Section I

Essential Concepts

1. Basics of Early Childhood Development
2. Domains of Development
3. The Sequential Evolution of Salient Neuromotor Capabilities

Chapter

1

Basics of Early Childhood Development

Development refers to the maturation of neurological functions leading to the acquisition of selected skills. It is a continuous process, with the sequential achievement of specific functions known as 'developmental milestones'. The process of development starts early *in utero* and continues after birth. While the milestones may appear distinct and isolated, they result from complex processes involving the formation of new synapses and pruning of others. The following rules govern this predictable process:

- The attainment of milestones follows a head-to-toe, i.e. cephalocaudal pattern. It also tracks from the axial to an appendicular axis. For example, head and neck control (midline) precedes control over arms and legs (distal). The sequence of milestone attainment also reflects the sequential process of brain maturation. Visual pathways are among the first to mature. Thus, visual fixation matures early in infancy.
- Development is a continuous and progressive process. A specific activity replaces mass muscle activity. For example, the palmar grasp is ultimately replaced by a mature pincer grasp.
- Although the rate of development may vary, milestones are universally attained in an orderly sequence irrespective of social and cultural upbringing. This recognizable pattern of progression underscores the biological foundations of human development, e.g. babies of all cultures will learn to coo and babble before using words.
- Abilities in one sphere are related to the other in a complex manner. For example, a seemingly simple skill, such as holding a bottle of milk, requires the coordinated maturation of motor, visual, and complex cortical pathways, and loss of early primitive reflexes.