

the rest of the body. Its weight is usually doubled by 1 year old in comparison with body weight, which triples during the same period. The size of the heart is still large in relation to the chest cavity; its width is approximately 55% of the chest width.

It is important to note that genetic, metabolic, environmental, and nutritional factors strongly influence infant growth; thus, the previous statements are general guidelines only. Use the appropriate infant growth charts reflecting weight for length and head circumference in each case to determine appropriate growth parameters. The World Health Organization growth charts released in 2006 are now recommended as reference growth charts in children 0 to 59 months old ([Turck, Michaelsen, Shamir, et al, 2013](#)).

Maturation of Systems

Other organ systems also change and grow during infancy. The respiratory rate slows somewhat and is relatively stable.

Respiratory movements continue to be abdominal. Several factors predispose infants to more severe and acute respiratory problems than older children. The close proximity of the trachea to the bronchi and its branching structures rapidly transmits infectious agents from one anatomic location to another. The short, straight eustachian tube closely communicates with the ear, allowing infection to ascend from the pharynx to the middle ear. In addition, the inability of the immune system to produce immunoglobulin A (IgA) in the mucosal lining provides less protection against infection in infancy than during later childhood.

The heart rate slows, and the rhythm is often **sinus arrhythmia** (rate increases with inspiration and decreases with expiration). Blood pressure also changes during infancy. Systolic pressure rises during the first 2 months as a result of the increasing ability of the left ventricle to pump blood into the systemic circulation. Diastolic pressure decreases during the first 3 months and then gradually rises to values close to those at birth. Fluctuations in blood pressure occur during varying states of activity and emotion.

Significant **hematopoietic changes** occur during the first year of life. Fetal hemoglobin (HgbF) is present for the first 5 months, with adult hemoglobin steadily increasing through the first half of infancy. Fetal hemoglobin results in a shortened survival of red blood cells (RBCs) and thus a decreased number of RBCs. A