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Please note the changes to the standard deviations for both head and abdominal circumferences.

I have adapted the technique of Deter et al (whose AC chart had been used by ASUM prior to mine) to simplify variability with gestational age. Thus, instead of having the SD at each week vary, the weeks have been grouped and the variations of standard deviations then averaged.

Australasian Society for Ultrasound in Medicine
Ultrasonic Fetal Measurement Standards for an Australian Population

Compiled by Dr Susan Campbell Westerway – University of Sydney

Gestation (weeks)	BPD (mm)	OFD (mm)	Head circ.	Abdominal Circ.(mm)	Femur (mm)	Humerus (mm)	Gestation (weeks)
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+/-2 standard deviations shown in brackets.

11	16 (2.0)	21 (2.0)	59 (15)	52 (10)	8 (2.0)	8 (3.0)	11
12	20 (4.0)	24 (2.0)	70 (15)	63 (10)	10 (2.5)	9 (2.0)	12
13	24 (4.0)	29 (3.0)	84 (15)	74 (10)	11 (2.5)	11 (3.0)	13
14	28 (4.0)	34 (3.0)	96 (15)	84 (10)	15 (3.0)	14 (4.0)	14
15	31 (4.0)	38 (3.0)	108 (15)	96 (10)	17 (3.5)	17 (5.5)	15
16	36 (5.0)	46 (3.0)	128 (15)	106 (10)	22 (4.0)	21 (4.0)	16
17	39 (5.0)	50 (3.0)	141 (15)	120 (15)	25 (4.0)	25 (5.0)	17
18	42 (4.0)	54 (3.5)	151 (20)	131 (15)	28 (5.0)	27 (5.5)	18
19	45 (5.0)	57 (3.5)	160 (20)	140 (15)	30 (5.0)	29 (5.0)	19
20	47 (4.0)	61 (3.5)	170 (20)	151 (15)	32 (6.0)	31 (5.0)	20
21	49 (4.0)	63 (4.0)	176 (20)	164 (20)	34 (6.0)	32 (6.0)	21
22	52 (5.0)	68 (3.5)	188 (20)	176 (20)	37 (5.0)	35 (6.0)	22
23	57 (5.0)	76 (4.0)	210 (20)	186 (20)	43 (5.0)	38 (4.0)	23
24	60 (6.0)	79 (4.0)	220 (20)	201 (20)	45 (4.0)	40 (6.0)	24
25	64 (6.0)	82 (4.5)	231 (20)	212 (20)	48 (5.0)	43 (5.0)	25
26	67 (4.0)	84 (4.5)	238 (20)	223 (25)	49 (5.0)	44 (4.0)	26
27	68 (5.0)	86 (4.5)	250 (20)	230 (25)	50 (5.0)	47 (4.0)	27
28	72 (4.0)	95 (5.0)	263 (20)	242 (25)	54 (4.0)	50 (5.0)	28
29	75 (4.0)	97 (5.5)	269 (25)	259 (25)	55 (5.5)	51 (5.0)	29
30	76 (4.0)	98 (5.5)	274 (25)	262 (25)	58 (6.0)	52 (5.0)	30
31	80 (6.0)	101 (5.0)	284 (25)	272 (30)	59 (5.5)	54 (5.0)	31
32	81 (4.0)	102 (5.0)	288 (25)	283 (30)	62 (6.0)	56 (5.0)	32
33	84 (6.0)	107 (5.5)	300 (25)	294 (30)	65 (4.0)	57 (6.0)	33
34	86 (6.0)	108 (5.5)	305 (25)	305 (30)	66 (4.0)	59 (5.5)	34
35	88 (6.5)	109 (5.5)	310 (25)	315 (30)	67 (6.0)	60 (6.0)	35
36	90 (6.0)	112 (5.5)	317 (25)	325 (35)	69 (6.0)	62 (5.0)	36
37	92 (6.5)	113 (6.0)	321 (25)	333 (35)	72 (5.0)	63 (6.0)	37
38	93 (6.0)	116 (5.5)	328 (25)	342 (35)	73 (5.5)	64 (6.0)	38
39	95 (8.0)	119 (6.0)	336 (25)	356 (35)	75 (6.0)	65 (5.5)	39
40	96 (8.0)	120 (6.0)	340 (25)	362 (35)	76 (4.0)	66 (6.0)	40
41	98 (8.0)	122 (6.0)	344 (25)	367 (35)	77 (5.0)	68(6.0)	41

This cross sectional study collected 11,600 measurements from 3,800 women representing 70 nationalities. Figures are based on completed weeks of gestation.

Crown-rump length measurements (mm) at points in gestation (weeks/days)

Gestation	CRL	Gestation	CRL	Gestation	CRL
5.2	1	8.3	20	11.4	52
5.3	2	8.4	21	11.5	55
5.4	3	8.5	22	11.6	56
5.5	3	8.6	22	12	57
5.6	4	9	23	12.1	58
6	4	9.1	24	12.2	60
6.1	5	9.2	26	12.3	61
6.2	6	9.3	27	12.4	63
6.3	7	9.4	28	12.5	64
6.4	8	9.5	29	12.6	65
6.5	9	9.6	31	13	68
6.6	10	10	34	13.1	70
7	11	10.1	36	13.2	72
7.1	11	10.2	37	13.3	74
7.2	12	10.3	38	13.4	76
7.3	12	10.4	39	13.5	77
7.4	13	10.5	39	13.6	80
7.5	14	10.6	40	14	81
7.6	15	11	44	14.1	84
8	17	11.1	45	14.2	85
8.1	18	11.2	47	14.3	86
8.2	19	11.3	48	14.4	87

CRL figures based on 500 pregnancies.

Adapted from Ultrasonic Fetal Measurements – new Australian standards for the new millennium. Aust. NZ .J. Obstetrics & Gynaecology August 2000,vol.40.No.3.

Regression Analysis

$$\text{CRL} = 0.5967 (\text{GA})^2 - 2.1413 (\text{GA}) - 3.4966 \quad (r^2 = 0.985)$$

$$\text{GA} = -0.0007 (\text{CRL})^2 + 0.1584 (\text{CRL}) + 5.2876 \quad (r^2 = 0.99)$$

$$\text{BPD} = -0.0371 (\text{GA})^2 + 4.69 (\text{GA}) - 31.546 \quad (r^2 = 0.969), \text{ and}$$

$$\text{GA} = 0.397 (\text{BPD}) - 0.00306 (\text{BPD})^2 + 0.00002788 (\text{BPD})^3 + 4.933$$

$$\text{OFD} = -0.0665 (\text{GA})^2 + 6.8881 (\text{GA}) - 49.08 \quad (r^2 = 0.963)$$

$$\text{GA} = 0.381 (\text{OFD}) - 0.00344 (\text{OFD})^2 + 0.00002298 (\text{OFD})^3 + 4.189$$

$$\text{HC} = -0.1699 (\text{GA})^2 + 18.494 (\text{GA}) - 127.91 \quad (r^2 = 0.991)$$

$$\text{GA} = 0.0001797 (\text{HC})^2 + 0.02631 (\text{HC}) + 9.667 \quad (r^2 = 0.996)$$

$$\text{AC} = -0.0469 (\text{GA})^2 + 13.204 (\text{GA}) - 90.946 \quad (r^2 = 0.984)$$

$$\text{GA} = 0.0000367 (\text{AC})^2 + 0.07715 (\text{AC}) + 7.192 \quad (r^2 = 0.999)$$

$$\text{FL} = -0.0004 (\text{GA})^3 + 0.0032 (\text{GA})^2 + 3.1263 (\text{GA}) - 28.489 \quad (r^2 = 0.974)$$

$$\text{GA} = 0.41 (\text{FL}) - 0.002884 (\text{FL})^2 + 0.00003924 (\text{FL})^3 + 8.284$$

$$\text{HL} = -0.0001 (\text{GA})^3 - 0.0235 (\text{GA})^2 + 3.5386 (\text{GA}) - 29.452 \quad (r^2 = 0.956)$$

$$\text{GA} = 0.406 (\text{HL}) - 0.002804 (\text{HL})^2 + 0.0000563 (\text{HL})^3 + 8.411 \quad (r^2 = 0.999)$$

Standard Deviation regressions

BPD

$$\text{BPD} + 2\text{SD} = -0.037(\text{GA})^2 + 4.0535(\text{GA}) + 15.808$$

$$\text{BPD} - 2\text{SD} = -0.041(\text{GA})^2 + 3.9347(\text{GA}) + 8.5077$$

$$\text{GA} = 0.274 (\text{BPD} + 2\text{SD}) - 0.000697(\text{BPD} + 2\text{SD})^2 + 0.00001166(\text{BPD} + 2\text{SD})^3 + 5.78$$

$$\text{GA} = 0.505 (\text{BPD} - 2\text{SD}) - 0.00558 (\text{BPD} - 2\text{SD})^2 + 0.00004862 (\text{BPD} - 2\text{SD})^3 + 4.728$$

OFD

$$\text{OFD} + 2\text{SD} = -0.0687(\text{GA})^2 + 5.8026(\text{GA}) + 17.852$$

$$\text{OFD} - 2\text{SD} = -0.0609(\text{GA})^2 + 5.1603(\text{GA}) + 9.3793$$

$$\text{GA} = 0.301 (\text{OFD} + 2\text{SD}) - 0.00217 (\text{OFD} + 2\text{SD})^2 + 0.00001479 (\text{OFD} + 2\text{SD})^3 + 4.653$$

$$\text{GA} = 0.473 (\text{OFD} - 2\text{SD}) - 0.0052 (\text{OFD} - 2\text{SD})^2 + 0.00003558 (\text{OFD} - 2\text{SD})^3 + 4.066$$

Head Circumference

$$\text{HC} + 2\text{SD} = -0.1788(\text{GA})^2 + 15.785(\text{GA}) + 52.956$$

$$\text{HC} - 2\text{SD} = -0.161(\text{GA})^2 + 14.406(\text{GA}) + 27.113$$

$$\text{GA} = 0.02109 (\text{HC} + 2\text{SD}) + 0.0001663 (\text{HC} + 2\text{SD})^2$$

$$\text{GA} = 0.03244 (\text{HC} - 2\text{SD}) + 0.0001945 (\text{HC} - 2\text{SD})^2$$

Abdominal Circumference

$$\text{AC} + 2\text{SD} = -0.0488(\text{GA})^2 + 13.285(\text{GA}) + 43.379$$

$$\text{AC} - 2\text{SD} = 0.0433(\text{GA})^2 + 11.17(\text{GA}) + 30.057$$

$$\text{GA} = 0.07101 (\text{AC} + 2\text{SD}) + 0.00003005 (\text{AC} + 2\text{SD})^2 + 6.935$$

$$\text{GA} = 0.08483 (\text{AC} - 2\text{SD}) + 0.00004515 (\text{AC} - 2\text{SD})^2 + 7.474$$

Femur Length

$$FL +2SD = - 0.0001(GA)^3 - 0.0284(GA)^2 + 3.4986(GA) + 5.5528$$

$$FL -2SD = - 0.0011(GA)^3 + 0.0272(GA)^2 + 2.4332(GA) + 2.1902$$

$$GA = 0.328 (FL+2SD) - 0.001241 (FL+2SD)^2 + 0.00002467 (FL+2SD)^3 + 8.104$$

$$GA = 0.518 (FL-2SD) - 0.005546 (FL-2SD)^2 + 0.00006438 (FL-2SD)^3 + 8.466$$

Humerus Length

$$HL +2SD = 0.0006(GA)^3 - 0.0644(GA)^2 + 3.6553(GA) + 5.3259$$

$$HL -2SD = - 0.0007(GA)^3 + 0.005(GA)^2 + 2.5053(GA) + 1.1813$$

$$GA = 0.256 (HL+2SD) + 0.0007266 (HL+2SD)^2 + 0.00002192 (HL+2SD)^3 + 8.752$$

$$GA = 0.553 (HL-2SD) - 0.007603 (HL-2SD)^2 + 0.0001137 (HL-2SD)^3 + 8.783$$

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11	16 (4)	21 (5)	59 (7)	52 (7)	8 (7)	8 (7)	11
12	20 (7)	24 (5)	70 (7)	63 (7)	10 (7)	9 (7)	12
13	24 (7)	29 (5)	84 (7)	74 (7)	11 (7)	11 (7)	13
14	28 (7)	34 (5)	96 (10)	84 (7)	15 (7)	14 (7)	14
15	31 (7)	38 (5)	108 (10)	96 (7)	17 (7)	17 (7)	15
16	36 (7)	46 (5)	128 (10)	106 (7)	22 (7)	21 (7)	16
17	39 (10)	50 (5)	141 (10)	120 (7)	25 (7)	25 (10)	17
18	42 (10)	54 (7)	151 (14)	131 (10)	28 (10)	27 (10)	18
19	45 (10)	57 (7)	160 (14)	140 (10)	30 (10)	29 (14)	19
20	47 (10)	61 (7)	170 (14)	151 (10)	32 (10)	31 (14)	20
21	49 (10)	63 (7)	176 (14)	164 (10)	34 (14)	32 (14)	21
22	52 (10)	68 (7)	188 (14)	176 (10)	37 (14)	35 (14)	22
23	57 (10)	76 (7)	210 (14)	186 (10)	43 (14)	38 (14)	23
24	60 (10)	79 (10)	220 (14)	201 (10)	45 (14)	40 (14)	24
25	64 (10)	82 (10)	231 (14)	212 (10)	48 (14)	43 (14)	25
26	67 (12)	84 (10)	238 (14)	223 (14)	49 (14)	44 (14)	26
27	68 (12)	86 (10)	250 (18)	230 (14)	50 (14)	47 (14)	27
28	72 (12)	95 (10)	263 (18)	242 (14)	54 (14)	50 (18)	28
29	75 (12)	97 (10)	269 (21)	259 (14)	55 (18)	51 (18)	29
30	76 (14)	98 (14)	274 (21)	262 (14)	58 (18)	52 (21)	30
31	80 (16)	101 (14)	284 (21)	272 (21)	59 (18)	54 (21)	31
32	81 (16)	102 (14)	288 (24)	283 (21)	62 (21)	56 (21)	32
33	84 (21)	107 (14)	300 (24)	294 (21)	65 (21)	57 (21)	33
34	86 (21)	108 (18)	305 (28)	305 (21)	66 (21)	59 (21)	34
35	88 (21)	109 (18)	310 (28)	315 (21)	67 (21)	60 (21)	35
36	90 (21)	112 (21)	317 (28)	325 (28)	69 (21)	62 (21)	36
37	92 (24)	113 (21)	321 (28)	333 (28)	72 (21)	63 (28)	37
38	93 (24)	116 (21)	328 (28)	342 (28)	73 (21)	64 (28)	38
39	95 (28)	119 (21)	336 (28)	356 (28)	75 (21)	65 (28)	39
40	96 (28)	120 (21)	340 (28)	362 (28)	76 (21)	66 (28)	40
41	98 (28)	122 (21)	344 (28)	367 (28)	77 (21)	68 (28)	41

This cross sectional study collected 11,600 measurements from 3,800 women representing 70 nationalities.
Figures are based on completed weeks of gestation.

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+/-2 standard deviations (averaged) shown in brackets.

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