

immobility it often imposes on a child. Children's natural tendency to be active influences all aspects of their growth and development. Impaired mobility presents a challenge to children, their families, and their caregivers.

Physiologic Effects of Immobilization

Many clinical studies, including space program research, have documented predictable consequences that occur after immobilization and the absence of gravitational force. Functional and metabolic responses to restricted movement can be noted in most of the body systems. Each has a direct influence on the child's growth and development because of homeostatic mechanisms that thrive on normal use and feedback to maintain dynamic equilibrium. Inactivity leads to a decrease in the functional capabilities of the whole body as dramatically as the lack of physical exercise leads to muscle weakness.

Disuse from illness, injury, or a sedentary lifestyle can limit function and potentially delay age-appropriate milestones. Most of the pathologic changes that occur during immobilization arise from decreased muscle strength and mass, decreased metabolism, and bone demineralization, which are closely interrelated, with one change leading to or affecting the others.

The major effects of immobilization are outlined briefly in [Table 29-1](#) and are related directly or indirectly to decreased muscle activity, which produces numerous primary changes in the musculoskeletal system with secondary alterations in the cardiovascular, respiratory, skeletal, metabolic, and renal systems. The musculoskeletal changes that occur during disuse are a result of alterations in the effect of gravity and stress on the muscles, joints, and bones. Muscle disuse leads to tissue breakdown and loss of muscle mass (**atrophy**). Muscle atrophy causes decreased strength and endurance, which may take weeks or months to restore.

TABLE 29-1
Summary of Physical Effects of Immobilization with Nursing Interventions*

Primary Effects	Secondary Effects	Nursing Considerations
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