

* Collaborating for a
Quality
Life-Span Through Vision

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*Program Panel

- *Dr. Marian C. Levy
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- *Dr. Glen T. Steele
- *Dr. Kathleen Murphy
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Nutrition: A Critical Influence on Child Development

Marian Levy, DrPH, RD

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Marian Levy, DrPH, RD

The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:

* No relationships to disclose

* Presenter Disclosure

* Overview

Nutrition in infant development

Cognitive development

Deficiencies

Excesses

Hope for the future

* Rapid Growth and Development

4 months: birthweight doubles

1st birthday

Birthweight triples

10-11 inches longer

brain, heart and kidneys double in size

18 months of age, most brain cells formed

Caloric need ~ adult 7,000 kcal

* Cognitive Development

Brain triples in size

Iron transport O_2 to brain
(concentration)

Protein (alertness, motivation)

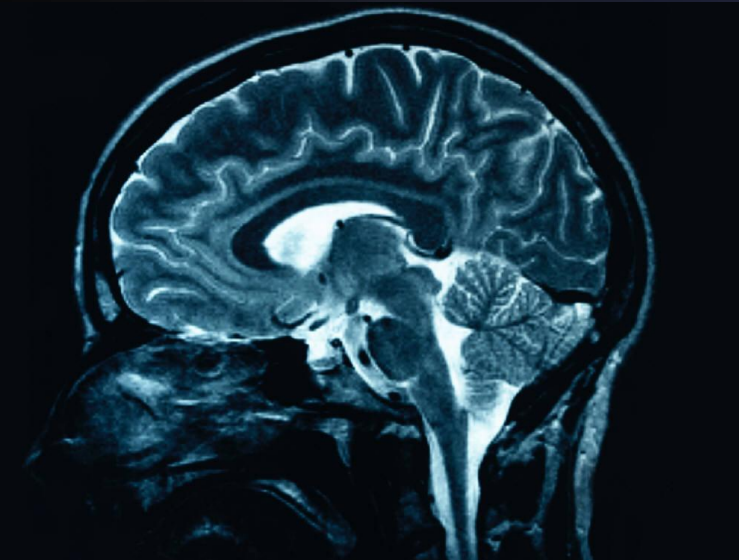
B-vitamins (memory)

Zinc (growth)

DHA (Omega-3 f.a.)

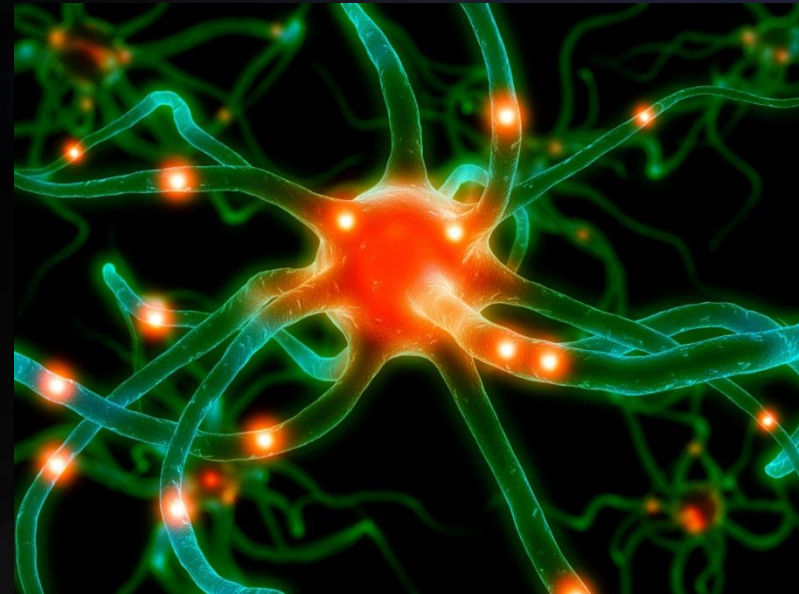
needed for visual acuity

retina rich in DHA



* DHA (Omega-3 fatty acid)

Component of synapse production
Enhances learning, development



* Nutrient Shortages and Cognition

Early - reduce cell production

Later - reduce cell size, complexity

Less efficient communication
between brain cells



* General Malnutrition

Delayed growth, motor development

Decreased attention, deficient learning

Learning disabilities

Lower IQ

Compromised immunity

* Iron Deficiency

Decreased attention, deficient learning

Growth retardation

Developmental delay

Compromised immunity

Fatigue

Delayed motor development

Lack of interest in social environment

Irritability

*Vitamin A Deficiency



- Night blindness
- Loss of taste
- Poor wound healing
- Dry eye
- Bitot spots
- Softening of the cornea and other cornea related problems
- Blindness
- Death



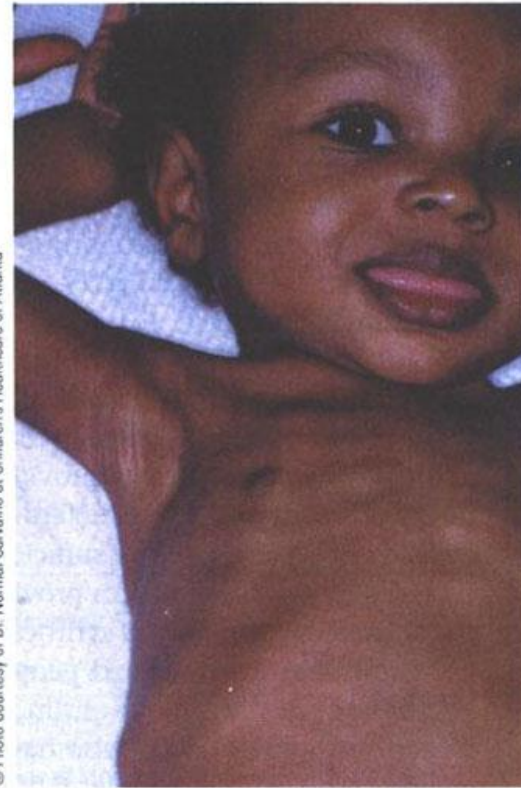
* Vitamin D Deficiency

FIGURE 11-10 Vitamin D-Deficiency Symptoms—Bowed Legs and Beaded Ribs of Rickets



Biophoto Associates/Photo Researchers Inc.

Bowed legs. In rickets, the poorly formed long bones of the legs bend outward as weight-bearing activities such as walking begin.



© Photo Courtesy of Dr. Normal Carvalho at Children's Healthcare of Atlanta

Beaded ribs. In rickets, a series of "beads" develop where the cartilages and bones attach.

*Protein Deficiency



© Wadsworth – Thomson Learning

* Excess Sugar

FIGURE 16-5
Tooth Decay

Nursing Bottle

This child was frequently put to bed sucking on a bottle filled with apple juice, so the teeth were bathed in carbohydrate for long periods of time—a perfect medium for bacterial growth. The upper teeth show signs of decay.



© E. H. Gill/Custom Medical Stock Photo

*Excess Iron

- * Most common type of accidental poisoning in children < 6 yrs
- * Liver damage
- * Particularly tempting because it appears similar to candy.

*Excess Vitamin A

- *Birth defects if taken during pregnancy
- *Eye malformation
- *Intracranial hypertension





Breastfeeding

- All major health organizations recommend exclusive breastfeeding for 6 months, continuing through at least one year (AAP, ACOG, AAFP)
- No longer a lifestyle choice, a public health issue. (AAP)

AAP, (2012). Breastfeeding and the use of human milk. *Pediatrics*, 129(3), e827-e841.



*Breastfeeding- what's not to like?

- * Proper nutrients
- * Proper balance
- * Bacterially safe
- * Immunity
- * Convenient
- * Economical
- * Sustainable
- * Bonding



BREASTFEEDING

It Rocks!

*Health Benefits for Infants

- *Hospitalization for LRI ↓ 72%
- *Otitis media ↓ 50%
- *Gastroenteritis ↓ 64%
- *Necrotizing enterocolitis ↓ 77%
- *SIDS ↓ 36%
- *Obesity ↓ 31%
- *Diabetes Type I ↓ 30%
- *Diabetes Type II ↓ 40%

*Public Health Implications

PUBLIC HEALTH *begins with* BREASTFEEDING

Massachusetts Breastfeeding Coalition | www.massbfc.org

Obesity Prevention

Begins With Breastfeeding



For more information on breastfeeding for health care professionals or for families, visit the Web site for the American Academy of Pediatrics Breastfeeding Initiative at www.aap.org/breastfeeding.

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN

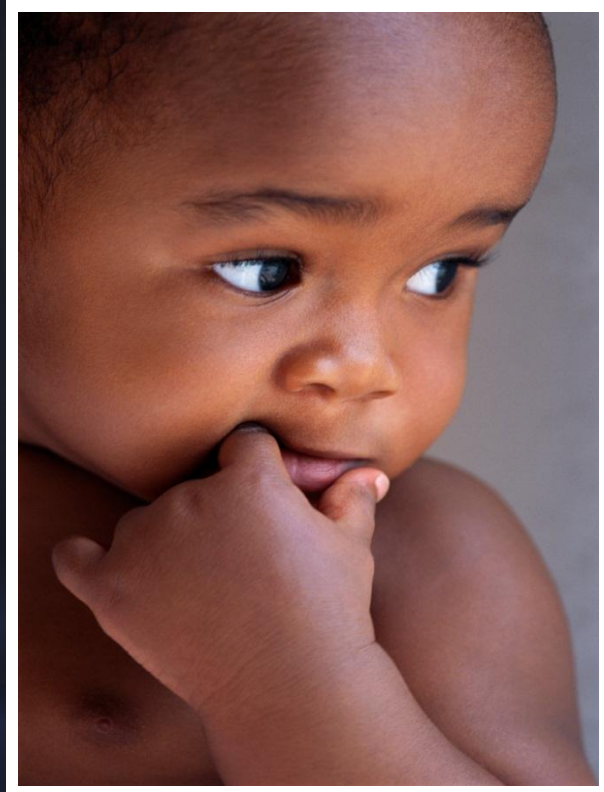
American Academy of Pediatrics
healthychildren.org



“Breastfeeding is the most precious
gift a mother can give her infant.
When there is illness or malnutrition, it
may be a lifesaving gift; when there is
poverty,
it may be the only gift.”

-- R.A. Lawrence, 2007

*Thank you!



* Infant Development in the First Year of Life

Marianne M. Hillemeier, PhD, MPH

Pennsylvania State University



Marianne M. Hillemeier, PhD, MPH

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Key Aspects of Infant Development

*Physical

- *Weight, length, and head circumference
- *Movement and coordination

*Social/Emotional

- *Interaction with caregivers

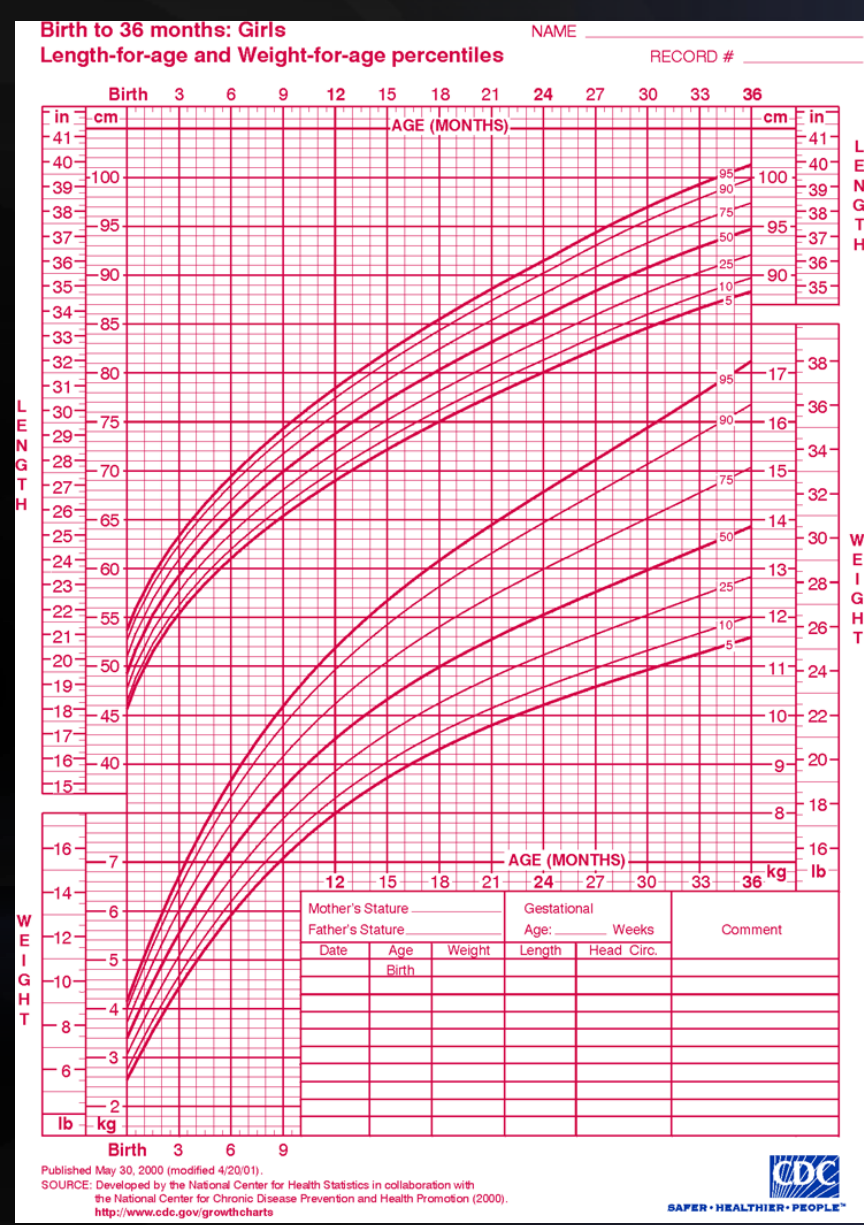
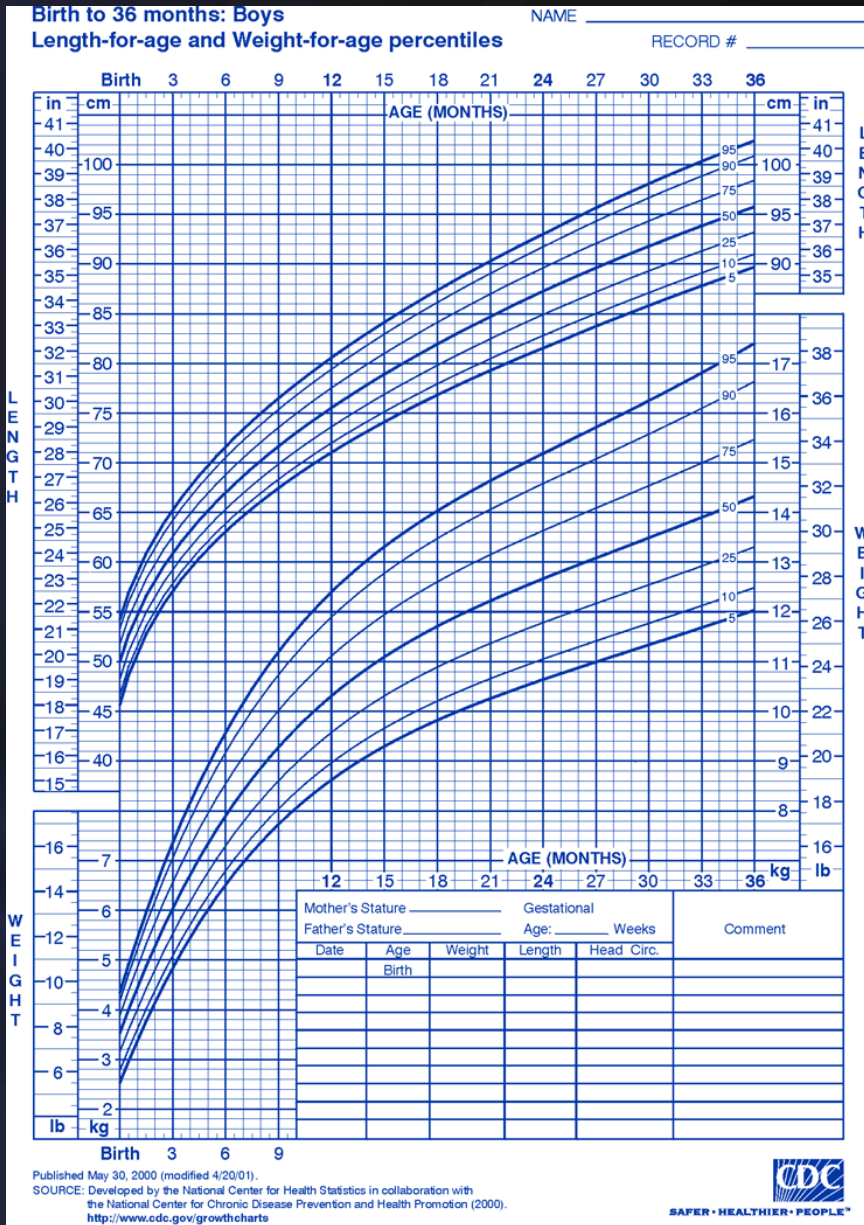
*Language

- *Receptive comprehension, verbal expression

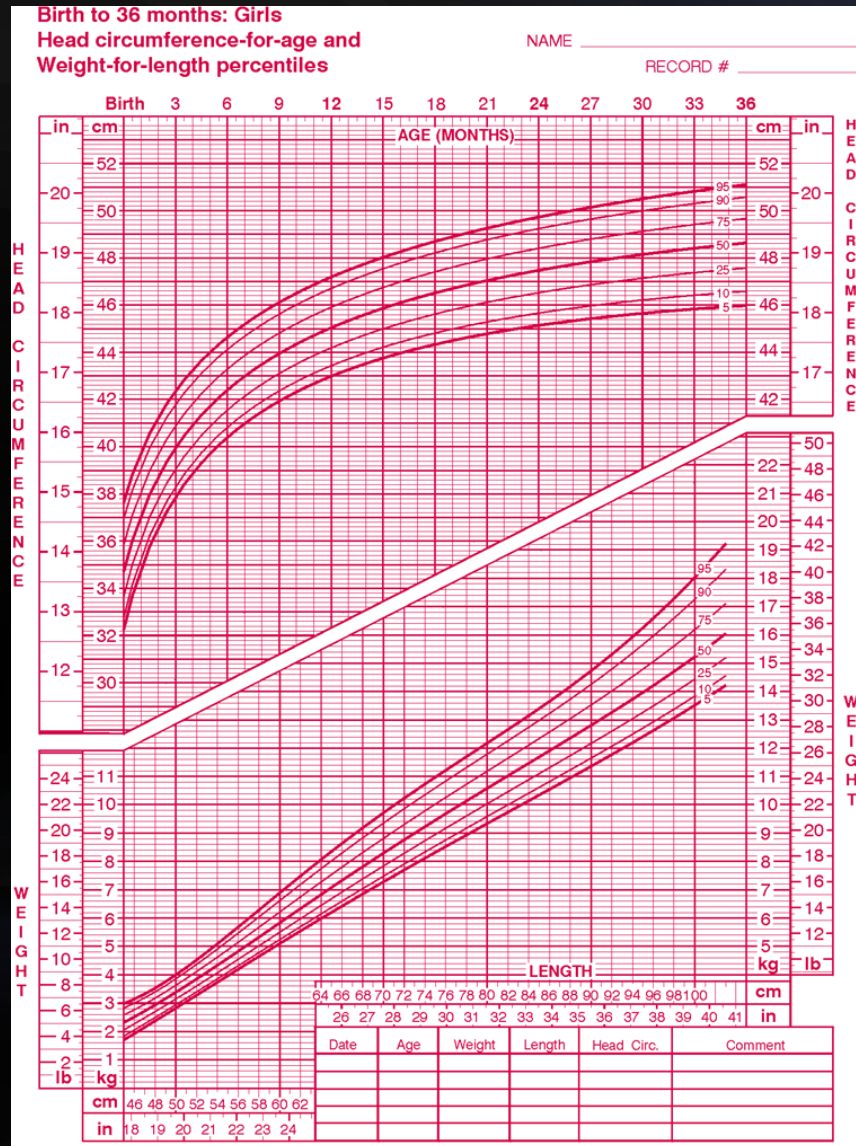
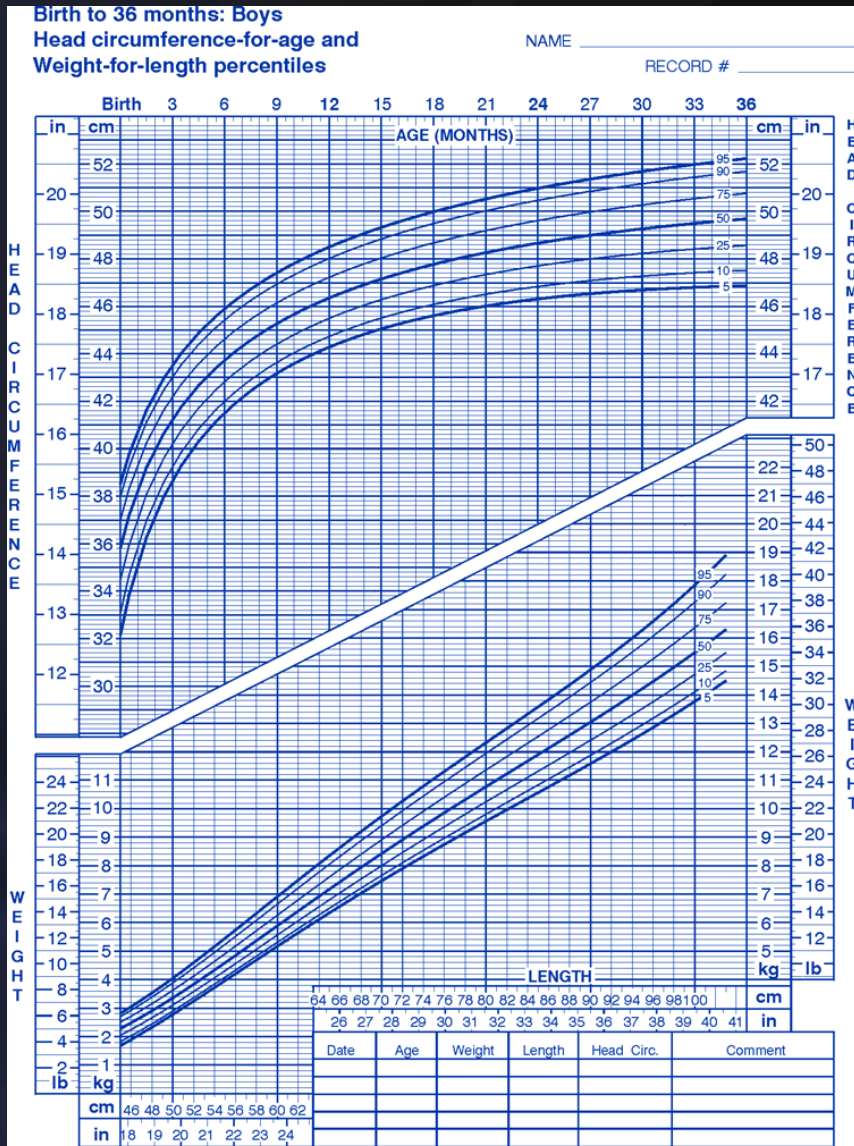
*Cognitive

- *Learning, thinking, problem-solving

Growth Charts: Length-For-Age and Weight-For-Age



Growth Charts: Head Circumference-For-Age and Weight-For-Length



Published May 30, 2000 (modified 10/16/00).
 SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).
<http://www.cdc.gov/growthcharts>



SAFER • HEALTHIER • PEOPLE™

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* Newborn

* Physical development

- * Loses weight after birth; regained in 10-12 days
- * Gains 4-8 ounces a week and grows 1-1.5 inches in first month

* Social/Emotional

- * Cries when uncomfortable
- * Soon baby's eyes track caregiver's movements
- * Facial expression brightens when cuddled and talked soothingly to

*Newborn



*Language

- *Baby listens and absorbs the basic and distinct sounds of language when spoken to

*Cognitive

- *Brain growth is extremely rapid
- *Positive interactions with caregivers promote healthy brain growth



*Two Months of Age

*Physical development

- *Can hold head up
- *Begins to push up when lying on tummy

*Social/Emotional

- *Begins to smile at people
- *Can briefly calm him/herself (may bring hands to mouth and suck on hand)
- *Tries to look at parent



*Two Months of Age

*Language

- * Coos, makes gurgling sounds
- * Turns head toward sounds

*Cognitive

- * Pays attention to faces
- * Begins to follow things with eyes and recognize people at a distance
- * Begins to act bored (cries, fussy) if activity doesn't change



* Four Months of Age

* Physical development

- * Holds head steady, unsupported
- * Pushes down on legs when feet are on hard surface
- * May be able to roll from tummy to back
- * Can hold a toy and shake it and swing at dangling toys



* Four Months of Age

* Social/Emotional

- * Smiles spontaneously, especially at people
- * Likes to play with people and might cry when playing stops
- * Copies some movements and facial expressions, like smiling or frowning



* Four Months of Age

* Language

- * Babbles with expression and copies sounds
- * Cries in different ways for hunger, pain, being tired

* Cognitive

- * Responds to affection
- * Reaches for toy with one hand
- * Uses hands and eyes together, such as seeing and reaching for a toy
- * Watches faces closely



*Six Months of Age

*Social/Emotional

- * Begins to know if someone is a stranger
- * Responds to other people's emotions and often seems happy
- * Likes to look at self in a mirror



*Six Months of Age

*Physical development

- *Rolls over front to back and back to front
- *Begins to sit without support
- *When standing, supports weight on legs
- *Rocks back and forth, sometimes crawling backward before moving forward



*Six Months of Age

*Language

- * Responds to sounds by making sounds
- * Strings vowels together (“ah,” “eh,” “oh”)
- * Responds to own name
- * Begins to say consonant sounds (“m,” “b”)

*Cognitive

- * Brings things to mouth
- * Shows curiosity about things and tries to get things out of reach
- * Begins to pass things from one hand to the other



* Nine Months of Age

* Physical development

- * Stands, holding on
- * Can get into sitting position
- * Pulls to stand
- * Crawls

* Social/Emotional

- * May be afraid of strangers
- * May be clingy with familiar adults
- * Has favorite toys



* Nine Months of Age

* Language

- * Understands “no”
- * Makes a lot of different sounds like “mamamama”
- * Copies sounds and gestures of others
- * Uses fingers to point at things



* Nine Months of Age

* Cognitive

- * Watches path of something as it falls
- * Looks for things he/she sees you hide
- * Plays peek-a-boo
- * Picks up things like cereal o's between thumb and index finger



*Twelve Months of Age

*Physical development

- *Walks holding on to furniture (cruises)
- *May take a few steps without holding on
- *May stand alone

*Social/Emotional

- *Is shy or nervous with strangers
- *Cries when mom or dad leaves
- *Hands you a book when he/she wants to hear a story
- *Repeats sounds or actions to get attention
- *Puts out arm or leg to help with dressing



* Twelve Months of Age

* Language

- * Responds to simple spoken requests
- * Uses simple gestures like shaking head “no”
- * Makes sounds with changes in tone
- * Tries to say words you say



* Twelve Months of Age

* Cognitive

- * Explores things in different ways, like shaking, banging, throwing
- * Looks at the right picture or thing when it is named
- * Bangs two things together
- * Puts things into a container, takes things out
- * Follows simple directions like “pick up the toy”



The American Academy of Pediatrics recommends that in addition to performing a physical exam, health care providers should educate parents about infant development during well-baby visits. This is just one of a long list of topics to be discussed, however...

American Academy of Pediatrics: Recommended Discussion Topics At Well-Child Visits

AGES	2-4 DAYS	1 MONTH	2 MONTHS
NUTRITION and EXERCISE	Breast or formula Feeding frequency - amount	Breastfeeding/Formula exclusive	Breastfeeding/Formula exclusive
DENTAL HEALTH	Early dental decay	Early dental decay	Early dental decay
ACCIDENT/INJURY PREVENTION	Supine sleeping position Injury prevention/ "Babyproofing" Safety with siblings and pets Drowning prevention Car seat/Auto safety "Shaken baby syndrome"	Supine sleeping position Injury prevention/ "Babyproofing" Safety with siblings and pets Drowning prevention/ Sun safety Car seat/Auto safety "Shaken baby syndrome"	Supine sleeping position Injury prevention/ "Babyproofing" Safety with siblings and pets Drowning prevention/ Sun safety Car seat/Auto safety "Shaken baby syndrome"
HEALTH AWARENESS/SAFETY HABITS	Signs of Illness Temperature taking, when to contact doctor, Emergency/911 Passive smoke Parenting practices "Safe at home" Potential for abuse	Signs of Illness Temperature taking, when to contact doctor Emergency/911 Passive smoke Parenting practices "Safe at home" Potential for abuse Child care safety Limit TV/Video exposure	Signs of illness Emergency/911 Passive smoke Parenting practices "Safe at home" Potential for abuse Child care safety Limit TV/Video exposure
PSYCHOSOCIAL ISSUES	Postpartum adjustment Family involvement Parent/Infant attachment	Postpartum adjustment Family involvement Parent/Infant attachment	Postpartum adjustment Family involvement Parent/Infant attachment
FOR ADDITIONAL INFORMATION	Literature on Child Development Next Appointment	Literature on Child Development Next Appointment	Literature on Child Development Next Appointment

American Academy of Pediatrics: Recommended Discussion Topics At Well-Child Visits

<u>AGES</u>	<u>FOUR MONTHS</u>	<u>SIX MONTHS</u>	<u>NINE MONTHS</u>	<u>TWELVE MONTHS</u>
NUTRITION and EXERCISE	May introduce baby food slowly	Finger foods Introduce cup use	Finger Foods/Self-feeding Transition to cup	Nutrition/Self-feeding Transition to cup
DENTAL HEALTH	Early dental decay	Teething / Early dental decay	Early dental decay	Dental caries prevention
ACCIDENT/INJURY PREVENTION	Supine sleeping position Injury prevention/ "Babyproofing"/ Safety with siblings and pets Drowning prevention/ Sun safety Car seat/Auto safety "Shaken baby syndrome"	Supine sleeping position Injury prevention/ "Babyproofing" Safety with siblings and pets Drowning prevention/ Sun safety Car seat/Auto safety "Shaken baby syndrome"	Sleep practices Injury prevention/ "Babyproofing"/ Poison control no. Safety with siblings and pets Drowning prevention/ Sun safety Car seat/Auto safety "Shaken baby syndrome"	Sleep practices "Babyproofing"/ Poison Control no. Safety with siblings and pets Drowning/ Sun safety Car seat/Auto safety
HEALTH AWARENESS/ SAFETY HABITS	Signs of illness Emergency/911 Passive smoke Parenting practices "Safe at home" Potential for abuse Child care safety Limit TV/Video exposure	Emergency/911 Passive smoke Parenting advice "Safe at home" Potential for abuse Child care safety Limit TV/Video exposure	Emergency/911 Passive smoke Parenting advice "Safe at home" Potential for abuse Child care safety Limit TV/Video exposure Time with parents/Reading	Emergency/911 Passive smoke "Safe at home" Parenting advice Potential for abuse Child care safety Limit TV/Video exposure Time with parents/Reading
PSYCHOSOCIAL ISSUES	Postpartum adjustment Family involvement Parent/Infant attachment Fears and phobias	Family involvement Interactions with parents Parental/Sibling adjustment Fears and phobias	Family involvement Interactions with parents Stranger awareness Sibling interactions Parental adjustment Family functioning	Stranger Awareness Social Interactions/ Expectations Sibling interactions Family functioning Parental adjustment
FOR ADDITIONAL INFORMATION	Literature on Child Development Next Appointment	Literature on Child Development Next Appointment	Literature on Child Development Next Appointment	Literature on Child Development Next Appointment



Discussion of infant development is likely to be brief. A 2011 study by Halfon and colleagues published in *Pediatrics* found:

- One-third of parents reported spending no more than 10 minutes with the clinician at their last well-child visit
- Nearly half spent 11 to 20 minutes

* InfantSEE[®] - a Program of Early Identification

Glen T. Steele, O.D. FCOVD

Chair, InfantSEE[®] - A Public Health Program
of Optometry Cares[™] - the AOA Foundation



Glen T. Steele, O.D, FCOVD

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* InfantSEE®

- * What is InfantSEE®
- * Volunteer optometrists examine babies without charge to parent or third party
- * An ongoing project - year round
- * Specific emphasis times to educate parents and caregivers about the need for early identification and intervention
- * Most importantly -
 - * **It's About Changing Lives**

* President and Mrs. Rosalyn Carter
Honorary National Spokespersons



Children's Care Historically

- Through EPSDT, most babies receive eye screening as a basic part of each well-baby health exam - visual acuity does not begin until age 3
- Bright Futures - done through Risk Assessment - a short questionnaire regarding the parent's view of the child's vision – no required screening until age 3.
- Prior to InfantSEE[®] it was assumed that about one in 30 babies may have a risk factor



her new glasses



*Alaina



*Ben



*Anderson



* Maya

- * Dislocated lenses discovered during the InfantSEE[®] examination
- * Parent told by consulting doctor that “InfantSEE was worthless”
- * Parent created a blog from Maya’s perspective entitled: **How Being Told, “InfantSEE is worthless,” Changed My Life**



*Emory



AMERICA
NOW

*Antarius



* InfantSEE[®] - What We Found (CDC)

- * 1051 total: 536 (F) 515 (M)
- * 145 Premature Babies (13.8 %)
- * 280 non-Caucasian background (26%)
- * 180 showed Risk Factors (17%) or
One in SIX at Risk
- * Lower socio-economic areas (25%)
One in FOUR at Risk

* InfantSEE[®] - What We Found (CDC)

- * Income: \$41,648 Average Reported Income

 - * 1 of 8 Exams above Avg. Income had Risk Factors

 - * 1 of 4 Exams below Avg. Income had Risk Factors

- * Areas most frequently noted were:

 - * Ocular motility

 - * Visual acuity

 - * Binocular function

* InfantSEE[®] - What We Found

- * Results suggest that visual impairment in infancy is more significant than originally reported
- * Children from families with lower income show a significantly higher incidence of visual risk factors
- * 315 of 1051 Exams have Public Insurance or NO Insurance (33%)

* InfantSEE®

- * When diagnosis and intervention takes place earlier in a baby's life, the chance of later success increases dramatically
- * Now how do we help?
- * InfantSEE is one specific way
- * How do we do it?
- * How do we change lives?

* Visual Links to Autism

- * Children With Autism Show Slower Pupil Responses
 - * *Journal of Autism and Developmental Disorders*
- * Infant's Gaze May Be an Early, but Subtle, Marker for Autism Risk
 - * *Journal of Child Psychology and Psychiatry*
- * Visual Pattern Preference May Be Indicator of Autism in Toddlers
 - * *Archives of General Psychiatry* - September 6 issue

*Gaze Following

- * Active gaze following by 12 months
 - * 335 words – known by 18 months
- * Babies without Active gaze following or other patterns
 - * 195 words known by 18 months

Meltzoff, A, The development of gaze following and its relation to language
Developmental Science 8:6 (2005), pp 535-543

*Visual Links to Prematurity

- *Babies are surviving today that did not survive in the past. After managing to survive, now the baby meets life head-on.
- *Beyond retinopathy of prematurity, babies are not able to move and often look in order for “normal development” to take place.

* Visual Links to Development

- * Babies are born with visual hunger -
- * Judgment of wakefulness is determined by how they are looking
 - * Looking – awake
 - * Stops looking – goes to sleep
- * Think of visual development in the broader sense of the development of looking

* Gesell and Amatruda – Developmental Diagnosis - 1947

* Challenge to Doctors

- * Remember these ten very important words “I Will Walk With You Every Step of the Way.”
- * By doing so, babies will get an earlier start toward success and the parents will have someone to help them better understand the diagnosis, it’s implications and possibilities of treatment.

* InfantSEE[®] - What Can You Do?

- * InfantSEE[®] is about caring for the eyes and vision care needs for people beginning at birth and continuing throughout their lifetime – **It's about changing lives**
- * Become an Ambassador for InfantSEE[®] – promote the program in your city, your state, and especially with the parents of the babies with whom you have contact

* InfantSEE® - What Can You Do?

- * When you have a baby who is not at the expected levels – think of vision as one of the contributing factors
- * Don't assume that vision has already been checked – make an appointment
- * Ensure that every baby has an early eye and vision assessment
- * Link with an InfantSEE® provider in your area – www.infantsee.org or 1-888-396-EYES (3937)

* InfantSEE[®] - www.infantsee.org



* Life Consequences Without Early Intervention

M. Kathleen Murphy, DNP, RN, FNP-BC

University of Texas Medical Branch, School of Nursing
Chair, Advisory Committee of the
National Center for Children's Vision and Eye Health

M. Kathleen Murphy, DNP, RN, FNP-
BC

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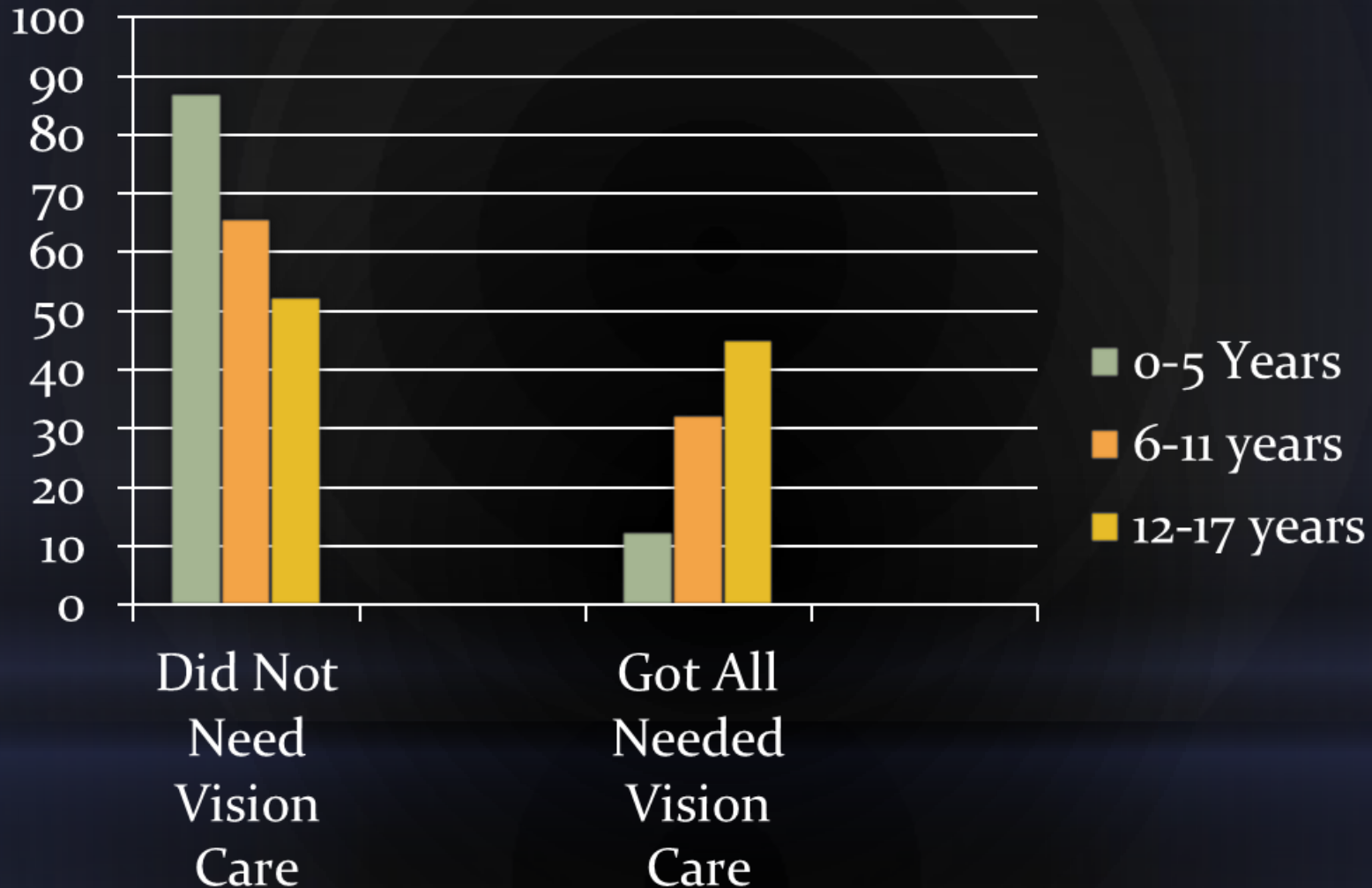
*Vision and School

“I got glasses in second grade and I remember being astonished that stars really do twinkle...”

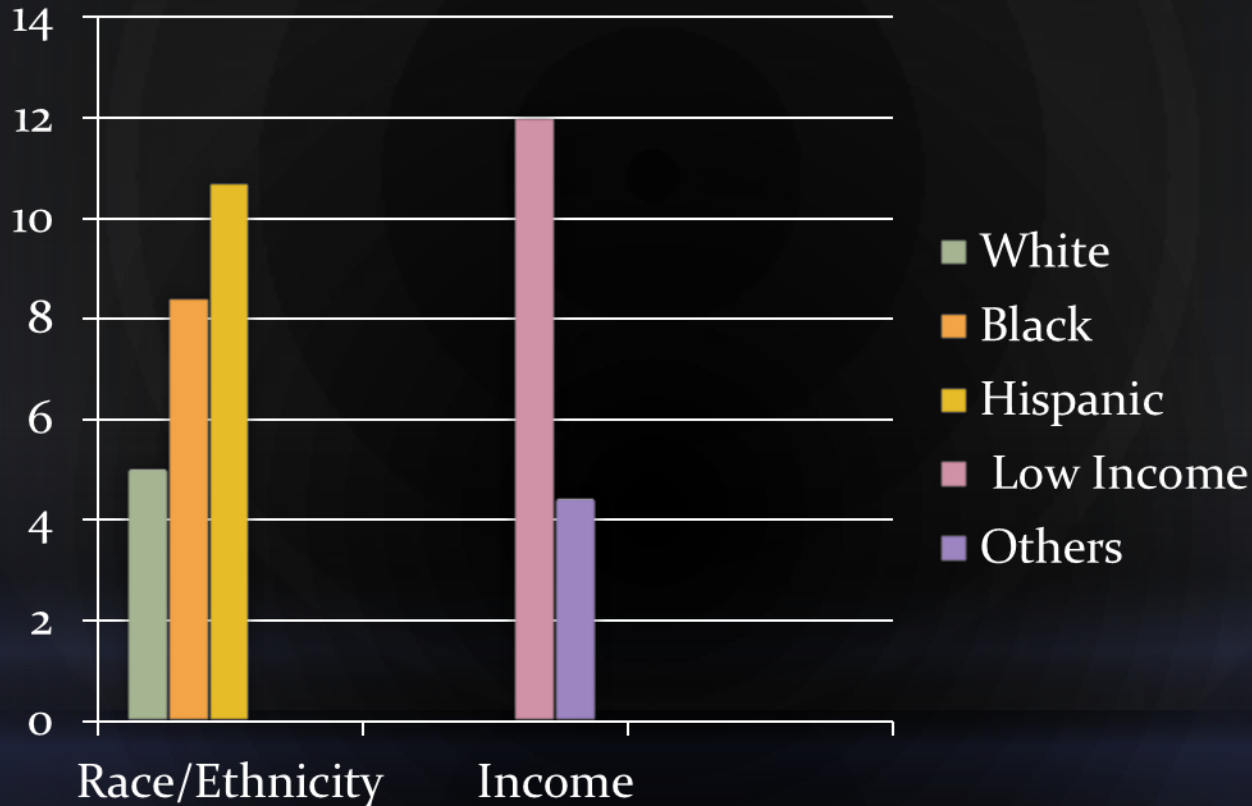
*Vision and School



*Unmet Vision Care Needs



* Rates of Visual Impairment for Persons Age 12 and Above by Race/Ethnicity and Income



*Issues Associated with Uncorrected Vision Problems

- Demoralization
- Fatigue
- Impaired Literacy
- School Avoidance
- Juvenile Delinquency
 - Study: 98% of juvenile offenders had a vision problem
 - Study: 84% of children in foster care had a vision problem

* Practical Matters

- * Impact of uncorrected vision problems on quality of life.
 - * School success predicated on literacy and reading
 - * Educational achievement as a predictor of health status
 - * Health disparities
 - * Burden of vision loss for individuals families and communities

* Practical Matters

- * Importance of improved communication between providers.
 - * Eye Care Professionals
 - * Healthcare Home
 - * Parents/Guardians/Families
 - * Educators
 - * School Nurses and School Based Health Centers
- * National Center for Children's Vision and Eye Health
 - * <http://nationalcenter.preventblindness.org>

*The Take Home Message



* InfantSEE[®] - www.infantsee.org

