Complications of Immobility by Body System

PULMONARY	CARDIOVASCULAR	GI/GU	MUSCULOSKELETAL	ENDOCRINE	CNS
• Decreased vital capacity and residual volume and resp rate • Ventilation / perfusion mismatch • Increased secretions and risk of aspiration • Pneumonia, PE, ARDS • Increased risk for atelectasis, • Decreased oxygenation • Decreased diaphragmatic strength and excursion • Decreased chest wall compliance • Increased shunting with atelectasis	• Diuresis and natriuresis • 10-20% decrease in plasma volume • Decreased Stroke Volume, Cardiac output, Oxygen intake • Orthostasis, Hypotension, DVT • Tachycardia, Heart Muscle atrophy • Baroreceptor dysfunction • Decreased oxygen delivery to the tissues and organs	• Fluid retention • Decreased peristalsis, constipation, Ileus • Urinary Stasis • UTI, Calculi formation • Calcium in Urine • Gastric Aspiration • Increased endotoxemia • Increased risk of UTI	• Skeletal muscle atrophy and neuromuscular dysfunction • Weakened cardiac muscle and inspiratory muscle weakness • Weakened muscles increase O2 and cellular demand (inefficient function) • Loss of bone mass density (increased risk of fractures with falls) • Increased calcium loss and decreased muscle contractility • Contractures and joint pain • Pressure ulcers and skin breakdown • Decreased functional ability	• Increased calcium, nitrogen, phosphorous excretion • Renal Calculi • Osteoporosis, fractures • Increased insulin resistance • Decreased protein synthesis • Decreased fatty acid metabolism	• Emotional and behavioral changes • Anxiety, Labile emotions and depression • Delirium • Decreased attention span • Decreased intellectual performance • Altered sleep pattern • Perceptual and coordination deficits • Dysfunction of homeostatic regulatory mechanisms

Negative Consequences of Immobility by Day

Day 1	Day 2	Day 3	Day 5	Day 7	Day 9
• Contractures beginning • Skeletal muscle atrophy begins • Pressure areas develop • Plasma volume begins to decrease • Orthostatic hypotension begins to develop • Hypoxemia • Increased Insulin resistance • Altered triglyceride levels	• Sarcopenia (loss of muscle strength) 1-3% per day • Dorsal Atelectasis begins • Increased thoracic fluid volume • Increased loss of calcium in urine, and increased risk of Renal calculi • Decreased peristalsis / increased impaction • 40% chance of becoming incontinent if >65years	• 8-10% loss of plasma volume • Increased Cardiac workload • Increased HR (rest) • Decreased Stroke Volume • Decreased Cardiac Output • Depressed central nervous system responses • Lower pain threshold • Anxiety and fear	• Increased risk of gastric aspiration and endotoxemia. • Microvascular dysfunction	• >1% bone mineralization lost per week • Visible weakness in 25-30% MV patients • 10% Decrease in Muscle strength • Increased CA+ in Urine	• Bone degradation continues as long as bed rest occurs • Risk of Ventilator acquired pneumonia increases every day • Risk of long-term disabling weakness continues every day • Risk for falls and delirium increases every day

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