

Anthropometric Training Manual

Part 4: Summary Tables or Hand Outs

June 2010

Division of Women, Infants and Children (WIC)



Summary of Guidelines for Measuring Stature and Weight

	Age	They should wear	Measure to nearest	Until agreement within
Recumbent Length	Infants/children: 0 to 24 mths. and 2-3 yrs. who: cannot stand and /or measure < 30” and/or weigh < 20#.	light clothing, no shoes	1/8 inch	1/4 inch
Height	Children 2-18 years who measure at least 30” and weigh at least 20#.	clothed, no shoes	1/8 inch	1/4 inch
	Adults:	clothed, no shoes	1/8 inch	1/4 inch
Weight	Infants/children (unable to stand, up to infant scale maximum.)	dry diaper ** or light clothing, no shoes	ounce (round to nearest 1/4 lb on PDF)	N/A
	Children: Able to stand.	light clothing, no shoes	1/4 lb	N/A
	Adults	light clothing, no shoes	1/4 lb	N/A

**New infants should be weighed in a dry diaper only, unless the room is too cold.

BMI—WIC Staff Reference Sheet

What is BMI?

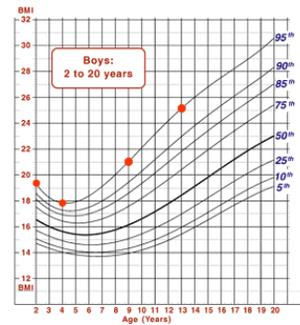
- BMI (Body Mass Index) is a number based on weight and height that helps to identify underweight and overweight in adults and children over age two. BMI correlates well to body fat (usually, the higher the BMI, the more body fat a person has)
- $BMI = \text{Weight (lbs)} \div \text{Height (inches)} \div \text{Height (inches)} \times 703$
- Quick WIC calculates BMI for you.
- For children, BMI is compared with other children of the same sex and age by plotting BMI/age on growth charts.
- For adults BMI is compared with set cut offs for underweight, overweight, etc (see handout “Your BMI”)

Why does WIC use BMI/age rather than weight/height for children over age 2?

- BMI/age allows you to plot weight, height, and age on the same chart, and correlates body fat with age. Body fat varies with age.
- BMI is the best tool to track under/overweight into adulthood. Although weight/height works equally well during the WIC years, BMI is a better tool after age 6.
- BMI can help identify children who may be at risk for future overweight.
- CDC/USDA strongly encourage the use of BMI in children 2 years and older.

Why is the BMI curve shaped differently from the weight/height curve?

The BMI curve tracks how BMI changes with age. BMI usually drops until about age 4–6 (as toddlers lose their “baby fat”) and then begins to rise again. Thus, the BMI curve goes downward then upward. Quick WIC only shows ages 2–5, so you don’t see the whole curve.



What is adiposity rebound?

The point where BMI begins to rise again (usually age 4 – 6)

What is early adiposity rebound and why is it important?

- When BMI begins to rise before age 4 - 6, this is called early adiposity rebound. Early adiposity rebound increases risk for health problems and overweight later in life

Are there any limitations to BMI?

- BMI is a screening tool, not a diagnostic tool. BMI is not an exact measure of body fat. A high or low BMI does not always mean the person has too much or too little body fat. Further evaluation is needed.
- BMI may be misleading in rare instances when high/low weight is due to muscle or bone mass rather than body fat.
 - Some children/adults (esp. athletes) may have high BMI due to large bone or muscle mass, and are not “overfat”.
 - Some children with limited muscle mass (e.g. Spina Bifida, Cerebral Palsy) may be “overfat”, yet have a normal BMI.

Interpretation of Growth Summary

Growth Reading/ Pattern	Nutr Risk	Possible Interpretation
Weight/age \leq 10%ile	N/A	<ul style="list-style-type: none"> ○ May be normal (especially if wt/length or BMI/age are normal and child is following growth curve) ○ May indicate under-nutrition ○ May be caused medical conditions or pre-maturity
Length/age or height/age \leq 10%ile	DM (<i>Short Stature or Risk of Short Stature</i>)	<ul style="list-style-type: none"> ○ May be normal, especially if parents are short (don't assume without full nutrition assessment) ○ May be due to medical condition or pre-maturity ○ May be due to chronic malnourishment
Weight/length or BMI/age \leq 10%ile	DK (<i>Underweight or risk of underweight</i>)	<ul style="list-style-type: none"> ○ May be normal leanness for that individual (don't assume without further evaluation) ○ May indicate under-nutrition or medical problem
BMI/age 85 - <95%ile	DG (<i>at risk of overweight; for children \geq 2 only</i>)	<ul style="list-style-type: none"> ○ May be at risk for future overweight ○ May have a high percentage of body fat due to overeating, high calorie choices and/or inactivity
BMI/age \geq 95%ile	DH (<i>overweight: for children \geq 2 only</i>)	<ul style="list-style-type: none"> ○ Most likely has high percentage of body fat due to overeating, high calorie choices and/or inactivity. ○ Child may have heavy muscles or bones, and is not overfat (not likely in children < 5)
Head/age < 5%ile	DL (<i>low head circumference; infants only</i>)	<p>May be due to heredity or normal for that child, especially if child is small</p> <p>Prenatal or postnatal malnutrition, medical condition</p> <p>Refer to MD if abnormal head size/growth is suspected</p>
Head/age \geq 95%ile	N/A	<p>May be due to heredity</p> <p>May be due to malformations, hydrocephalus, or medical condition</p> <p>Refer to MD if abnormal head size/growth is suspected</p>
1 – 2 percentile drop in wt/age, wt/length or BMI/age	Possibly risk DF (<i>inadequate growth or FTT</i>)	<ul style="list-style-type: none"> ○ May be due to poor nutrition, illness, or medical condition ○ May be normal****
1 –2 percentile drop in length/age or height/age	N/A	<ul style="list-style-type: none"> ○ May be due to chronic malnourishment (especially if wt/age has been dropping too) ○ May be inaccurate measurement ○ May be normal for that individual****
1 –2 percentile increase in BMI/age or wt/length	N/A	<ul style="list-style-type: none"> ○ May be due to high calorie choices, large portions and/or inadequate activity. ○ May be normal or recovering from illness/ underwt

****Weight loss in infants and young children is not normal (except during 1st few days of life). However, it may be normal for children < 24 mos to gradually shift percentiles up or down toward their “genetic potential”, usually toward the 50%ile. Do not assume growth shifts are normal without further evaluation.

Growth Assessment in WIC

Following Johnny through WIC

Johnny is a healthy full term infant new to WIC

It would be normal for Johnny to lose up to about _____ % of his body weight during the first few days of life.

Loss of more than ___ ounces or ___ % of body weight would qualify him for nutrition risk _____. A chart to calculate this is on the reverse side of the Nutrition Risk Assessment (NRA) form.

Johnny should be back to birth weight by _____ days and gain about _____ ounces per week during the first four months of life.

He should double his birth weight by _____ months and triple his birth weight by _____. He will probably grow _____ inches by one year.

Most likely Johnny will follow his growth channels. However, it may be normal for him to **slowly** cross channels toward the 50%ile until he is about _____ months. This is because his birth measures may be reflective of _____ factors and not necessarily his _____. **Weight loss or rapid crossing of growth channels is not normal.**

Beginning at age two and when he can stand, we will begin assessing Johnny's _____. We use BMI because it is a better screening tool for _____, the most common growth problem in children today.

Unlike the weight for height curve, the BMI curve declines until about age _____, and then begins to rise again. The point where BMI begins to rise is called adiposity rebound. If BMI begins to rise before age 4 – 6, this is called early adiposity rebound. Early adiposity rebound is associated with overweight and health problems in adulthood.

Growth Assessment in WIC - Answers

Following Johnny through WIC

Johnny is a healthy full term infant new to WIC

It would be normal for Johnny to lose up to about 6 % of his body weight during the first few days of life.

Loss of more than 8 ounces or 8 % of body weight would qualify him for nutrition risk DEF. A chart to calculate this is on the reverse side of the Nutrition Risk Assessment (NRA) form.

Johnny should be back to birth weight by 10 -14 days and gain about 5 -7 ounces per week during the first four months of life.

He should double his birth weight by 4 -6 months and triple his birth weight by 1 year. He will probably grow 9 - 11 inches by one year.

Most likely Johnny will follow his growth channels. However, it may be normal for him to **slowly** cross channels toward the 50%ile until he is about 24 months. This is because his birth measures may be reflective of prenatal factors and not necessarily his “genetic potential”. **Weight loss or rapid crossing of growth channels is not normal.**

Beginning at age two and when he can stand, we will begin assessing Johnny’s BMI. We use BMI because it is a better screening tool for obesity, the most common growth problem in children today.

Unlike the weight for height curve, the BMI curve declines until about age 4 - 6, and then begins to rise again. The point where BMI begins to rise is called adiposity rebound. If BMI begins to rise before age 4 – 6, this is called early adiposity rebound. Early adiposity rebound is associated with overweight and health problems in adulthood.

Anthropometric Training Helpful Websites and References

www.cdc.gov/growthcharts (to print and obtain growth charts for children)

www.cdc.gov/nccdphp/dnpa/growthcharts/training/modules (CDC Growth Chart Training Modules: Overview of CDC Growth Charts, Using BMI for age Growth Charts, Recommendations to Screen, Assess and Manage Overweight)

<http://depts.washington.edu/growth/> (To learn about accurate weighing and measuring technique)

Please note that some procedures in the Pennsylvania WIC Anthropometric Manual may differ slightly from MCH recommendations on the website due to practical and time considerations. Pennsylvania WIC staff may follow the recommendations in the WIC Anthropometric Manual.

WIC Anthropometric Manual	MCH Recommendation
“Test” scales for accuracy at least yearly and when moved	“Test” scales for accuracy at least monthly and when moved
Weigh on infant scale to the nearest ounce	Weigh on infant scale to the nearest ½ ounce
Measure head circumference to nearest 1/8 inch	Measure head circumference to nearest .1 cm
Weigh children to nearest ¼ lb	Weigh children to nearest ½ ounce
Weigh infants and children once	Weigh infants and children twice
Length, height, and head circumference should be measured twice, or until two measures agree within ¼ inch. Record second measurement	Length, height and head circumference should be measured twice, or until two measures agree within ¼ inch. The average of the two measures should be recorded.
Weigh infants in a dry diaper. Light indoor clothing without shoes is allowed if room is cold	Weigh infants nude or in clean dry diaper
Measure Head Circumference for infants only	Measure head circumference up to age 3
Any child able to stand may be weighed on an adult scale	Children over 36 months may be weighed on adult scale.

<http://depts.washington.edu/growth/poorgrowth/text/intro.htm> (Identifying Poor Growth in Infants and Toddlers)

YOUR CHILD'S BMI

WHAT IS BMI?

BMI (Body Mass Index) is a number based on a person's height and weight. It is used to help identify people who may be underweight or overweight. BMI is used in adults and children over age two.



WHAT DOES YOUR CHILD'S BMI MEAN?

Your child's BMI will be plotted on a growth chart to determine the BMI percentile. The BMI percentile compares your child with other children of the same sex and age. For example:

BMI 0 - 5 th percentile:	Your child may be underweight
BMI 6 – 10 th percentile:	Your child is “at risk of underweight”
BMI 11 – 84 th percentile:	Your child is in the “normal range”
BMI 85 – 94 th percentile:	Your child is “at risk for overweight”
BMI greater than 95 th percentile:	Your child may be overweight

Usually, a child with a high BMI has high body fat. But, BMI alone will not tell you if your child has too much or too little body fat. Some children may have high BMI due to heavy muscles or bones. Also, it is more important to watch how your child grows over time than to look at just one growth plot. Your child's doctor can do a complete evaluation including overall health, diet and activity.

WHY IS YOUR CHILD'S BMI SO IMPORTANT?

We check your child's BMI to help prevent health problems now and as your child gets older. There has been a large increase in children who are overweight. These children are likely to become overweight adults and have health problems.

WIC nutritionists can help you make small changes in your child's diet and activity that can help keep your child at a healthy weight.

Name: _____	Date: _____	
Height: _____	Weight: _____	BMI/age: _____
Nutritionist's Comments/Goal: _____		

BMI AND YOUR CHILD'S HEALTH



WHAT IS BMI?

BMI (Body Mass Index) is a number based on a person's height and weight. It is used to help identify people who may be underweight or overweight, and roughly estimates body fat. BMI is used in adults and children over age two.

WHAT DOES YOUR CHILD'S BMI MEAN?

Your child's BMI will be plotted on a growth chart to determine the BMI percentile. The BMI percentile compares your child with other children of the same sex and age. For example:

BMI 0 - 5 th percentile:	Your child may be underweight
BMI 6 - 10 th percentile:	Your child is "at risk of underweight"
BMI 11 - 84 th percentile:	Your child is in the "normal range"
BMI 85 - 94 th percentile:	Your child is "at risk for overweight"
BMI greater than 95 th percentile:	Your child may be overweight

Usually, a child with a high BMI has increased body fat. But, BMI alone will not tell you if your child has too much or too little body fat. Some children may have high BMI due to heavy muscles or bones. **Also, it is very important that you watch how your child grows over time, rather than to look at one point on the chart.** Your child's doctor can do a complete evaluation including overall health, his diet and activity.

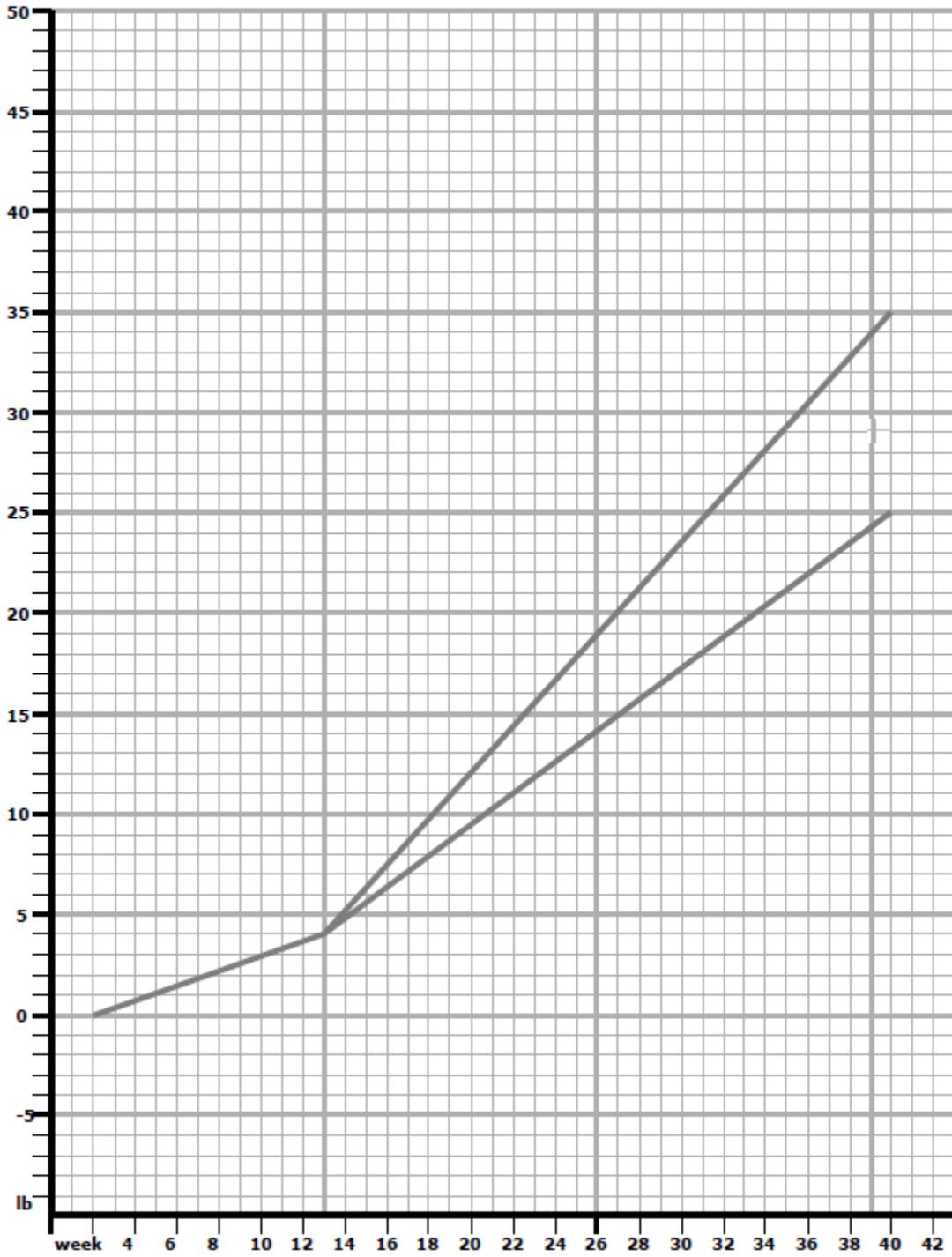


WHY IS YOUR CHILD'S BMI SO IMPORTANT?

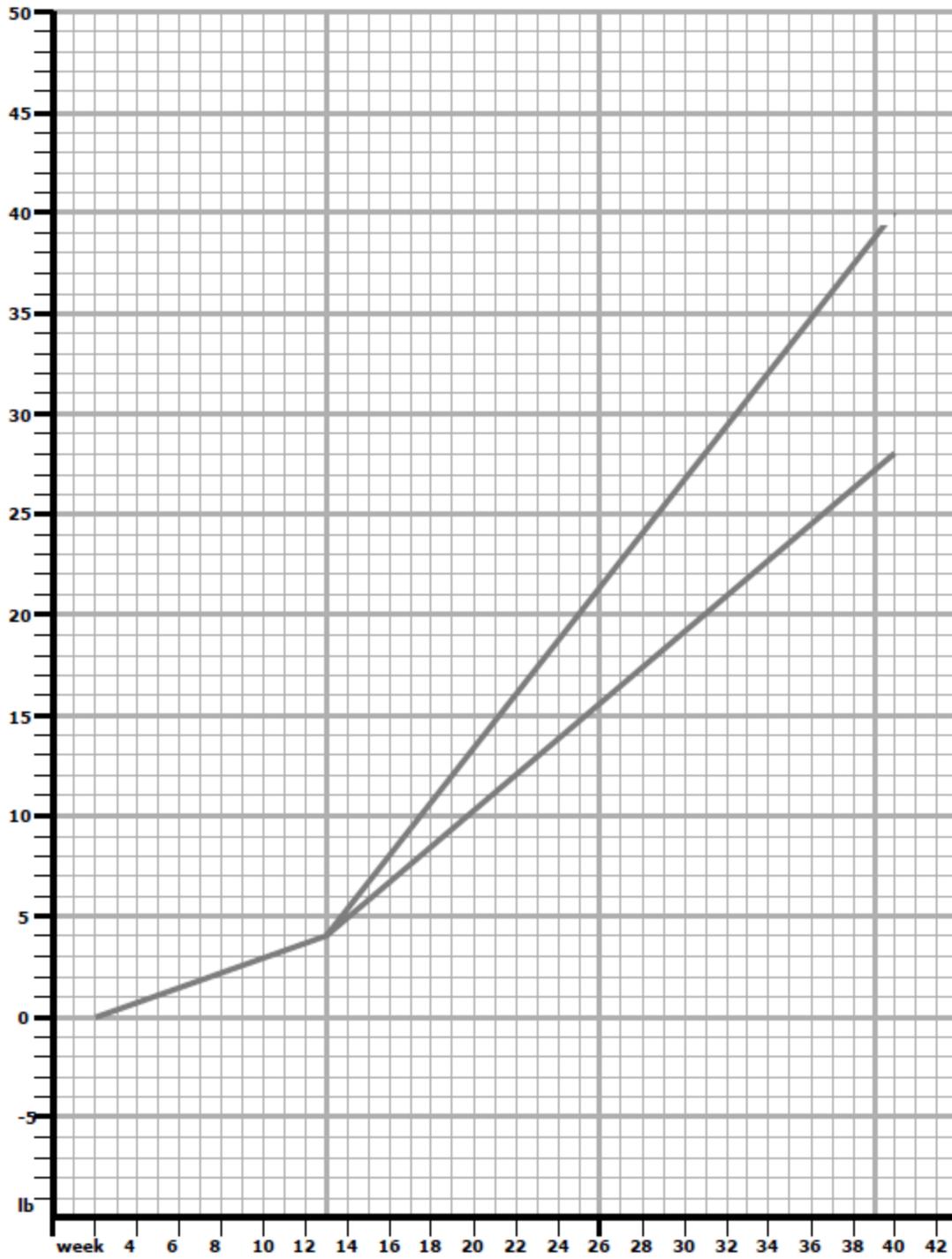
We look at your child's BMI to help prevent health problems now and as your child gets older. There has been a large increase in children who are overweight. These children are likely to have health problems and become overweight adults. Some of these health problems include high blood pressure, heart disease, diabetes, asthma, sleep apnea, and psychosocial problems such as low self-esteem, depression and high risk behaviors.

If your family has a history of heart disease, diabetes, or high blood pressure, it would be especially wise to start making changes now in your child's health habits. Paying attention to the types of foods eaten, portion sizes and physical activity is a good start to better health in the future!

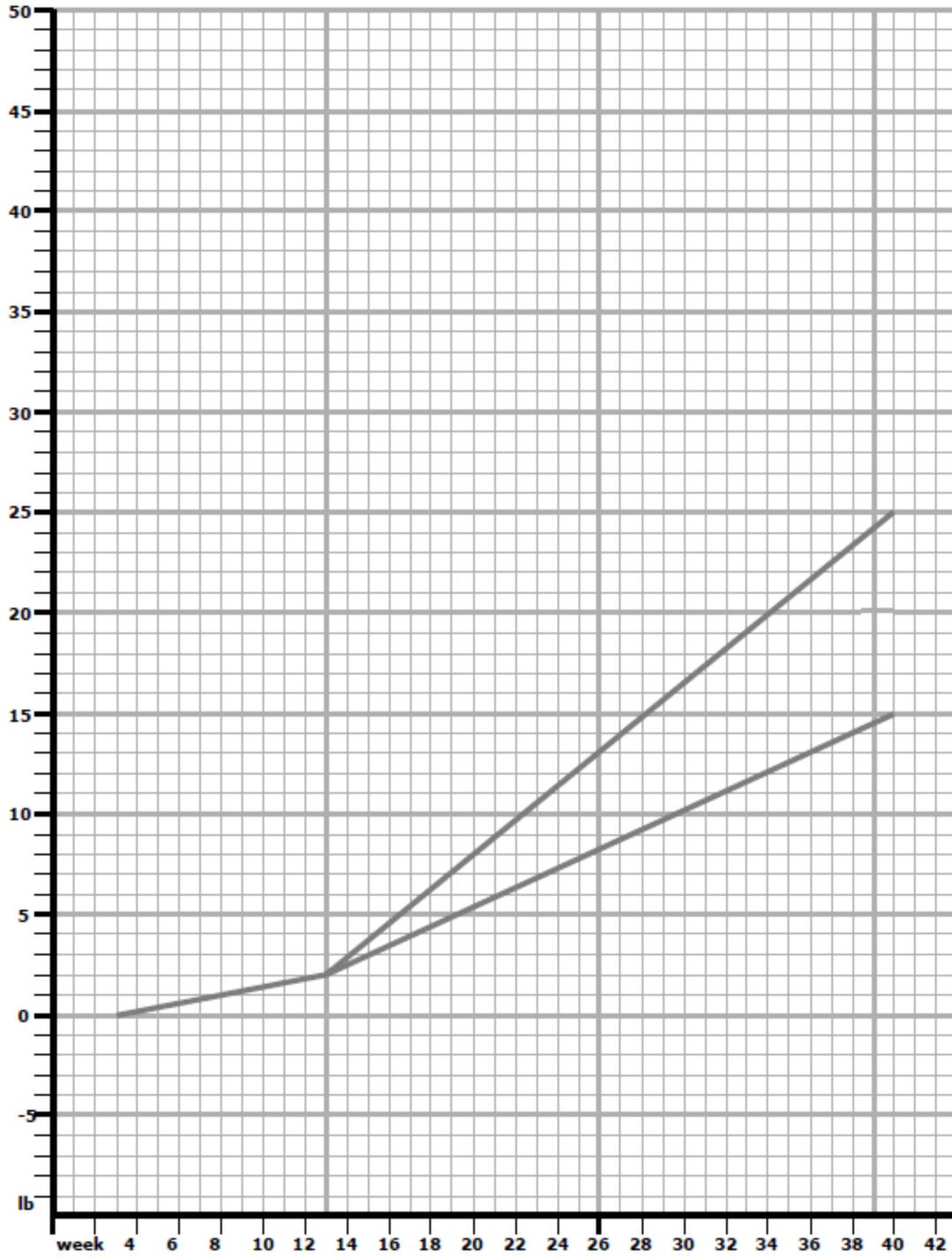
Prenatal Weight Gain Normal



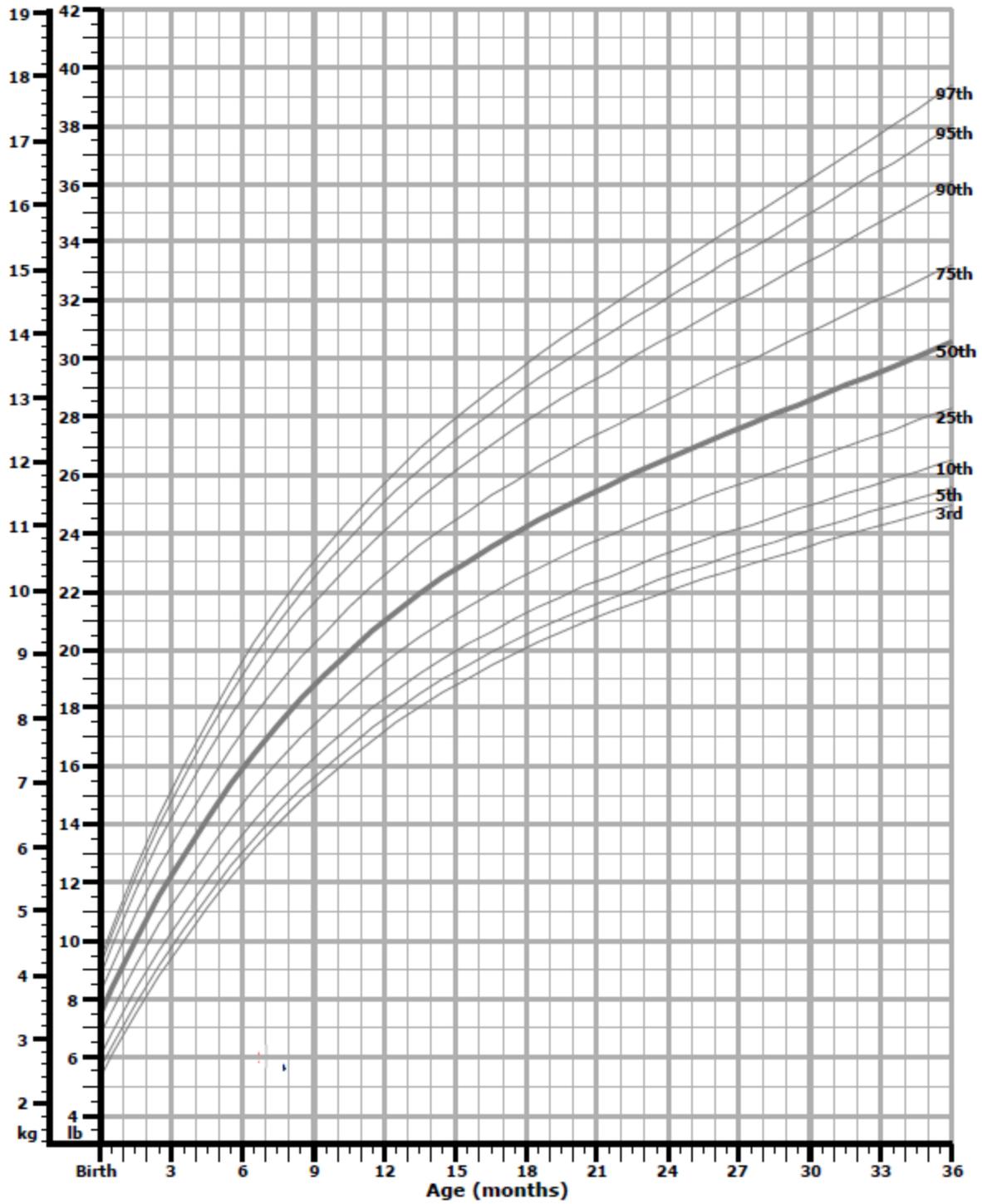
Prenatal Weight Gain Under



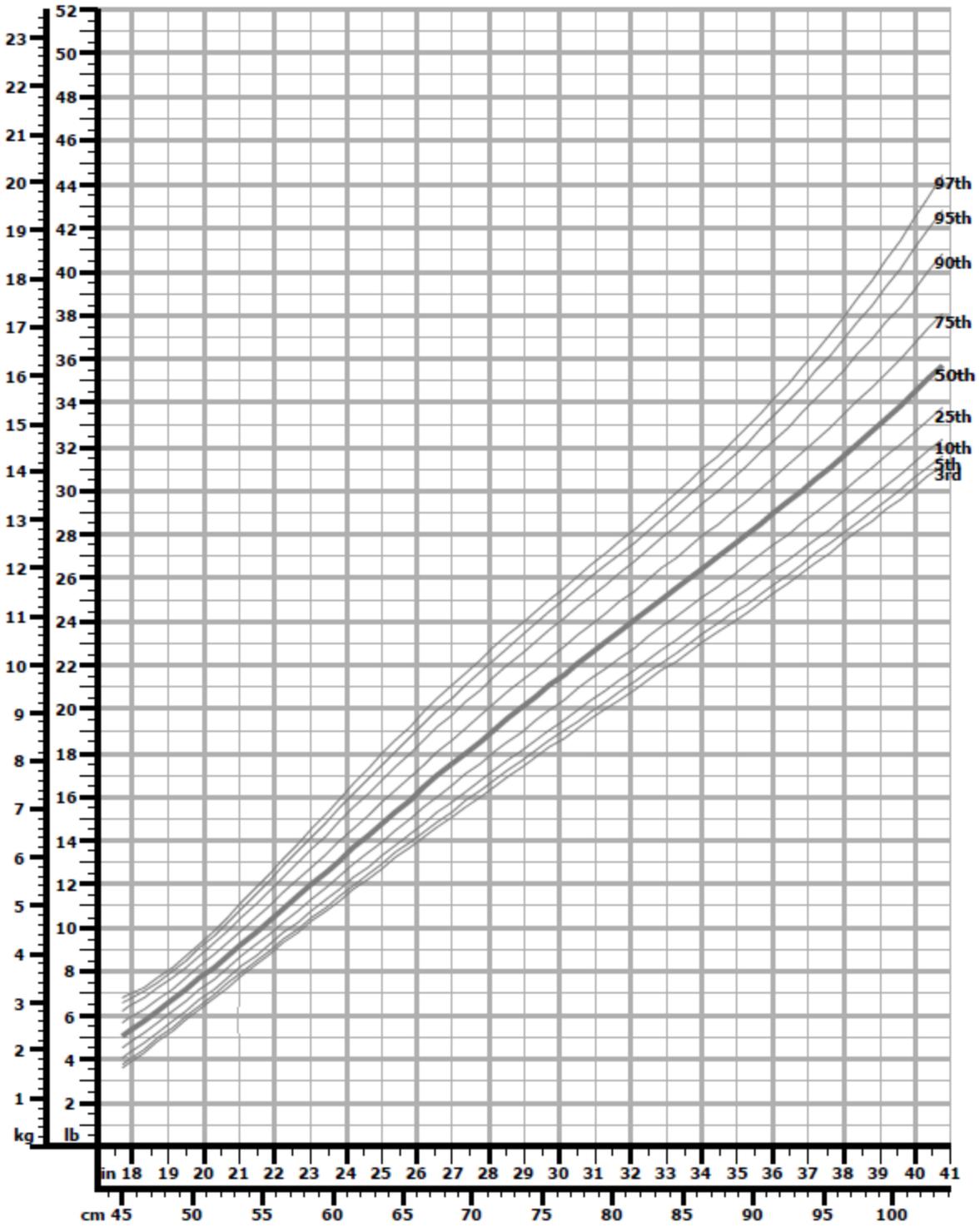
Prenatal Weight Gain Over



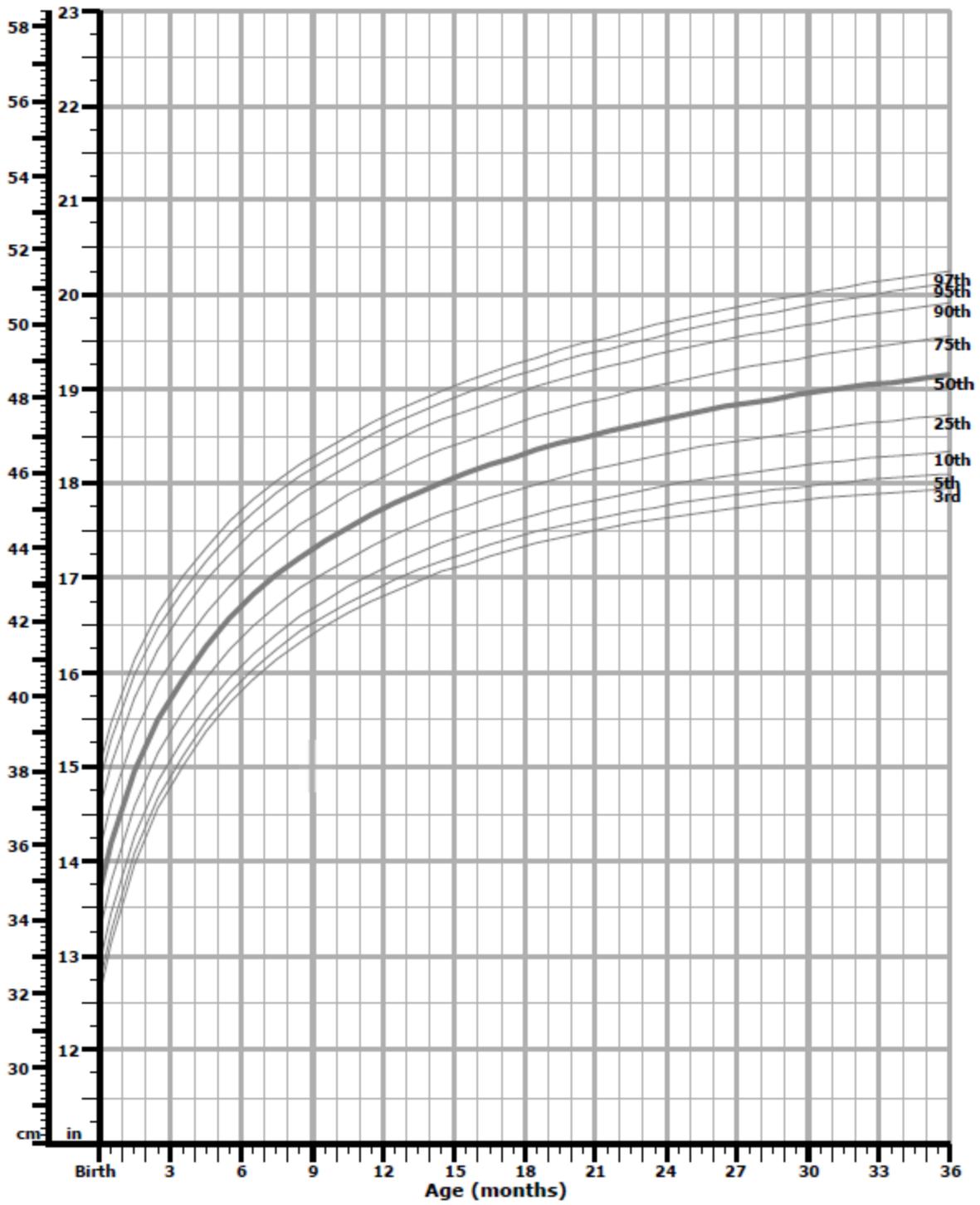
Female Infant Weight For Age Chart



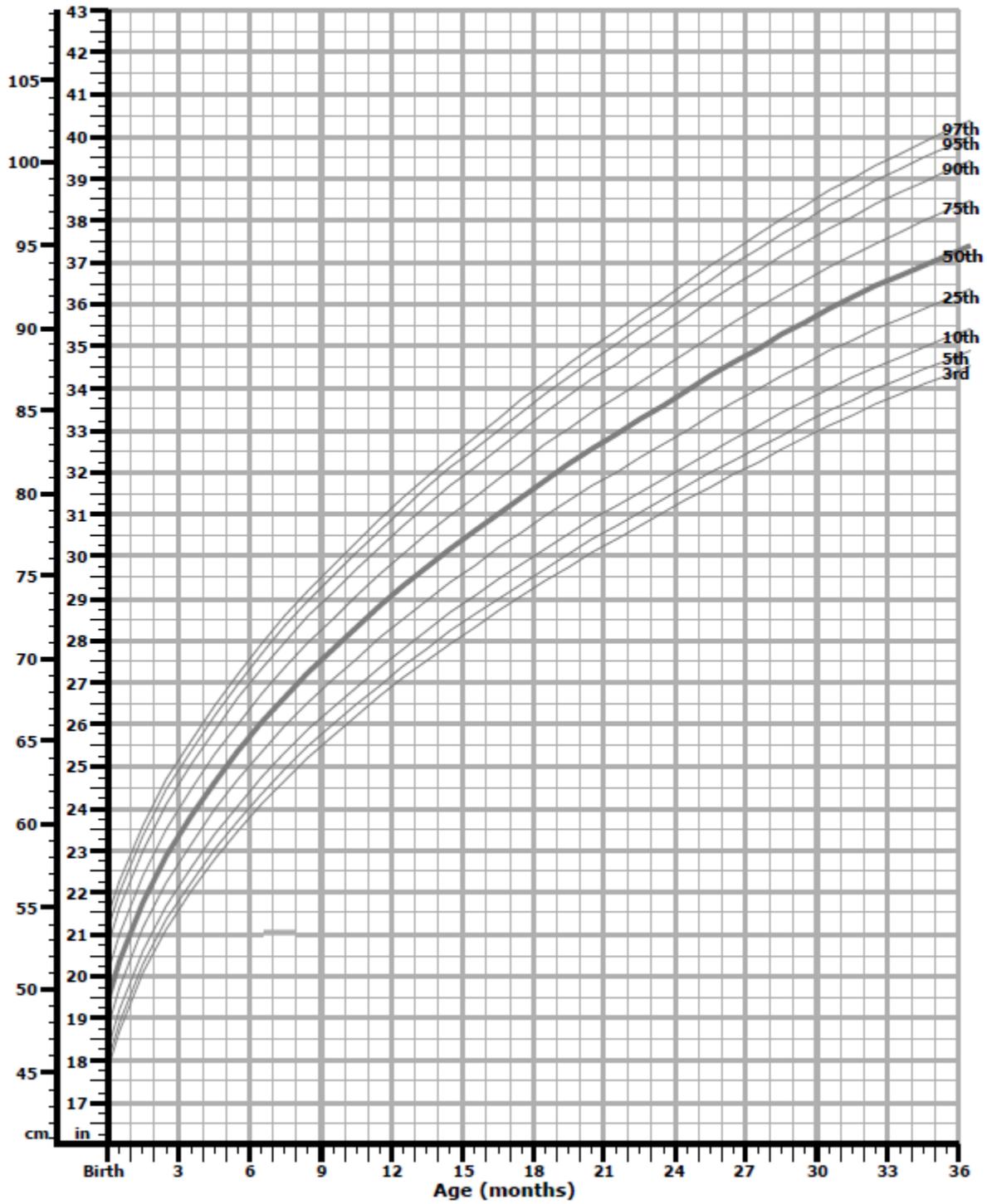
Female Infant Weight For Length Chart



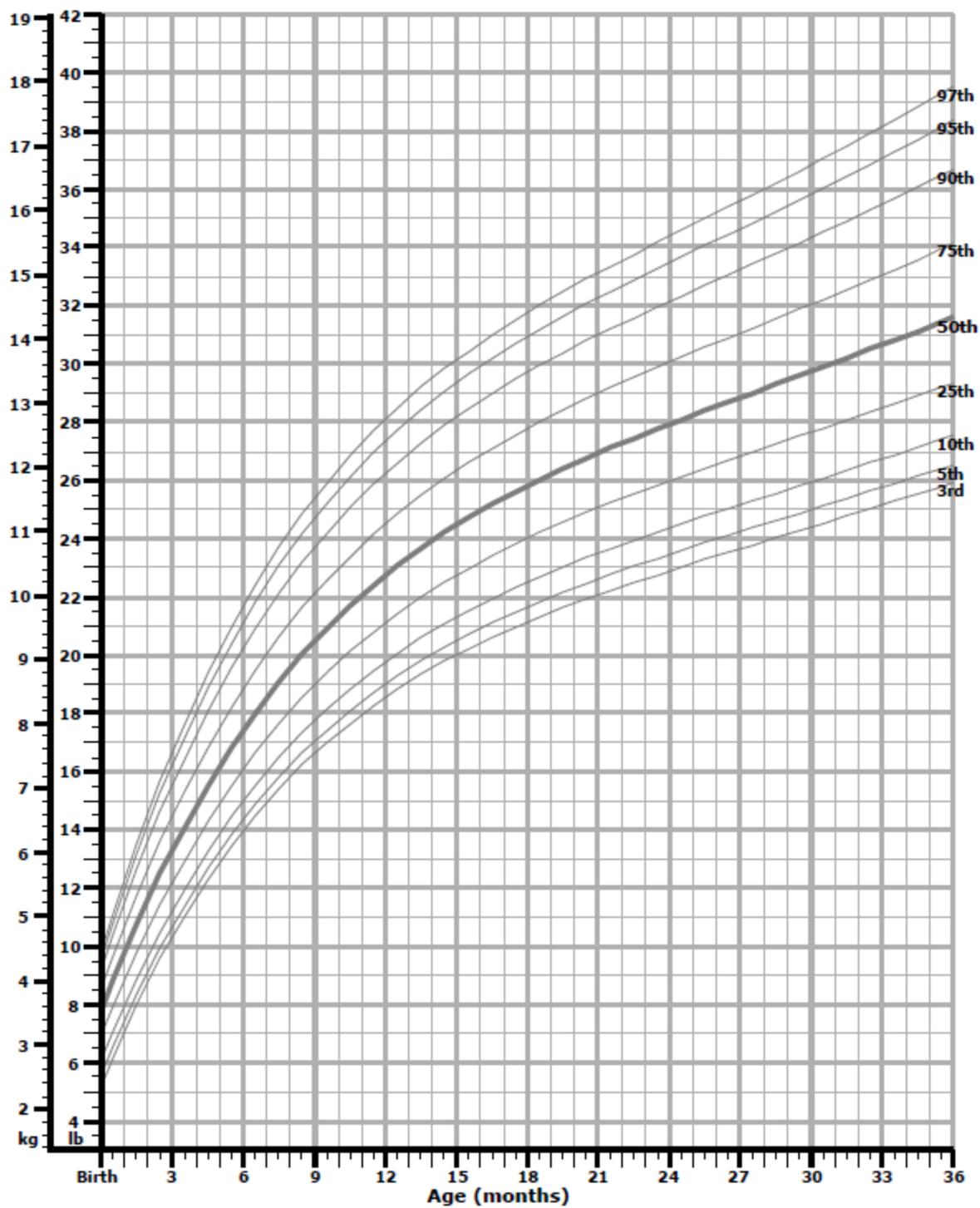
Female Infant Head Circumference For Age Chart



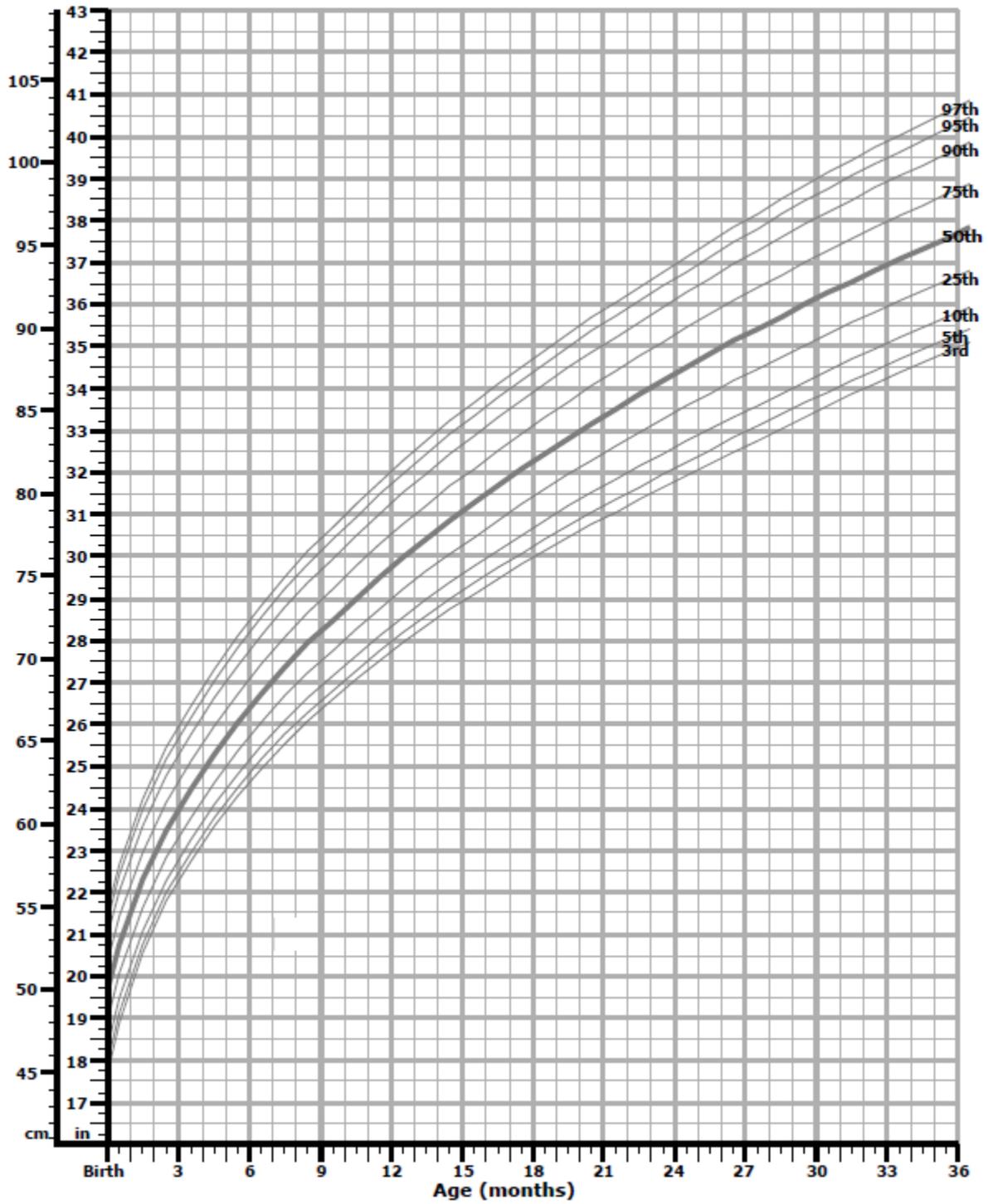
Female Infant Length For Age Chart



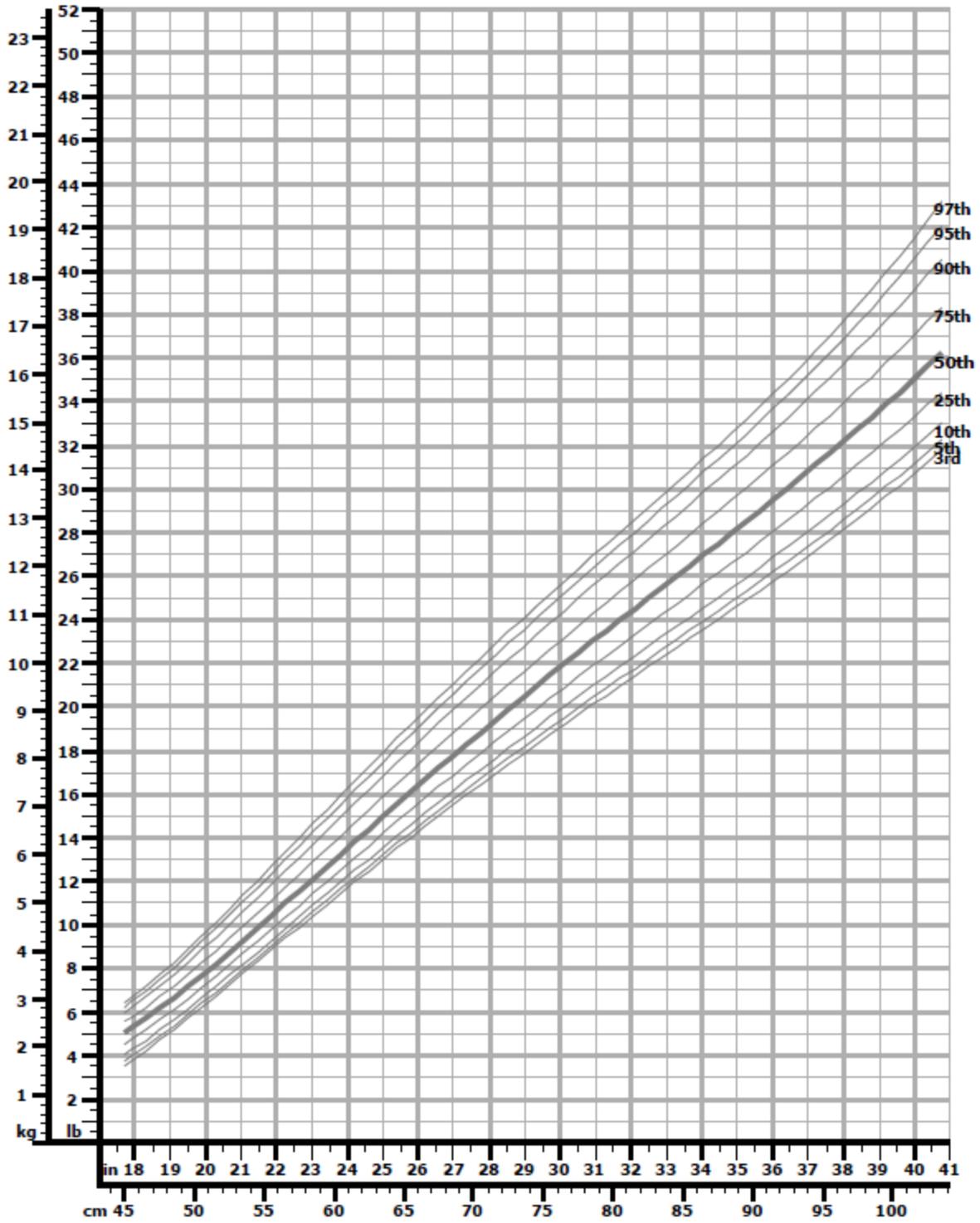
Male Infant Weight For Age Chart



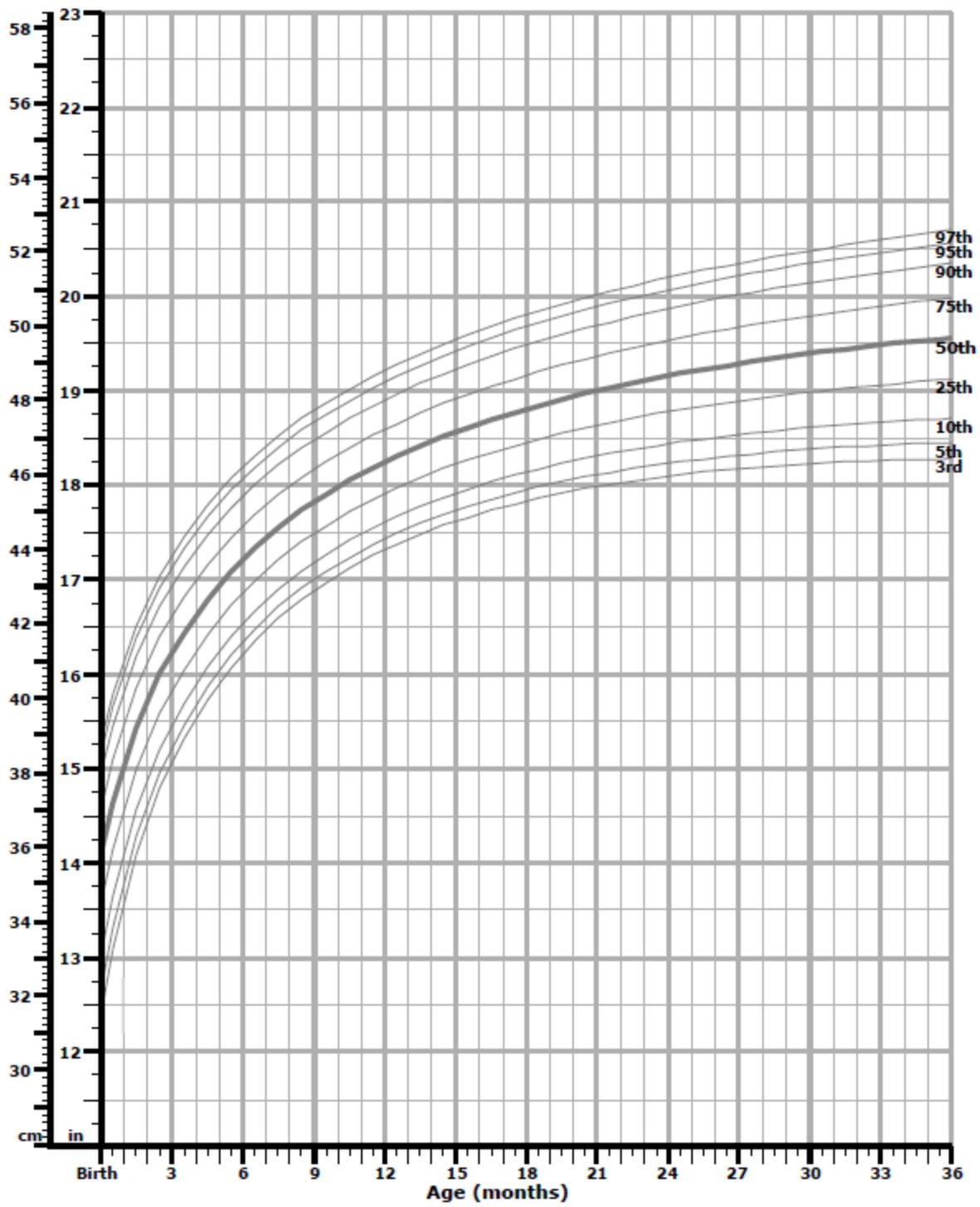
Male Infant Length For Age Chart



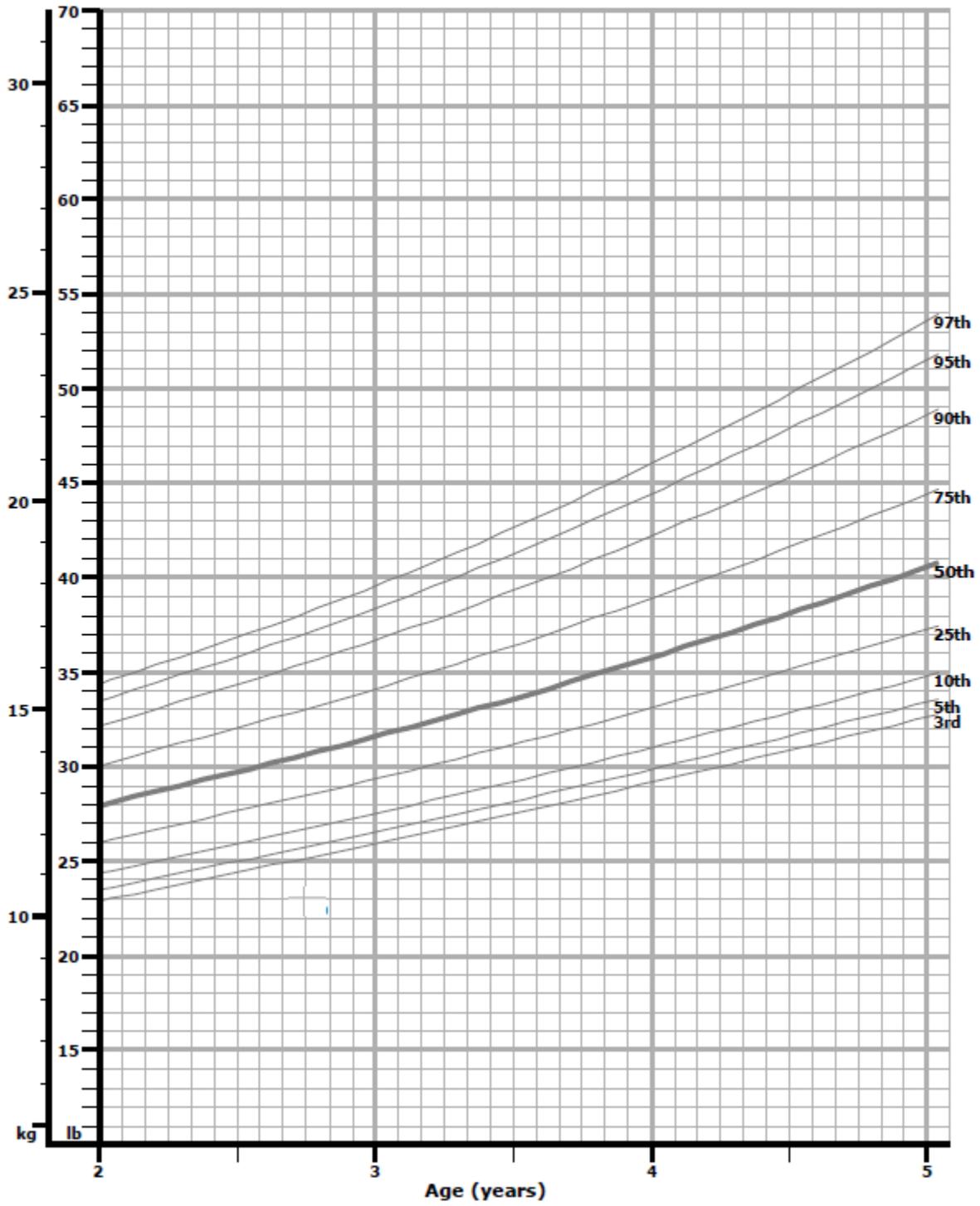
Male Infant Weight For Length Chart



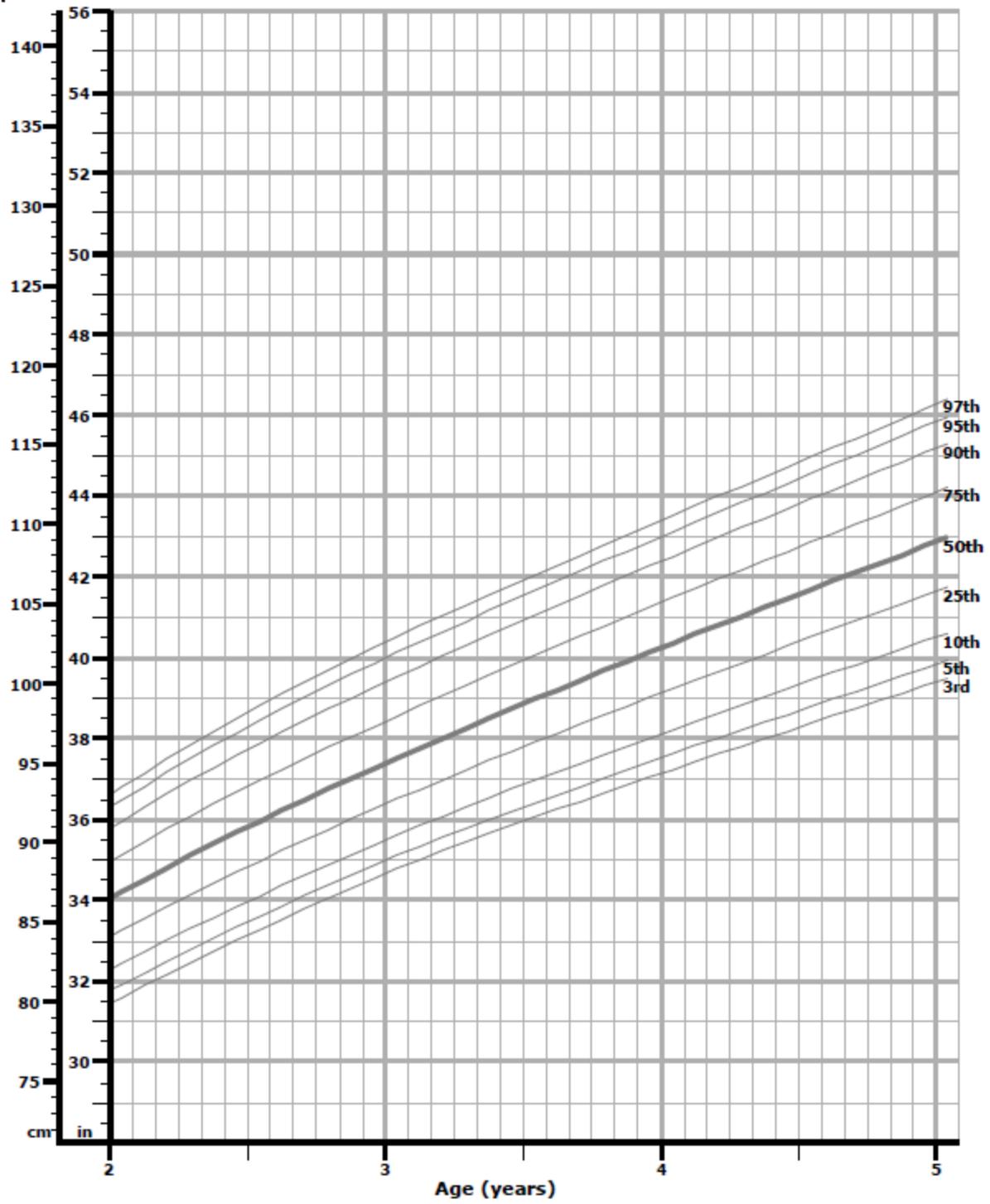
Male Infant Head Circumference For Age Chart



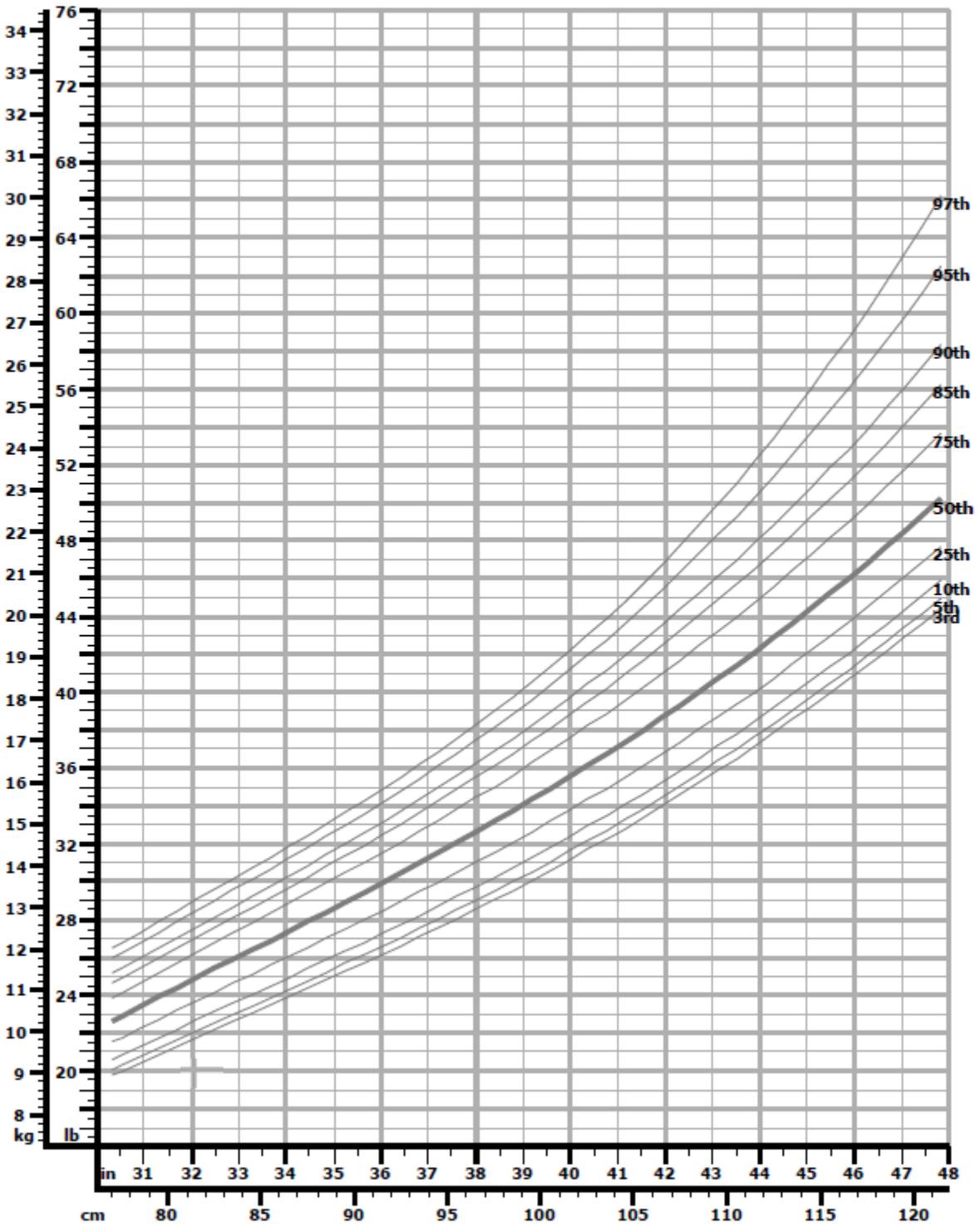
Male Child Weight For Age Chart



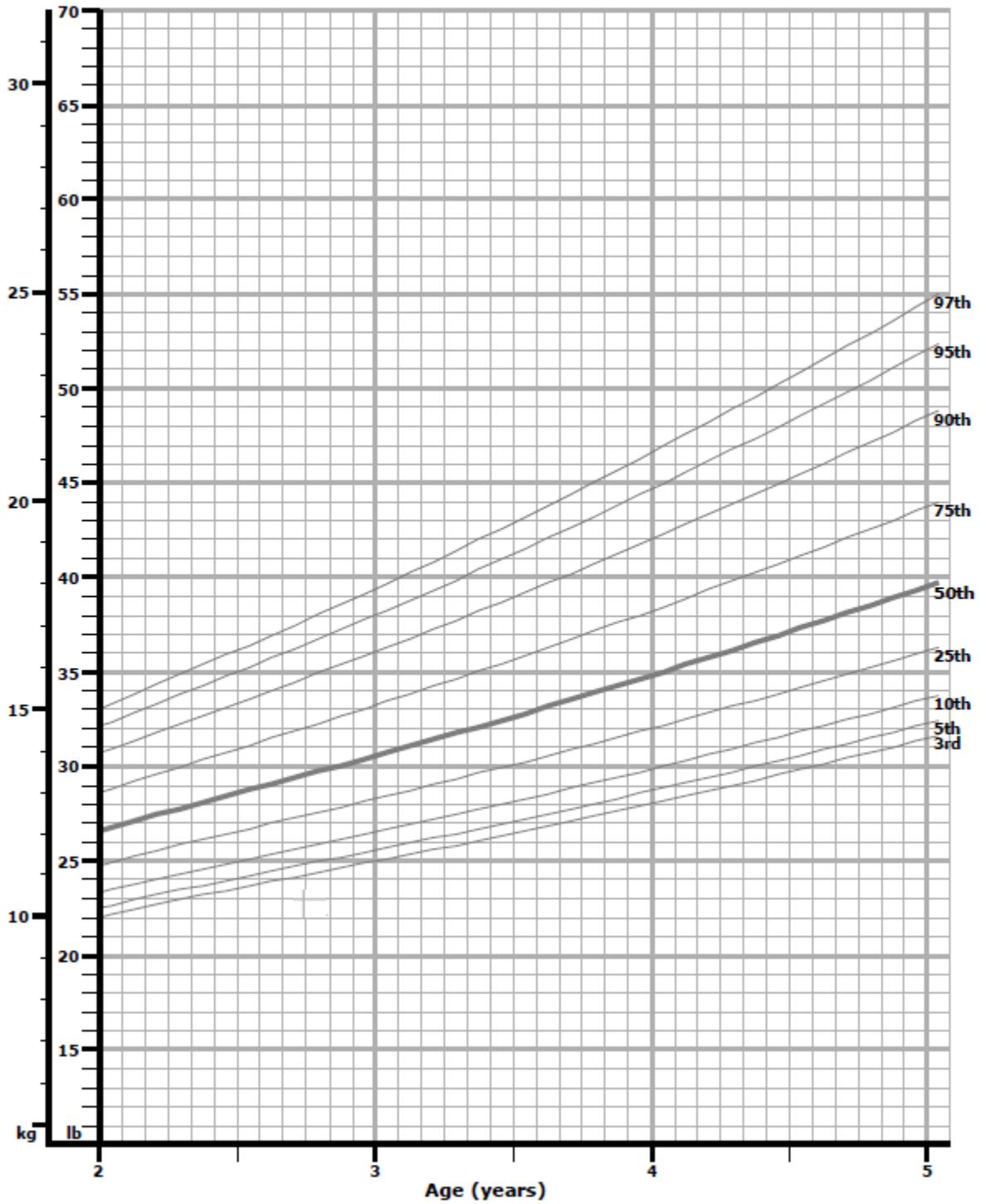
Male Child Stature For Age



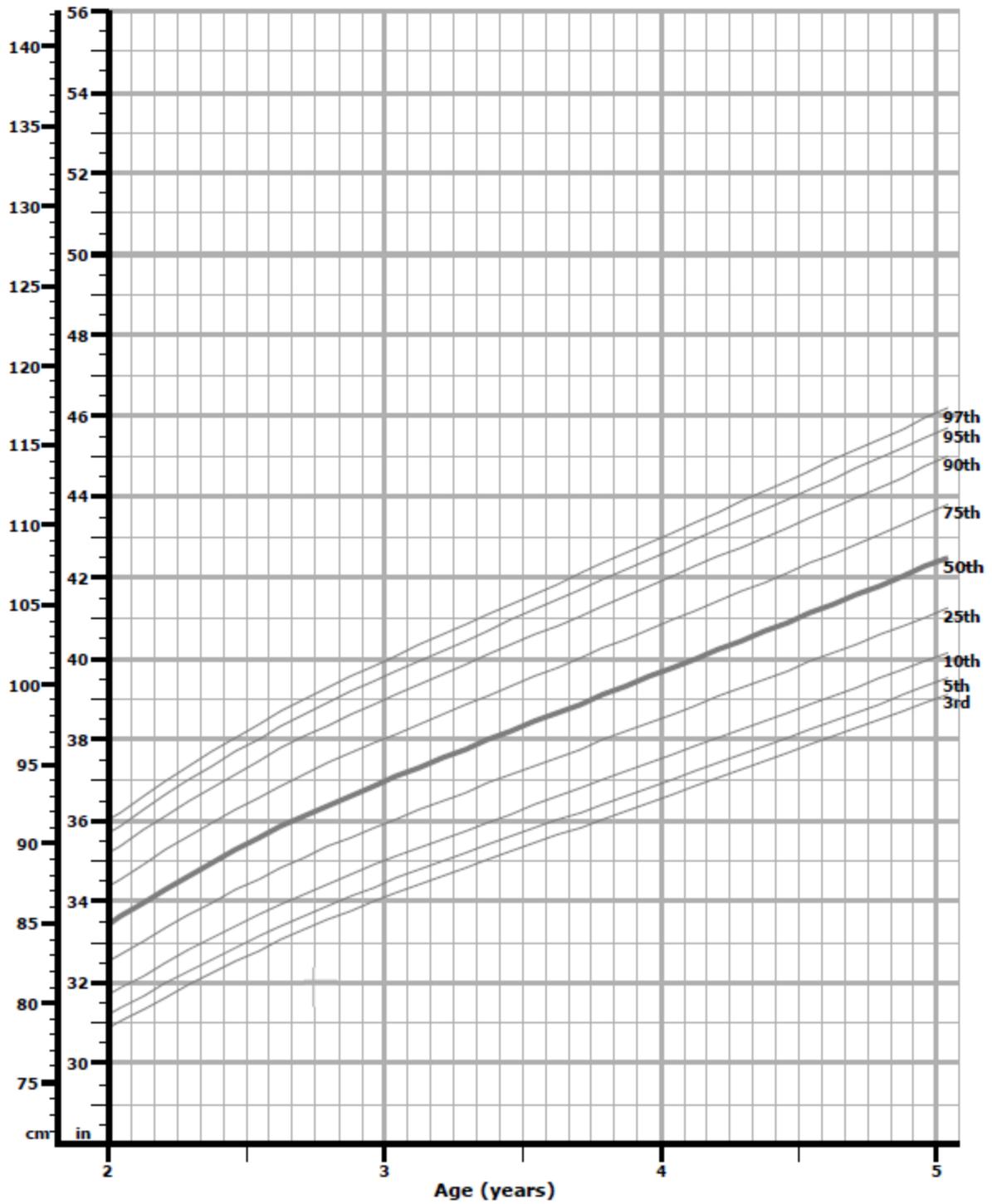
Male Child Weight For Stature Chart



Female Child Weight For Age Chart



Female Child Stature For Age



Female Child Weight For Stature Chart

