d	50.00	29w6d	71.00	35w3d
9.00	16w1d	30.00	24w0d	51.00	30w1d	72.00	35w5d
10.00	16w3d	31.00	24w2d	52.00	30w3d	73.00	36w0d
11.00	16w5d	32.00	24w5d	53.00	30w5d	74.00	36w2d
12.00	17w3d	33.00	25w0d	54.00	30w6d	75.00	36w4d
13.00	17w6d	34.00	25w2d	55.00	31w1d	76.00	36w6d
14.00	18w2d	35.00	25w4d	56.00	31w3d	77.00	37w1d
15.00	18w4d	36.00	25w6d	57.00	31w5d	78.00	37w3d
16.00	19w1d	37.00	26w1d	58.00	32w0d	79.00	37w5d
17.00	19w4d	38.00	26w3d	59.00	32w2d	80.00	37w6d
18.00	19w6d	39.00	26w5d	60.00	32w3d	81.00	38w2d
19.00	20w2d	40.00	27w0d	61.00	32w5d	82.00	38w4d
20.00	20w5d	41.00	27w2d	62.00	33w0d	83.00	39w0d
21.00	21w0d	42.00	27w4d	63.00	33w2d	84.00	39w1d
22.00	21w3d	43.00	27w6d	64.00	33w4d	85.00	39w3d
23.00	21w5d	44.00	28w1d	65.00	33w6d	86.00	39w6d
24.00	22w1d	45.00	28w3d	66.00	34w0d	86.60	40w0d
25.00	22w3d	46.00	28w5d	67.00	34w2d		

**Fetal Growth Table***Osaka University Method 1989, 3 by Univ. Of Osaka*

Age (wd)	Growth (cm <sup>2</sup> )	±SD (cm <sup>2</sup> )
14w0d	5.60	1.20
14w1d	5.80	1.20
14w2d	6.00	1.20
14w3d	6.30	1.30
14w4d	6.50	1.30
14w5d	6.80	1.30
14w6d	7.10	1.30
15w0d	7.30	1.40
15w1d	7.60	1.40
15w2d	7.80	1.40
15w3d	8.10	1.50
15w4d	8.40	1.50
15w5d	8.70	1.50
15w6d	8.90	1.50
16w0d	9.20	1.60
16w1d	9.50	1.60
16w2d	9.80	1.60
16w3d	10.10	1.70
16w4d	10.40	1.70
16w5d	10.70	1.70
16w6d	11.00	1.80

Age (wd)	Growth (cm <sup>2</sup> )	±SD (cm <sup>2</sup> )
27w1d	40.40	4.80
27w2d	40.90	4.80
27w3d	41.40	4.90
27w4d	41.90	4.90
27w5d	42.40	5.00
27w6d	42.90	5.00
28w0d	43.40	5.10
28w1d	44.00	5.10
28w2d	44.50	5.20
28w3d	45.00	5.20
28w4d	45.50	5.30
28w5d	46.00	5.30
28w6d	46.60	5.40
29w0d	47.10	5.40
29w1d	47.60	5.50
29w2d	48.10	5.60
29w3d	48.70	5.60
29w4d	49.20	5.70
29w5d	49.70	5.70
29w6d	50.20	5.80
30w0d	50.80	5.80

17w0d	11.30	1.80
17w1d	11.60	1.80
17w2d	11.90	1.90
17w3d	12.20	1.90
17w4d	12.50	1.90
17w5d	12.80	2.00
17w6d	13.20	2.00
18w0d	13.50	2.00
18w1d	13.80	2.10
18w2d	14.10	2.10
18w3d	14.50	2.10
18w4d	14.80	2.20
18w5d	15.20	2.20
18w6d	15.50	2.20
19w0d	15.80	2.30
19w1d	16.20	2.30
19w2d	16.60	2.30
19w3d	16.90	2.40
19w4d	17.30	2.40
19w5d	17.60	2.50
19w6d	18.00	2.50
20w0d	18.40	2.50
20w1d	18.70	2.60
20w2d	19.10	2.60
20w3d	19.50	2.60
20w4d	19.90	2.70

30w1d	51.30	5.90
30w2d	51.80	5.90
30w3d	52.40	6.00
30w4d	52.90	6.10
30w5d	53.40	6.10
30w6d	54.00	6.20
31w0d	54.50	6.20
31w1d	55.00	6.30
31w2d	55.60	6.40
31w3d	56.10	6.40
31w4d	56.70	6.50
31w5d	57.20	6.50
31w6d	57.70	6.60
32w0d	58.30	6.70
32w1d	58.80	6.70
32w2d	59.40	6.80
32w3d	59.90	6.80
32w4d	60.40	6.90
32w5d	61.00	7.00
32w6d	61.50	7.00
33w0d	62.10	7.10
33w1d	62.60	7.10
33w2d	63.10	7.20
33w3d	63.70	7.30
33w4d	64.20	7.30
33w5d	64.70	7.40

20w5d	20.20	2.70
20w6d	20.60	2.80
21w0d	21.00	2.80
21w1d	21.40	2.80
21w2d	21.80	2.90
21w3d	22.20	2.90
21w4d	22.60	3.00
21w5d	23.00	3.00
21w6d	23.40	3.00
22w0d	23.80	3.10
22w1d	24.20	3.10
22w2d	24.70	3.20
22w3d	25.10	3.20
22w4d	25.50	3.30
22w5d	25.90	3.30
22w6d	26.40	3.30
23w0d	26.80	3.40
23w1d	27.20	3.40
23w2d	27.70	3.50
23w3d	28.10	3.50
23w4d	28.50	3.60
23w5d	29.00	3.60
23w6d	29.40	3.70
24w0d	29.90	3.70
24w1d	30.30	3.70
24w2d	30.80	3.80

33w6d	65.30	7.50
34w0d	65.80	7.50
34w1d	66.40	7.60
34w2d	66.90	7.60
34w3d	67.40	7.70
34w4d	67.90	7.80
34w5d	68.50	7.80
34w6d	69.00	7.90
35w0d	69.50	8.00
35w1d	70.10	8.00
35w2d	70.60	8.10
35w3d	71.10	8.20
35w4d	71.60	8.20
35w5d	72.20	8.30
35w6d	72.70	8.40
36w0d	73.20	8.40
36w1d	73.70	8.50
36w2d	74.20	8.60
36w3d	74.70	8.60
36w4d	75.20	8.70
36w5d	75.70	8.80
36w6d	76.20	8.80
37w0d	76.80	8.90
37w1d	77.30	9.00
37w2d	77.70	9.10
37w3d	78.20	9.10

24w3d	31.30	3.80
24w4d	31.70	3.90
24w5d	32.20	3.90
24w6d	32.60	4.00
25w0d	33.10	4.00
25w1d	33.60	4.10
25w2d	34.10	4.10
25w3d	34.50	4.20
25w4d	35.00	4.20
25w5d	35.50	4.30
25w6d	36.00	4.30
26w0d	36.50	4.40
26w1d	36.90	4.40
26w2d	37.40	4.50
26w3d	37.90	4.50
26w4d	38.40	4.60
26w5d	38.90	4.60
26w6d	39.40	4.70
27w0d	39.90	4.70

37w4d	78.70	9.20
37w5d	79.20	9.30
37w6d	79.70	9.30
38w0d	80.20	9.40
38w1d	80.70	9.50
38w2d	81.10	9.60
38w3d	81.60	9.60
38w4d	82.10	9.70
38w5d	82.60	9.80
38w6d	83.00	9.80
39w0d	83.50	9.90
39w1d	83.90	10.00
39w2d	84.40	10.10
39w3d	84.80	10.10
39w4d	85.30	10.20
39w5d	85.70	10.30
39w6d	86.10	10.40
40w0d	86.60	10.40

**Clavicle (CLAV) : YARKONI**

**GA Table**

Yarkoni, S., et. al. "Clavicular Measurement: A New Biometric Parameter for Fetal Evaluation." *Journal of Ultrasound in Medicine* 4:467-470, September, 1985.

$$GA = 3.717731 + 8.272778 \times CLAV$$

Output Unit : w(weeks)

Input Unit : cm



Min Range : 1.10 cm

Max Range : 4.50 cm

#### Fetal Growth Table

Yarkoni, S., Schmidt, W., Jeanty, P. et. al. (1985) Clavicle measurement: A new biometric parameter for fetal evaluation. *J. Ultrasound Med.*, 4, 467-470

Age (W)	Growth (cm)	Min (cm)	Max (cm)	Age (W)	Growth (cm)	Min (cm)	Max (cm)
15	1.60	1.10	2.10	28	2.90	2.40	3.40
16	1.70	1.20	2.20	29	3.00	2.50	3.50
17	1.80	1.30	2.30	30	3.10	2.60	3.60
18	1.90	1.40	2.40	31	3.20	2.70	3.70
19	2.00	1.50	2.50	32	3.30	2.80	3.80
20	2.10	1.60	2.60	33	3.40	2.90	3.90
21	2.20	1.70	2.70	34	3.50	3.00	4.00
22	2.30	1.80	2.80	35	3.60	3.10	4.10
23	2.40	1.90	2.90	36	3.70	3.20	4.20
24	2.50	2.00	3.00	37	3.80	3.30	4.30
25	2.60	2.10	3.10	38	3.90	3.40	4.40
26	2.70	2.20	3.20	39	4.00	3.50	4.50
27	2.80	2.30	3.30	40	4.10	3.60	4.60

#### Length of Vertebral (Vertebral) : TOKYO

##### GA Table

*Jpn J Med Ultrasonics* Vol. 23. No. 12 (1996)

Vertebral (cm)	Age (wd)	0±SD (wd)	Vertebral (cm)	Age (wd)	0±SD (wd)
4.05	21w0d	01w0d	6.72	31w0d	04w0d
4.39	22w0d	01w2d	6.93	32w0d	04w3d
4.71	23w0d	01w4d	7.13	33w0d	04w6d
5.01	24w0d	01w5d	7.32	34w0d	05w0d
5.30	25w0d	02w0d	7.51	35w0d	05w3d
5.57	26w0d	02w3d	7.70	36w0d	05w5d
5.82	27w0d	02w5d	7.89	37w0d	06w0d
6.06	28w0d	03w0d	8.08	38w0d	06w2d
6.30	29w0d	03w3d	8.27	39w0d	06w4d
6.51	30w0d	03w4d	8.47	40w0d	06w6d

**Radius Length (RAD) : MERZ**

**Fetal Growth Table**

[Fetal Limb Biometry] (Radiology 1083:147:602)

Table Data : 95 percentile data form <Growth format>

Age (W)	Growth (cm)	Min (cm)	Max (cm)	Age (W)	Growth (cm)	Min (cm)	Max (cm)
13	0.60	0.30	0.90	28	4.00	3.60	4.40
14	1.00	0.60	1.30	29	4.20	3.80	4.50
15	1.30	1.00	1.60	30	4.30	3.90	4.70
16	1.60	1.20	1.90	31	4.40	4.10	4.80
17	1.80	1.50	2.20	32	4.60	4.20	5.00
18	2.10	1.70	2.40	33	4.70	4.30	5.10
19	2.30	2.00	2.60	34	4.80	4.40	5.20
20	2.50	2.20	2.90	35	4.90	4.50	5.30
21	2.80	2.40	3.10	36	5.00	4.60	5.40
22	3.00	2.60	3.30	37	5.10	4.70	5.50
23	3.20	2.80	3.50	38	5.20	4.80	5.60
24	3.30	3.00	3.70	39	5.30	4.90	5.70
25	3.50	3.20	3.90	40	5.30	4.90	5.80
26	3.70	3.30	4.10	41	5.40	5.00	5.80
27	3.90	3.50	4.20				

**Mean Abdominal Diameter (MAD) : EIK-NESSH**

**GA Table**

Eik-Nes SH, Jorgensen NP, Grottum P, Lokvik B. Normal range curves for the intrauterine growth of the fetal abdominal diameters, Submitted JCU.

$$MAD = (APD + TAD) / 2$$

MAD (cm)	G.A (wd)	MAD (cm)	G.A (wd)	MAD (cm)	G.A (wd)	MAD (cm)	G.A (wd)
3.60	16w0d	5.40	22w5d	7.20	27w5d	9.00	32w6d
3.70	16w3d	5.50	23w0d	7.30	28w0d	9.10	33w1d
3.80	16w6d	5.60	23w2d	7.40	28w2d	9.20	33w4d
3.90	17w3d	5.70	23w4d	7.50	28w4d	9.30	33w6d
4.00	17w6d	5.80	23w6d	7.60	28w6d	9.40	34w1d
4.10	18w2d	5.90	24w1d	7.70	29w1d	9.50	34w3d
4.20	18w4d	6.00	24w3d	7.80	29w3d	9.60	34w6d
4.30	19w0d	6.10	24w5d	7.90	29w5d	9.70	35w1d
4.40	19w3d	6.20	25w0d	8.00	30w0d	9.80	35w3d
4.50	19w5d	6.30	25w2d	8.10	30w2d	9.90	35w6d
4.60	20w1d	6.40	25w4d	8.20	30w4d	10.00	36w1d
4.70	20w3d	6.50	25w6d	8.30	30w6d	10.10	36w4d
4.80	20w5d	6.60	26w1d	8.40	31w1d	10.20	37w0d
4.90	21w1d	6.70	26w3d	8.50	31w3d	10.30	37w3d
5.00	21w3d	6.80	26w5d	8.60	31w5d	10.40	37w6d
5.10	21w5d	6.90	27w0d	8.70	32w0d	10.50	38w2d
5.20	22w0d	7.00	27w2d	8.80	32w2d	10.60	38w5d
5.30	22w2d	7.10	27w3d	8.90	32w4d	10.70	39w1d
						10.80	39w5d

**Fetal Growth Table**

Eik-Nes SH, Jorgensen NP, Grottum P, Lokvik B. Normal range curves for the intrauterine growth of the fetal abdominal diameters, Submitted JCU.

MAD = (APD + TAD) /2

Age (wd)	Growth (cm)	Age (wd)	Growth (cm)	Age (wd)	Growth (cm)	Age (wd)	Growth (cm)
16w0d	3.60	23w0d	5.50	28w2d	7.40	33w6d	9.30
16w3d	3.70	23w2d	5.60	28w4d	7.50	34w1d	9.40
16w6d	3.80	23w4d	5.70	28w6d	7.60	34w3d	9.50
17w3d	3.90	23w6d	5.80	29w1d	7.70	34w6d	9.60
17w6d	4.00	24w1d	5.90	29w3d	7.80	35w1d	9.70
18w2d	4.10	24w3d	6.00	29w5d	7.90	35w3d	9.80
18w4d	4.20	24w5d	6.10	30w0d	8.00	35w6d	9.90
19w0d	4.30	25w0d	6.20	30w2d	8.10	36w1d	10.00
19w3d	4.40	25w2d	6.30	30w4d	8.20	36w4d	10.10
19w5d	4.50	25w4d	6.40	30w6d	8.30	37w0d	10.20
20w1d	4.60	25w6d	6.50	31w1d	8.40	37w3d	10.30
20w3d	4.70	26w1d	6.60	31w3d	8.50	37w6d	10.40
20w5d	4.80	26w3d	6.70	31w5d	8.60	38w2d	10.50
21w1d	4.90	26w5d	6.80	32w0d	8.70	38w5d	10.60
21w3d	5.00	27w0d	6.90	32w2d	8.80	39w1d	10.70
21w5d	5.10	27w2d	7.00	32w4d	8.90	39w5d	10.80
22w0d	5.20	27w3d	7.10	32w6d	9.00		
22w2d	5.30	27w5d	7.20	33w1d	9.10		
22w5d	5.40	28w0d	7.30	33w4d	9.20		

**Mid Cerebral Artery(MCA)-Resistance Index(RI) : SHINOZUKA****Fetal Growth Table**

N.Shinozuka & H.Kagawa 1996. <http://www.shinozuka.com>

Age (W)	10%	90%	Age (W)	10%	90%
21w3d	0.77	0.86	32w3d	0.78	0.92
22w3d	0.78	0.89	33w3d	0.77	0.91
23w3d	0.79	0.91	34w3d	0.76	0.90
24w3d	0.80	0.92	35w3d	0.75	0.89
25w3d	0.80	0.93	36w3d	0.73	0.88
26w3d	0.80	0.94	37w3d	0.72	0.87
27w3d	0.80	0.94	38w3d	0.70	0.86
28w3d	0.80	0.95	39w3d	0.68	0.85
29w3d	0.80	0.94	40w3d	0.66	0.84
30w3d	0.79	0.94	41w3d	0.64	0.83
31w3d	0.79	0.93			

**Mid Cerebral Artery(MCA)-Pulsatility Index(PI) : SHINOZUKA****Fetal Growth Table**

N.Shinozuka & H.Kagawa 1996. <http://www.shinozuka.com>

Age (W)	10%	90%	Age (W)	10%	90%
21w3d	1.51	2.02	32w3d	1.54	2.45
22w3d	1.56	2.19	33w3d	1.49	2.38
23w3d	1.59	2.34	34w3d	1.44	2.30
24w3d	1.62	2.46	35w3d	1.38	2.21

25w3d	1.64	2.54
26w3d	1.65	2.60
27w3d	1.65	2.63
28w3d	1.65	2.63
29w3d	1.63	2.61
30w3d	1.61	2.57
31w3d	1.58	2.52

36w3d	1.32	2.13
37w3d	1.25	2.05
38w3d	1.19	1.98
39w3d	1.12	1.92
40w3d	1.05	1.87
41w3d	0.99	1.83

**Umbilical Artery(UmA)-Resistance Index(RI) : SHINOZUKA**

**Fetal Growth Table**

*N.Shinozuka & H.Kagawa. "Standard value of Fetal blood flow wave form analysis" <http://www.shinozuka.com>, 1996*

Age (W)	10%	90%
13w3d	0.76	0.96
14w3d	0.73	0.92
15w3d	0.71	0.89
16w3d	0.69	0.86
17w3d	0.67	0.84
18w3d	0.66	0.83
19w3d	0.65	0.81
20w3d	0.64	0.80
21w3d	0.64	0.79
22w3d	0.63	0.78
23w3d	0.62	0.78
24w3d	0.62	0.77

Age (W)	10%	90%
28w3d	0.59	0.75
29w3d	0.58	0.74
30w3d	0.57	0.74
31w3d	0.56	0.73
32w3d	0.55	0.72
33w3d	0.54	0.71
34w3d	0.53	0.70
35w3d	0.52	0.70
36w3d	0.51	0.69
37w3d	0.50	0.68
38w3d	0.50	0.67
39w3d	0.50	0.67

25w3d	0.61	0.77
26w3d	0.61	0.76
27w3d	0.60	0.75

40w3d	0.50	0.67
41w3d	0.50	0.67

**Umbilical Artery(UmA)- Pulsatility Index(PI) : SHINOZUKA**

**Fetal Growth Table**

*N.Shinozuka & H.Kagawa. "Standard value of Fetal blood flow wave form analysis" <http://www.shinozuka.com>, 1996*

Age (W)	10%	90%
13w3d	1.29	2.58
14w3d	1.20	2.22
15w3d	1.13	1.97
16w3d	1.08	1.79
17w3d	1.05	1.66
18w3d	1.02	1.57
19w3d	1.00	1.50
20w3d	0.99	1.45
21w3d	0.97	1.41
22w3d	0.96	1.37
23w3d	0.95	1.35
24w3d	0.94	1.33
25w3d	0.92	1.31
26w3d	0.91	1.29
27w3d	0.90	1.27

Age (W)	10%	90%
28w3d	0.88	1.25
29w3d	0.87	1.23
30w3d	0.85	1.21
31w3d	0.82	1.19
32w3d	0.80	1.16
33w3d	0.78	1.14
34w3d	0.75	1.12
35w3d	0.73	1.10
36w3d	0.70	1.08
37w3d	0.68	1.06
38w3d	0.67	1.05
39w3d	0.66	1.04
40w3d	0.66	1.03
41w3d	0.67	1.03

**Anterior Posterior Abdominal Diameter (APD): HANSMANN**

GA Table

APD (cm)	G.A (wd)	APD (cm)	G.A (wd)	APD (cm)	G.A (wd)	APD (cm)	G.A (wd)
2.60	15w0d	4.70	22w0d	6.70	29w0d	8.70	36w0d
2.90	16w0d	4.90	23w0d	7.00	30w0d	9.00	37w0d
3.10	17w0d	5.20	24w0d	7.30	31w0d	9.30	38w0d
3.50	18w0d	5.50	25w0d	7.60	32w0d	9.50	39w0d
3.80	19w0d	5.80	26w0d	7.90	33w0d	9.70	40w0d
4.00	20w0d	6.10	27w0d	8.20	34w0d	9.80	41w0d
4.30	21w0d	6.40	28w0d	8.40	35w0d	9.90	42w0d

Fetal Growth Table

Age (W)	Growth (cm)	Age (W)	Growth (cm)	Age (W)	Growth (cm)	Age (W)	Growth (cm)
15	2.60	22	4.70	29	6.70	36	8.70
16	2.90	23	4.90	30	7.00	37	9.00
17	3.10	24	5.20	31	7.30	38	9.30
18	3.50	25	5.50	32	7.60	39	9.50
19	3.80	26	5.80	33	7.90	40	9.70
20	4.00	27	6.10	34	8.20	41	9.80
21	4.30	28	6.40	35	8.40	42	9.90

**Anterior Posterior Abdominal Diameter (APD): BESSIS**

GA Table

The data are those provided by Dr. Bessis to M. Le Bel. (Same as SIGMA 20, see memo from Ch. Gahwiler dated , June 23, 1983)

APD (cm)	GA (wd)	±SD (wd)	APD (cm)	GA (wd)	±SD (wd)
2.50	14w0d	01w1d	8.20	33w4d	03w1d
7.00	28w5d	02w1d	8.40	34w3d	03w4d
7.50	30w5d	02w3d	8.60	35w5d	04w1d
8.00	32w4d	03w1d	8.80	37w1d	04w6d

**Transverse Abdominal Diameter (TAD) : CFEF**

Fetal Growth Table

J. Créquat, M. Duyme, G. Brodaty

Biométrie 2000. Tables de croissance foetale par le Collège Français d'Echographie Foetale (CFEF) et l'Inserm U155

Gynecol Obstet Fertil 2000 Jun;28(6):435-45

Age (W)	Growth (cm)	Min (cm)	Max (cm)	Age (W)	Growth (cm)	Min (cm)	Max (cm)
11	1.35	1.10	1.60	27	6.71	6.07	7.34
12	1.70	1.40	2.00	28	7.03	6.36	7.68
13	2.06	1.73	2.40	29	7.33	6.64	8.02
14	2.40	2.04	2.78	30	7.62	6.92	8.35
15	2.77	2.36	3.17	31	7.93	7.19	8.67
16	3.12	2.70	3.55	32	8.21	7.44	8.98
17	3.47	3.03	3.92	33	8.48	7.68	9.29
18	3.83	3.36	4.29	34	8.76	7.91	9.59
19	4.17	3.70	4.64	35	9.00	8.11	9.90
20	4.52	4.03	5.00	36	9.24	8.29	10.20
21	4.83	4.35	5.32	37	9.48	8.46	10.50

22	5.16	4.66	5.68
23	5.47	4.95	6.00
24	5.79	5.24	6.34
25	6.10	5.52	6.67
26	6.40	5.80	7.01

38	9.70	8.61	10.82
39	9.93	8.74	11.13
40	10.16	8.86	11.45
41	10.30	8.92	11.70

**Head Circumference(HC) / Abdominal Circumference(AC): Campbell**

**Fetal Growth Table**

*Campbell HC/AC Fetal Growth Tabel for Uranus*

*Campbell, s. "Ultrasound Measurement of the Fetal Head to Abdomen Circumference Ratio in the Assessment of Growth Retardation." Br J Obstetrics and Gynecology, Vol. 84. 165-174. March 1977.*

Age (W)	HC/AC (None)	Min (None)	Max (None)
13	1.23	1.14	1.31
14	1.23	1.14	1.31
15	1.22	1.05	1.39
16	1.22	1.05	1.39
17	1.18	1.07	1.29
18	1.18	1.07	1.29
19	1.18	1.09	1.26
20	1.18	1.09	1.26
21	1.15	1.06	1.25
22	1.15	1.06	1.25
23	1.13	1.05	1.21
24	1.13	1.05	1.21
25	1.13	1.04	1.22
26	1.13	1.04	1.22
27	1.13	1.05	1.22

Age (W)	HC/AC (None)	Min (None)	Max (None)
28	1.13	1.05	1.22
29	1.10	0.99	1.21
30	1.10	0.99	1.21
31	1.07	0.96	1.17
32	1.07	0.96	1.17
33	1.04	0.96	1.11
34	1.04	0.96	1.11
35	1.02	0.93	1.11
36	1.02	0.93	1.11
37	0.98	0.92	1.05
38	0.98	0.92	1.05
39	0.97	0.87	1.06
40	0.97	0.87	1.06
41	0.96	0.93	1.00
42	0.96	0.93	1.00

**Estimated Fetal Weight Growth Reference**

**Estimate Fetal Weight (EFW) : BRENNER**

**Fetal Growth Table**

*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*

Age (W)	Growth (g)	Min (g)	Max (g)
21	410	280	860
22	480	320	920
23	550	370	990
24	640	420	1080
25	740	490	1180
26	860	570	1320
27	990	660	1470
28	1150	770	1660
29	1310	890	1890
30	1460	1030	2100
31	1630	1180	2290
32	1810	1310	2500

Age (W)	Growth (g)	Min (g)	Max (g)
33	2010	1480	2690
34	2220	1670	2880
35	2430	1870	3090
36	2650	2190	3290
37	2870	2310	3470
38	3030	2510	3610
39	3170	2680	3750
40	3280	2750	3870
41	3360	2800	3980
42	3410	2830	4060
43	3420	2840	4100
44	3390	2790	4110

## Estimate Fetal Weight (EFW) : DOUBILET

### Fetal Growth Table

Improved Birth Weight Table for Neonates Developed from Gestations Dated by Early Ultrasonography. Peter M. Doubilet, MD, PhD, Carol B. Benson, MD, Allan S. Nadel, MD, Steven A. Ringer, MD, PhD. by the American Institute of Ultrasound in Medicine J Ultrasound Med 16:241-249, 1997

Age (W)	Growth (g)	Min (g)	Max (g)
25	660	490	889
26	760	568	1016
27	875	660	1160
28	1005	765	1322
29	1153	884	1504
30	1319	1020	1706
31	1502	1171	1928
32	1702	1338	2167
33	1918	1519	2421
34	2146	1714	2687

Age (W)	Growth (g)	Min (g)	Max (g)
35	2383	1919	2959
36	2622	2129	3230
37	2859	2340	3493
38	3083	2544	3736
39	3288	2735	3952
40	3462	2904	4127
41	3597	3042	4254
42	3685	3142	4322
43	3717	3195	4324

## Estimate Fetal Weight (EFW) : OSAKA

### Fetal Growth Table

Osaka University Method 1989, 3 by Univ. Of Osaka

Age (W)	Growth (g)	±SD (g)
16w0d	137	29
16w1d	142	29

Age (W)	Growth (g)	±SD (g)
28w1d	1275	158
28w2d	1296	160

16w2d	147	29	28w3d	1318	162
16w3d	153	29	28w4d	1340	164
16w4d	158	30	28w5d	1363	167
16w5d	164	30	28w6d	1385	169
16w6d	170	30	29w0d	1407	171
17w0d	176	31	29w1d	1430	174
17w1d	182	31	29w2d	1453	176
17w2d	188	32	29w3d	1476	178
17w3d	195	33	29w4d	1499	181
17w4d	202	33	29w5d	1522	183
17w5d	209	34	29w6d	1545	185
17w6d	216	35	30w0d	1568	188
18w0d	223	35	30w1d	1592	190
18w1d	231	36	30w2d	1615	192
18w2d	238	37	30w3d	1639	195
18w3d	246	38	30w4d	1663	197
18w4d	254	39	30w5d	1687	200
18w5d	263	40	30w6d	1711	202
18w6d	271	41	31w0d	1735	204
19w0d	280	42	31w1d	1759	207
19w1d	289	43	31w2d	1783	209
19w2d	298	44	31w3d	1808	212
19w3d	308	45	31w4d	1832	214
19w4d	317	46	31w5d	1857	217
19w5d	327	48	31w6d	1881	219
19w6d	337	49	32w0d	1906	222
20w0d	347	50	32w1d	1930	224
20w1d	358	51	32w2d	1955	227

20w2d	368	53
20w3d	379	54
20w4d	390	56
20w5d	401	57
20w6d	413	58
21w0d	425	60
21w1d	436	61
21w2d	449	63
21w3d	461	65
21w4d	474	66
21w5d	486	68
21w6d	499	69
22w0d	513	71
22w1d	526	73
22w2d	540	74
22w3d	553	76
22w4d	568	78
22w5d	582	80
22w6d	596	81
23w0d	611	83
23w1d	626	85
23w2d	641	87
23w3d	656	89
23w4d	672	91
23w5d	688	92
23w6d	704	94
24w0d	720	96
24w1d	736	98

32w3d	1980	229
32w4d	2005	232
32w5d	2029	234
32w6d	2054	237
33w0d	2079	239
33w1d	2104	242
33w2d	2129	244
33w3d	2154	247
33w4d	2179	250
33w5d	2204	252
33w6d	2229	255
34w0d	2254	257
34w1d	2279	260
34w2d	2304	263
34w3d	2329	265
34w4d	2354	268
34w5d	2379	271
34w6d	2403	274
35w0d	2428	276
35w1d	2453	279
35w2d	2478	282
35w3d	2502	285
35w4d	2527	288
35w5d	2551	290
35w6d	2576	293
36w0d	2600	296
36w1d	2624	299
36w2d	2648	302

24w2d	753	100
24w3d	770	102
24w4d	787	104
24w5d	804	106
24w6d	822	108
25w0d	839	110
25w1d	857	112
25w2d	875	114
25w3d	893	116
25w4d	912	118
25w5d	930	120
25w6d	949	123
26w0d	968	125
26w1d	987	127
26w2d	1007	129
26w3d	1026	131
26w4d	1046	133
26w5d	1066	135
26w6d	1086	138
27w0d	1106	140
27w1d	1127	142
27w2d	1147	144
27w3d	1168	146
27w4d	1189	149
27w5d	1210	151
27w6d	1232	153
28w0d	1253	155

36w3d	2672	305
36w4d	2696	308
36w5d	2720	311
36w6d	2744	314
37w0d	2767	317
37w1d	2791	320
37w2d	2814	323
37w3d	2837	326
37w4d	2860	329
37w5d	2883	332
37w6d	2906	335
38w0d	2928	339
38w1d	2950	342
38w2d	2973	345
38w3d	2995	348
38w4d	3016	352
38w5d	3038	355
38w6d	3059	358
39w0d	3080	362
39w1d	3101	365
39w2d	3121	369
39w3d	3142	372
39w4d	3162	376
39w5d	3182	379
39w6d	3201	383
40w0d	3220	387



## Estimate Fetal Weight (EFW) : HADLOCK

### Fetal Growth Table

Hadlock, F., Harrist, R.B., Martinez-Poyer, J. "In-utero Analysis of Fetal Growth: A Sonographic Weight Standard" Radiology. 1991, 181: 129-133.

Age (W)	Growth (g)	Min (g)	Max (g)	Age (W)	Growth (g)	Min (g)	Max (g)
10	35	29	41	26	913	758	1068
11	45	37	53	27	1055	876	1234
12	58	48	68	28	1210	1004	1416
13	73	61	86	29	1379	1145	1613
14	93	77	109	30	1559	1294	1824
15	117	97	137	31	1751	1453	2049
16	146	121	171	32	1953	1621	2285
17	181	150	212	33	2162	1794	2530
18	223	185	261	34	2377	1973	2781
19	273	227	319	35	2595	2154	3036
20	331	275	387	36	2813	2335	3291
21	399	331	467	37	3028	2513	3543
22	478	398	559	38	3236	2686	3786
23	568	471	665	39	3435	2851	4019
24	670	556	784	40	3619	3004	4234
25	785	652	918				

## Estimate Fetal Weight (EFW) : SHINOZUKA

### Fetal Growth Table

Norio Shinozuka, Takashi Okai, et al. "Standard Values of Ultrasonographic Fetal Biometry" Japanese Journal of Medical Ultrasonics, Vol.23, No.12, 1996, pp877-888

Age (W)	Growth (g)	Min (g)	Max (g)	Age (W)	Growth (g)	Min (g)	Max (g)
18w3d	216	163	269	30w3d	1552	1261	1843
19w3d	279	211	348	31w3d	1720	1404	2035
20w3d	349	264	434	32w3d	1892	1551	2233
21w3d	427	324	529	33w3d	2068	1701	2434
22w3d	513	392	634	34w3d	2244	1851	2638
23w3d	609	469	748	35w3d	2420	1999	2841
24w3d	714	555	873	36w3d	2592	2143	3041
25w3d	830	651	1009	37w3d	2758	2280	3236
26w3d	956	756	1156	38w3d	2915	2407	3422
27w3d	1092	870	1313	39w3d	3059	2521	3596
28w3d	1237	993	1481	40w3d	3187	2618	3756
29w3d	1391	1123	1658	41w3d	3296	2695	3896

**Estimate Fetal Weight (EFW) : WILLIAMS****Fetal Growth Table**

*Williams RL, Creasy RK, Cunningham GC, et al: Fetal growth and perinatal viability in California. Obstet Gynecol 1982 May; 59(5): 624-32*

Age (W)	Growth (g)	Min (g)	Max (g)
22	513	320	746
23	589	365	861
24	675	417	989
25	773	477	1132
26	882	546	1289
27	1005	627	1463
28	1143	720	1653
29	1298	829	1809
30	1484	955	2136
31	1695	1100	2402
32	1920	1284	2673
33	2155	1499	2910

Age (W)	Growth (g)	Min (g)	Max (g)
34	2394	1728	3132
35	2628	1974	3333
36	2849	2224	3521
37	3052	2455	3706
38	3227	2642	3867
39	3364	2790	3994
40	3462	2881	4080
41	3524	2946	4127
42	3589	3011	4185
43	3626	3044	4221
44	3633	3043	4233

## Vascular Reference

### Resistivity Index

$$RI = \frac{Vsystolic - Vdiastolic}{Vsystolic}$$

**Reference** : Burns, Peter N., " The Physical principles of Doppler Spectral Analysis," *Journal of Clinical Ultrasound*, Nov./Dec. 1987, Vol.15, No.9,p.586

### Pulsatility Index

$$PI = \frac{Vsystolic - Vdiastolic}{Vmean}$$

**Reference** : Burns, Peter N., " The Physical principles of Doppler Spectral Analysis," *Journal of Clinical Ultrasound*, Nov./Dec. 1987, Vol.15, No.9,p.586

### SD (systolic, diastolic ratio)

$$SD = \frac{Vsystolic}{Vdiastolic} \times 100 (\%)$$

**Reference** : Ameriso S, et al., "Pulseless Transcranial Doppler Finding in Takayasu's Arteritis," *J Clin Ultrasound*, September 1990; 18:592-6

### Gradient

$$P = 4 \times V^2 \quad (\text{mmHg}) \quad \text{where, } P : \text{pressure gradient}$$

V : the maximum instantaneous velocity(m/sec)

### %STA

$$\%STA = \frac{StenosisArea}{BloodVesselArea} \times 100 (\%)$$

**Reference** : Jacob, Norma M et, al., " Duplex Carotid Sonography : Criteria for Stenosis, Accuracy, and Pitfalls," *Radiology* 154: 385~391, 1985.

### %STD

$$\%STD = \frac{StenosisDist}{BloodVesselDist} \times 100 (\%)$$

**Reference** : Taylor K. J. W., Burns P. N., Breslau P., "Clinical Applications of Doppler Ultrasound", Raven Press, N.Y., pages 130-136.

### Volume Flow(Area)

$$VolumeFlow = Area \times TAM \times 60 \quad (\text{ml/min})$$

### Volume Flow(Dist.)

$$VolumeFlow = \frac{\pi \times d^2}{4} \times TAM \times 60 \quad (\text{ml/min})$$

## Urology Reference

### Resistivity Index

$$RI = \frac{Vsystolic - Vdiastolic}{Vsystolic}$$

Reference : Burns, Peter N., "The Physical principles of Doppler Spectral Analysis," *Journal of Clinical Ultrasound*, Nov./Dec. 1987, Vol.15, No.9, p.586

### Pulsatility Index

$$PI = \frac{Vsystolic - Vdiastolic}{Vmean}$$

Reference : Burns, Peter N., "The Physical principles of Doppler Spectral Analysis," *Journal of Clinical Ultrasound*, Nov./Dec. 1987, Vol.15, No.9, p.585

### S/D (systolic, diastolic ratio)

$$S / D = \frac{Vsystolic}{Vdiastolic}$$

Reference : Ameriso S, et al., "Pulseless Transcranial Doppler Finding in Takayasu's Arteritis," *J Clin Ultrasound*, September 1990; 18:592-6

### Gradient

$$4 \times PSV^2 \text{ (mmHg)}$$

Where, P: pressure gradient, V: the maximum instantaneous velocity (m/sec)

### Volume Flow (Area)

$$VolumeFlow = Area \times TAM \times 60 \text{ (ml/min)}$$

### Volume Flow (Dist.)

$$VolumeFlow = \frac{\pi \times d^2}{4} \times TAM \times 60 \text{ (ml/min)}$$

### Prostate Volume (3 Distances)

$$\frac{4}{3} \pi \cdot \frac{1stDia}{2} \cdot \frac{2ndDia}{2} \cdot \frac{3rdDia}{2} \text{ (ml)}$$

### Prostate Volume (3 Distances x Factor)

$$1stDia \cdot 2ndDia \cdot 3rdDia \cdot Factor$$

### Prostate Volume (Ellipsoid)

$$\frac{4}{3} \pi \cdot \frac{MainDia}{2} \cdot \left( \frac{BesideDia}{2} \right)^2$$

### Prostate Volume (Sum of 20 Disks)

$$Vol. = \frac{\pi}{4} \sum_{i=1}^n a_i^2 \cdot \frac{L}{n} \text{ where } n = 20$$

### Prostate Spec. Antigen

$$PSAD = PSA / ProstateVolume$$

**Residual Volume**

$$V_{res} = V_{post} - V_{pre}$$

**%STA**

$$\%STA = \frac{StenosisArea}{BloodVesselArea} \times 100 \quad (\%)$$

Reference : Jacob, Normaan M et, al., "Duplex Carotid Sonography : Criteria for Stenosis, Accuracy, and Pitfalls," Radiology 154: 385~391, 1985.

**%STD**

$$\%STD = \frac{StenosisDist}{BloodVesselDist} \times 100 \quad (\%)$$

Reference : Taylor K. J. W., Burns P. N., Breslau P., "Clinical Applications of Doppler

**Fetal Echo Reference****Stroke Volume (SV)**

$$SV = (EDV - ESV) \quad (ml)$$

where, EDV : End Diastolic Volume, ESV : End Systolic Volume

**Cardiac Output (CO)**

$$CO = \frac{(SV * HR)}{1000} \quad l/min$$

**Ejection Fraction (EF)**

$$EF = \frac{(EDV - ESV)}{EDV} * 100 \quad \%$$

where, EDV : End Diastolic Volume, ESV : End Systolic Volume

Reference : Oh, J.K., Seward, J.B., Tajik, A.J. "The Echo Manual" Boston: Little, Brown and Company, 1994; 43

**LV Vol. d (LV Volume Diastolic)**

$$Teichholz \quad EDV = \frac{7.0}{2.4 + LVDd} \cdot LVDd^3$$

Reference : Teichholz, L.E., Kreulen, T., Herman, M.V., et. al. "Problems in echocardiographic volume determinations: echocardiographic-angiographic correlations in the presence or absence of asynergy." American Journal of Cardiology, 1976, 37:7.

$$Cubed \quad EDV = LVDd^3$$

Reference : Pombo, J.F., et. al. "Left Ventricular Volumes and Ejection Fraction by Echocardiography." Circulation, Vol. XLIII, 482, April, 1971.

$$\text{Gibson } EDV = 0.52 * (0.98 * LVDd + 5.90) * LVDd^2$$

Reference : "Basic Echocardiography" Iowa Heart Center, Mark J. Harry R.D.C.S., R.V.T. Jan, 1997 p. 30

### LV Vol. s (LV Volume Systolic)

$$\text{Teichholz } ESV = \frac{7.0}{2.4 + LVDs} \cdot LVDs^3$$

Reference : Teichholz, L.E., Kreulen, T., Herman, M.V., et. al. "Problems in echocardiographic volume determinations: echocardiographic-angiographic correlations in the presence or absence of asynergy." American Journal of Cardiology, 1976, 37:7.

$$\text{Cubed } EDV = LVDs^3$$

Reference : Pombo, J.F., et. al. "Left Ventricular Volumes and Ejection Fraction by Echocardiography." Circulation, Vol. XLIII, 482, April, 1971.

$$\text{Gibson } EDV = 0.52 * (1.14 * LVDs + 4.18) * LVDs^2$$

Reference : "Basic Echocardiography" Iowa Heart Center, Mark J. Harry R.D.C.S., R.V.T. Jan, 1997 p. 30

### LV Mass

$$LV_{mass}(\text{grams}) = 1.04 \cdot [(LVDd + LVPWd + IVSd)^3 - LVDd^3] * 0.8 + 0.6$$

Reference : Oh, J.K., Seward, J.B. The Echo Manual. Boston: Little, Brown and company, 1994, p.43.

### Fractional Shortening of Left Ventricle Internal diameter

A percent change in LV cavity dimension with systolic contraction

$$FS = \frac{LVDd - LVDs}{LVDd} * 100 (\%)$$

Harvey Feigenbaum, "Echocardiography", 1995 fifth edition

### Resistivity Index

$$RI = \frac{Vsystolic - Vdiastolic}{Vsystolic}$$

Reference : Burns, Peter N., "The Physical principles of Doppler Spectral Analysis," Journal of Clinical Ultrasound, Nov./Dec. 1987, Vol.15, No.9,p.586

### Pulsatility Index

$$PI = \frac{Vsystolic - Vdiastolic}{Vmean}$$

Reference : Burns, Peter N., "The Physical principles of Doppler Spectral Analysis," Journal of Clinical Ultrasound, Nov./Dec. 1987, Vol.15, No.9,p.585

### SD (systolic, diastolic ratio)

$$SD = \frac{Vsystolic}{Vdiastolic} \times 100 (\%)$$

Reference : Ameriso S, et al., "Pulseless Transcranial Doppler Finding in Takayasu's Arteritis," J Clin Ultrasound, September 1990; 18:592-61

### Preload Index

Atrial Reversal Flow/Systolic Flow

## Cardiology Reference

### Cardiology 2D

#### BSA(Body Surface Area)

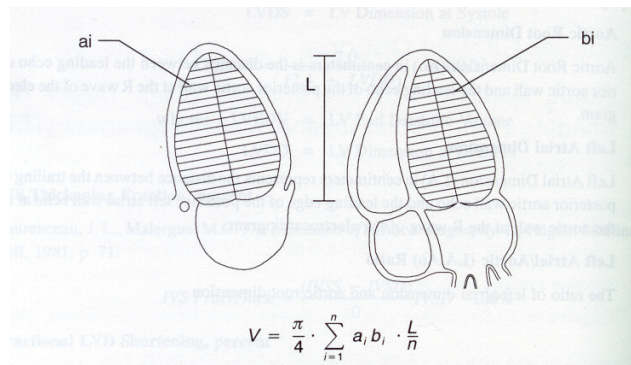
BSA can be calculated by entering patient's weight and height in New Patient Input Screen.

$$BSA = H^{0.725} * W^{0.425} * 0.007184 \text{ (m}^2\text{)}$$

where, H : centimeters      W : kilograms

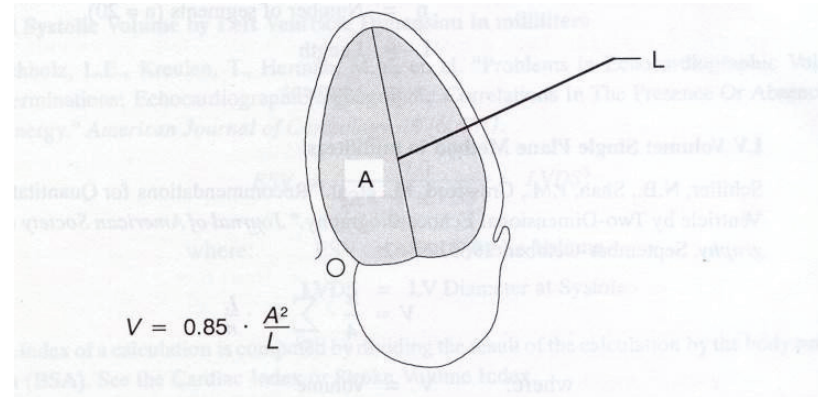
Reference : Grossman, W. "Cardiac Catheterization and Angiography." Blood Flow Measurement : Hemodynamic Principles, 1980. Chapter8, page 90.

#### Simpson's method



Simpson's protocol is used for calculation left ventricular volume from measurements taken in two scan planes. The calculation of volume for both methods (2-chamber or the 4-chamber view) results from summation of areas from diameters of 20 cylinders or discs of equal height, apportioned over the left ventricular length

#### LV Vol. A/L



LV Volume: Single Plane Area Length

#### Stroke Volume (SV)

$$SV = (EDV - ESV) \text{ (ml)}$$

where, EDV : End Diastolic Volume      ESV : End Systolic Volume

#### Stroke Volume Index(SI)

$$SI = SV / BSA$$

#### Cardiac Output (CO)

$$CO = \frac{(SV \times HR)}{1000} \text{ l/min}$$

**Cardiac Index (CI)**

$$CI = CO / BSA$$

**Ejection Fraction (EF)**

$$EF = \frac{(EDV - ESV)}{EDV} \times 100 \%$$

where, EDV : End Diastolic Volume      ESV : End Systolic Volume

Reference : Harvey Feigenbaum, "Echocardiography", 1995 fifth edition Chapter3 p 144 ,Lea&Febiger

**2D Measure**

LV Vol. d (LV Volume Diastolic)

$$\text{Teichholz} \quad EDV = \frac{7.0}{2.4 + LVDd} \cdot LVDd^3$$

Reference : Teichholz, L.E., Kreulen, T., Herman, M.V., et. al. "Problems in echocardiographic volume determinations: echocardiographic-angiographic correlations in the presence or absence of asynergy." American Journal of Cardiology, 1976, 37:7.

$$\text{Cubed} \quad EDV = LVDd^3$$

Reference : Pombo, J.F., et. al. "Left Ventricular Volumes and Ejection Fraction by Echocardiography." Circulation, Vol. XLIII, 482, April, 1971

$$\text{Gibson} \quad EDV = 0.52 \times (0.98 \times LVDd + 5.90) \times LVDd^2$$

Reference : "Basic Echocardiography" Iowa Heart Center, Mark J. Harry R.D.C.S., R.V.T. Jan, 1997 p. 30

LV Vol. s (LV Volume Systolic)

$$\text{Teichholz} \quad ESV = \frac{7.0}{2.4 + LVDs} \cdot LVDs^3$$

Reference : Teichholz, L.E., Kreulen, T., Herman, M.V., et. al. "Problems in echocardiographic volume determinations: echocardiographic-angiographic correlations in the presence or absence of asynergy." American Journal of Cardiology, 1976, 37:7.

$$\text{Cubed} \quad EDV = LVDs^3$$

Reference : Pombo, J.F., et. al. "Left Ventricular Volumes and Ejection Fraction by Echocardiography." Circulation, Vol. XLIII, 482, April, 1971.

$$\text{Gibson} \quad EDV = 0.52 * (1.14 * LVDs + 4.18) * LVDs^2$$

Reference : "Basic Echocardiography" Iowa Heart Center, Mark J. Harry R.D.C.S., R.V.T. Jan, 1997 p. 30

LV Mass

Lvmass (grams) =

$$1.04 \cdot [(LVDd + LVPWd + IVSd)^3 - LVDd^3] * 0.8 + 0.6$$

LVDd : Left Ventricle Dimension Diastole

LVPWd : Left Ventricle Posterior Wall Dimension Diastole

LVSD : Interventricular Septal Thickness Diastole

**Stroke Volume (SV)**

$$SV = (EDV - ESV) \text{ (ml)}$$

where, EDV : End Diastolic Volume      ESV : End Systolic Volume



**Stroke Volume Index(SI)**

$$SI = SV / BSA \text{ (ml/m}^2\text{)}$$

**Cardiac Output (CO)**

$$CO = \frac{(SV \times HR)}{1000} \text{ l/min}$$

**Cardiac Index (CI)**

$$CI = CO / BSA \text{ (l/m}^2\text{)}$$

**Ejection Fraction (EF)**

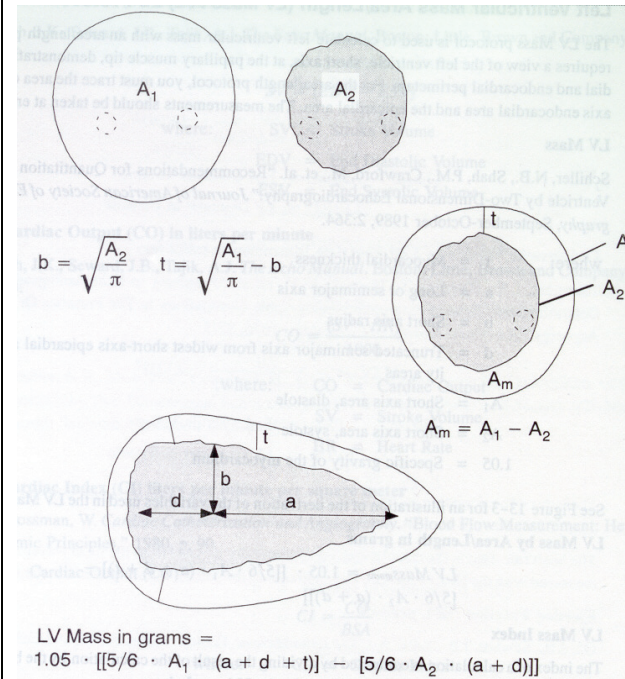
$$EF = \frac{(EDV - ESV)}{EDV} \times 100 \%$$

where, EDV : End Diastolic Volume      ESV : End Systolic Volume

Reference : Harvey Feigenbaum, "Echocardiography", 1995 fifth edition Chapter3  
p 144 ,Lea&Febiger

**Fraction Shortening (FS)**

$$FS = \frac{(LVDd - LVDs)}{LVDd} \times 100 \%$$

**LV MASS**

$$LVmass = 1.05 \times \left[ \left( \frac{5}{6} \times A1 \times L1 \right) - \left( \frac{5}{6} \times A2 \times L2 \right) \right] \text{ grams}$$

where,

A1 : short axis area, Epicardial (cm<sup>2</sup>)

A2 : short axis area, Endocardial (cm<sup>2</sup>)

L1 : long axis Epicardial length (cm)

L2 : long axis Endocardial length (cm)

Epicardial Volume

$$Epi.V = 5/6 \times A1 \times L1 \quad (ml)$$

Endocardial Volume

$$Endo.V = \frac{5}{6} * A2 * L2 \quad (ml)$$

Reference : Harvey Feigenbaum, "Echocardiography", 1995 fifth edition Chapter3 p 158, Lea&Febiger

Myocardial Thickness

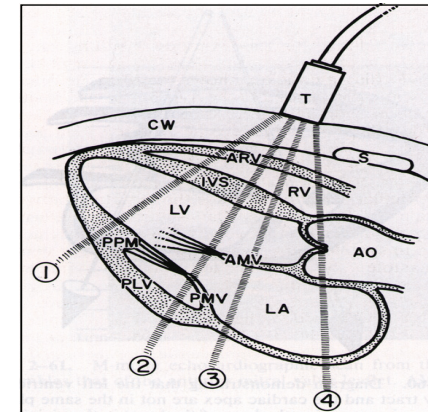
$$Tmy = \sqrt{Epi.Area / \pi} - \sqrt{Endo.Area / \pi} \quad (cm)$$

LV Mass Index

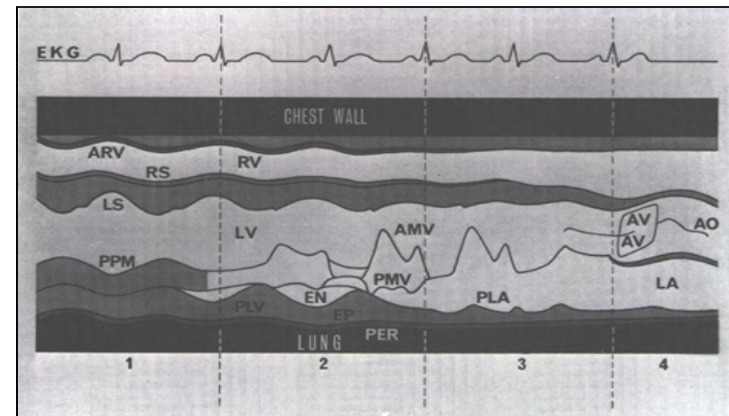
$$LV\ Mass\ Index = LV\ Mass / BSA \quad (g/m^2)$$

## Cardiology M mode

### Left Ventricle



Reference : Harvey Feigenbaum, "Echocardiography", 1995 fifth edition



Reference : Harvey Feigenbaum, "Echocardiography", 1995 fifth edition

### ■ LV Vol. d (LV Volume Diastolic)

$$\text{Teichholz } EDV = \frac{7.0}{2.4 + LVDd} \cdot LVDd^3$$

Reference : Teichholz, L.E., Kreulen, T., Herman, M.V., et. al. "Problems in echocardiographic volume determinations: echocardiographic-angiographic correlations in the presence or absence of asynergy." American Journal of Cardiology, 1976, 37:7.

$$\text{Cubed } EDV = LVDd^3$$

Reference : Pombo, J.F., et. al. "Left Ventricular Volumes and Ejection Fraction by Echocardiography." Circulation, Vol. XLIII, 482, April, 1971.

$$\text{Gibson } EDV = 0.52 * (0.98 * LVDd + 5.90) * LVDd^2$$

Reference : "Basic Echocardiography" Iowa Heart Center, Mark J. Harry R.D.C.S., R.V.T. Jan, 1997 p. 30

### ■ LV Vol. s (LV Volume Systolic)

$$\text{Teichholz } ESV = \frac{7.0}{2.4 + LVDs} \cdot LVDs^3$$

Reference : Teichholz, L.E., Kreulen, T., Herman, M.V., et. al. "Problems in echocardiographic volume determinations: echocardiographic-angiographic correlations in the presence or absence of asynergy." American Journal of Cardiology, 1976, 37:7.

$$\text{Cubed } EDV = LVDs^3$$

Reference : Pombo, J.F., et. al. "Left Ventricular Volumes and Ejection Fraction by Echocardiography." Circulation, Vol. XLIII, 482, April, 1971.

$$\text{Gibson } EDV = 0.52 * (1.14 * LVDs + 4.18) * LVDs^2$$

Reference : "Basic Echocardiography" Iowa Heart Center, Mark J. Harry R.D.C.S., R.V.T. Jan, 1997 p. 30

### ■ Stroke Volume (SV)

$$SV = (EDV - ESV) \text{ (ml)}$$

where, EDV : End Diastolic Volume    ESV : End Systolic Volume

### ■ Stroke Volume Index(SI)

$$SI = SV / BSA \text{ (ml/m}^2\text{)}$$

### ■ Cardiac Output (CO)

$$CO = \frac{(SV * HR)}{1000} \text{ l/min}$$

### ■ Cardiac Index (CI)

$$CI = CO / BSA \text{ (l/m}^2\text{)}$$

**Ejection Fraction (EF)**

$$EF = \frac{(EDV - ESV)}{EDV} * 100 \%$$

where, EDV : End Diastolic Volume, ESV : End Systolic Volume

Reference : Harvey Feigenbaum, "Echocardiography", 1995 fifth edition Chapter3 p 144 ,Lea&Febiger

**Fraction Shortening (FS)**

$$FS = \frac{(LVDd - LVDs)}{LVDd} * 100 \%$$

**LV Mass**

$$LV_{mass}(grams) = 1.04 \cdot [(LVDd + LVPWd + IVSd)^3 - LVDd^3] * 0.8 + 0.6$$

Reference : Oh, J.K., Seward, J.B. The Echo Manual. Boston: Little, Brown and company, 1994, p.43.

**LV Mass Index**

$$LV \text{ Mass Index} = LV \text{ Mass} / BSA (g/m^2)$$

**MV (Mitral Valve)**

Definition for the Mitral Valve

D : end of systolic, immediately before the opening of the Mitral Valve

E : the arterial leaflet of the Mitral valve open, it peaks at E

F : lowest point of the initial diastolic closing

A : In atrial systole, blood is propelled through the Mitral orifice and the Mitral leaflets reopen

the peak of this phase of Mitral valve motion is indicated as A

C : complete closure occurs after the onset of ventricular systole

Mitral Valve D-E Excursion (unit : cm)

Distance between the onset of the opening of the Mitral valve at D and the maximum opening of the anterior Mitral valve leaflet at E

Mitral Valve D-E Slope (unit : cm/sec)

Automatically calculated from the D-E excursion the rate of change that exists between two point(D, E)

Mitral Valve E-F Slope (unit : cm/sec)

The rate of change that exists between two point(E, F)

EPSS ( Mitral Valve E Point Septal Separation ) ( unit : cm)

Distance between the Mitral Valve E point and posterior edge of the interventricular septum at the same point in time

A-C interval (unit : msec)

The distance between the A point and the C point

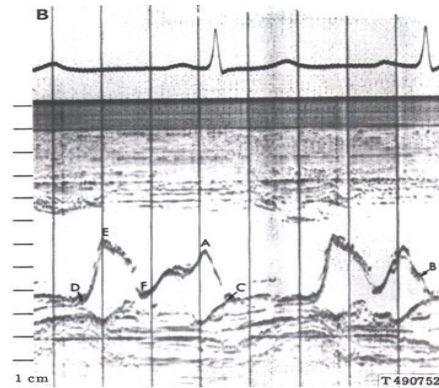


Figure - Mitral Valve M mode Waveform

**Ao/LA**

**Aortic Root Diameter (unit:cm) : Ao Root Dia.**

The distance between the leading echo of the anterior aortic wall and the leading echo of the posterior aortic wall at R wave of the electrocardiogram

**Aortic Valve Cusp Separation (Ao Cusp Sep.)**

The distance between the trailing echo of the anterior aortic valve leaflet and the leading echo of the posterior aortic valve leaflet in early diastole

**Left Atrial Diameter (unit:cm) : LA Dia.**

The distance between the trailing edge of the posterior aortic wall echo and the leading edge of the posterior left atrial wall echo at the level of aortic wall at the wave of the electrocardiogram.

**Cardiology Doppler**

**Mitral Valve, Tricuspid Valve**

Pressure Gradient

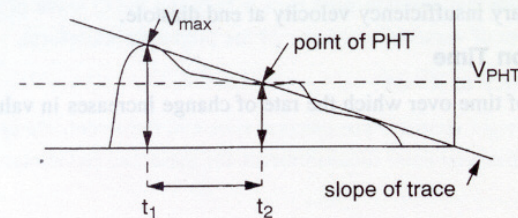
$$Pg = 4 \times V^2 \text{ (mmHg)}$$

where, V : Velocity (m/sec)

PHT ; Pressure Half Time

Reference : Oh, J.K., Seward, J.B., Tajik, A.J. *The Echo Manual*. Boston: Little, Brown and Company, 1994, p.59-60

Pressure half-time (PHT) is the time it takes for the peak pressure gradient to fall to half to half of its peak value. DT is deceleration time in centimeters per second from the peak velocity to the baseline.



$$V_{PHT} = V_{max} \cdot \frac{\sqrt{2}}{1.4} = \frac{V_{max}}{1.4} \quad PHT = t_2 - t_1$$

$$slope = \frac{(t_2 - t_1)}{(V_{PHT} - V_{max})} = \frac{PHT}{\frac{V_{max}}{1.4} - V_{max}}$$

$$PHT = slope \times V_{max} \times (-0.29)$$

Mitral Valve area

$$MVA = \frac{220}{PHT} \text{ (cm}^2\text{)}$$

where ; PHT is Pressure Half Time (milliseconds)

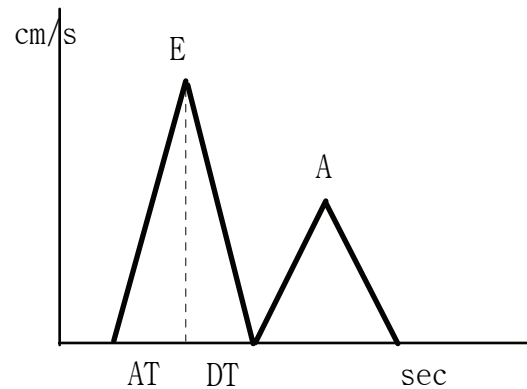
Reference : John H. Phillipse, " Practical Quantitative Doppler Echocardiography", p47, chapter6, CRC press, 1991

VTI(Velocity Time Integral)

$$VTI = \text{Mean velocity(cm/sec)} * \text{Ejection time(sec)} = L \text{ (cm)}$$

ACC(Acceleration), DEC(Deceleration)

$$V2 - V1 / T2 - T1 \text{ (m/sec}^2\text{)}$$



AT :Acceleration Time, DT : Deceleration Time  
E point : Early Diastolic Flow, A point : Atrial contraction

### ■ Aortic Valve, LVOT Doppler

HR(Heart Rate)

$$HR = \text{\#beats} * 60 / \text{time (bpm : bit/minute)}$$

CONT(Continuity Equation)

When there is a constant flow in a flow channel with a Stenosis, the flow volume at the Stenosis portion equals that at nonstenotic portions .

This equation is valid not only in a constant flow, but also in a pulsality flow channel .

$$SV1 = SV2$$

where, SV1 : stroke volume in the nonstenotic area

SV2: stroke volume in the stenotic area

$$AVA = LVOTareaX \frac{V1}{V2} \text{ cm}^2$$

where, AVA(1) : Aortic Valve Area by Velocity

AVA(2) : Aortic Valve Area by VTI

$$LVOTarea : \pi * Dia_{LVOT}^2 / 4$$

VTI1 : Left Ventricle output track VTI

VTI2 : Aortic valve VTI

V1 : Left Ventricle output track velocity

V2: Aortic valve velocity

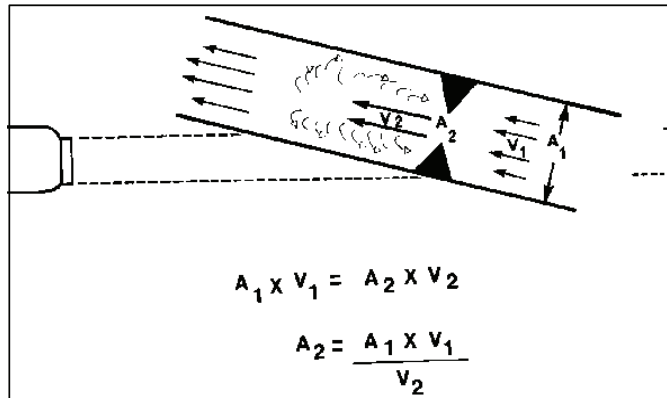


Figure - Continuity Equation

Reference : Harvey Feigenbaum, "Echocardiography", 1995 fifth edition

CSA(Cross Sectional Area)

$$Area = \pi \times (D/2)^2$$

where, D: diameter

Pulmonic Veins

Reference : Oh, J.K., Seward, J.B., Tajik, A.J. *The Echo Manual*. Boston: Little, Brown and Company, 1994, p.48

Diastolic Velocity

Velocity measured at diastole.

Systolic Velocity

Velocity measured at systole.

Atrial Reversal Velocity (A. Rev Vel)

Atrial reversal velocity is the peak velocity of the atrial reversal component.

Pulmonary Atrial Reversal Duration (A. Rev Dur)

Pulmonary atrial flow reversal duration is the time between the diastolic component of pulmonary venous flow and the closure of the mitral valve.

Sys/Dia (Systole/Diastole)

Ratio of the velocity measured at systole and the velocity measured at diastole.

Shunt Ratio QP : QS

The equations that follows area derieve dfrom the following source:

Oh, J.K., Seward, J.B., Tajik, A.J. *The Echo Manual*, Boston: Little, Brown, and Company, 1994.

QP : QS = Pulmonic Cardiac Output / Sysemic Cardiac Output

CO = Pulm SV \* Pulm HR / 1000

Outflow Trace Area =  $\pi * (\text{Pulm Dia} / 2)^2$

## Acoustic Power Tables

### IEC Tables

#### Symbols and Definitions

Standard 60601-2-37 published by the International Electrotechnical Commission (IEC) requires the declaration of acoustic output information. The definitions and units of the symbols in those tables are listed below, and are consistent with IEC 60601-2-37 and IEC 62359. Definitions for CAPITALIZED parameters, if not found here, can be found in the reference documents.

All table entries have been obtained at the operating conditions that give rise to the Maximum Index Value (shown in the second row of the table). Due to the complexities of the system user interface, it may be difficult to exactly replicate the declared condition. Contact Medison for further information as needed.

Note that Medison provides information for both of the TIS non-scanned columns. The 'Aaprt≤1' (cm<sup>2</sup>) column is an 'at\_surface' TIS value and the 'Aaprt>1' (cm<sup>2</sup>) column is a 'below surface' TIS value. The tables will provide additional informational flags (\*\*\*) in the event that the largest TIS non-scanned value is an 'at\_surface' value with Aaprt > 1 cm<sup>2</sup>, or if the largest TIS non-scanned value is a 'below\_surface' value with Aaprt ≤ 1 cm<sup>2</sup> case (very rare).

A <sub>aprt</sub>	the –12 dB OUTPUT BEAM AREA, or transmit aperture area, of the ultrasonic beam. Derived from the –12 dB OUTPUT BEAM DIMENSIONS. (centimeters squared)
d <sub>eq</sub> at max. I <sub>pi</sub>	the EQUIVALENT BEAM DIAMETER at the point where the free-field (non-attenuated), PULSE INTENSITY INTEGRAL is a maximum (centimeters).
d <sub>eq</sub> (Z <sub>b</sub> )	the EQUIVALENT BEAM DIAMETER at axial distance z <sub>b</sub> . Equal to $[(4/\pi)(P_{\alpha}(Z_b) / I_{ta,\alpha}(Z_b))]^{0.5}$ . (centimeters)

Dim of A <sub>aprt</sub>	the –12 dB OUTPUT BEAM DIMENSIONS. The active aperture dimensions in the azimuthal and elevational directions. (centimeters). For scanned modes, the 'X_dim' is the length of the entire scanned aperture.
f <sub>awf</sub>	the ACOUSTIC WORKING FREQUENCY. Center frequency. (megahertz)
Focal Length	The nominal focal points, azimuthal (FL <sub>x</sub> ) and elevational (FL <sub>y</sub> ), for the operating condition. (centimeters).
I <sub>pa,α</sub> at max. MI	the ATTENUATED PULSE-AVERAGE INTENSITY at the depth of reported MI, $Z_{at\_max\_I_{pi,\alpha}}$ . (watts per square centimeter).
I <sub>ta,α</sub> (Z)	the ATTENUATED TEMPORAL-AVERAGE INTENSITY at axial distance z. (milliwatts per square centimeter)
MI	the displayed parameter representing potential cavitation bio-effects. (unit-less)
P	the time-average ultrasonic OUTPUT POWER radiated by the transducer for the transmit pattern(s) associated with the reported Index. For TIS <sub>non_scan</sub> and TIB <sub>non_scan</sub> this is the total acoustic power of the non-scanned beam(s). For TIC it is the total acoustic power of the contributing modes (which will be listed separately, for the reader to sum). The reported maximum TIS <sub>scan</sub> value may (likely) come from a combinational mode. In this case, $P = P_1 + P_{1x1}$ . P <sub>1</sub> is the BOUNDED OUTPUT POWER (the maximum power emitted from a one cm width of the active (scanned) transmit aperture of the transducer in the scan plane direction) of each the <u>scanned</u> transmit modes. For instance in 2D color mode P1_2D and P1_Col will be listed. P <sub>1x1</sub> is the maximum contribution from any one square centimeter of the <u>non-scanned</u> transmit mode(s) active aperture. (milliwatts).



$P_{\alpha}(z)$	the (ultrasonic) ATTENUATED OUTPUT POWER at axial distance $z_s$ for the non-scanned modes or TRANSMIT PATTERNS. (milliwatts)
$P_{r,\alpha}$	the ATTENUATED PEAK-RAREFACTIONAL ACOUSTIC PRESSURE associated with the transmit pattern giving rise to the reported value of MI. (megapascals)
$P_r$ at max. $I_{pi}$	the PEAK-RAREFACTIONAL ACOUSTIC PRESSURE at the point where the free-field (non-attenuated), PULSE INTENSITY INTEGRAL is a maximum (megapascals).
$pr$	the PULSE REPETITION RATE associated with the transmit pattern giving rise to the reported value of MI (pulses per second).
TIB	the BONE THERMAL INDEX for applications, such as fetal (second and third trimester) or neonatal cephalic (through the fontanelle), in which the ultrasound beam passes through soft tissue and a focal region is in the immediate vicinity of bone. (unit-less)
TIC	the CRANIAL BONE THERMAL INDEX.
$TIS_{scan}$	the SOFT TISSUE THERMAL INDEX in a scanning mode. (unit-less)
$TIS_{non-scan}$	the SOFT TISSUE THERMAL INDEX in a non-auto scanning mode. (unit-less)
$t_d$	the PULSE DURATION associated with the TRANSMIT PATTERN giving rise to the reported value of MI. (microseconds)
$z_{at\_max\_I_{pi},\alpha}$	the axial distance from the transducer where the ATTENUATED PULSE INTENSITY INTEGRAL $I_{pi,\alpha}$ is maximum.

$z_b$	the distance where TIB_non-scan is determined. For non-scanned modes, Distance along the beam axis to the plane where the product of the ATTENUATED OUTPUT POWER and ATTENUATED TEMPORAL-AVERAGE INTENSITY ( $P_{\alpha}(z) \times I_{ta,\alpha}(z)$ ) maximizes. (centimeters)
$z_{bp}$	value equal to 1.5 times the EQUIVALENT APERTURE DIAMETER ( $D_{eq}$ ). Also equals $1.69 * \sqrt{A_{aprt}}$ . (centimeters)
$z_s$	the distance where TIS_non-scan is determined. The axial distance corresponding to the location of $\max[\min(P_{\alpha}(z), I_{ta,\alpha}(z) \times 1 \text{ cm}^2)]$ , where $z \geq z_{bp}$ . (centimeters)

### Explanatory Notes

- (a) This index is not required to this operating mode.
- (b) This probe is not intended for adult transcranial uses.
- (c) This formulation for TIS is less than that for an alternate formulation in this mode.
- (d) The maximum index value is less than 1.0

\* If the MI comes from a scanning mode Transmit Pattern (pulse), the 'pr' listed is the average per second for the 'worst case' scan line. 'pr' for scanning modes is the product of the frame rate and the number of pulse per line of the Transmit Pattern .

\*\* The max TIS unscanned value is an 'at\_surface' value and occurs for aperture > 1.0 cm<sup>2</sup>, OR The max TIS unscanned value is a 'below\_surface' value and occurs for aperture <= 1.0 cm<sup>2</sup>.

+ The max TIB for this combinational mode = the at\_surface TIS\_scanned value. The non-scanned\_TIB value indicated is the below\_surface max. A "+" is used when the TIB value is less than the TIS\_scanned value for the operating condition.

**C2-4ES**

**C2-4ES: 2D& 2D+M mode**

Index Label		M.I.	TIS			TIB non-scan	TIC
			scan	non-scan			
				A <sub>aprt</sub> ≤1	A <sub>aprt</sub> >1		
Maximum Index Value		0.70	0.85	0.06	0.03	0.05+	(b)
Associated Acoustic Parameters	P <sub>r,α</sub> (MPa)	1.06	-	-	-	-	-
	P (mW)	-	2D P1:81.0	M P1x1:4.57		M P:4.48	(b)
	Min.of [P <sub>α</sub> (z <sub>s</sub> ), I <sub>pa, α</sub> (z <sub>s</sub> )x1cm <sup>2</sup> ] <sub>j</sub> (mW)	-	-	-	2.29	-	-
	z <sub>s</sub> (cm)	-	-	-	3.80	-	-
	z <sub>bp</sub> (cm)	-	-	-	0.68	-	-
	z <sub>b</sub> (cm)	-	-	-	-	5.00	-
	z <sub>at_max</sub> I <sub>pi,α</sub> (cm)	4.70	-	-	-	-	-
	d <sub>eq</sub> (z <sub>b</sub> ) (cm)	-	-	-	-	0.79	-
	f <sub>awf</sub> (MHz)	2.29	2.20	2.54	2.56	2.56	(b)
	Dim of A <sub>aprt</sub>	X (cm)		3.13	1.35	1.35	1.35
Y (cm)			0.12	0.12	0.12	0.12	(b)
Other Information	t <sub>d</sub> (μsec)	0.76	-	-	-	-	-
	prr (pulses/sec)	*8.94	-	-	-	-	-
	P <sub>r</sub> at max. I <sub>pi</sub> (MPa)	1.53	-	-	-	-	-
	d <sub>eq</sub> at max. I <sub>pi</sub> (cm)	-	-	-	-	0.72	-
	I <sub>pa,α</sub> at max. MI (W/cm <sup>2</sup> )	57.1	-	-	-	-	-
	Focal Length	FLx (cm)	-	-	8.80	6.80	-
FLy (cm)		-	-	7.00	7.00	-	-
Operating Control Conditions	Control 1	MI					
	Control 2		TIS_as				
	Control 3			TIS_as_U			
	Control 4				TIS_bs	TIB_bs	

Control 1:Mode : 2D , 2.37Mhz , Focal:3 , Focus:6.8Cm , FR:8.94

Control 2:Mode : 2D , 2.20Mhz , Focal:4 , Focus:8.8Cm , FR:42.05

Control 3:Mode : 2D+M , 3.42Mhz , Focal:4 , Focus:8.8Cm , FR:22.04

Control 4:Mode : 2D+M , 3.42Mhz , Focal:3 , Focus:6.8Cm , FR:28.24

**C2-4ES: Pulsed Doppler & 2D+Pulsed Doppler**

Index Label		M.I.	TIS			TIB non-scan	TIC
			scan	non-scan			
				A <sub>aprt</sub> ≤1	A <sub>aprt</sub> >1		
Maximum Index Value		0.49	1.48	1.55	0.80	1.36+	(b)
Associated Acoustic Parameters	P <sub>r,α</sub> (MPa)	0.76	-	-	-	-	-
	P (mW)	-	2D P1:3.06 PD P1x1:72.7	PD P1x1:107		PD P:95.6	(b)
	Min.of [P <sub>α</sub> (z <sub>s</sub> ), I <sub>pa, α</sub> (z <sub>s</sub> )x1cm <sup>2</sup> ] <sub>j</sub> (mW)	-	-	-	54.9	-	-
	z <sub>s</sub> (cm)	-	-	-	1.10	-	-
	z <sub>bp</sub> (cm)	-	-	-	0.48	-	-
	z <sub>b</sub> (cm)	-	-	-	-	4.60	-
	z <sub>at_max</sub> I <sub>pi,α</sub> (cm)	1.60	-	-	-	-	-
	d <sub>eq</sub> (z <sub>b</sub> ) (cm)	-	-	-	-	0.75	-
	f <sub>awf</sub> (MHz)	2.36	2D:2.86 PD:3.03	3.05	3.06	2.37	(b)
	Dim of A <sub>aprt</sub>	X (cm)		2D:3.61 PD:1.35	1.35	0.68	1.35
Y (cm)			0.12	0.12	0.12	0.12	(b)
Other Information	t <sub>d</sub> (μsec)	1.82	-	-	-	-	-
	prr (pulses/sec)	999	-	-	-	-	-
	P <sub>r</sub> at max. I <sub>pi</sub> (MPa)	0.73	-	-	-	-	-
	d <sub>eq</sub> at max. I <sub>pi</sub> (cm)	-	-	-	-	0.68	-
	I <sub>pa,α</sub> at max. MI (W/cm <sup>2</sup> )	19.2	-	-	-	-	-
	Focal Length	FLx (cm)	-	-	11.0	3.50	-
FLy (cm)		-	-	7.00	7.00	-	-
Operating Control Conditions	Control 1	MI					
	Control 2		TIS_as				
	Control 3			TIS_as_U			
	Control 4				TIS_bs		
	Control 5					TIB_bs	

Control 1:Mode : Pulsed Doppler , 2.37Mhz , Focal:1 , Focus:3.5Cm

Control 2:Mode : 2D+Pulsed Doppler , 3.08Mhz , Focal:5 , Focus:11.0Cm , FR:12.32

Control 3:Mode : Pulsed Doppler , 3.08Mhz , Focal:5 , Focus:11.0Cm ,

Control 4:Mode : 2D+Pulsed Doppler , 3.08Mhz , Focal:1 , Focus:3.5Cm , FR:18.96

Control 5:Mode : 2D+Pulsed Doppler , 2.37Mhz , Focal:3 , Focus:6.8Cm , FR:14.35

**C2-5ET**

**C2-5ET: 2D& 2D+M mode**

Index Label	M.I.	TIS			TIB	TIC	
		scan	non- scan		non- scan		
			A <sub>aprt</sub> ≤1	A <sub>aprt</sub> >1			
Maximum Index Value	1.60	1.21	0.07	0.10	0.31	(b)	
Associated Acoustic Parameters	P <sub>r,α</sub> (MPa)	2.44	-	-	-	-	-
	P (mW)	-	2D P1:118	M P1x1:5.56	-	M P:15.5	(b)
	Min.of [P <sub>α</sub> (z <sub>s</sub> ),I <sub>la, α</sub> (z <sub>s</sub> )x1cm <sup>2</sup> ]	-	-	-	8.97	-	-
	Z <sub>s</sub> (cm)	-	-	-	3.40	-	-
	Z <sub>bp</sub> (cm)	-	-	-	2.95	-	-
	Z <sub>b</sub> (cm)	-	-	-	-	6.20	-
	z_at_max_lpi,α (cm)	4.60	-	-	-	-	-
	d <sub>eq</sub> (z <sub>b</sub> ) (cm)	-	-	-	-	0.44	-
	f <sub>awf</sub> (MHz)	2.33	2.17	2.59	2.31	2.31	(b)
	Dim of A <sub>aprt</sub> X (cm)	-	4.41	0.72	1.92	1.92	(b)
Y (cm)	-	1.58	1.58	1.58	1.58	(b)	
Other Information	t <sub>d</sub> (μsec)	0.73	-	-	-	-	-
	pr (pulses/sec)	*8.91	-	-	-	-	-
	P <sub>r</sub> at max. I <sub>pi</sub> (MPa)	2.99	-	-	-	-	-
	d <sub>eq</sub> at max. I <sub>pi</sub> (cm)	-	-	-	-	0.42	-
	I <sub>pa,α</sub> at max. MI (W/cm <sup>2</sup> )	475	-	-	-	-	-
	Focal Length FLx (cm)	-	-	3.50	8.80	-	-
FLy (cm)	-	-	8.30	8.30	-	-	
Operating Control Conditions	Control 1	MI					
	Control 2		TIS_as				
	Control 3			TIS_as_U			
	Control 4				TIS_bs	TIB_bs	

Control 1:Mode : 2D , 2.37Mhz , Focal:2 , Focus:5.0Cm , FR:8.91  
 Control 2:Mode : 2D , 2.20Mhz , Focal:6 , Focus:14.5Cm , FR:31.05  
 Control 3:Mode : 2D+M , 3.42Mhz , Focal:1 , Focus:3.5Cm , FR:30.98  
 Control 4:Mode : 2D+M , 3.42Mhz , Focal:4 , Focus:8.8Cm , FR:21.85

**C2-5ET: Pulsed Doppler & 2D + Pulsed Doppler**

Index Label	M.I.	TIS			TIB	TIC	
		scan	non- scan		non- scan		
			A <sub>aprt</sub> ≤1	A <sub>aprt</sub> >1			
Maximum Index Value	1.13	1.47	1.43	1.47	3.82	(b)	
Associated Acoustic Parameters	P <sub>r,α</sub> (MPa)	1.96	-	-	-	-	-
	P (mW)	-	2D P1:2.48	PD	-	PD	(b)
	Min.of [P <sub>α</sub> (z <sub>s</sub> ),I <sub>la, α</sub> (z <sub>s</sub> )x1cm <sup>2</sup> ]	-	PD P1x1:112	P1x1:98.9	-	P:110	-
	Z <sub>s</sub> (cm)	-	-	-	103	-	-
	Z <sub>bp</sub> (cm)	-	-	-	2.50	-	-
	Z <sub>b</sub> (cm)	-	-	-	2.95	-	-
	z_at_max_lpi,α (cm)	5.00	-	-	-	-	-
	d <sub>eq</sub> (z <sub>b</sub> ) (cm)	-	-	-	-	0.59	-
	f <sub>awf</sub> (MHz)	3.00	2D:3.15	3.03	3.00	2.21	(b)
	Dim of A <sub>aprt</sub> X (cm)	-	PD:3.03	-	-	-	-
	Y (cm)	-	2D:4.49	0.72	1.92	0.40	(b)
		-	PD:0.72	-	-	-	-
	Other Information	t <sub>d</sub> (μsec)	1.57	-	-	-	-
pr (pulses/sec)		999	-	-	-	-	-
P <sub>r</sub> at max. I <sub>pi</sub> (MPa)		2.79	-	-	-	-	-
d <sub>eq</sub> at max. I <sub>pi</sub> (cm)		-	-	-	-	0.53	-
I <sub>pa,α</sub> at max. MI (W/cm <sup>2</sup> )		241	-	-	-	-	-
Focal Length FLx (cm)		-	-	3.50	11.0	-	-
FLy (cm)		-	-	8.30	8.30	-	-
Operating Control Conditions	Control 1	MI					
	Control 2		TIS_as	TIS_as_U			
	Control 3				TIS_bs		
	Control 4					TIB_bs	

Control 1:Mode : Pulsed Doppler , 3.08Mhz , Focal:2 , Focus:5.0Cm  
 Control 2:Mode : 2D+Pulsed Doppler , 3.08Mhz , Focal:1 , Focus:3.5Cm , FR:19.14  
 Control 3:Mode : 2D+Pulsed Doppler , 3.08Mhz , Focal:5 , Focus:11.0Cm , FR:12.32  
 Control 4:Mode : 2D+Pulsed Doppler , 2.20Mhz , Focal:0 , Focus:2.0Cm , FR:19.14

**C3-7ED**

**C3-7ED: 2D& 2D+M mode**

Index Label	M.I.	TIS			TIB	TIC	
		scan	non- scan				
			$A_{aprt} \leq 1$	$A_{aprt} > 1$	non- scan		
Maximum Index Value	1.10	0.95	0.10	0.09	0.13+	(b)	
Associated Acoustic Parameters	$P_{r,\alpha}$ (MPa)	1.74	-	-	-	-	
	P (mW)	-	2D P1:58.0	M P1x1:5.27	-	M P:7.03	(b)
	Min.of $[P_{\alpha}(z_s), I_{ta, \alpha}(z_s) \times 1cm^2]$ (mW)	-	-	-	4.89	-	-
	$Z_s$ (cm)	-	-	-	3.00	-	-
	$Z_{bp}$ (cm)	-	-	-	2.71	-	-
	$Z_b$ (cm)	-	-	-	-	3.70	-
	$z\_at\_max\_I_{pi,\alpha}$ (cm)	3.90	-	-	-	-	-
	$d_{eq}(Z_b)$ (cm)	-	-	-	-	0.46	-
	$f_{awf}$ (MHz)	2.52	3.45	4.12	3.94	3.90	(b)
	Dim of $A_{aprt}$	X (cm)	-	4.90	0.97	2.33	1.36
Y (cm)		-	1.10	1.10	1.10	1.10	(b)
Other Information	$t_d$ ( $\mu$ sec)	0.74	-	-	-	-	-
	pr (pulses/sec)	*40.3	-	-	-	-	-
	$P_r$ at max. $I_{pi}$ (MPa)	2.28	-	-	-	-	-
	$d_{eq}$ at max. $I_{pi}$ (cm)	-	-	-	-	0.43	-
	$I_{pa,\alpha}$ at max. MI ( $W/cm^2$ )	81.8	-	-	-	-	-
	Focal Length	FLx (cm)	-	-	3.50	8.80	-
FLy (cm)		-	-	7.00	7.00	-	-
Operating Control Conditions	Control 1	MI					
	Control 2		TIS_as				
	Control 3			TIS_as_U			
	Control 4				TIS_bs		
	Control 5					TIB_bs	

Control 1:Mode : 2D , 2.37Mhz , Focal:2 , Focus:5.0Cm , FR:40.29  
 Control 2:Mode : 2D , 3.42Mhz , Focal:3 , Focus:6.8Cm , FR:52.80  
 Control 3:Mode : 2D+M , 4.74Mhz , Focal:1 , Focus:3.5Cm , FR:30.92  
 Control 4:Mode : 2D+M , 4.74Mhz , Focal:4 , Focus:8.8Cm , FR:21.92  
 Control 5:Mode : 2D+M , 4.11Mhz , Focal:2 , Focus:5.0Cm , FR:30.92

**C3-7ED: Pulsed Doppler & 2D + Pulsed Doppler**

Index Label	M.I.	TIS			TIB	TIC	
		scan	non- scan				
			$A_{aprt} \leq 1$	$A_{aprt} > 1$	non- scan		
Maximum Index Value	0.85	1.31	1.26	1.33	2.09	(b)	
Associated Acoustic Parameters	$P_{r,\alpha}$ (MPa)	1.51	-	-	-	-	
	P (mW)	-	2D P1:2.50 PD P1x1:68.8	PD P1x1:64.5	-	PD P:60.2	(b)
	Min.of $[P_{\alpha}(z_s), I_{ta, \alpha}(z_s) \times 1cm^2]$ (mW)	-	-	-	67.8	-	-
	$Z_s$ (cm)	-	-	-	2.80	-	-
	$Z_{bp}$ (cm)	-	-	-	2.71	-	-
	$Z_b$ (cm)	-	-	-	-	3.10	-
	$z\_at\_max\_I_{pi,\alpha}$ (cm)	3.70	-	-	-	-	-
	$d_{eq}(Z_b)$ (cm)	-	-	-	-	0.33	-
	$f_{awf}$ (MHz)	3.11	2D:4.14 PD:4.11	4.11	4.12	3.14	(b)
	Dim of $A_{aprt}$	X (cm)	-	2D:5.43 PD:0.97	0.97	2.33	0.97
Y (cm)		-	1.10	1.10	1.10	1.10	(b)
Other Information	$t_d$ ( $\mu$ sec)	1.55	-	-	-	-	
	pr (pulses/sec)	999	-	-	-	-	
	$P_r$ at max. $I_{pi}$ (MPa)	2.23	-	-	-	-	
	$d_{eq}$ at max. $I_{pi}$ (cm)	-	-	-	-	0.31	
	$I_{pa,\alpha}$ at max. MI ( $W/cm^2$ )	121	-	-	-	-	
	Focal Length FLx (cm)	-	-	3.50	11.0	-	-
	Length FLY (cm)	-	-	7.00	7.00	-	-
Operating Control Conditions	Control 1	MI					
	Control 2		TIS_as	TIS_as_U			
	Control 3				TIS_bs		
	Control 4					TIB_bs	

Control 1:Mode : Pulsed Doppler , 3.08Mhz , Focal:2 , Focus:5.0Cm  
 Control 2:Mode : 2D+Pulsed Doppler , 4.11Mhz , Focal:1 , Focus:3.5Cm , FR:18.96  
 Control 3:Mode : Pulsed Doppler , 4.11Mhz , Focal:5 , Focus:11.0Cm  
 Control 4:Mode : Pulsed Doppler , 3.08Mhz , Focal:1 , Focus:3.5Cm

**C3-7EP**

**C3-7EP: 2D& 2D+M mode**

Index Label	M.I.	TIS				TIB	TIC
		scan	non- scan		non- scan		
			$A_{aprt} \leq 1$	$A_{aprt} > 1$		scan	
Maximum Index Value	1.45	0.90	0.13	0.14	0.24+	(b)	
Associated Acoustic Parameters	$P_{r,\alpha}$ (MPa)	2.28	-	-	-	-	-
	P (mW)	-	2D P1:56.9	M P1x1:5.87	-	M P:5.13	(b)
	Min. of $[P_{\alpha}(z_s), I_{la, \alpha}(z_s) \times 1cm^2]$ (mW)	-	-	-	8.29	-	-
	$z_s$ (cm)	-	-	-	1.64	-	-
	$z_{bp}$ (cm)	-	-	-	2.68	-	-
	$z_b$ (cm)	-	-	-	-	1.28	-
	$z_{at\_max\_lpi,\alpha}$ (cm)	1.20	-	-	-	-	-
	$d_{eq}(z_b)$ (cm)	-	-	-	-	0.34	-
	$f_{awf}$ (MHz)	2.48	3.31	3.82	3.49	3.94	(b)
	Dim of $A_{aprt}$ X (cm)	-	5.31	0.95	2.28	0.57	(b)
	Y (cm)	-	1.10	1.10	1.10	1.10	(b)
	Other Information	$t_d$ (µsec)	0.74	-	-	-	-
pr (pulses/sec)		*59.2	-	-	-	-	-
$P_r$ at max. $I_{pi}$ (MPa)		2.55	-	-	-	-	-
$d_{eq}$ at max. $I_{pi}$ (cm)		-	-	-	-	0.34	-
$I_{pa,\alpha}$ at max. MI (W/cm <sup>2</sup> )		135	-	-	-	-	-
Focal Length FLx (cm)		-	-	3.50	17.5	-	-
FLy (cm)	-	-	7.00	7.00	-	-	
Operating Conditions	Control 1	MI					
	Control 2		TIS_as				
	Control 3			TIS_as_U			
	Control 4				TIS_bs		
	Control 5					TIB_bs	

Control 1:Mode : 2D , 2.20Mhz , Focal:0 , Focus:2.0Cm , FR:59.19  
 Control 2:Mode : 2D , 4.40Mhz , Focal:6 , Focus:14.5Cm , FR:31.49  
 Control 3:Mode : 2D+M , 4.40Mhz , Focal:1 , Focus:3.5Cm , FR:31.64  
 Control 4:Mode : 2D+M , 5.60Mhz , Focal:7 , Focus:17.5Cm , FR:13.94  
 Control 5:Mode : 2D+M , 4.40Mhz , Focal:0 , Focus:2.0Cm , FR:31.64

**C3-7EP: Pulsed Doppler & 2D + Pulsed Doppler**

Index Label	M.I.	TIS				TIB	TIC
		scan	non- scan		non- scan		
			$A_{aprt} \leq 1$	$A_{aprt} > 1$		scan	
Maximum Index Value	1.42	1.00	1.05	1.37	2.85	(b)	
Associated Acoustic Parameters	$P_{r,\alpha}$ (MPa)	2.50	-	-	-	-	-
	P (mW)	-	2D P1:3.14	PD P1x1:70.2	PD P1x1:72.0	PD P:150	(b)
	Min. of $[P_{\alpha}(z_s), I_{la, \alpha}(z_s) \times 1cm^2]$ (mW)	-	-	-	94.4	-	-
	$z_s$ (cm)	-	-	-	2.20	-	-
	$z_{bp}$ (cm)	-	-	-	2.44	-	-
	$z_b$ (cm)	-	-	-	-	2.20	-
	$z_{at\_max\_lpi,\alpha}$ (cm)	1.25	-	-	-	-	-
	$d_{eq}(z_b)$ (cm)	-	-	-	-	0.76	-
	$f_{awf}$ (MHz)	3.10	2D:4.18	PD:3.06	3.06	3.06	(b)
	Dim of $A_{aprt}$ X (cm)	-	2D:6.07	PD:1.90	1.90	1.90	(b)
	Y (cm)	-	1.10	1.10	1.10	1.10	(b)
	Other Information	$t_d$ (µsec)	1.39	-	-	-	-
pr (pulses/sec)		999	-	-	-	-	-
$P_r$ at max. $I_{pi}$ (MPa)		2.84	-	-	-	-	-
$d_{eq}$ at max. $I_{pi}$ (cm)		-	-	-	-	0.37	-
$I_{pa,\alpha}$ at max. MI (W/cm <sup>2</sup> )		244	-	-	-	-	-
Focal Length FLx (cm)		-	-	6.80	6.80	-	-
FLy (cm)	-	-	7.00	7.00	-	-	
Operating Conditions	Control 1	MI					
	Control 2		TIS_as			TIB_bs	
	Control 3			TIS_as_U	TIS_bs		

Control 1:Mode : Pulsed Doppler , 3.08Mhz , Focal:0 , Focus:2.0Cm  
 Control 2:Mode : 2D+Pulsed Doppler , 3.08Mhz , Focal:3 , Focus:6.8Cm , FR:4.78  
 Control 3:Mode : Pulsed Doppler , 3.08Mhz , Focal:3 , Focus:6.8Cm

**C4-9ED**  
C4-9ED: 2D& 2D+M mode

Index Label	M.I.	TIS			TIB	TIC	
		scan	non- scan		non- scan		
			A <sub>aprt</sub> ≤1	A <sub>aprt</sub> >1			
Maximum Index Value	0.70	0.89	0.09	0.06	0.06+	1.42	
Associated Acoustic Parameters	P <sub>r,α</sub> (MPa)	1.65	-	-	-	-	-
	P (mW)	-	2D P1:39.5	M P1x1:3.97	-	M P:3.94	2D P:74.3 M P:3.61
	Min. of [P <sub>α</sub> (z <sub>s</sub> ), I <sub>ta, α</sub> (z <sub>s</sub> )x1cm <sup>2</sup> ] (mW)	-	-	-	2.73	-	-
	z <sub>s</sub> (cm)	-	-	-	0.70	-	-
	z <sub>bp</sub> (cm)	-	-	-	1.30	-	-
	z <sub>b</sub> (cm)	-	-	-	-	0.70	-
	z <sub>at_max</sub> _lpi,α (cm)	0.60	-	-	-	-	-
	d <sub>eq</sub> (z <sub>b</sub> ) (cm)	-	-	-	-	1.21	-
	f <sub>awf</sub> (MHz)	5.48	4.70	4.79	4.63	4.63	4.67
	Dim of A <sub>aprt</sub>						
	X (cm)		2.62	0.98	0.98	0.98	2D:2.62 M:0.98
	Y (cm)		0.60	0.60	0.60	0.60	0.60
Other Information	t <sub>d</sub> (μsec)	0.23	-	-	-	-	-
	pr <sub>r</sub> (pulses/sec)	*11.4	-	-	-	-	-
	P <sub>r</sub> at max. I <sub>pi</sub> (MPa)	1.88	-	-	-	-	-
	d <sub>eq</sub> at max. I <sub>pi</sub> (cm)	-	-	-	-	0.86	-
	I <sub>pa,α</sub> at max. MI (W/cm <sup>2</sup> )	113	-	-	-	-	-
	Focal Length						
		FLx (cm)	-	-	9.00	9.00	-
	FLy (cm)	-	-	3.80	3.80	-	-
Operating Control Conditions	Control 1	MI					
	Control 2		TIS_as				
	Control 3			TIS_as_U			
	Control 4				TIS_bs	TIB_bs	
	Control 5						TIC_as

Control 1:Mode : 2D , 6.16Mhz , Focal:0 , Focus:1.5Cm , FR:11.43  
 Control 2:Mode : 2D , 5.13Mhz , Focal:5 , Focus:6.5Cm , FR:19.53  
 Control 3:Mode : 2D+M , 6.16Mhz , Focal:7 , Focus:9.0Cm , FR:11.43  
 Control 4:Mode : 2D+M , 5.13Mhz , Focal:7 , Focus:9.0Cm , FR:11.43  
 Control 5:Mode : 2D+M , 5.13Mhz , Focal:6 , Focus:7.5Cm , FR:13.49

**C4-9ED: Pulsed Doppler & 2D + Pulsed Doppler**

Index Label	M.I.	TIS			TIB	TIC	
		scan	non- scan		non- scan		
			A <sub>aprt</sub> ≤1	A <sub>aprt</sub> >1			
Maximum Index Value	0.73	1.59	1.67	1.15	0.91+	1.78	
Associated Acoustic Parameters	P <sub>r,α</sub> (MPa)	1.80	-	-	-	-	-
	P (mW)	-	2D P1:4.08 PD P1x1:51.7	PD P1x1:57.7	-	PD P:60.9	61.8
	Min. of [P <sub>α</sub> (z <sub>s</sub> ), I <sub>ta, α</sub> (z <sub>s</sub> )x1cm <sup>2</sup> ] (mW)	-	-	-	41.3	-	-
	z <sub>s</sub> (cm)	-	-	-	0.70	-	-
	z <sub>bp</sub> (cm)	-	-	-	1.30	-	-
	z <sub>b</sub> (cm)	-	-	-	-	0.70	-
	z <sub>at_max</sub> _lpi,α (cm)	0.60	-	-	-	-	-
	d <sub>eq</sub> (z <sub>b</sub> ) (cm)	-	-	-	-	1.19	-
	f <sub>awf</sub> (MHz)	6.09	2D:4.71 PD:6.08	6.08	5.83	4.99	4.98
	Dim of A <sub>aprt</sub>						
	X (cm)		2D:2.62 PD:0.98	0.98	0.98	0.98	0.98
	Y (cm)		0.60	0.60	0.60	0.60	0.60
Other Information	t <sub>d</sub> (μsec)	0.68	-	-	-	-	-
	pr <sub>r</sub> (pulses/sec)	999	-	-	-	-	-
	P <sub>r</sub> at max. I <sub>pi</sub> (MPa)	2.03	-	-	-	-	-
	d <sub>eq</sub> at max. I <sub>pi</sub> (cm)	-	-	-	-	0.95	-
	I <sub>pa,α</sub> at max. MI (W/cm <sup>2</sup> )	123	-	-	-	-	-
Focal Length	FLx (cm)	-	-	9.00	6.50	-	-
	FLy (cm)	-	-	3.80	3.80	-	-
Operating Control Conditions	Control 1	MI					
	Control 2		TIS_as				
	Control 3			TIS_as_U			
	Control 4				TIS_bs		
	Control 5					TIB_bs	
	Control 6						TIC_as

Control 1:Mode : Pulsed Doppler , 6.16Mhz , Focal:0 , Focus:1.5Cm  
 Control 2:Mode : 2D+Pulsed Doppler , 6.16Mhz , Focal:7 , Focus:9.0Cm , FR:2.52  
 Control 3:Mode : Pulsed Doppler , 6.16Mhz , Focal:7 , Focus:9.0Cm  
 Control 4:Mode : Pulsed Doppler , 6.16Mhz , Focal:5 , Focus:6.5Cm  
 Control 5:Mode : Pulsed Doppler , 5.13Mhz , Focal:5 , Focus:6.5Cm  
 Control 6:Mode : Pulsed Doppler , 5.13Mhz , Focal:7 , Focus:9.0 ±

**HL5-9ED**

**HL5-9ED: 2D& 2D+M mode**

Index Label	M.I.	TIS			TIB non- scan	TIC	
		scan	non- scan				
			$A_{aprt} \leq 1$	$A_{aprt} > 1$			
Maximum Index Value	1.12	0.66	0.06	0.03	0.06+	(b)	
Associated Acoustic Parameters	$P_{r,\alpha}$ (MPa)	2.84	-	-	-	-	-
	P (mW)	-	2D P1:22.9	M P1x1:1.6 8	-	M P:1.89	(b)
	Min.of $[P_{\alpha}(z_s), I_{I_{\alpha}, \alpha}$ ( $z_s$ )x1cm <sup>2</sup> ]	-	-	-	1.01	-	-
	$z_s$ (cm)	-	-	-	1.50	-	-
	$z_{bp}$ (cm)	-	-	-	1.57	-	-
	$z_b$ (cm)	-	-	-	-	1.50	-
	$z_{at\_max\_I_{pi,\alpha}}$ (cm)	1.50	-	-	-	-	-
	$d_{eq}(z_b)$ (cm)	-	-	-	-	0.37	-
	$f_{awf}$ (MHz)	6.40	6.08	7.00	6.04	6.04	(b)
	Dim of $A_{aprt}$ X (cm)	-	3.33	1.44	1.44	1.44	(b)
Y (cm)	-	0.60	0.60	0.60	0.60	(b)	
Other Information	$t_d$ (µsec)	0.10	-	-	-	-	-
	prr (pulses/sec)	*358	-	-	-	-	-
	$P_r$ at max. $I_{pi}$ (MPa)	3.47	-	-	-	-	-
	$d_{eq}$ at max. $I_{pi}$ (cm)	-	-	-	-	0.32	-
	$I_{pa,\alpha}$ at max. MI ( $W/cm^2$ )	722	-	-	-	-	-
	Focal Length FLx (cm)	-	-	6.50	6.50	-	-
	FLy (cm)	-	-	2.00	2.00	-	-
Operating Control Conditions	Control 1	MI					
	Control 2		TIS_as				
	Control 3			TIS_as_U			
	Control 4				TIS_bs	TIB_bs	

Control 1:Mode : 2D+M , 5.60Mhz , Focal:2 , Focus:2.0Cm , FR:58.27  
 Control 2:Mode : 2D , 5.60Mhz , Focal:6 , Focus:5.6Cm , FR:61.33  
 Control 3:Mode : 2D+M , 10.27Mhz , Focal:7 , Focus:6.5Cm , FR:30.97  
 Control 4:Mode : 2D+M , 5.60Mhz , Focal:7 , Focus:6.5Cm , FR:30.97

**HL5-9ED: Pulsed Doppler & 2D + Pulsed Doppler**

Index Label	M.I.	TIS			TIB non- scan	TIC	
		scan	non- scan				
			$A_{aprt} \leq 1$	$A_{aprt} > 1$			
Maximum Index Value	1.25	1.20	1.17	0.59	1.53	(b)	
Associated Acoustic Parameters	$P_{r,\alpha}$ (MPa)	2.97	-	-	-	-	-
	P (mW)	-	2D P1:0.80 PD P1x1:24.8	PD P1x1:36.1	-	PD P:40.9	(b)
	Min.of $[P_{\alpha}(z_s), I_{I_{\alpha}, \alpha}$ ( $z_s$ )x1cm <sup>2</sup> ]	-	-	-	21.9	-	-
	$z_s$ (cm)	-	-	-	1.60	-	-
	$z_{bp}$ (cm)	-	-	-	1.57	-	-
	$z_b$ (cm)	-	-	-	-	1.60	-
	$z_{at\_max\_I_{pi,\alpha}}$ (cm)	1.50	-	-	-	-	-
	$d_{eq}(z_b)$ (cm)	-	-	-	-	0.32	-
	$f_{awf}$ (MHz)	5.60	2D:7.20 PD:6.81	6.81	5.65	5.65	(b)
	Dim of $A_{aprt}$ X (cm)	-	2D:3.84 PD:1.44	1.44	1.44	1.44	(b)
Y (cm)	-	0.60	0.60	0.60	0.60	(b)	
Other Information	$t_d$ (µsec)	0.87	-	-	-	-	-
	prr (pulses/sec)	999	-	-	-	-	-
	$P_r$ at max. $I_{pi}$ (MPa)	3.62	-	-	-	-	-
	$d_{eq}$ at max. $I_{pi}$ (cm)	-	-	-	-	0.24	-
	$I_{pa,\alpha}$ at max. MI ( $W/cm^2$ )	451	-	-	-	-	-
	Focal Length FLx (cm)	-	-	6.50	6.50	-	-
FLy (cm)	-	-	2.00	2.00	-	-	
Operating Control Conditions	Control 1	MI					
	Control 2		TIS_as	TIS_as_U			
	Control 3				TIS_bs	TIS_as_U	

Control 1:Mode : Pulsed Doppler , 5.60Mhz , Focal:2 , Focus:2.0Cm  
 Control 2:Mode : 2D+Pulsed Doppler , 6.84Mhz , Focal:7 , Focus:6.5Cm , FR:18.96  
 Control 3:Mode : 2D+Pulsed Doppler , 5.60Mhz , Focal:7 , Focus:6.5Cm , FR:18.96

**HL5-12ED**

**HL5-12ED: 2D& 2D+M mode**

Index Label	M.I.	TIS			TIB	TIC		
		scan	non- scan					
			A <sub>aprt</sub> ≤1	A <sub>aprt</sub> >1	non- scan			
Maximum Index Value	1.51	0.75	0.06	0.04	0.11+	(b)		
Associated Acoustic Parameters	P <sub>r,α</sub> (MPa)	3.33	-	-	-	-		
	P (mW)	-	2D P1:35.9	M P1x1:3.0 8	M P:2.93	(b)		
	Min.of [P <sub>α</sub> (z <sub>s</sub> ),I <sub>ta, α</sub> (z <sub>s</sub> )x1cm <sup>2</sup> ] <sub>2</sub> (mW)	-	-	-	1.86	-		
	z <sub>s</sub> (cm)	-	-	-	1.65	-		
	z <sub>bp</sub> (cm)	-	-	-	1.57	-		
	z <sub>b</sub> (cm)	-	-	-	-	1.64		
	z_at_max_lpi,α (cm)	2.07	-	-	-	-		
	d <sub>eq</sub> (z <sub>b</sub> ) (cm)	-	-	-	-	0.35		
	f <sub>awf</sub> (MHz)	4.87	4.40	4.41	4.41	4.40	(b)	
	Dim of A <sub>aprt</sub>	X (cm)	-	3.33	1.44	1.44	1.44	(b)
		Y (cm)	-	0.60	0.60	0.60	0.60	(b)
	Other Information	t <sub>d</sub> (μsec)	0.23	-	-	-	-	
prr (pulses/sec)		*22.7	-	-	-	-		
P <sub>r</sub> at max. I <sub>pi</sub> (MPa)		4.84	-	-	-	-		
d <sub>eq</sub> at max. I <sub>pi</sub> (cm)		-	-	-	-	0.28		
I <sub>pa,α</sub> at max. MI (W/cm <sup>2</sup> )		359	-	-	-	-		
Focal Length		FLx (cm)	-	-	6.50	6.50	-	
	FLy (cm)	-	-	2.00	2.00	-		
Operating Control Conditions	Control 1	MI						
	Control 2		TIS_as					
	Control 3			TIS_as_U	TIS_bs			
	Control 4					TIB_bs		

Control 1:Mode : 2D , 10.27Mhz , Focal:3 , Focus:2.8Cm , FR:22.71  
 Control 2:Mode : 2D , 5.60Mhz , Focal:7 , Focus:6.5Cm , FR:58.34  
 Control 3:Mode : 2D+M , 7.70Mhz , Focal:7 , Focus:6.5Cm , FR:30.99  
 Control 4:Mode : 2D+M , 5.60Mhz , Focal:7 , Focus:6.5Cm , FR:30.99

**HL5-12ED: Pulsed Doppler & 2D + Pulsed Doppler**

Index Label	M.I.	TIS			TIB	TIC		
		scan	non- scan					
			A <sub>aprt</sub> ≤1	A <sub>aprt</sub> >1	non- scan			
Maximum Index Value	1.42	1.53	1.50	0.79	1.91	(b)		
Associated Acoustic Parameters	P <sub>r,α</sub> (MPa)	3.31	-	-	-	-		
	P (mW)	-	2D P1:1.48 PD P1x1:32.2	PD P1x1:46.8	-	PD P:47.9	(b)	
	Min.of [P <sub>α</sub> (z <sub>s</sub> ),I <sub>ta, α</sub> (z <sub>s</sub> )x1cm <sup>2</sup> ] <sub>2</sub> (mW)	-	-	-	30.2	-		
	z <sub>s</sub> (cm)	-	-	-	1.51	-		
	z <sub>bp</sub> (cm)	-	-	-	1.57	-		
	z <sub>b</sub> (cm)	-	-	-	-	1.64		
	z_at_max_lpi,α (cm)	1.74	-	-	-	-		
	d <sub>eq</sub> (z <sub>b</sub> ) (cm)	-	-	-	-	0.31		
	f <sub>awf</sub> (MHz)	5.45	2D:5.00 PD:6.72	6.72	5.49	5.41	(b)	
	Dim of A <sub>aprt</sub>	X (cm)	-	2D:3.84 PD:1.44	1.44	1.44	1.14	(b)
		Y (cm)	-	0.60	0.60	0.60	0.60	(b)
	Other Information	t <sub>d</sub> (μsec)	0.87	-	-	-	-	
prr (pulses/sec)		999	-	-	-	-		
P <sub>r</sub> at max. I <sub>pi</sub> (MPa)		4.46	-	-	-	-		
d <sub>eq</sub> at max. I <sub>pi</sub> (cm)		-	-	-	-	0.31		
I <sub>pa,α</sub> at max. MI (W/cm <sup>2</sup> )		437	-	-	-	-		
Focal Length	FLx (cm)	-	-	5.60	6.50	-		
	FLy (cm)	-	-	2.00	2.00	-		
Operating Control Conditions	Control 1	MI						
	Control 2		TIS_as					
	Control 3			TIS_as_U				
	Control 4				TIS_bs			
	Control 5					TIB_bs		

Control 1:Mode : Pulsed Doppler , 5.60Mhz , Focal:4 , Focus:3.6Cm  
 Control 2:Mode : 2D+Pulsed Doppler , 6.84Mhz , Focal:6 , Focus:5.6Cm , FR:4.74  
 Control 3:Mode : Pulsed Doppler , 6.84Mhz , Focal:6 , Focus:5.6Cm  
 Control 4:Mode : Pulsed Doppler , 5.60Mhz , Focal:7 , Focus:6.5Cm  
 Control 5:Mode : Pulsed Doppler , 5.60Mhz , Focal:4 , Focus:3.6Cm



**L5-9EC**

**L5-9EC: 2D& 2D+M mode**

Index Label	M.I.	TIS			TIB	TIC	
		scan	non- scan				
			$A_{aprt} \leq 1$	$A_{aprt} > 1$	non- scan		
Maximum Index Value	0.99	0.66	0.05	0.03	0.06+	(b)	
Associated Acoustic Parameters	$P_{r,\alpha}$ (MPa)	2.48	-	-	-	-	
	P (mW)	-	2D P1:30.9	M P1x1:2.24	-	M P:2.24	(b)
	Min. of $[P_{\alpha}(z_s), I_{\alpha, \alpha}$ ( $z_s$ )x1cm <sup>2</sup> ]	-	-	-	1.61	-	-
	$z_s$ (cm)	-	-	-	1.10	-	-
	$z_{bp}$ (cm)	-	-	-	1.28	-	-
	$z_b$ (cm)	-	-	-	-	1.10	-
	$z_{at\_max\_lpi,\alpha}$ (cm)	1.00	-	-	-	-	-
	$d_{eq}(z_b)$ (cm)	-	-	-	-	0.60	-
	$f_{awf}$ (MHz)	6.22	4.46	4.37	4.37	4.37	(b)
	Dim of $A_{aprt}$		3.33	1.44	1.44	1.44	(b)
		0.40	0.40	0.40	0.40	(b)	
Other Information	$t_d$ (µsec)	0.15	-	-	-	-	
	prf (pulses/sec)	*23.3	-	-	-	-	
	$P_r$ at max. $I_{pi}$ (MPa)	3.12	-	-	-	-	
	$d_{eq}$ at max. $I_{pi}$ (cm)	-	-	-	-	0.45	
	$I_{pa,\alpha}$ at max. MI ( $W/cm^2$ )	253	-	-	-	-	
	Focal Length		-	4.40	4.40	-	
			-	1.50	1.50	-	
Operating Control Conditions	Control 1	MI					
	Control 2		TIS_as			TIB_bs	
	Control 3			TIS_as_U	TIS_bs		

Control 1:Mode : 2D , 10.27Mhz , Focal:1 , Focus:1.3Cm , FR:23.31  
 Control 2:Mode : 2D , 7.70Mhz , Focal:5 , Focus:4.4Cm , FR:75.22  
 Control 3:Mode : 2D+M , 7.70Mhz , Focal:5 , Focus:4.4Cm , FR:40.71

**L5-9EC: Pulsed Doppler & 2D + Pulsed Doppler**

Index Label	M.I.	scan	TIS		TIB	TIC	
			non- scan	non- scan			
			$A_{aprt} \leq 1$	$A_{aprt} > 1$	non- scan		
Maximum Index Value	1.15	1.55	1.53	0.96	1.32+	(b)	
Associated Acoustic Parameters	$P_{r,\alpha}$ (MPa)	2.72	-	-	-	-	
	P (mW)	-	2D P1:1.08 PD P1x1:32.7	PD P1x1:47.6	-	PD P:50.7	(b)
	Min. of $[P_{\alpha}(z_s), I_{\alpha, \alpha}$ ( $z_s$ )x1cm <sup>2</sup> ]	-	-	-	29.8	-	-
	$z_s$ (cm)	-	-	-	1.00	-	-
	$z_{bp}$ (cm)	-	-	-	1.28	-	-
	$z_b$ (cm)	-	-	-	-	1.00	-
	$z_{at\_max\_lpi,\alpha}$ (cm)	0.90	-	-	-	-	-
	$d_{eq}(z_b)$ (cm)	-	-	-	-	0.58	-
	$f_{awf}$ (MHz)	5.62	2D:4.92 PD:6.75	6.75	6.75	5.59	(b)
	Dim of $A_{aprt}$		2D:3.84 PD:1.44	1.44	1.44	1.44	(b)
		0.40	0.40	0.40	0.40	(b)	
Other Information	$t_d$ (µsec)	0.75	-	-	-	-	
	prf (pulses/sec)	999	-	-	-	-	
	$P_r$ at max. $I_{pi}$ (MPa)	3.24	-	-	-	-	
	$d_{eq}$ at max. $I_{pi}$ (cm)	-	-	-	-	0.34	
	$I_{pa,\alpha}$ at max. MI ( $W/cm^2$ )	402	-	-	-	-	
	Focal Length		-	6.50	6.50	-	
			-	1.50	1.50	-	
Operating Control Conditions	Control 1	MI					
	Control 2		TIS_as				
	Control 3			TIS_as_U	TIS_bs		
	Control 4					TIB_bs	

Control 1:Mode : Pulsed Doppler , 5.60Mhz , Focal:1 , Focus:1.3Cm  
 Control 2:Mode : 2D+Pulsed Doppler , 6.84Mhz , Focal:7 , Focus:6.5Cm , FR:4.74  
 Control 3:Mode : Pulsed Doppler , 6.84Mhz , Focal:7 , Focus:6.5Cm  
 Control 4:Mode : 2D+Pulsed Doppler , 5.60Mhz , Focal:7 , Focus:6.5Cm , FR:18.96

**L5-9EE**  
L5-9EE: 2D& 2D+M mode

Index Label	M.I.	TIS			TIB	TIC	
		scan	non- scan		non- scan		
			A <sub>aprt</sub> ≤1	A <sub>aprt</sub> >1			
Maximum Index Value	0.62	0.43	0.05	0.02	0.04+	(b)	
Associated Acoustic Parameters	P <sub>r,α</sub> (MPa)	1.57	-	-	-	-	-
	P (mW)	-	2D P1:15.0	M P1x1:1.65	-	M P:0.73	(b)
	Min. of [P <sub>α</sub> (z <sub>s</sub> ), I <sub>ba, α</sub> (z <sub>s</sub> )x1cm <sup>2</sup> ]	-	-	-	0.89	-	-
	z <sub>s</sub> (cm)	-	-	-	1.51	-	-
	z <sub>bp</sub> (cm)	-	-	-	1.55	-	-
	z <sub>b</sub> (cm)	-	-	-	-	1.37	-
	z <sub>at_max_lpi,α</sub> (cm)	1.51	-	-	-	-	-
	d <sub>eq</sub> (z <sub>b</sub> ) (cm)	-	-	-	-	0.23	-
	f <sub>awf</sub> (MHz)	6.40	5.98	5.86	5.86	6.40	(b)
	Dim of A <sub>aprt</sub>	X (cm)	-	3.86	1.87	1.87	0.62
Y (cm)		-	0.45	0.45	0.45	0.45	(b)
Other Information	t <sub>d</sub> (μsec)	0.16	-	-	-	-	-
	prf (pulses/sec)	*106	-	-	-	-	-
	P <sub>r</sub> at max. I <sub>pi</sub> (MPa)	2.19	-	-	-	-	-
	d <sub>eq</sub> at max. I <sub>pi</sub> (cm)	-	-	-	-	0.21	-
	I <sub>pa,α</sub> at max. MI (W/cm <sup>2</sup> )	209	-	-	-	-	-
	Focal Length	FLx (cm)	-	-	6.50	6.50	-
FLy (cm)	-	-	1.80	1.80	-	-	
Operating Conditions	Control 1	MI					
	Control 2		TIS_as				
	Control 3			TIS_as_U	TIS_bs		
	Control 4					TIB_bs	

Control 1: Mode : 2D , 6.84Mhz , Focal:2 , Focus:2.0Cm , FR:106.3  
 Control 2: Mode : 2D , 6.84Mhz , Focal:5 , Focus:4.4Cm , FR:74.04  
 Control 3: Mode : 2D+M , 7.70Mhz , Focal:7 , Focus:6.5Cm , FR:31.51  
 Control 4: Mode : 2D+M , 6.84Mhz , Focal:2 , Focus:2.0Cm , FR:59.90

**L5-9EE: Pulsed Doppler & 2D + Pulsed Doppler**

Index Label	M.I.	TIS			TIB	TIC	
		scan	non- scan		non- scan		
			A <sub>aprt</sub> ≤1	A <sub>aprt</sub> >1			
Maximum Index Value	0.92	1.10	1.07	0.63	1.38	(b)	
Associated Acoustic Parameters	P <sub>r,α</sub> (MPa)	2.16	-	-	-	-	-
	P (mW)	-	2D P1:0.87 PD P1x1:29.2	PD 1x1:40.4	-	PD P:20.2	(b)
	Min. of [P <sub>α</sub> (z <sub>s</sub> ), I <sub>ba, α</sub> (z <sub>s</sub> )x1cm <sup>2</sup> ]	-	-	-	23.9	-	-
	z <sub>s</sub> (cm)	-	-	-	1.37	-	-
	z <sub>bp</sub> (cm)	-	-	-	1.35	-	-
	z <sub>b</sub> (cm)	-	-	-	-	0.60	-
	z <sub>at_max_lpi,α</sub> (cm)	1.37	-	-	-	-	-
	d <sub>eq</sub> (z <sub>b</sub> ) (cm)	-	-	-	-	0.27	-
	f <sub>awf</sub> (MHz)	5.55	2D:6.55 PD:5.56	5.56	5.56	5.61	(b)
	Dim of A <sub>aprt</sub>	X (cm)	-	2D:4.99 PD:1.40	1.40	1.40	0.31
Y (cm)		-	0.45	0.45	0.45	0.45	(b)
Other Information	t <sub>d</sub> (μsec)	0.89	-	-	-	-	-
	prf (pulses/sec)	999	-	-	-	-	-
	P <sub>r</sub> at max. I <sub>pi</sub> (MPa)	2.74	-	-	-	-	-
	d <sub>eq</sub> at max. I <sub>pi</sub> (cm)	-	-	-	-	0.27	-
	I <sub>pa,α</sub> at max. MI (W/cm <sup>2</sup> )	300	-	-	-	-	-
	Focal Length	FLx (cm)	-	-	4.40	4.40	-
FLy (cm)	-	-	1.80	1.80	-	-	
Operating Conditions	Control 1	MI					
	Control 2		TIS_as	TIS_as_U	TIS_bs		
	Control 3					TIB_bs	

Control 1: Mode : Pulsed Doppler , 5.60Mhz , Focal:2 , Focus:2.0Cm ,  
 Control 2: Mode : 2D+Pulsed Doppler , 5.60Mhz , Focal:5 , Focus:4.4Cm , FR:23.26 ,  
 Control 3: Mode : Pulsed Doppler , 5.60Mhz , Focal:0 , Focus:0.5Cm ,

**L5-12/50EP**

**L5-12/50EP: 2D& 2D+M mode**

Index Label	M.I.	TIS			TIB non- scan	TIC	
		scan	non- scan				
			$A_{aprt} \leq 1$	$A_{aprt} > 1$	non- scan		
Maximum Index Value	0.94	0.74	0.07**	0.04	0.05+	(b)	
Associated Acoustic Parameters	$P_{r,\alpha}$ (MPa)	2.41	-	-	-	-	
	P (mW)	-	2D P1:23.2	M P1x1:2.24	-	M P:0.85	(b)
	Min. of $[P_{\alpha}(z_s), I_{\alpha, \alpha}$ ( $z_s$ )x1cm <sup>2</sup> ] (mW)	-	-	-	1.21	-	-
	$z_s$ (cm)	-	-	-	1.65	-	-
	$z_{bp}$ (cm)	-	-	-	1.79	-	-
	$z_b$ (cm)	-	-	-	-	1.44	-
	$z_{at\_max\_lpi,\alpha}$ (cm)	1.55	-	-	-	-	-
	$d_{eq}(z_b)$ (cm)	-	-	-	-	0.20	-
	$f_{awf}$ (MHz)	6.56	6.67	6.67	6.53	6.55	(b)
	Dim of $A_{aprt}$ X (cm)	-	4.25	1.79	1.87	0.62	(b)
Y (cm)	-	0.60	0.60	0.60	0.60	(b)	
Other Information	$t_d$ (µsec)	0.12	-	-	-	-	
	pr (pulses/sec)	97.1*	-	-	-	-	
	$P_r$ at max. $I_{pi}$ (MPa)	3.37	-	-	-	-	
	$d_{eq}$ at max. $I_{pi}$ (cm)	-	-	-	-	0.19	
	$I_{pa,\alpha}$ at max. MI (W/cm <sup>2</sup> )	421	-	-	-	-	
Focal Length FLx (cm)	-	-	5.60	6.50	-	-	
FLy (cm)	-	-	2.00	2.00	-	-	
Operating Control Conditions	Control 1	MI					
	Control 2		TIS_as				
	Control 3			TIS_as_U			
	Control 4				TIS_bs		
	Control 5					TIB_bs	

- Control 1: 2D mode , 2D:6.8Mhz , Focus:2.0Cm , FR:97.05
- Control 2: 2D mode , 2D:6.8Mhz , Focus:5.6Cm , FR:59.61
- Control 3: 2D+M mode , 2D:6.8Mhz , Focus:5.6Cm , FR:31.86
- Control 4: 2D+M mode , 2D:7.7Mhz , Focus:6.5Cm , FR:30.37
- Control 5: 2D+M mode , 2D:7.7Mhz , Focus:2.0Cm , FR:54.07

**L5-12/50EP: Pulsed Doppler & 2D + Pulsed Doppler**

Index Label	M.I.	TIS			TIB non- scan	TIC	
		scan	non- scan				
			$A_{aprt} \leq 1$	$A_{aprt} > 1$	non- scan		
Maximum Index Value	1.37	1.50	1.53**	0.85	1.66	(b)	
Associated Acoustic Parameters	$P_{r,\alpha}$ (MPa)	3.20	-	-	-	-	
	P (mW)	-	2D P1:1.19 PD P1x1:27.5	PD P1x1:48.1	-	PD P: 40.2	(b)
	Min. of $[P_{\alpha}(z_s), I_{\alpha, \alpha}$ ( $z_s$ )x1cm <sup>2</sup> ] (mW)	-	-	-	32.3	-	-
	$z_s$ (cm)	-	-	-	1.55	-	-
	$z_{bp}$ (cm)	-	-	-	1.79	-	-
	$z_b$ (cm)	-	-	-	-	1.55	-
	$z_{at\_max\_lpi,\alpha}$ (cm)	0.70	-	-	-	-	-
	$d_{eq}(z_b)$ (cm)	-	-	-	-	0.31	-
	$f_{awf}$ (MHz)	5.50	2D:6.81 PD:6.79	6.70	5.51	5.55	(b)
	Dim of $A_{aprt}$ X (cm)	-	2D:4.99 PD:1.87	1.79	1.87	0.94	(b)
Y (cm)	-	0.60	0.60	0.60	0.60	(b)	
Other Information	$t_d$ (µsec)	0.82	-	-	-	-	
	pr (pulses/sec)	999	-	-	-	-	
	$P_r$ at max. $I_{pi}$ (MPa)	3.39	-	-	-	-	
	$d_{eq}$ at max. $I_{pi}$ (cm)	-	-	-	-	0.23	
	$I_{pa,\alpha}$ at max. MI (W/cm <sup>2</sup> )	399	-	-	-	-	
Focal Length FLx (cm)	-	-	5.60	6.50	-	-	
FLy (cm)	-	-	2.00	2.00	-	-	
Operating Control Conditions	Control 1	MI					
	Control 2		TIS_as				
	Control 3			TIS_as_U			
	Control 4				TIS_bs		
	Control 5					TIB_bs	

- Control 1: Pulsed Doppler mode , PD:5.6Mhz , Focus:1.3Cm
- Control 2: 2D+Pulsed Doppler mode , 2D:7.7Mhz , PD:6.8Mhz , Focus:6.5Cm , FR:19.14
- Control 3: Pulsed Doppler mode , PD:6.8Mhz , Focus:5.6Cm
- Control 4: Pulsed Doppler mode , PD:5.6Mhz , Focus:6.5 Cm
- Control 5: 2D+Pulsed Doppler mode , 2D:7.7Mhz , PD:5.6Mhz , Focus:4.4Cm , FR:23.26

**EC4-9ED**

**EC4-9ED: 2D& 2D+M mode**

Index Label		M.I.	TIS			TIB	TIC
			scan	non- scan		non- scan	
				A <sub>aprt</sub> ≤1	A <sub>aprt</sub> >1		
Maximum Index Value		0.70	0.89	0.09	0.06	0.06+	(b)
Associated Acoustic Parameters	P <sub>r,α</sub> (MPa)	1.65	-	-	-	-	-
	P (mW)	-	2D P1:39.5	M P1x1:3.97	-	M P:3.94	(b)
	Min.of [P <sub>α</sub> (z <sub>s</sub> ), I <sub>ta, α</sub> (z <sub>s</sub> )x1cm <sup>2</sup> ] <sub>1</sub> (mW)	-	-	-	2.73	-	-
	z <sub>s</sub> (cm)	-	-	-	0.70	-	-
	z <sub>bp</sub> (cm)	-	-	-	1.30	-	-
	z <sub>b</sub> (cm)	-	-	-	-	0.70	-
	z_at_max_lpi,α (cm)	0.60	-	-	-	-	-
	d <sub>eq</sub> (z <sub>b</sub> ) (cm)	-	-	-	-	1.21	-
	f <sub>awf</sub> (MHz)	5.48	4.70	4.79	4.63	4.63	(b)
	Dim of A <sub>aprt</sub> X (cm)	-	2.62	0.98	0.98	0.98	(b)
Y (cm)	-	0.60	0.60	0.60	0.60	(b)	
Other Information	t <sub>d</sub> (μsec)	0.23	-	-	-	-	-
	prr (pulses/sec)	*11.4	-	-	-	-	-
	P <sub>r</sub> at max. I <sub>pi</sub> (MPa)	1.88	-	-	-	-	-
	d <sub>eq</sub> at max. I <sub>pi</sub> (cm)	-	-	-	-	0.86	-
	I <sub>pa,α</sub> at max. MI (W/cm <sup>2</sup> )	113	-	-	-	-	-
	Focal Length FLx (cm)	-	-	9.00	9.00	-	-
FLy (cm)	-	-	3.80	3.80	-	-	
Operating Control Conditions	Control 1	MI					
	Control 2		TIS_as				
	Control 3			TIS_as_U			
	Control 4				TIS_bs	TIB_bs	

Control 1:Mode : 2D , 6.16Mhz , Focal:0 , Focus:1.5Cm , FR:11.43

Control 2:Mode : 2D , 5.13Mhz , Focal:5 , Focus:6.5Cm , FR:19.53

Control 3:Mode : 2D+M , 6.16Mhz , Focal:7 , Focus:9.0Cm , FR:11.43

Control 4:Mode : 2D+M , 5.13Mhz , Focal:7 , Focus:9.0Cm , FR:11.43

**EC4-9ED: Pulsed Doppler & 2D + Pulsed Doppler**

Index Label		M.I.	TIS			TIB	TIC
			scan	non- scan		non- scan	
				A <sub>aprt</sub> ≤1	A <sub>aprt</sub> >1		
Maximum Index Value		0.73	1.59	1.67	1.15	0.91+	(b)
Associated Acoustic Parameters	P <sub>r,α</sub> (MPa)	1.80	-	-	-	-	-
	P (mW)	-	2D P1:4.08 PD P1x1:51.7	PD P1x1:57.7	-	PD P:60.9	(b)
	Min.of [P <sub>α</sub> (z <sub>s</sub> ), I <sub>ta, α</sub> (z <sub>s</sub> )x1cm <sup>2</sup> ] <sub>1</sub> (mW)	-	-	-	41.3	-	-
	z <sub>s</sub> (cm)	-	-	-	0.70	-	-
	z <sub>bp</sub> (cm)	-	-	-	1.30	-	-
	z <sub>b</sub> (cm)	-	-	-	-	0.70	-
	z_at_max_lpi,α (cm)	0.60	-	-	-	-	-
	d <sub>eq</sub> (z <sub>b</sub> ) (cm)	-	-	-	-	1.19	-
	f <sub>awf</sub> (MHz)	6.09	2D:4.71 PD:6.08	6.08	5.83	4.99	(b)
	Dim of A <sub>aprt</sub> X (cm)	-	2D:2.62 PD:0.98	0.98	0.98	0.98	(b)
Y (cm)	-	0.60	0.60	0.60	0.60	(b)	
Other Information	t <sub>d</sub> (μsec)	0.68	-	-	-	-	-
	prr (pulses/sec)	999	-	-	-	-	-
	P <sub>r</sub> at max. I <sub>pi</sub> (MPa)	2.03	-	-	-	-	-
	d <sub>eq</sub> at max. I <sub>pi</sub> (cm)	-	-	-	-	0.95	-
	I <sub>pa,α</sub> at max. MI (W/cm <sup>2</sup> )	123	-	-	-	-	-
	Focal Length FLx (cm)	-	-	9.00	6.50	-	-
FLy (cm)	-	-	3.80	3.80	-	-	
Operating Control Conditions	Control 1	MI					
	Control 2		TIS_as				
	Control 3			TIS_as_U			
	Control 4				TIS_bs		
	Control 5					TIB_bs	

Control 1:Mode : Pulsed Doppler , 6.16Mhz , Focal:0 , Focus:1.5Cm

Control 2:Mode : 2D+Pulsed Doppler , 6.16Mhz , Focal:7 , Focus:9.0Cm , FR:2.52

Control 3:Mode : Pulsed Doppler , 6.16Mhz , Focal:7 , Focus:9.0Cm

Control 4:Mode : Pulsed Doppler , 6.16Mhz , Focal:5 , Focus:6.5Cm

Control 5:Mode : Pulsed Doppler , 5.13Mhz , Focal:5 , Focus:6.5Cm

**EC4-9ES**

**EC4-9ES: 2D& 2D+M mode**

Index Label	M.I.	TIS			TIB	TIC	
		scan	non- scan		non- scan		
			A <sub>aprt</sub> ≤1	A <sub>aprt</sub> >1			
Maximum Index Value	1.58	1.01	0.08	0.05	0.16+	(b)	
Associated Acoustic Parameters	P <sub>r,α</sub> (MPa)	3.65	-	-	-	-	-
	P (mW)	-	2D P1:46.2	M P1x1:3.23	-	M P:2.05	(b)
	Min. of [P <sub>α</sub> (z <sub>s</sub> ), I <sub>ba, α</sub> (z <sub>s</sub> )x1cm <sup>2</sup> ]	-	-	-	2.24	-	-
	z <sub>s</sub> (cm)	-	-	-	1.40	-	-
	z <sub>bp</sub> (cm)	-	-	-	1.30	-	-
	z <sub>b</sub> (cm)	-	-	-	-	1.20	-
	z <sub>at_max_lpi,α</sub> (cm)	1.30	-	-	-	-	-
	d <sub>eq(z<sub>b</sub>)</sub> (cm)	-	-	-	-	0.20	-
	f <sub>awf</sub> (MHz)	5.34	4.58	5.45	4.79	4.94	(b)
	Dim of A <sub>aprt</sub> X (cm)	-	1.95	0.98	0.98	0.41	(b)
Y (cm)	-	0.60	0.60	0.60	0.60	(b)	
Other Information	t <sub>d</sub> (μsec)	0.25	-	-	-	-	-
	p <sub>rr</sub> (pulses/sec)	*11.4	-	-	-	-	-
	P <sub>r</sub> at max. I <sub>pi</sub> (MPa)	4.14	-	-	-	-	-
	d <sub>eq</sub> at max. I <sub>pi</sub> (cm)	-	-	-	-	0.19	-
	I <sub>pa,α</sub> at max. MI (W/cm <sup>2</sup> )	535	-	-	-	-	-
	Focal Length FLx (cm)	-	-	9.00	9.00	-	-
FLy (cm)	-	-	3.00	3.00	-	-	
Operating Conditions	Control 1	MI					
	Control 2		TIS_as				
	Control 3			TIS_as_U			
	Control 4				TIS_bs		
	Control 5					TIB_bs	

Control 1:Mode : 2D , 6.16Mhz , Focal:1 , Focus:2.0Cm , FR:11.43  
 Control 2:Mode : 2D , 4.11Mhz , Focal:2 , Focus:3.0Cm , FR:35.83  
 Control 3:Mode : 2D+M , 6.16Mhz , Focal:7 , Focus:9.0Cm , FR:11.43  
 Control 4:Mode : 2D+M , 5.13Mhz , Focal:7 , Focus:9.0Cm , FR:11.43  
 Control 5:Mode : 2D+M , 5.13Mhz , Focal:1 , Focus:2.0Cm , FR:18.62

**EC4-9ES: Pulsed Doppler & 2D + Pulsed Doppler**

Index Label	M.I.	TIS				TIB	TIC
		scan	non- scan		non- scan		
			A <sub>aprt</sub> ≤1	A <sub>aprt</sub> >1			
Maximum Index Value	1.01	1.38	1.41	0.86	2.31	(b)	
Associated Acoustic Parameters	P <sub>r,α</sub> (MPa)	2.50	-	-	-	-	-
	P (mW)	-	2D P1:3.57 PD P1x1:44.5	P1x1P:57 .8	-	PD P:55.4	(b)
	Min. of [P <sub>α</sub> (z <sub>s</sub> ), I <sub>ba, α</sub> (z <sub>s</sub> )x1cm <sup>2</sup> ]	-	-	-	35.2	-	-
	z <sub>s</sub> (cm)	-	-	-	1.40	-	-
	z <sub>bp</sub> (cm)	-	-	-	1.30	-	-
	z <sub>b</sub> (cm)	-	-	-	-	1.40	-
	z <sub>at_max_lpi,α</sub> (cm)	1.40	-	-	-	-	-
	d <sub>eq(z<sub>b</sub>)</sub> (cm)	-	-	-	-	0.33	-
	f <sub>awf</sub> (MHz)	6.11	2D:5.16 PD:6.09	5.12	5.12	5.06	(b)
	Dim of A <sub>aprt</sub> X (cm)	-	2D:2.62 PD:0.98	0.98	0.98	0.98	(b)
Y (cm)	-	0.60	0.60	0.60	0.60	(b)	
Other Information	t <sub>d</sub> (μsec)	0.64	-	-	-	-	-
	p <sub>rr</sub> (pulses/sec)	999	-	-	-	-	-
	P <sub>r</sub> at max. I <sub>pi</sub> (MPa)	3.10	-	-	-	-	-
	d <sub>eq</sub> at max. I <sub>pi</sub> (cm)	-	-	-	-	0.30	-
	I <sub>pa,α</sub> at max. MI (W/cm <sup>2</sup> )	365	-	-	-	-	-
	Focal Length FLx (cm)	-	-	9.00	9.00	-	-
FLy (cm)	-	-	3.00	3.00	-	-	
Operating Conditions	Control 1	MI					
	Control 2		TIS_as				
	Control 3			TIS_as_U	TIS_bs		
	Control 4					TIB_bs	

Control 1:Mode : Pulsed Doppler , 6.16Mhz , Focal:1 , Focus:2.0Cm  
 Control 2:Mode : 2D+Pulsed Doppler , 6.16Mhz , Focal:4 , Focus:5.5Cm , FR:7.44  
 Control 3:Mode : Pulsed Doppler , 5.13Mhz , Focal:7 , Focus:9.0Cm  
 Control 4:Mode : Pulsed Doppler , 5.13Mhz , Focal:4 , Focus:5.5Cm

## FDA Tables

### Explanatory Notes

- (a) This index is not required to this operating mode.
- (b) This probe is not intended for adult transcranial uses.
- (c) This formulation for TIS is less than that for an alternate formulation in this mode.
- (d) The maximum index value is less than 1.0

\* PRF for scanning modes is the product of the frame rate and the number of pulse per line

### C2-4ES

#### C2-4ES: 2D& 2D+M mode

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm <sup>2</sup>	Aaprt>1cm <sup>2</sup>		
Maximum index value	0.70	0.85	0.05	(c)	0.05	(b)
Pr.3	1.06					
W0		81.0	4.57		4.48	(b)
min[W.3,Ita.3]				(c)		
z1				(c)		
Zbp				(c)		
Zsp	4.70				5.00	
deq(zsp)					0.79	
fc	2.29	2.20	2.54	(c)	2.56	(b)
X Aaprt		3.13	1.35	(c)	1.35	(b)
Y Aaprt		0.12	0.12	(c)	0.12	(b)
PD	0.76					
PRF	* 8.94					
Pr_Pii_max	1.53					
deq_Pii_max					0.72	
FLx (cm)		8.8	8.80	(c)		(b)
FLy (cm)		7.00	7.00	(c)		(b)
lpa.MI_max	57.1					
Control 1	MI					
Control 2		TIS_as				
Control 3			TIS_asu			
Control 4					TIB_bs	

Control 1: 2D mode, Resolution Imaging, FZ 3, FR 8.946 PRF 2289

Control 2: 2D mode, Penetration Imaging, FZ 4, FR 42.05 PRF 5382

Control 3: 2D+M mode, Penetration Imaging, FZ 4, FR 22.04 PRF 5642

Control 4: 2D+M mode, Penetration Imaging, FZ 3, FR 28.24 PRF 7229

**C2-4ES: Pulsed Doppler & 2D+Pulsed Doppler**

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm <sup>2</sup>	Aaprt>1cm <sup>2</sup>		
Maximum index value	0.49	1.48	1.55	(c)	1.36	(b)
Pr.3	0.76	-	-	-	-	
W0	-	75.8	107	-	95.6	(b)
min[W.3,Ita.3]	-	-	-	(c)	-	
z1	-	-	-	(c)	-	
Zbp	-	-	-	(c)	-	
Zsp	1.60	-	-	-	4.60	
deq(zsp)	-	-	-	-	0.75	
fc	2.36	2D:2.86 PD:3.03	3.05	(c)	2.37	(b)
X Aaprt	-	2D:3.61 PD:1.35	1.35	(c)	1.35	(b)
Y Aaprt	-	0.12	0.12	(c)	0.12	(b)
PD	1.82	-	-	-	-	
PRF	* 999	-	-	-	-	
Pr_Pii_max	0.73	-	-	-	-	
deq_Pii_max	-	-	-	-	0.68	
FLx (cm)	-	11.0	11.0	(c)	-	(b)
FLy (cm)	-	7.00	7.00	(c)	-	(b)
lpa.MI_max	19.2	-	-	-	-	
Control 1	MI					
Control 2		TIS_as				
Control 3			TIS_asu			
Control 4					TIB_bs	

Control 1: Pulsed Doppler, General Imageing FZ 1, PRF 999

Control 2: 2D+Pulsed Doppler, General Imageing, FZ 5, PRF 2500

Control 3: Pulsed Doppler, General Imageing, FZ 5, PRF 7000

Control 2: 2D+Pulsed Doppler, General Imageing, FZ 3, PRF 3000

**C2-5ET****C2-5ET: 2D& 2D+M mode**

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm <sup>2</sup>	Aaprt>1cm <sup>2</sup>		
Maximum index value	1.60	1.21	(c)	0.10	0.31	(b)
Pr.3	2.44					
W0		118	(c)		15.0	(b)
min[W.3,Ita.3]				8.97		
z1				3.40		
Zbp				2.95		
Zsp	4.60				6.20	
deq(zsp)					0.44	
fc	2.33	2.17	(c)	2.31	2.31	(b)
X Aaprt		4.41	(c)	1.92	1.92	(b)
Y Aaprt		1.58	(c)	1.58	1.58	(b)
PD	0.74					
PRF	* 8.91					
Pr_Pii_max	2.99					
deq_Pii_max					0.42	
FLx (cm)		14.5	(c)	8.80		(b)
FLy (cm)		8.30	(c)	8.30		(b)
lpa.MI_max	475					
Control 1	MI					
Control 2		TIS_as				
Control 3					TisBS	TIB_bs

Control 1: 2D mode, Resolution Imaging, FZ 2, FR 8.91 PRF 2281

Control 2: 2D mode, Penetration Imaging, FZ 6, FR 31.05 PRF 3973

Control 3: 2D+M mode, Penetration Imaging, FZ 4, FR 21.85 PRF 5592

**C2-5ET: Pulsed Doppler & 2D+Pulsed Doppler**

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm <sup>2</sup>	Aaprt>1cm <sup>2</sup>		
Maximum index value	1.13	1.47	(c)	1.47	3.82	(b)
Pr.3	1.96	-	-	-	-	
W0	-	114	(c)	-	110	(b)
min[W.3,Ita.3]	-	-	-	103	-	
z1	-	-	-	2.50	-	
Zbp	-	-	-	2.95	-	
Zsp	5.00	-	-	-	0.60	
deq(zsp)	-	-	-	-	0.60	
fc	3.00	2D:3.15 PD3.03	(c)	3.00	2.21	(b)
X Aaprt	-	2D:4.49 PD:0.72	(c)	1.92	0.40	(b)
Y Aaprt	-	1.58	(c)	1.58	1.58	(b)
PD	1.57	-	-	-	-	
PRF	* 999	-	-	-	-	
Pr_Pii_max	2.79	-	-	-	-	
deq_Pii_max	-	-	-	-	0.53	
FLx (cm)	-	3.50	(c)	11.0	-	(b)
FLy (cm)	-	8.30	(c)	8.30	-	(b)
lpa.MI_max	241	-	-	-	-	
Control 1	MI					
Control 2		TIS_as				
Control 3				TIsBS		
Control 4					TIB_bs	

Control 1: Pulsed Doppler, General Imageing FZ 2, PRF 999  
 Control 2: 2D+Pulsed Doppler, General Imageing, FZ 1, PRF 3999  
 Control 3: 2D+Pulsed Doppler, General Imageing, FZ 5, PRF 2500  
 Control 4: 2D+Pulsed Doppler, General Imageing, FZ 0, PRF 3999

**C3-7ED**

**C3-7ED: 2D& 2D+M mode**

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm <sup>2</sup>	Aaprt>1cm <sup>2</sup>		
Maximum index value	1.10	0.953	0.103	0.07	0.127	(b)
Pr.3	1.74					
W0		58.0	5.27		7.03	(b)
min[W.3,Ita.3]				3.37		
z1				1.80		
Zbp				1.75		
Zsp	3.90				3.70	
deq(zsp)					0.458	
fc	2.52	3.45	4.12	4.12	3.90	(b)
X Aaprt		4.90	0.97	0.97	1.36	(b)
Y Aaprt		1.10	1.10	1.10	1.10	(b)
PD	0.743					
PRF	* 40.3					
Pr_Pii_max	2.28					
deq_Pii_max					0.434	
FLx (cm)		6.80	3.50	3.50		(b)
FLy (cm)		7.00	7.00	7.00		(b)
lpa.MI_max	81.8					
Control 1	MI					
Control 2		TIS_as				
Control 3			TIS_as_u	TIsBS		
Control 4					TIB_bs	

Control 1: 2D mode, General Imaging, FZ 2, FR 40.29  
 Control 2: 2D mode, Penetration Imaging, FZ 3, FR 52.8  
 Control 3: 2D+M mode, Resolution Imaging, FZ 1, FR 30.92  
 Control 4: 2D+M mode, Resolution Imaging, FZ 2, FR 21.92



**C3-7ED: Pulsed Doppler & 2D+Pulsed Doppler**

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm <sup>2</sup>	Aaprt>1cm <sup>2</sup>		
Maximum index value	0.854	1.31	(c)	1.33	2.09	(b)
Pr.3	1.51	-	-	-	-	
W0	-	71.3	(c)	-	60.2	(b)
min[W.3,Ita.3]	-	-	-	67.8	-	
z1	-	-	-	2.80	-	
Zbp	-	-	-	2.71	-	
Zsp	3.70	-	-	-	3.10	
deq(zsp)	-	-	-	-	0.33	
fc	3.11	2D:4.14 PD:4.11	(c)	4.12	3.14	(b)
X Aaprt	-	2D:5.43 PD:0.97	(c)	2.33	0.97	(b)
Y Aaprt	-	1.10	(c)	1.10	1.10	(b)
PD	1.55	-	-	-	-	
PRF	* 999	-	-	-	-	
Pr_Pii_max	2.23	-	-	-	-	
deq_Pii_max	-	-	-	-	0.31	
FLx (cm)	-	3.50	(c)	11.0	-	(b)
FLy (cm)	-	7.00	(c)	7.00	-	(b)
Ipa.MI_max	121	-	-	-	-	
Control 1	MI					
Control 2		TIS_as				
Control 3				TIsBS		
Control 4					TIB_bs	

Control 1: Pulsed Doppler, General Imageing FZ 2, PRF 999

Control 2: 2D+Pulsed Doppler, General Imageing, FZ 1, PRF 3999

Control 3: Pulsed Doppler, General Imageing, FZ 5, PRF 7999

Control 4: Pulsed Doppler , General , FZ 1 , Depth 3.5Cm

**C3-7EP****C3-7EP: 2D& 2D+M mode**

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm <sup>2</sup>	Aaprt>1cm <sup>2</sup>		
Maximum index value	1.45	0.90	(c)	0.14	0.24	(b)
Pr.3	2.28					
W0		56.9	(c)		5.13	(b)
min[W.3,Ita.3]				8.29		
z1				1.64		
Zbp				2.68		
Zsp	1.20				1.28	
deq(zsp)					0.34	
fc	2.48	3.31	(c)	3.49	3.94	(b)
X Aaprt		5.31	(c)	2.28	0.57	(b)
Y Aaprt		1.10	(c)	1.10	1.10	(b)
PD	0.74					
PRF	*59.2					
Pr_Pii_max	2.55					
deq_Pii_max					0.34	
FLx (cm)		14.5	(c)	17.5		(b)
FLy (cm)		7.00	(c)	7.00		(b)
Ipa.MI_max	135					
Control 1	MI					
Control 2		TIS_as				
Control 3				TIsBS		
Control 4					TIB_bs	

Control 1: 2D mode, Penetration Imaging, FZ 0, FR 59.19 PRF 7576

Control 2: 2D mode, Penetration Imaging, FZ 6, FR 31.49 PRF 4030

Control 3: 2D+M mode, General Imaging, FZ 7, FR 13.94 PRF 3567

Control 4: 2D+M mode, Penetration Imaging, FZ 0, FR 31.64 PRF 8100

**C3-7EP: Pulsed Doppler & 2D+Pulsed Doppler**

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm <sup>2</sup>	Aaprt>1cm <sup>2</sup>		
Maximum index value	1.42	1.00	(c)	1.37	2.85	(b)
Pr.3	2.50	-	-	-	-	
W0	-	73.3	(c)	-	150	(b)
min[W.3,Ita.3]	-	-	-	94.4	-	
z1	-	-	-	2.20	-	
Zbp	-	-	-	2.44	-	
Zsp	1.25	-	-	-	2.20	
deq(zsp)	-	-	-	-	0.76	
fc	3.10	2D:4.18 PD:3.06	(c)	3.06	3.06	(b)
X Aaprt	-	2D:6.07 PD:1.90	(c)	1.90	1.90	(b)
Y Aaprt	-	1.10	(c)	1.10	1.10	(b)
PD	1.39	-	-	-	-	
PRF	* 999	-	-	-	-	
Pr_Pii_max	2.84	-	-	-	-	
deq_Pii_max	-	-	-	-	0.37	
FLx (cm)	-	6.80	(c)	6.80	-	(b)
FLy (cm)	-	7.00	(c)	7.00	-	(b)
Ipa.MI_max	244	-	-	-	-	
Control 1	MI					
Control 2		TIS_as				
Control 3				TISBS	TIB_bs	

Control 1: Pulsed Doppler, General Imageing FZ 0, PRF 999  
 Control 2: 2D+Pulsed Doppler, General Imageing, FZ 3, PRF 999  
 Control 3: Pulsed Doppler, General Imageing, FZ 3, PRF 999

**C4-9ED**

**C4-9ED: 2D& 2D+M mode**

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm <sup>2</sup>	Aaprt>1cm <sup>2</sup>		
Maximum index value	0.704	0.885	0.09	(c)	0.06	1.42
Pr.3	1.65					
W0		39.5	3.97		3.94	77.9
min[W.3,Ita.3]				(c)		
z1				(c)		
Zbp				(c)		
Zsp	0.60				0.70	
deq(zsp)					1.21	
fc	5.48	4.70	4.79	(c)	4.63	4.67
X Aaprt		2.62	0.984	(c)	0.98	Es:2.62 Eu:0.98
Y Aaprt		0.60	0.6	(c)	0.6	0.60
PD	0.231					
PRF	* 11.4					
Pr_Pii_max	1.88					
deq_Pii_max					0.86	
FLx (cm)		6.50	9.00	(c)		7.50
FLy (cm)		3.80	3.80	(c)		3.80
Ipa.MI_max	113					
Control 1	MI					
Control 2		TIS_as				
Control 3			TISASu			
Control 4					TIB_bs	
Control 5						TicAS

Control 1: 2D mode, Resolution Imaging, FZ 0, FR 11.43 PRF 5851  
 Control 2: 2D mode, General Imaging, FZ 5, FR 19.53 PRF 7498  
 Control 3: 2D+M mode, Resolution Imaging, FZ 7, FR 11.43 PRF 5851  
 Control 4: 2D+M mode, General Imaging, FZ 7, FR 11.43 PRF 5851  
 Control 5: 2D+M mode, General Imaging, FZ 6, FR 13.49 PRF 6905

**C4-9ED: Pulsed Doppler & 2D+Pulsed Doppler**

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm <sup>2</sup>	Aaprt>1cm <sup>2</sup>		
Maximum index value	0.73	1.59	1.67	(c)	0.91	1.78
Pr.3	1.80	-	-	-	-	-
W0	-	55.78	57.7	-	60.9	61.8
min[W.3,Ita.3]	-	-	-	(c)	-	-
z1	-	-	-	(c)	-	-
Zbp	-	-	-	(c)	-	-
Zsp	0.60	-	-	-	0.70	-
deq(zsp)	-	-	-	-	1.19	-
fc	6.09	2D:4.71 PD:6.08	6.08	(c)	4.99	4.98
X Aaprt	-	2D:2.62 PD:0.98	0.98	(c)	0.98	0.98
Y Aaprt	-	0.60	0.60	(c)	0.60	0.60
PD	0.68	-	-	-	-	-
PRF	* 999	-	-	-	-	-
Pr_Pii_max	2.03	-	-	-	-	-
deq_Pii_max	-	-	-	-	0.94	-
FLx (cm)	-	9.00	9.00	(c)	-	9.00
FLy (cm)	-	3.80	3.80	(c)	-	3.80
Ipa.MI_max	123	-	-	-	-	-
Control 1	MI					
Control 2		TIS_as				
Control 3			TISAS u			
Control 4					TIB_bs	
Control 5						TicAS

Control 1: Pulsed Doppler, General Imageing FZ 0, PRF 999  
Control 2: 2D+Pulsed Doppler, General Imageing, FZ 7, PRF 999  
Control 3: Pulsed Doppler, General Imageing, FZ 7, PRF 999  
Control 4: Pulsed Doppler, General Imageing, FZ 5, PRF 999  
Control 5: Pulsed Doppler, General Imageing, FZ 7, PRF 999

**HL5-9ED****HL5-9ED: 2D& 2D+M mode**

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm <sup>2</sup>	Aaprt>1cm <sup>2</sup>		
Maximum index value	1.12	0.66	0.05	(c)	0.06	(b)
Pr.3	2.84	-	-	-	-	-
W0	-	22.9	1.68	-	1.89	(b)
min[W.3,Ita.3]	-	-	-	(c)	-	-
z1	-	-	-	(c)	-	-
Zbp	-	-	-	(c)	-	-
Zsp	1.50	-	-	-	1.50	-
deq(zsp)	-	-	-	-	0.37	-
fc	6.40	6.08	7.00	(c)	6.04	(b)
X Aaprt	-	3.33	1.44	(c)	1.44	(b)
Y Aaprt	-	0.60	0.60	(c)	0.60	(b)
PD	0.09	-	-	-	-	-
PRF	* 358	-	-	-	-	-
Pr_Pii_max	3.47	-	-	-	-	-
deq_Pii_max	-	-	-	-	0.32	-
FLx (cm)	-	5.60	6.50	(c)	-	(b)
FLy (cm)	-	2.00	2.00	(c)	-	(b)
Ipa.MI_max	722	-	-	-	-	-
Control 1	MI					
Control 2		TIS_as				
Control 3			TIS_asu			
Control 4					TibBS	

Control 1: 2D+M mode, Penetration Imaging, FZ 2, PRF 14917 FR 58.27  
Control 2: 2D mode, Penetration Imaging, FZ 6, PRF 7850 FR 61.33  
Control 3: 2D+M mode, Resolution Imaging, FZ 7, PRF 7928 FR 30.97  
Control 4: 2D+M mode, Penetration Imaging, FZ 7, PRF 7928 FR 30.97

**HL5-9ED: Pulsed Doppler & 2D+Pulsed Doppler**

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm²	Aaprt>1cm²		
Maximum index value	1.25	1.20	1.17	(c)	1.53	(b)
Pr.3	2.97				-	
W0		25.60	36.0		31.2	(b)
min[W.3,Ita.3]				(c)	-	
z1				(c)	-	
Zbp				(c)	-	
Zsp	1.50				1.70	
deq(zsp)					0.24	
fc	5.60	2D:7.20 PD:6.81	6.80	(c)	5.66	(b)
X Aaprt		2D:3.84 PD:1.44	1.44	(c)	1.14	(b)
Y Aaprt		0.60	0.60	(c)	0.60	(b)
PD	0.87				-	
PRF	* 999				-	
Pr_Pii_max	3.62				-	
deq_Pii_max					0.17	
FLx (cm)		6.50	5.60	(c)	-	(b)
FLy (cm)		2.00	2.00	(c)	-	(b)
Ipa.MI_max	451		-	-	-	
Control 1	MI					
Control 2		TIS_as				
Control 3			TIS_asu			
Control 4					TIB_bs	

Control 1: Pulsed Doppler, General Imaging, FZ 2, PRF 999  
 Control 2: 2D+Pulsed Doppler, General Imaging, FZ 7, PRF 3999  
 Control 3: 2D+Pulsed Doppler, General Imaging, FZ 6 PRF 3999  
 Control 4: 2D+Pulsed Doppler, General Imaging, FZ 4, PRF 5000

**HL5-12ED**

**HL5-12ED: 2D& 2D+M mode**

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm²	Aaprt>1cm²		
Maximum index value	1.51	0.75	0.06	(c)	0.11	(b)
Pr.3	3.33					
W0		35.9	3.08		2.93	(b)
min[W.3,Ita.3]				(c)		
z1				(c)		
Zbp				(c)		
Zsp	2.07				1.64	
deq(zsp)					0.35	
fc	4.87	4.40	4.41	(c)	4.40	(b)
X Aaprt		3.33	1.44	(c)	1.44	(b)
Y Aaprt		0.60	0.60	(c)	0.60	(b)
PD	0.23					
PRF	*22.7					
Pr_Pii_max	4.84					
deq_Pii_max					0.28	
FLx (cm)		6.50	6.5	(c)		(b)
FLy (cm)		2.00	2.00	(c)		(b)
Ipa.MI_max	359					
Control 1	MI					
Control 2		TIS_as				
Control 3			TisAS_U			
Control 4					TIB_bs	

Control 1: 2D mode, resolution Imaging, FZ 3, FR 22.71 PRF 5814  
 Control 2: 2D mode, Penetration Imaging, FZ 7, FR 58.34 PRF 7467  
 Control 3: 2D+M mode, General Imaging, FZ 7, FR 30.99 PRF 7932  
 Control 4: 2D+M mode, Penetration Imaging, FZ 7, FR 30.99 PRF 7932

**HL5-12ED: Pulsed Doppler & 2D+Pulsed Doppler**

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm <sup>2</sup>	Aaprt>1cm <sup>2</sup>		
Maximum index value	1.42	1.53	1.50	(c)	1.91	(b)
Pr.3	3.31	-	-	-	-	-
W0	-	33.6	46.8	-	47.9	(b)
min[W.3,Ita.3]	-	-	-	(c)	-	-
z1	-	-	-	(c)	-	-
Zbp	-	-	-	(c)	-	-
Zsp	1.74	-	-	-	1.64	-
deq(zsp)	-	-	-	-	0.31	-
fc	5.45	2D:4.67 PD:6.71	6.71	(c)	5.41	(b)
X Aaprt	-	2D:3.84 PD:1.44	1.44	(c)	1.14	(b)
Y Aaprt	-	0.60	0.60	(c)	0.60	(b)
PD	0.87	-	-	-	-	-
PRF	* 999	-	-	-	-	-
Pr_Pii_max	4.46	-	-	-	-	-
deq_Pii_max	-	-	-	-	0.31	-
FLx (cm)	-	4.40	4.40	(c)	-	(b)
FLy (cm)	-	2.00	2.00	(c)	-	(b)
Ipa.MI_max	437	-	-	-	-	-
Control 1	MI					
Control 2		TIS_as				
Control 3			TISAS_u			
Control 4					TIB_bs	

Control 1: Pulsed Doppler, General Imageing FZ 4, PRF 999

Control 2: 2D+Pulsed Doppler, General Imageing, FZ 5, PRF 999

Control 3: Pulsed Doppler, General Imageing, FZ 5, PRF 999

Control 3: Pulsed Doppler, General Imageing, FZ 4, PRF 999

**L5-9EC****L5-9EC: 2D& 2D+M mode**

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm <sup>2</sup>	Aaprt>1cm <sup>2</sup>		
Maximum index value	0.995	0.66	0.05	(c)	0.06	(b)
Pr.3	2.48	-	-	-	-	-
W0	-	30.9	2.24	-	2.20	(b)
min[W.3,Ita.3]	-	-	-	(c)	-	-
z1	-	-	-	(c)	-	-
Zbp	-	-	-	(c)	-	-
Zsp	1.00	-	-	-	1.10	-
deq(zsp)	-	-	-	-	0.60	-
fc	6.22	4.46	4.37	(c)	4.37	(b)
X Aaprt	-	3.33	1.44	(c)	1.44	(b)
Y Aaprt	-	0.40	0.40	(c)	0.40	(b)
PD	0.16	-	-	-	-	-
PRF	*23.3	-	-	-	-	-
Pr_Pii_max	3.12	-	-	-	-	-
deq_Pii_max	-	-	-	-	0.45	-
FLx (cm)	-	4.40	4.40	(c)	-	(b)
FLy (cm)	-	1.50	1.50	(c)	-	(b)
Ipa.MI_max	253	-	-	-	-	-
Control 1	MI					
Control 2		TIS_as				
Control 3			TISASu		TIB_bs	

Control 1: 2D mode, Resolution Imaging, FZ 1, FR 23.31 PRF 5967

Control 2: 2D mode, Penetration Imaging, FZ 5, FR 75.22 PRF 9628

Control 3: 2D+M mode, Penetration Imaging, FZ 5, FR 40.71 PRF 10421

**L5-9EC: Pulsed Doppler & 2D+Pulsed Doppler**

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm <sup>2</sup>	Aaprt>1cm <sup>2</sup>		
Maximum index value	1.15	1.55	1.53	(c)	1.32	(b)
Pr.3	2.72	-	-	-	-	
W0	-	33.75	47.5	-	50.7	(b)
min[W.3,Ita.3]	-	-	-	(c)	-	
z1	-	-	-	(c)	-	
Zbp	-	-	-	(c)	-	
Zsp	0.90	-	-	-	1.00	
deq(zsp)	-	-	-	-	0.58	
fc	5.62	2D:4.93 PD:6.75	6.75	(c)	5.59	(b)
X Aaprt	-	2D:3.84 PD:1.44	1.44	(c)	1.44	(b)
Y Aaprt	-	0.40	0.40	(c)	0.40	(b)
PD	0.75	-	-	-	-	
PRF	* 999	-	-	-	-	
Pr_Pii_max	3.24	-	-	-	-	
deq_Pii_max	-	-	-	-	0.34	
FLx (cm)	-	95.60	5.60	(c)	-	(b)
FLy (cm)	-	1.50	1.50	(c)	-	(b)
Ipa.MI_max	402	-	-	-	-	
Control 1	MI					
Control 2		TIS_as				
Control 3			TIsAS u			
Control 4					TIB_bs	

Control 1: Pulsed Doppler, General Imageing FZ 1, PRF 999  
 Control 2: 2D+Pulsed Doppler, General Imageing, FZ 6, PRF 999  
 Control 3: Pulsed Doppler, General Imageing, FZ 6, PRF 999  
 Control 4: 2D+Pulsed Doppler, General Imageing, FZ 7, PRF 3999

**L5-9EE**

**L5-9EE: 2D& 2D+M mode**

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm <sup>2</sup>	Aaprt>1cm <sup>2</sup>		
Maximum index value	0.62	0.43	0.05	(c)	0.04	(b)
Pr.3	1.57					
W0		15.0	15.0		0.73	(b)
min[W.3,Ita.3]				(c)		
z1				(c)		
Zbp				(c)		
Zsp	1.51				1.37	
deq(zsp)					0.23	
fc	6.40	5.98	5.98	(c)	6.40	(b)
X Aaprt		3.86	3.86	(c)	0.62	(b)
Y Aaprt		0.45	0.45	(c)	0.45	(b)
PD	0.16					
PRF	*106					
Pr_Pii_max	2.19					
deq_Pii_max					0.21	
FLx (cm)		4.40	4.40	(c)		(b)
FLy (cm)		1.80	1.80	(c)		(b)
Ipa.MI_max	209					
Control 1	MI					
Control 2		TIS_as				
Control 3			TIsASu			
Control 4					TIB_bs	

Control 1: 2D mode, Penetration Imaging, FZ 2, FR 106.37 PRF 13615  
 Control 2: 2D mode, Penetration Imaging, FZ 5, FR 74.04 PRF 9477  
 Control 3: 2D+M mode, General Imaging, FZ 7, FR 31.51 PRF 8065  
 Control 4: 2D+M mode, Penetration Imaging, FZ 2, FR 59.9 PRF 15335

**L5-9EE: Pulsed Doppler & 2D+Pulsed Doppler**

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm <sup>2</sup>	Aaprt>1cm <sup>2</sup>		
Maximum index value	0.92	1.10	1.07	(c)	1.38	(b)
Pr.3	2.16	-	-	-	-	
W0	-	30.06	34.0	-	20.2	(b)
min[W.3,Ita.3]	-	-	-	(c)	-	
z1	-	-	-	(c)	-	
Zbp	-	-	-	(c)	-	
Zsp	1.37	-	-	-	0.60	
deq(zsp)	-	-	-	-	0.27	
fc	5.55	2D:6.55 PD:5.56	6.61	(c)	5.61	(b)
X Aaprt	-	2D:4.99 PD:1.40	1.40	(c)	0.31	(b)
Y Aaprt	-	0.45	0.45	(c)	0.45	(b)
PD	0.89	-	-	-	-	
PRF	*999	-	-	-	-	
Pr_Pii_max	2.74	-	-	-	-	
deq_Pii_max	-	-	-	-	0.27	
FLx (cm)	-	4.40	4.40	(c)	-	(b)
FLy (cm)	-	1.80	1.80	(c)	-	(b)
Ipa.MI_max	300	-	-	-	-	
Control 1	MI					
Control 2		TIS_as				
Control 3			TIsAS u			
Control 4					TIB_bs	

Control 1: Pulsed Doppler, General Imageing FZ 2, PRF 999

Control 2: 2D+Pulsed Doppler, General Imageing, FZ 5, PRF 5000

Control 3: Pulsed Doppler, General Imageing, FZ 5, PRF 999

Control 4: Pulsed Doppler, General Imageing, FZ 0, PRF 7999

**L5-12/50EP****L5-12/50EP: 2D& 2D+M mode**

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm <sup>2</sup>	Aaprt>1cm <sup>2</sup>		
Maximum index value	0.94	0.74	0.07**	0.04	0.05+	(b)
Pr.3	2.41					
W0		2D P1:23.2	M P1x1:2.24		M P:0.85	(b)
min[W.3,Ita.3]				1.21		
z1				1.65		
Zbp				1.79		
Zsp	1.55				1.44	
deq(zsp)					0.20	
fc	6.56	6.67	6.67	6.53	6.55	(b)
X Aaprt		4.25	1.79	1.87	0.62	(b)
Y Aaprt		0.60	0.60	0.60	0.60	(b)
PD	0.12					
PRF	97.1*					
Pr_Pii_max	3.37					
deq_Pii_max					0.19	
FLx (cm)		5.60	5.60	6.50		(b)
FLy (cm)		2.00	2.00	2.00		(b)
Ipa.MI_max	421					
Control 1	MI					
Control 2		TIS_as				
Control 3			TIS_as_U			
Control 4				TIS_bs		
Control 5					TIB_bs	

Control 1: 2D mode , 2D:6.8Mhz , Focus:2.0Cm , FR:97.05

Control 2: 2D mode , 2D:6.8Mhz , Focus:5.6Cm , FR:59.61

Control 3: 2D+M mode , 2D:6.8Mhz , Focus:5.6Cm , FR:31.86

Control 4: 2D+M mode , 2D:7.7Mhz , Focus:6.5Cm , FR:30.37

Control 5: 2D+M mode , 2D:7.7Mhz , Focus:2.0Cm , FR:54.07

**L5-12/50EP: Pulsed Doppler & 2D+Pulsed Doppler**

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm <sup>2</sup>	Aaprt>1cm <sup>2</sup>		
Maximum index value	1.37	1.50	1.53**	0.85	1.66	(b)
Pr.3	3.20					
W0		2D P1:1.19 PD P1x1:27.5	PD P1x1:48.1		PD P: 40.2	(b)
min[W.3,Ita.3]				32.3		
z1				1.55		
Zbp				1.79		
Zsp	0.70				1.55	
deq(zsp)					0.31	
fc	5.50	2D:6.81 PD:6.79	6.70	5.51	5.55	(b)
X Aaprt		2D:4.99 PD:1.87	1.79	1.87	0.94	(b)
Y Aaprt		0.60	0.60	0.60	0.60	(b)
PD	0.82					
PRF	999					
Pr_Pii_max	3.39					
deq_Pii_max					0.23	
FLx (cm)		6.50	5.60	6.50		(b)
FLy (cm)		2.00	2.00	2.00		(b)
Ipa.MI_max	399					
Control 1	MI					
Control 2		TIS_as				
Control 3			TIS_as_U			
Control 4				TIS_bs		
Control 5					TIB_bs	

Control 1: Pulsed Doppler mode , PD:5.6Mhz , Focus:1.3Cm  
 Control 2: 2D+Pulsed Doppler mode , 2D:7.7Mhz , PD:6.8Mhz , Focus:6.5Cm , FR:19.14  
 Control 3: Pulsed Doppler mode , PD:6.8Mhz , Focus:5.6Cm  
 Control 4: Pulsed Doppler mode , PD:5.6Mhz , Focus:6.5Cm  
 Control 5: 2D+Pulsed Doppler mode , 2D:7.7Mhz , PD:5.6Mhz , Focus:4.4Cm , FR:23.26

**EC4-9ED**

**EC4-9ED: 2D& 2D+M mode**

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm <sup>2</sup>	Aaprt>1cm <sup>2</sup>		
Maximum index value	0.704	0.885	0.09	(c)	0.06	(b)
Pr.3	1.65					
W0		39.5	3.97		3.94	(b)
min[W.3,Ita.3]				(c)		
z1				(c)		
Zbp				(c)		
Zsp	0.60				0.70	
deq(zsp)					1.21	
fc	5.48	4.70	4.79	(c)	4.63	(b)
X Aaprt		2.62	0.984	(c)	0.98	(b)
Y Aaprt		0.60	0.6	(c)	0.6	(b)
PD	0.231					
PRF	* 11.4					
Pr_Pii_max	1.88					
deq_Pii_max					0.86	
FLx (cm)		6.50	9.00	(c)		(b)
FLy (cm)		3.80	3.80	(c)		(b)
Ipa.MI_max	113					
Control 1	MI					
Control 2		TIS_as				
Control 3			TIsASu			
Control 4					TIB_bs	

Control 1:Mode : 2D , 6.16Mhz , Focal:0 , Focus:1.5Cm , FR:11.43  
 Control 2:Mode : 2D , 5.13Mhz , Focal:5 , Focus:6.5Cm , FR:19.53  
 Control 3:Mode : 2D+M , 6.16Mhz , Focal:7 , Focus:9.0Cm , FR:11.43  
 Control 4:Mode : 2D+M , 5.13Mhz , Focal:7 , Focus:9.0Cm , FR:11.43



**EC4-9ED: Pulsed Doppler & 2D+Pulsed Doppler**

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm <sup>2</sup>	Aaprt>1cm <sup>2</sup>		
Maximum index value	0.73	1.59	1.67	(c)	0.91	(b)
Pr.3	1.80	-	-	-	-	
W0	-	55.78	57.7	-	60.9	(b)
min[W.3,Ita.3]	-	-	-	(c)	-	
z1	-	-	-	(c)	-	
Zbp	-	-	-	(c)	-	
Zsp	0.60	-	-	-	0.70	
deq(zsp)	-	-	-	-	1.19	
fc	6.09	2D:4.71 PD:6.08	6.08	(c)	4.99	(b)
X Aaprt	-	2D:2.62 PD:0.98	0.98	(c)	0.98	(b)
Y Aaprt	-	0.60	0.60	(c)	0.60	(b)
PD	0.68	-	-	-	-	
PRF	* 999	-	-	-	-	
Pr_Pii_max	2.03	-	-	-	-	
deq_Pii_max	-	-	-	-	0.94	
FLx (cm)	-	9.00	9.00	(c)	-	(b)
FLy (cm)	-	3.80	3.80	(c)	-	(b)
Ipa.MI_max	123	-	-	-	-	
Control 1	MI					
Control 2		TIS_as				
Control 3			TIsAS u			
Control 4					TIB_bs	

Control 1: Pulsed Doppler, General Imageing FZ 0, PRF 999

Control 2: 2D+Pulsed Doppler, General Imageing, FZ 7, PRF 999

Control 3: Pulsed Doppler, General Imageing, FZ 7, PRF 999

Control 4: Pulsed Doppler, General Imageing, FZ 5, PRF 999

**EC4-9ES****EC4-9ES: 2D& 2D+M mode**

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm <sup>2</sup>	Aaprt>1cm <sup>2</sup>		
Maximum index value	1.58	1.01	0.08	(c)	0.16	(b)
Pr.3	3.65					
W0		46.2	3.23		2.05	(b)
min[W.3,Ita.3]				(c)		
z1				(c)		
Zbp				(c)		
Zsp	1.30				1.20	
deq(zsp)					0.20	
fc	5.34	4.58	5.45	(c)	4.94	(b)
X Aaprt		1.95	0.98	(c)	0.41	(b)
Y Aaprt		0.60	0.60	(c)	0.60	(b)
PD	0.25					
PRF	* 11.4					
Pr_Pii_max	4.14					
deq_Pii_max					0.19	
FLx (cm)		3.00	9.00	(c)		(b)
FLy (cm)		3.00	3.00	(c)		(b)
Ipa.MI_max	535					
Control 1	MI					
Control 2		TIS_as				
Control 3			TIS_as_u			
Control 4					TIB_bs	

Control 1: 2D mode, Resolution Imaging, FZ 1, FR 11.43 PRF 5851

Control 2: 2D mode, Penetration Imaging, FZ 2, FR 35.83 PRF 9172

Control 3: 2D+M mode, Resolution Imaging, FZ 7, FR 11.43 PRF 5851

Control 4: 2D+M mode, General Imaging, FZ 1, FR 18.62 PRF 9533

**EC4-9ES: Pulsed Doppler & 2D+Pulsed Doppler**

Index Label	MI	Scan	TIS		TIB	TIC
			Non-scan	Non-scan	Non-scan	
			Aaprt≤1cm <sup>2</sup>	Aaprt>1cm <sup>2</sup>		
Maximum index value	1.01	1.38	1.41	(c)	2.31	(b)
Pr.3	2.27	-	-	-	-	
W0	-	48.7	57.8	-	55.4	(b)
min[W.3,Ita.3]	-	-	-	(c)	-	
z1	-	-	-	(c)	-	
Zbp	-	-	-	(c)	-	
Zsp	1.70	-	-	-	1.40	
deq(zsp)	-	-	-	-	0.33	
fc	5.09	2D: 5.16 PD: 6.09	5.12	(c)	5.06	(b)
X Aaprt	-	2D: 2.62 PD: 0.98	0.98	(c)	0.98	(b)
Y Aaprt	-	0.60	0.60	(c)	0.60	(b)
PD	0.84	-	-	-	-	
PRF	* 999	-	-	-	-	
Pr_Pii_max	2.95	-	-	-	-	
deq_Pii_max	-	-	-	-	0.30	
FLx (cm)	-	5.50	9.00	(c)	-	(b)
FLy (cm)	-	3.00	3.00	(c)	-	(b)
Ipa.MI_max	343	-	-	-	-	
Control 1	MI					
Control 2		TIS_as				
Control 3			TIS_as_u		TIB_bs	

Control 1: Pulsed Doppler, General Imaging, FZ 2, PRF 999  
 Control 2: 2D+Pulsed Doppler, General Imaging, FZ 4, PRF 3000  
 Control 3: Pulsed Doppler, General Imaging, FZ 7, PRF 7999  
 Control 4: Pulsed Doppler, General Imaging, FZ 4, PRF 7999