

# **Growth and development measurement**

Objectives:: •

\*To know the measurement of growth and development. •

\*To calculate the body mass index (BMI). •

\*To know the normal (height ,weight, and head circumstanes ) •

# Head circumference

Taken around the largest part of the forehead, above the eyes and ears line. (occipitofrontal circumference) In rare situations, such as premature closure of the junctions (sutures) between specific skull bones, brain growth causes the skull to expand upward rather than from front to back, this condition, termed craniosynostosis.

- The main abnormalities : •
- 1-macrocephaly: large head •
  - 2-microcephaly : small head •

# Method

- The measurement by flexible tape measure.
- Wrap the tape around the widest possible circumference - from the most prominent part of the forehead(1-2 fingers above the eyebrow) around to the widest part of the back of the head.

Try to find the widest way around the head •

# Body mass index BMI

## BMI

## CATEGORY

Below 18.5

Underweight

18.5 - 24.9

Healthy

25.0 - 29.9

Overweight

30.0 - 39.9

Obese

Over 40

Morbidly obese

Body mass index BMI is not always an •  
accurate way to determine whether you need  
to lose weight. Here are some exceptions

- **Body builders:** Because muscle weighs more than fat, people who are unusually muscular may have a high BMI.
- **Elderly:** In the elderly it is often better to have a BMI between 25 and 27, rather than under 25. If you are older than 65, for example, a slightly higher BMI may help protect you from osteoporosis.

**Children:** While an alarming number of children are • obese, do not use this BMI calculator for evaluating a child. Talk to your pediatrician about the appropriate weight for your child's age



# Developmental mile stones

- \*At 1 month ---- social smiling. •
- \*At 3 months ---- ah and nagma •
- \*At 5-6 months---- turn from prone to supine . •
- \*At 6-6.5 months ---- sit with hand or pelvic support. •
- \*At 7 month ----turn from supine to prone. •
- \*At 7-9 month ---- sits alone with no support. •
- \*At 9 month ---- start standing and crawling and says •  
: baba , mama.

- \*At 13 month ----says few words beside baba •  
mama.
- \* At 15 month ---- walking alone . •
- \*At 2years ---- running and can control sphincter at •  
day time .
- \*At 3 years ---- rides a tricycle and can control •  
sphincter during night time .
- \*At 4 years ---- goes to toilet alone . •
- \*At 5 years ---- dress and undress alone •  
•

# Normal height

- At birth = 50 cm •
- 6 month = 65 cm •
- 1 year = 75 cm •
- 2 years = 85 cm •
- 3 years = 95 cm •
- 4 years = 100 cm •
- School age = 6 cm /year •

# Normal Weight

Full term infant doubles birth weight by 5 month and •  
tripled by 1 year

At birth = 2.5 – 4.5 kg •

Up to 1 year =  $(\text{age in month} + 9) / 2$  •

1-6 year =  $(\text{age in years} + 4) * 2$  •

6-12 year =  $(\text{age in years}) * 3$  •

School age = 3-3.5 kg/year (increment) •

Head circumference (OFC) •

35 cm at birth , 44 cm at 6 month , 47 cm at 1 year •

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Growth chart (Boys)									
AGE	Weight(kg)			Height(cm)			head circum.(cm)		
	3	50	97	3	50	97	3	50	97
Birth	2.9	3.5	4.2	48	50	53	33.5	35	36.5
3m	4.4	5.7	7.2	55	60	65	38	41	43
6m	6.2	7.8	9.8	62	66.5	71	41	44	46
9m	7.6	9.3	11.6	66.5	71	76	43	46	47
12m	8.4	10.3	12.8	70	75	80	44	47	49
18m	9.4	11.7	14.2	75	81	87	46	49	51
2yr	10.2	12.7	15.7	80	87	93	47	50	52
3yr	11.6	14.7	17.8	86	95	102	48	50	53
4yr	13	15	21	94	101	110			
5yr	14	19	23	100	108	117	49	51	54
6yr	16	21	27	105	114	124			
7yr	17	23	30	110	120	130			
8yr	19	25	34	115	126	137	50	52	55
9yr	21	27.5	39	120	132	143			
10yr	23	30	44	125	137	148			
11yr	25	34	50	129	142	154			
12yr	27	38	58	133	147	160	51	54	56
13yr	30	43	64	138	153	168			
14yr	33	49	71	144	160	176	53	56	58
15yr	39	55	76	152	170	182			
16yr	46	60	79	158	172	185			
17yr	49	62	80	162	174	187			
18yr	50	64	82	162	175	187			

Growth chart (Girls )									
AGE	Wt(kg)			Ht(cm)			head circumference(cm)		
	3	50	97	3	50	97	3	50	97
Birth	2.8	3.4	4	48	49	52	33.5	35	36
3m	4.2	5.2	7	55	58	62	37	40	43
6m	5.9	7.3	9.4	61	65	69	40	43	45
9m	7	8.7	10.9	65	70	74	42	44	47
12m	7.6	9.6	12	69	74	78	43	46	48
18m	8.8	10.9	13.6	75	80	85	45	47	50
2yr	9.6	12	14.9	79	85	91	46	48	51
3yr	11.2	14.1	17.4	86	93	100	47	49	52
4yr	13	16	20	92	100	109			
5yr	15	18	23	98	107	116	48	50	53
6yr	16	20	27	104	114	123			
7yr	18	23	30	109	120	130			
8yr	19	25	35	114	125	136	50	52	54
9yr	21	28	40	120	130	142			
10yr	23	31	48	125	136	148			
11yr	25	35	56	130	143	155			
12yr	28	40	64	135	149	164	51	53	56
13yr	32	46	70	142	156	168			
14yr	37	51	73	148	160	172	52	54	57
15yr	42	54	74	150	162	173			
16yr	45	56	75	151	162	174			
17yr	46	56	75						
18yr	46	57	75						

Q. Discuss; •

Q1. Enumerate the main abnormalities in the •  
head?

Q2. How can we measure the head •  
circumferences?

THANKS•