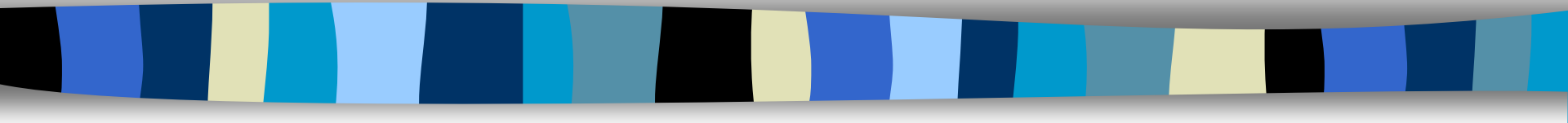
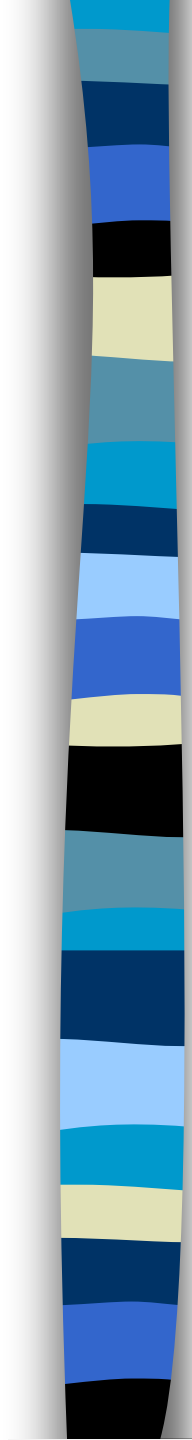


Physical Development in Infancy

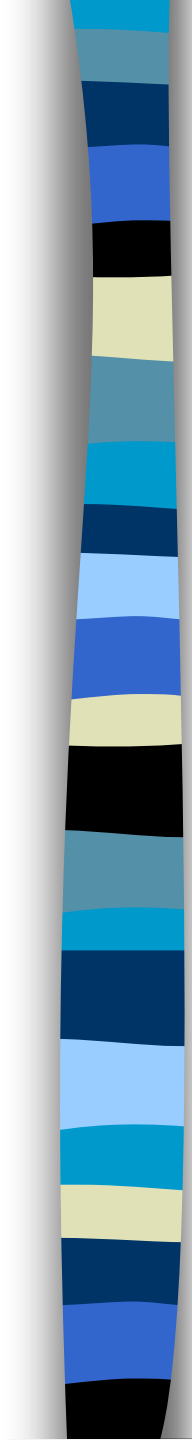


Human Development



Lesson Objectives

- Recognise the sequence of general physical development.
- Examine physical growth changes for the developing child.
- Discuss the factors influencing physical development and childhood obesity.



Growth from Pre-natal Onwards

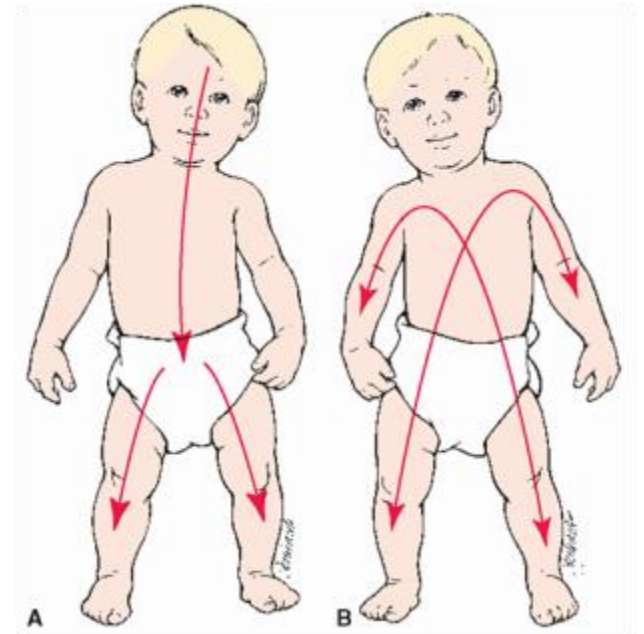
- Physical growth begins in the embryonic stage (birth to 8 weeks).
- Organs begin forming, around 3 weeks, and are developed in the foetal stage (10 -12 weeks).
- Foetal stage lasts until 38-40 weeks.

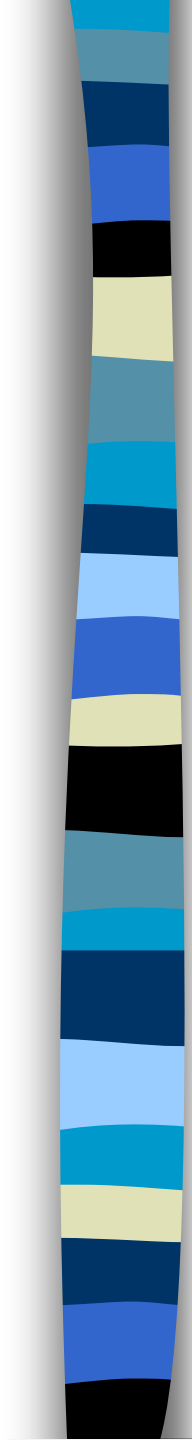
(White, 2014)

Physical Development Patterns

- The progress of human development follows two main patterns:

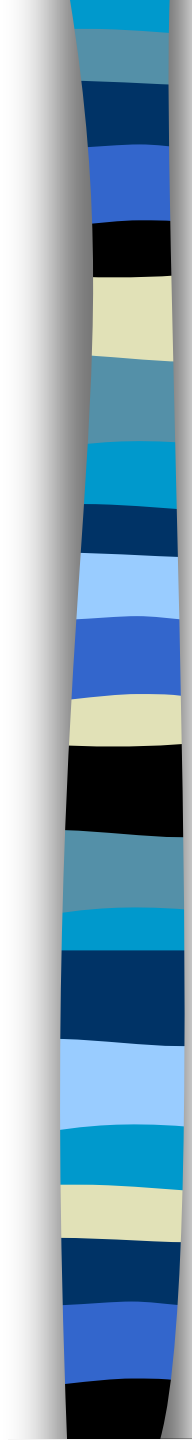
- Cephalocaudal
- Proximodistal





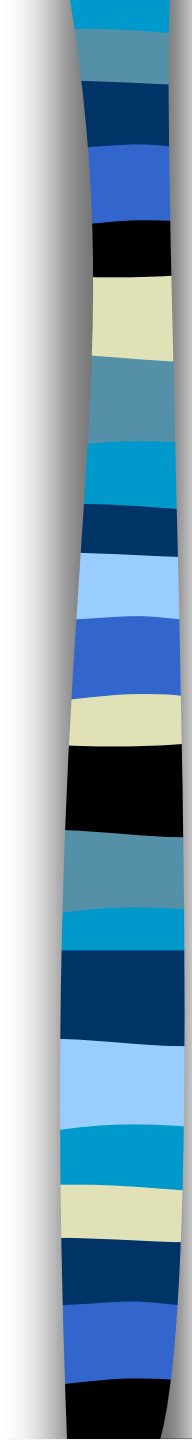
Cephalocaudal & Proximodistal Patterns

- **Cephalocaudal:** the sequence in which greatest growth occurs at the top (head), working its way to neck, shoulders, middle trunk, so on...
- **Cephalocaudal** development of motor development that occurs sequentially from head to toes.



Cephalocaudal & Proximodistal Patterns

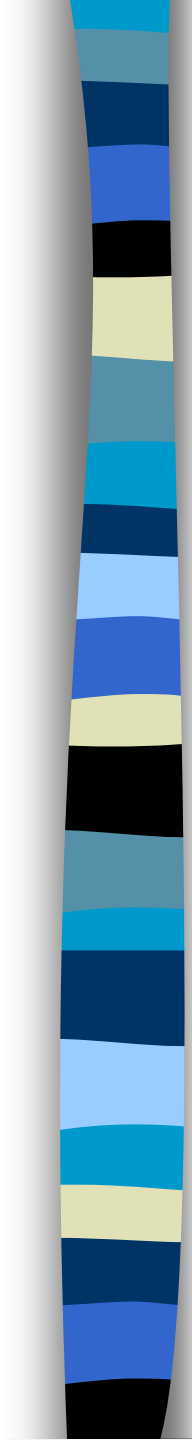
- **Proximodistal:** the sequence in which growth starts at the centre of the body and moves toward the extremities.
- **Proximodistal** development is motor development that occurs sequentially from the centre of the body outwards.



Physical Development Patterns

- During gestation organs form before limbs.
- As the foetus develops bone and muscle tone it begins to move its limbs, hands and feet, demonstrating movement begins in the womb.
- Following birth babies develop at a rapid rate.

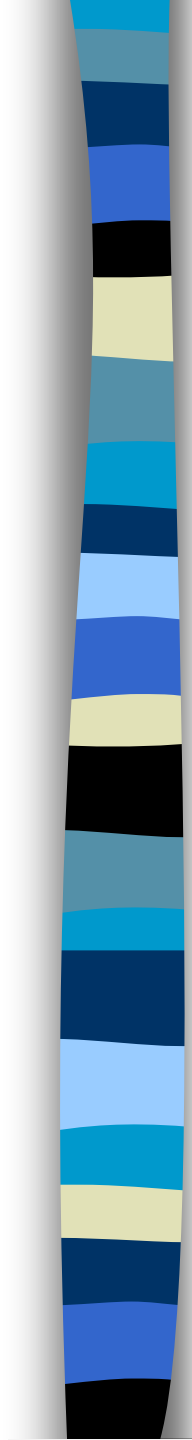
(White, 2014)



Body Size: Height and Weight

■ Height:

- Infants double their birth-weight by four months of age, triple it by their first birthday, and grow an inch a month during their first year.
- At birth children are approximately $\frac{1}{3}$ adult height and by age two, this rises to $\frac{1}{2}$.
- Shows an S-wave growth trend: growth acceleration during the prenatal stage and infancy, slowing down in childhood, and accelerating during adolescence.



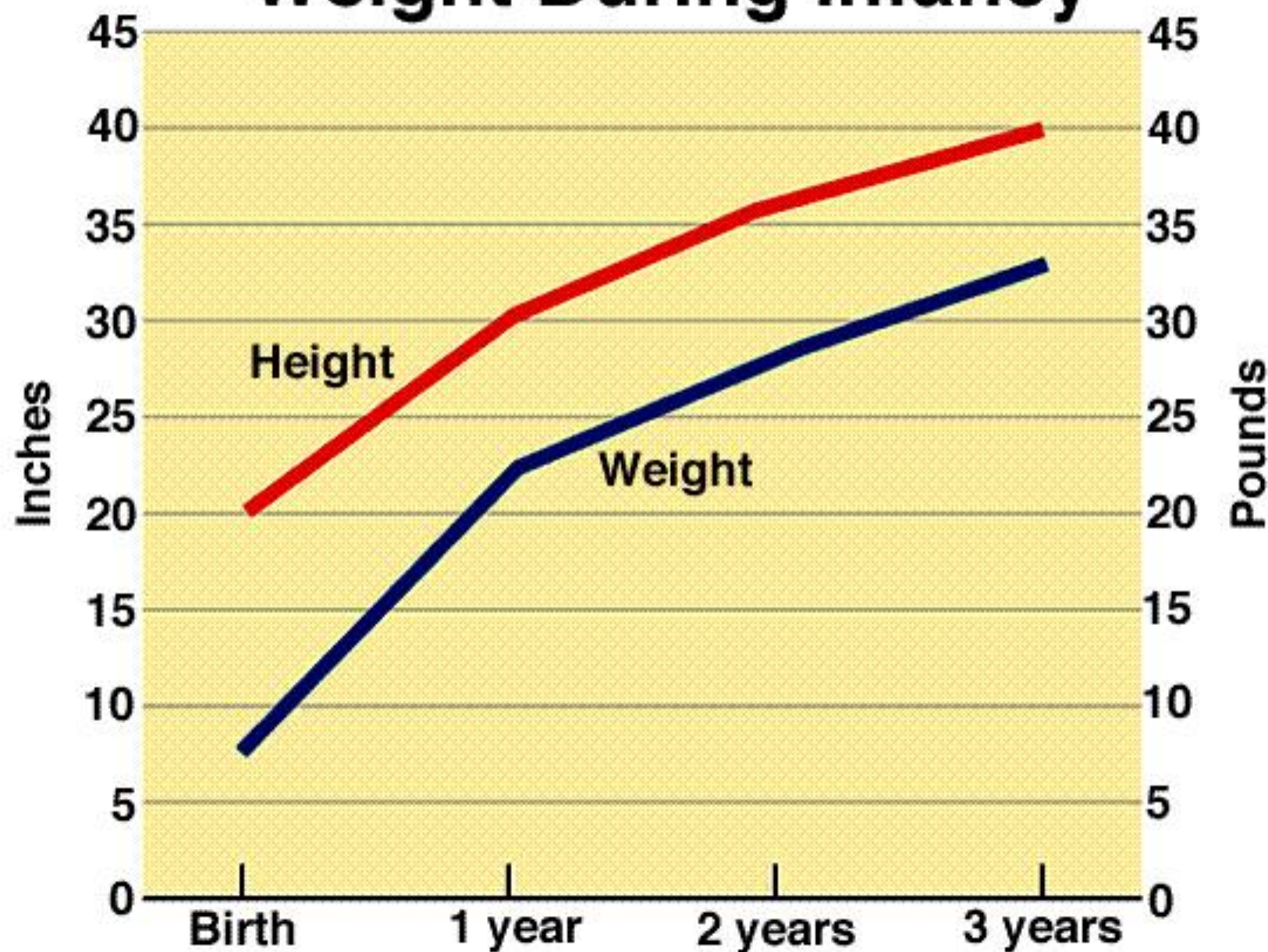
Body Size: Height and Weight

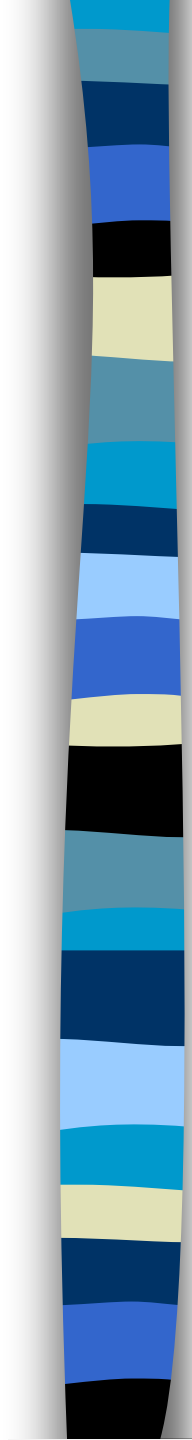
■ Weight

- An average newborn's weight is 3.35kg (7.4lb) and this doubles in the first five months.
- By the end of the first year it triples to 9.1kg (20.5lb); by two years weight has increased to 12.5kg (27.5lb) and the child has reached about one-half of their adult height; and by age five years weight has increased to 18.3kg (40.3lb)

(Kuczmarski *et al.*, 2000 in Doherty & Hughes 2009)

Growth in Height and Weight During Infancy

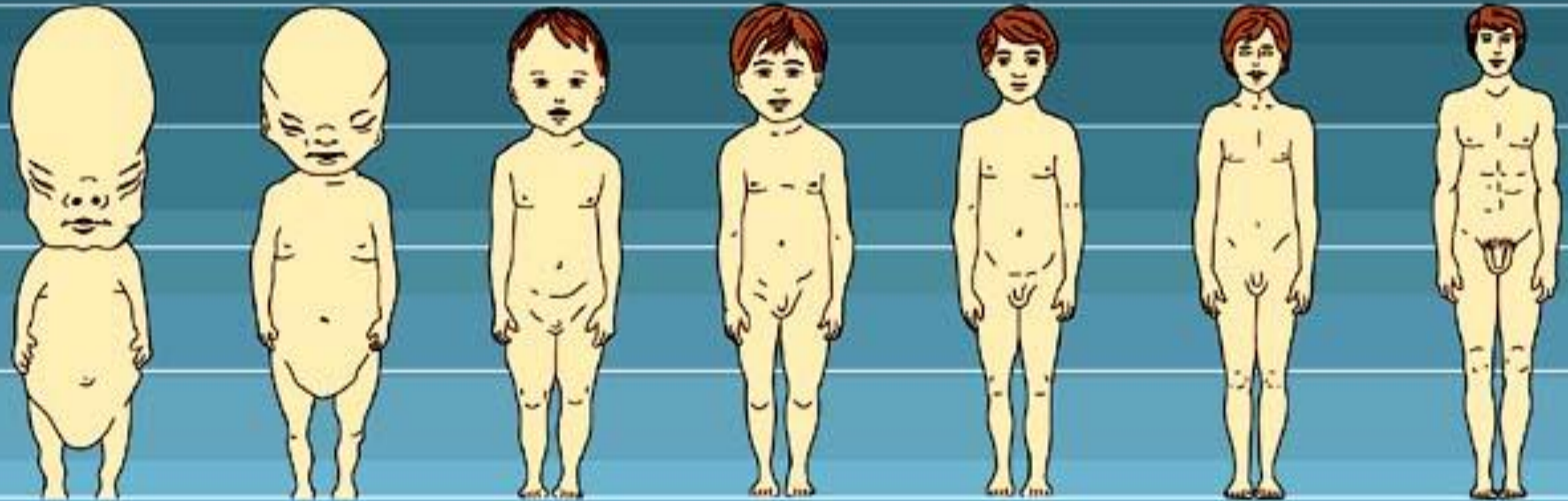




Body Proportions and Patterns

- The rate of physical growth for different parts of the body varies.
- Excluding adolescence, proportions show similarity between the sexes in the early years.
- The infant's head is about $\frac{1}{4}$ of the total body length at birth. By age six, the head is $\frac{1}{6}$ of the total body length. By adulthood it is $\frac{1}{8}$ of the total length of the body.

Changes in Body Form and Proportion



2 months
(fetal)

5 months
(fetal)

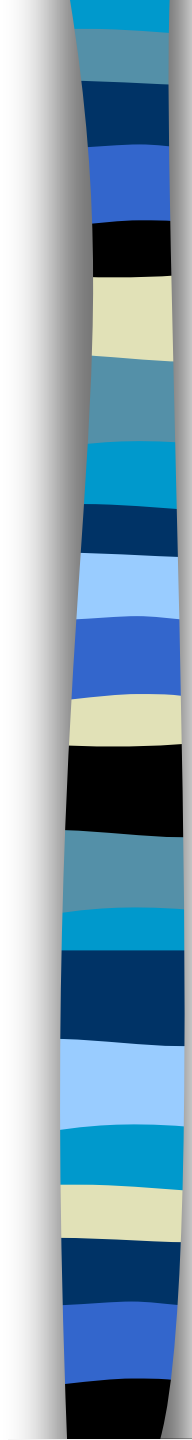
Newborn

2 years

6 years

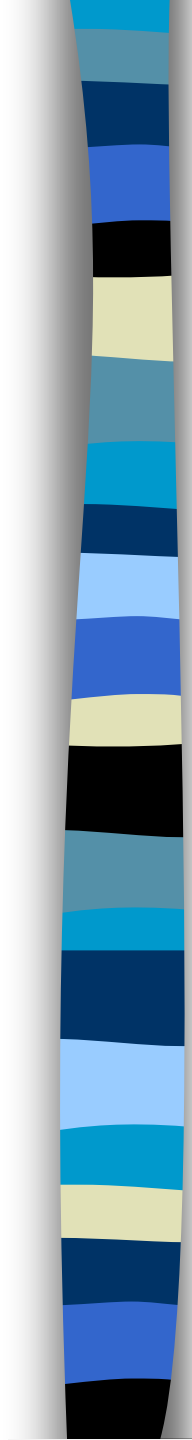
12 years

25 years



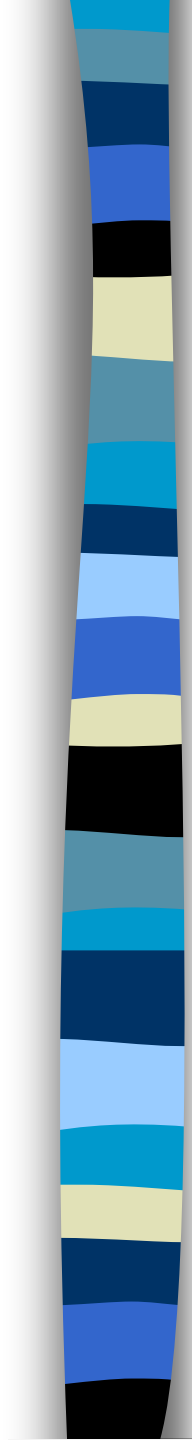
Gender differences

- Females have a more developed skeletal system than males.
- Even at birth girls are more advanced than boys, typically by between 4 and 6 weeks.
- Males have more muscle mass than females: a result of genetics, hormonal differences and the types of physical activity they engage in.
- This is also true for strength differences between girls and boys.



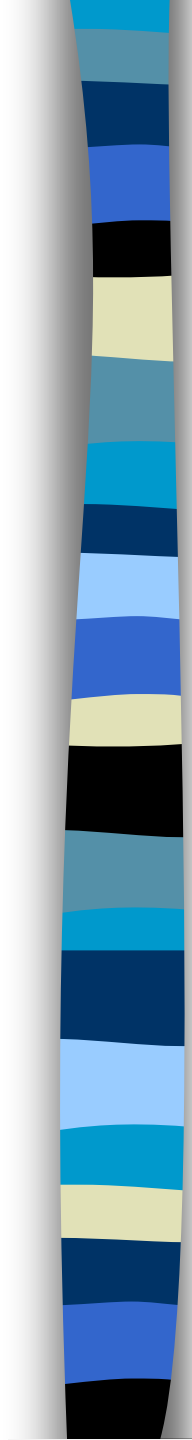
Physical growth changes in childhood

- **Anthropometric measures:** measurements that assess physical growth – including height, weight and proportional measurements.
 - Conducted by GP or health professionals.
- **Body mass index (BMI)** is bodyweight (in kilograms) divided by height (in metres) squared.
 - Regarded as the amount of adipose (fat) tissue expressed as percentage of total weight – a useful measure of how much fat there is in the body. There has been some criticism of using this with children and people who engage in sporting activities.



Assessing newborns' capabilities and states

- Assessments begin immediately after birth to allow an accurate diagnosis of the child's general health.
- Assessments identify what the child is capable of doing; which, in turn, can signal need for further action.
- **Apgar Scale:** the scale used to assess a newborn's physical state after birth.
- **Brazelton Neonatal Behavioural Assessment Scale:** a rating used to assess a newborn's reflexes and responsiveness after birth
(www.brazelton.co.uk)



Measuring Development

Theories, scales and charts which assist childcare practitioners in determining whether a child is developing according to accepted norms include:

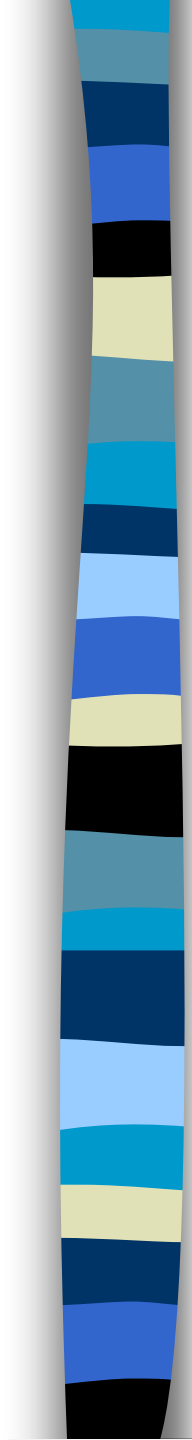
- Jean Piaget's developmental milestones theory.
- Mary Sheridan's age related sequences of development.
- Growth charts.

Development Scales

Most developmental scales are based on the work of Arnold Gessell who researched the development of children in the 1930s.

(Slater, A & Lewis, M. (2002), *Introduction to Infant Development*. Oxford: Oxford University Press)

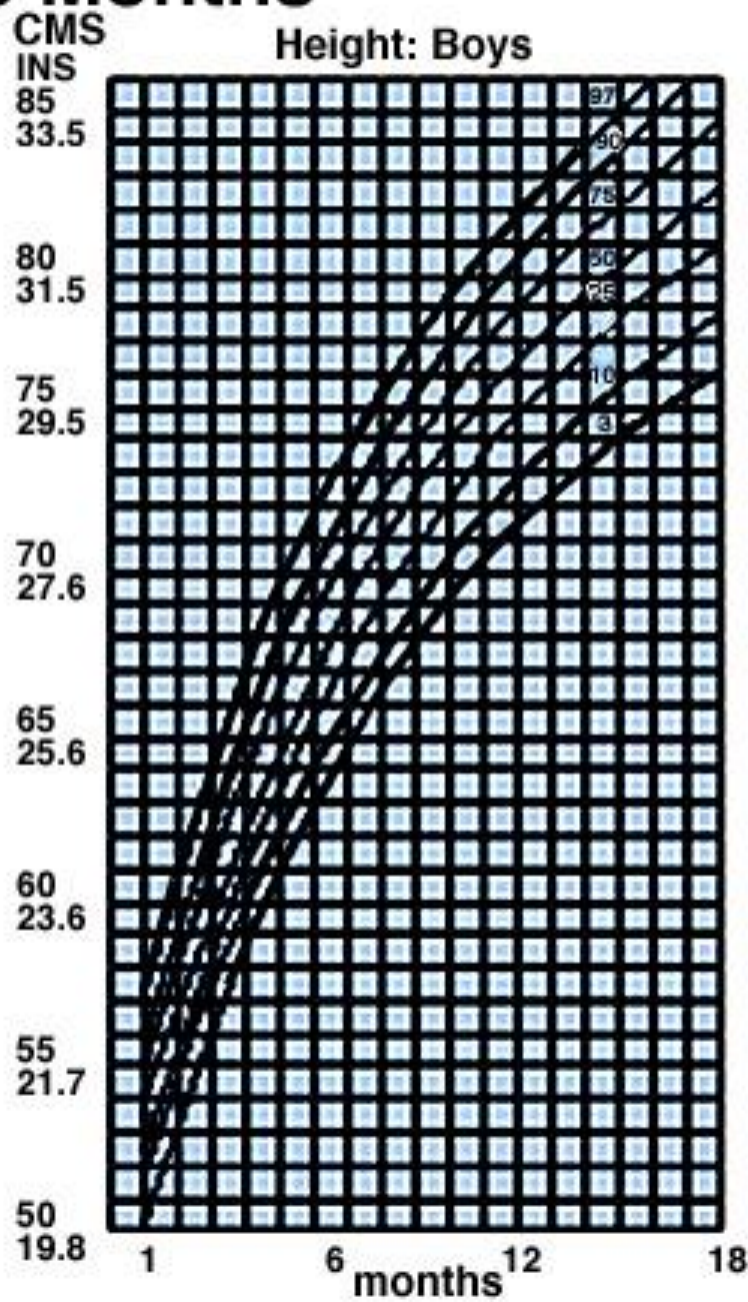
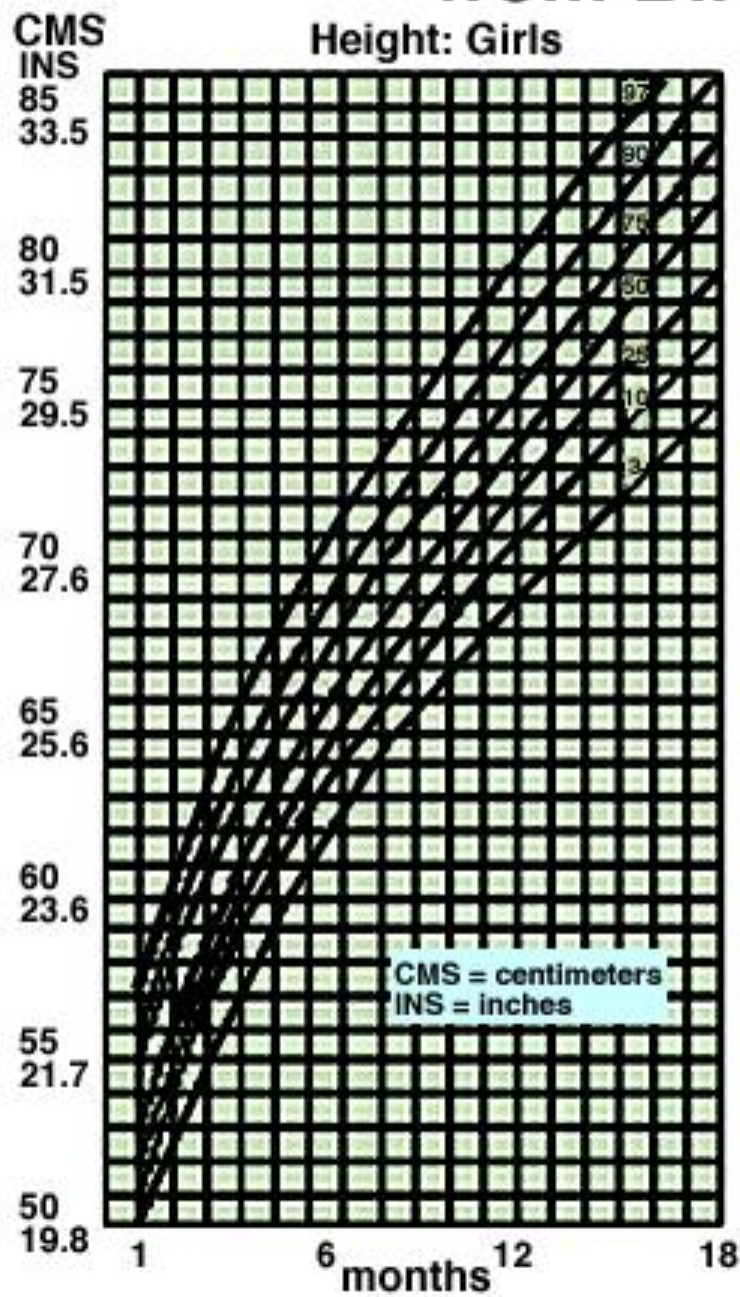


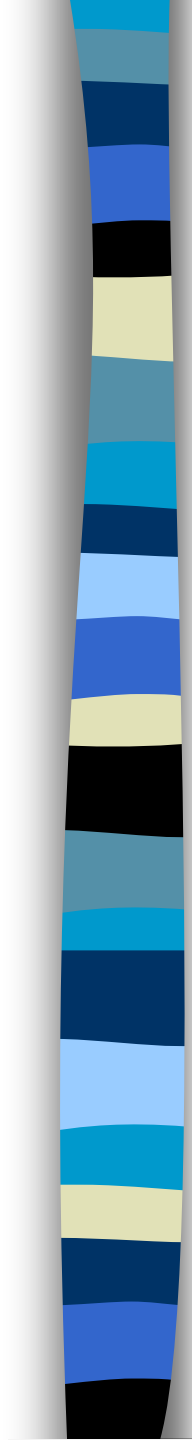


Developmental Checks

- Today health visitors use the Screening Checklist and Developmental Centile chart to record a child's progress.
- Health professionals can easily see if there is a cause for concern.
- Child will be referred to a specialist if a problem is identified.

Developmental Changes in Height and Weight from Birth to 18 Months

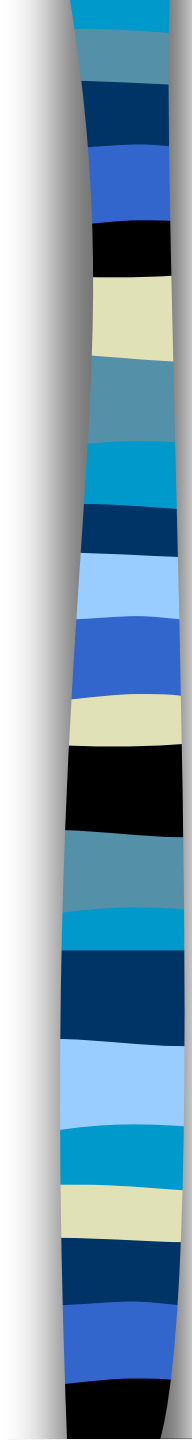




Concerns Relating to Development

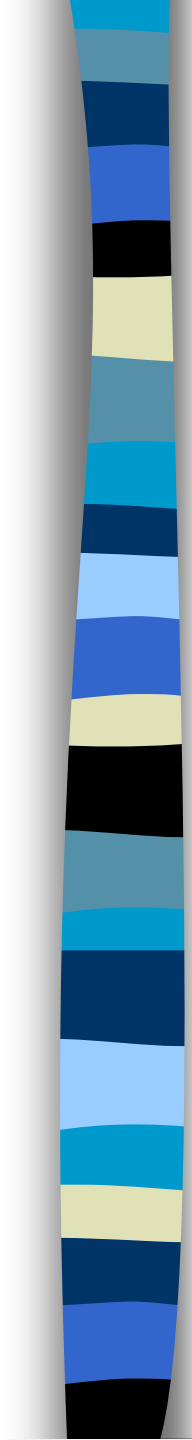
Practitioners or parents may express concerns that a child's development is:

- Slow
- Delayed
- Advanced
- Precocious (Matured beyond normal for age)



Developmental Assessment

- If there is a developmental delay parents/carers want to know about the problem as soon as possible.
- It's easier to come to terms with a serious problem in a young baby than an older child.
- Health professionals need to take parental concern's seriously.



Developmental Assessment

Parent held records:

These are given to parents by health clinics to keep track of a child's progress.

Records are kept on:

- Height and weight
- Immunisations
- Childhood illnesses and accidents.

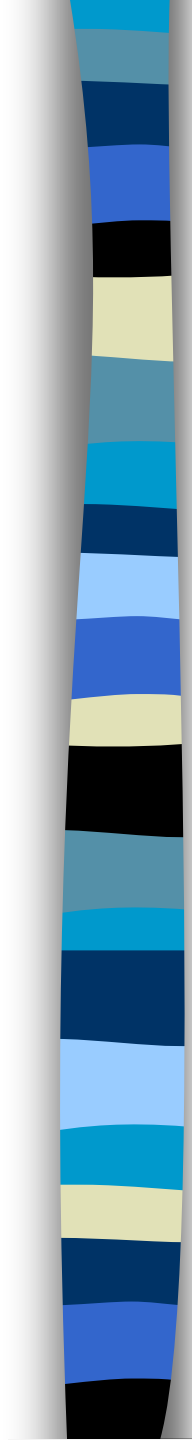
Developmental Assessment

Developmental reviews are carried out at child health clinics and at home.

Checks are carried out by:

- Health visitor
- General practitioner
- Nurses visiting schools





Developmental Reviews

Child's holistic development is reviewed.

- Gross motor skills: *sitting, standing, walking, running*
- Fine motor skills: *handling toys, stacking bricks, buttons and laces*
- Speech and language, including hearing
- Vision
- Social behaviour

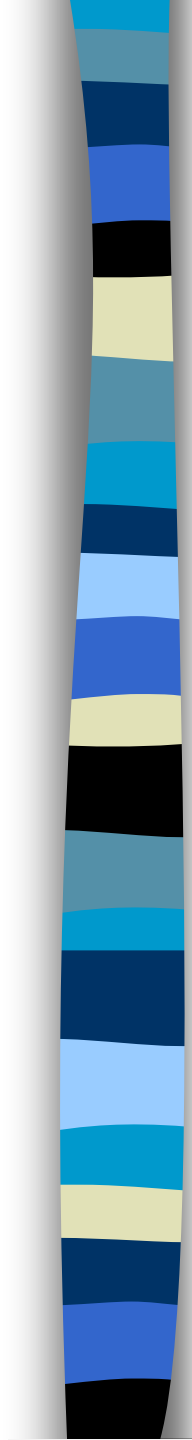
Developmental Reviews

Age for reviews:

- Assessment of newborn by paediatrician
- 6 - 8 weeks
- 6 - 9 months
- 18 - 24 months
- 4 - 5 years



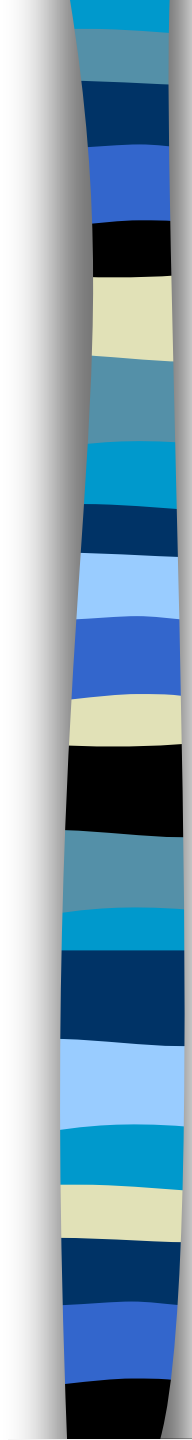
(Meggitt, C, 2005, Child Development an Illustrated Guide, Birth to 16 years, 2nd Edition. Oxford, Heinemann)



Individual and cultural differences

- Individual variations on growth trends are significant.
- There are social implications for the rate at which an individual child matures physically.
- Diet, climate, food and health are obvious factors to explain these differences, apart from small genetic differences and adaptations.
- Variations are reported between urban and rural communities in many countries (UNICEF, 2001).

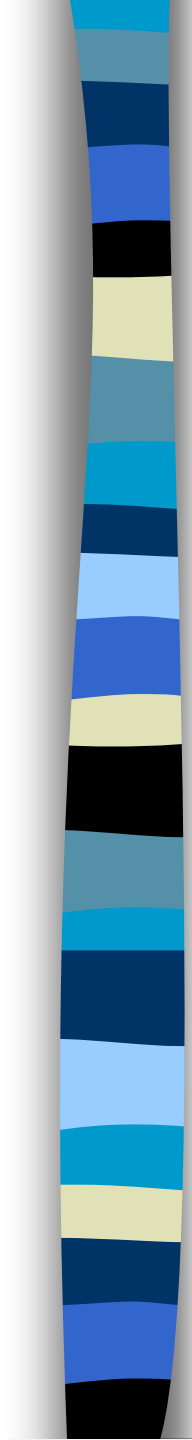
(Doherty & Hughes, 2009)



Factors influencing physical development

- **Heredity**

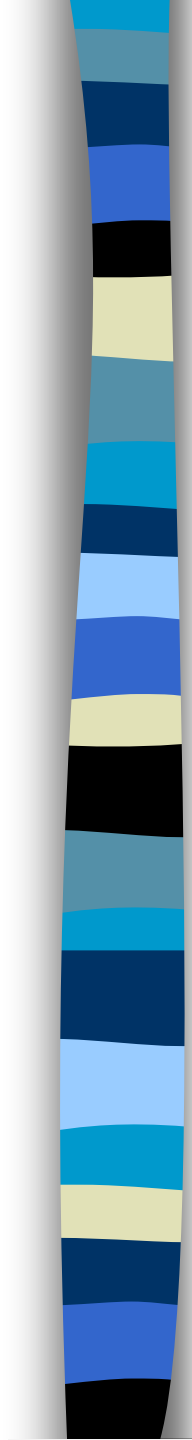
- Heredity sets limits but the environment plays an important role in how these limits are reached.
- The more dominant influence for weight is the environment.
- Genetics tend to be the dominant determinant for body height.
- Menstruation is primarily genetically controlled, but socio-economic factors such as nutrition, social class and family size all affect onset.



Factors influencing physical development

■ Lifestyle factors

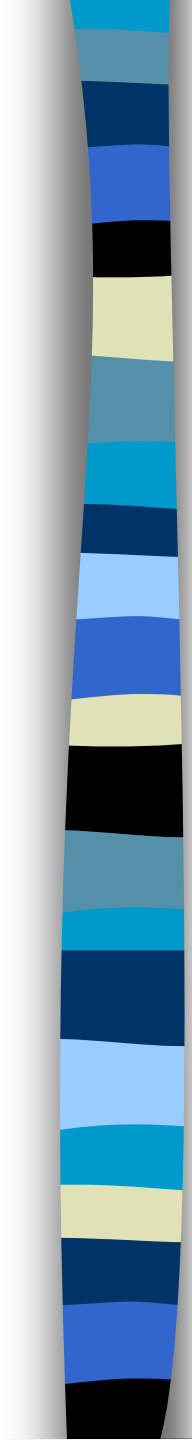
- Exercise, proper nutrition and health care.
- Socioeconomic conditions (poor housing and bad sanitation).
- Psychological stress.
- Individual resilience.



Factors influencing physical development

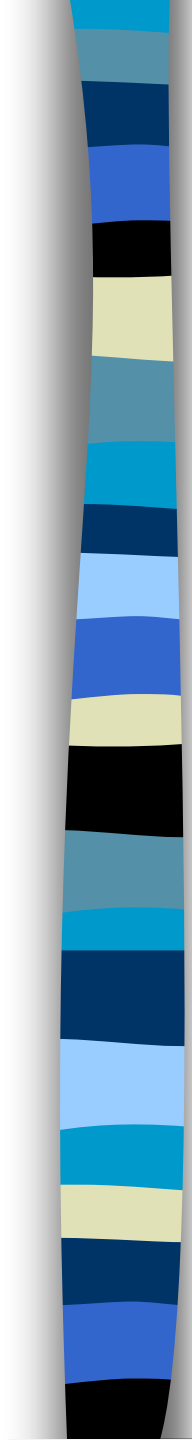
■ Nutrition

- Important in very early development when brain and body growth gains are at their most rapid.
- Proportionally, children breathe more air, drink more water and consume more food than adults.
- Children today are taller and heavier than in previous generations as a result of better nutrition.
- Steer towards breast-feeding for infants.
- Family eating patterns established early are important through lifetime.



Nutrition

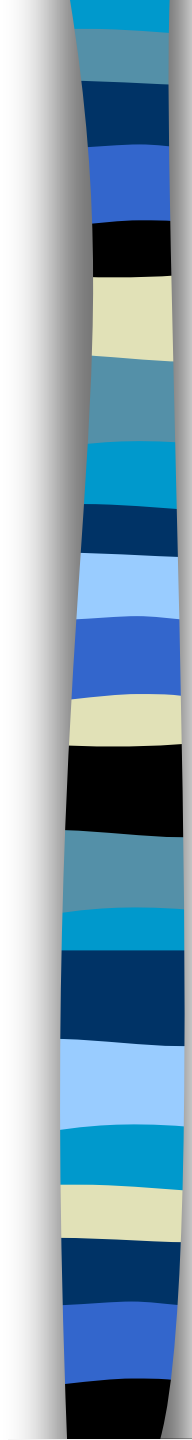
- Growing research supports nutrition programs for infants which will supply needed nutrients for proper physical, cognitive and emotional development.
- Breast/Bottle Feeding - While most experts believe that breast-feeding is nutritionally better for the infant, it presents problems for a working mother.
- Malnutrition - Infants who are malnourished in their first year may suffer from marasmus - wasting away of body tissues caused by severe protein-calorie deficiency which leads to severe underdevelopment of child's cognitive, physical & emotional growth.



Childhood Obesity

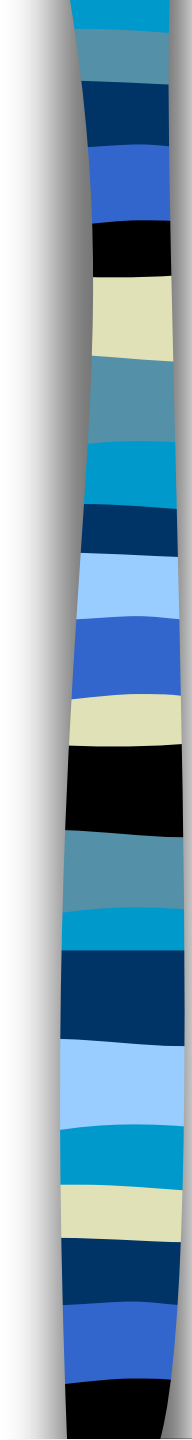
‘Welcome To Fat Land. Where the fries are extra large, the sodas are jumbo size and the jeans are “baggy fit” ’

(Critser, 2003)



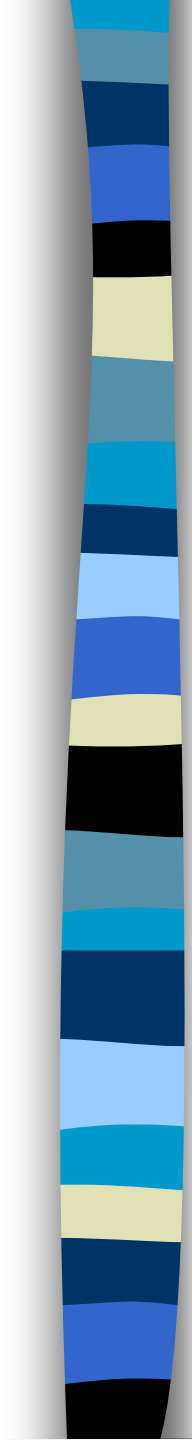
Childhood Obesity

- Global problem, epidemic scale.
- 155 million school-age children worldwide are overweight or obese (International Obesity Task Force (2004).
- 22 million children under five years are affected – altogether 1 in 10 children.
- Associated *physical* consequences include coronary heart disease, type 2 diabetes, raised blood pressure and joint pains.
- Associated *psychological* consequences include low self-esteem, concerns about body image, and depression, leading to bullying and social exclusion (Doherty & Whiting, 2004).



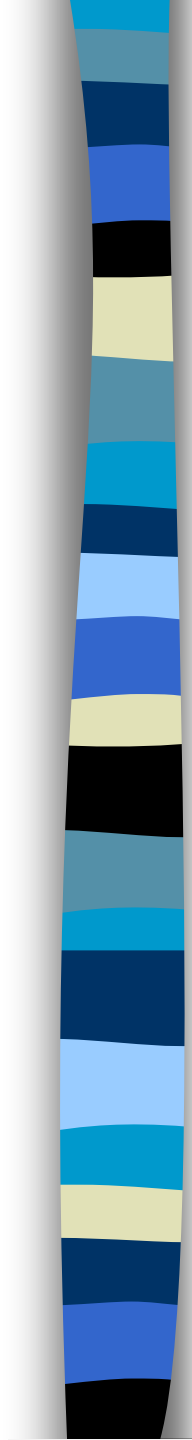
Motor Milestones

- Early and fundamental motor skills that appear in a relatively consistent sequence but with individual timing variations:
 - Gross motor skills, e.g. running and jumping.
 - Fine motor skills, e.g. reaching and grasping.
- **Handedness**, or a preference for one hand over the other, can be seen by age three.
- In the childhood years there is steady improvement in children's performance of motor skills due to improvements in brain and body capacity.
- Many of these are directly associated with their success in school – academically, physically and socially.



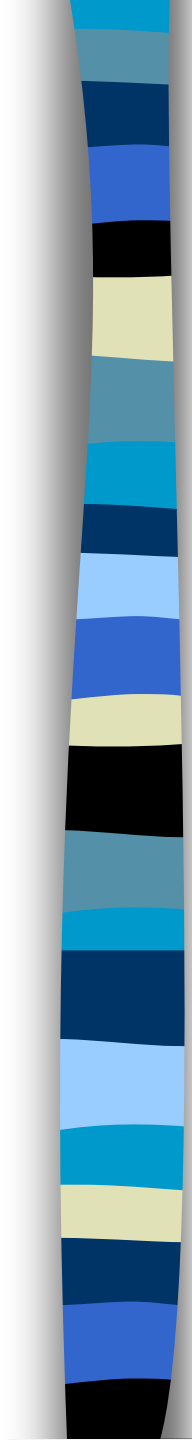
Factors influencing motor development

- Motor development follows an almost universal sequence.
- Where there are cultural variations, this may be explained in part, but not entirely, by genetic factors.
- A more acceptable explanation is that differences are also due to factors and customs within particular environments; for example, in practices that encourage early or late development of motor skills.
- Example of child-rearing (some West Indian cultures).
- Example of formal handling (some African and Jamaican communities).



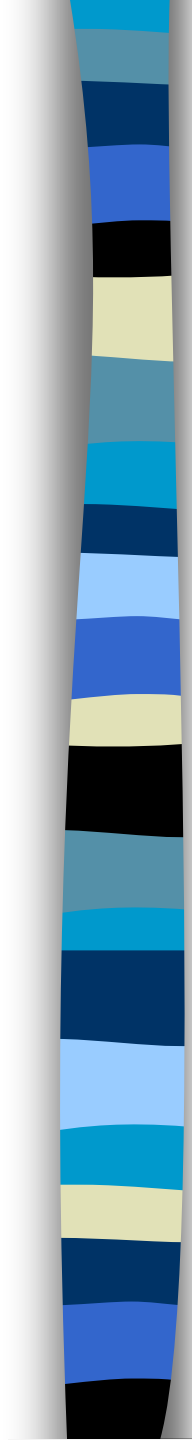
Factors influencing motor development

- Cultural practices can slow down motor development. See classic study by Wayne Dennis (1960) of the motor development of Iranian orphans in very deprived circumstances.
- Differences between the sexes in the performance of motor skills before the age of eleven are minimal.



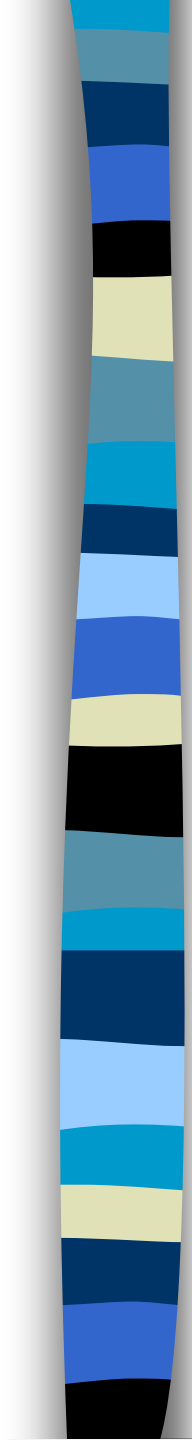
Other influencing factors

- Environmental factors (e.g. family and gender expectations) have a role to play in influencing gender differences in motor development.
- In the middle and later childhood years, the influence of one's peers as a socialisation agent in sport and activity increases, but lack of motor development can lead to social exclusion.
- There is strong evidence of increases in self-esteem, confidence and general well-being from regular participation in physical activity.
- Opportunities for outside play are important.



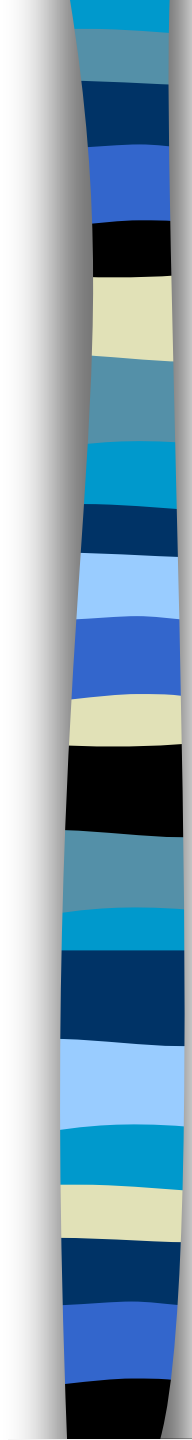
Other influencing factors

- Despite the importance of very early home and family influences, school remains the main institution in society for the development of skills and physical activity.
- Schools should offer many opportunities to develop children's motor skills within their curricula, at playtimes, and in after-school activities.



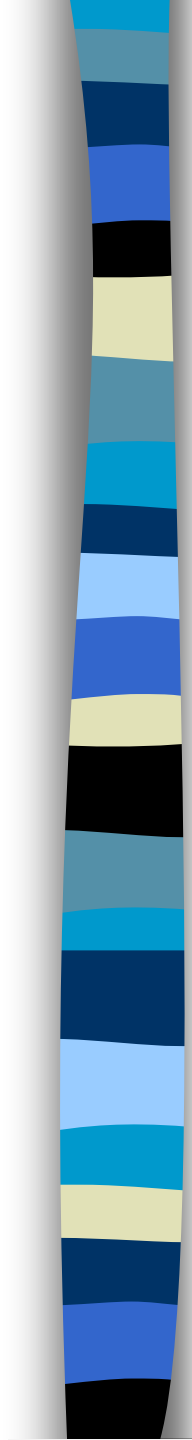
Toilet Training

- Children are usually trained by age 3, there is much discussion and debate as to the methods employed.
- The issue can be exacerbated by working parents who must leave their children in day-care centres which often require toilet-training as a prerequisite for admission.



Immunization & Prevention

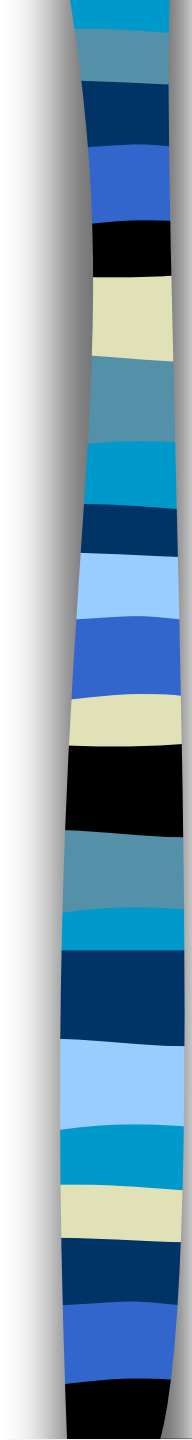
- Programmes for immunization have been credited with decline of infectious diseases.
- Beginning in infancy through 16 years of age, children should be immunized against diphtheria, polio, measles, mumps, and rubella.
- Accident Prevention - Between the ages of 6 to 12 years, accidents continue to rank as highest cause for injury and death.
- Increasing injuries are being reported on playgrounds.



Reflection

- Consider and discuss how a young child's behaviour may be affected by illness or a medical condition.
- How might certain types of physical incapacity hamper a child's physical development?

(White, 2014:345)



References

- Doherty, J. & Hughes, M., (2009) *Child Development: Theory and Practice 0 -11* Harlow: Pearson Education Ltd.
- White, R. (2014) Physical Development and the Role of the Physical Environment in Mukherji, P. And Dryden, L. (Eds) *Foundations of Early Childhood: Principles and Practice*, London: Sage