
POSITION STATEMENT

Mobility

INTRODUCTION

Mobility is essential to life. Our bodies are designed to move and that movement positively affects one's overall health. According to the U.S. Department of Health and Human Services (2017), 28% of Americans aged 6 and older are physically inactive. In a nationally representative survey of the United States population between 2001 and 2016 results showed that the prevalence of sitting and watching television or videos for at least 2 hours a day stayed high but steady. The frequency of computer use during free time increased among all age groups as well as the total sitting time for adolescents and adults (Yang, Cao, & Kantor, 2019). With the increase in inactivity, nurses play an important role in educating the population on the benefits of movement and the health risks associated with a sedentary lifestyle.

POSITION

The National Association of Orthopaedic Nurses (NAON) emphasizes the importance of mobility because:

- Mobility is crucial at all stages of life for maintaining independence
- Movement and physical activity can positively affect all body systems
- Sedentary lifestyles can cause physical and psychological medical problems

According to the Center for Disease Control and Prevention (2019), the benefits of regular physical activity include improved sleep, increased ability to perform everyday activities, improved cognitive ability and reduced risk of dementia, and improved bone and musculoskeletal health. Mobility limitations can put older adults at risk for falls, reduced access to medical services, poor physiological and psychological health, declining functional abilities and negative health outcomes (Musich, Wang, Ruiz, Hawkins, & Wicker, 2018). Sedentary lifestyles can also affect children and adolescents, increasing the risk of becoming overweight or obese, developing

hyperlipidemia, hypertension, insulin resistance, type II diabetes, and low bone density (Center for Disease Control and Prevention, 2018).

The effects of mobility on the body can be seen in all systems including:

Cardiovascular

Immobility causes many direct and indirect adverse impacts on the cardiovascular system in patients of all ages and in variable settings. Fluid and electrolyte imbalance occurs as fluid is shifted into the core and away from the natural cycle through the lower half of the body. This causes higher intracardiac pressure and hormone release which contributes to loss of blood volume and pressure as well as increased blood viscosity (Knight et al, 2018a). This loss of pressure can have multiple systemic effects that include postural hypotension and cardiac deconditioning. The vascular system suffers from venous stasis, hypercoagulability, and blood vessel damage, which cause emboli that lead to vascular damage or death (Knight et al., 2018a).

Pulmonary

The longer a patient remains immobile the more hypoxic a patient can become. Supine positions can decrease the function on the rib cage, which in turn, will affect tidal exchange. Certain populations, like the elderly, are more at risk due to the physiologic changes in the respiratory system already present (Sanguineti, Wild, & Fain, 2014). The aforementioned shift of fluid results in decreased residual volume that leads to collapse. Mucus secretions are unable to be processed correctly by the upper airway. This in combination with thicker secretions from dehydration and a reduction in diameter of the airways will produce difficulty for patients in clearing secretions which leads to labored breathing, infection, and collapse (Knight et al., 2018b).

Integumentary

Mobility allows an individual to meet their basic needs of adequate skin care, hydration, and nutrition, allowing the skin, the body's number one defense against infection, to function properly. Mobility allows the body to regulate its temperature and eliminate wastes properly through the skin. Mobility permits proper elimination of urine and feces from the body; reducing skin contact with such fluids decreases the risk of skin breakdown. Being mobile allows for repositioning off pressure points, and reduces shearing and friction on the skin, lowering one's risks for pressure ulcers (Registered Nursing, 2020). According to Wu, Li, Jiao, Wang, Liu et al (2018), pressure ulcers, a major complication of immobility, can be associated with negative emotions of frustration, anxiety, and depression, and can negatively affect perception of quality of life.

Gastrointestinal

Mobility stimulates appetite and fluid consumption, and helps burn calories. Mobility allows a person to sit upright to chew, swallow, and digest their meals, reducing the risk for gastroesophageal reflux disease (GERD), regurgitation, and heartburn. Mobility encourages peristalsis and the passage of stool through the gut at a normal rate. Once stool reaches the rectum, the effects of gravity cause the stool to place pressure on the anal sphincter, and defecation occurs. Mobility allows for proper elimination of stool from the body, reducing the risk of constipation and impaction. Immobility can cause changes in appetite reducing caloric intake and increasing the risk for vitamin and mineral deficiencies; these can lead to delayed tissue healing, slower recovery from infections, and an increase in mortality in hospitalized patients (Knight et al, 2018c).

Genitourinary

Mobility allows the body to adjust positions. In the upright position, gravity promotes urine distribution, allowing urine to drain from the kidneys through the ureters into the bladder. Mobility prevents urine from pooling in the kidneys and allows bacteria to be flushed from the bladder, decreasing risks for bladder infections, kidney infections, and post-operative urinary retention (POUR). Prolonged immobility is associated with increased urea in the blood and urine from the catabolic destruction of muscle and lean tissue. It also causes electrolyte imbalances due to reduced levels of antidiuretic hormone and reduced food and water intake. Prolonged immobility is also associated with

increased calcium in the blood and urine from bone demineralization. Increased urea, calcium, and electrolyte imbalances are associated with an increased risk of renal calculi formation (Knight et al, 2019).

Endocrine

Mobility affects the endocrine system by instructing certain glands to release hormones that assist in regulating key components that help to keep us strong and healthy. The pituitary gland releases the human growth hormone, which acts on almost all tissues in the body to control metabolism and growth (Society for Endocrinology, 2018a). The thyroid gland releases hormones that regulate the body's temperature, heart rate, and blood pressure. The adrenal glands are also stimulated by mobility and exercise by releasing hormones which regulate blood pressure and glucose. It also acts as an anti-inflammatory agent (Society for Endocrinology, 2018b).

Psychological

Mobility can help improve one's mental health, mood, and self-esteem. Physical activity can trigger certain neurotransmitters that are responsible for happiness. These neurotransmitters have shown to increase one's mood by causing a positive feeling and by diminishing the perception of pain. According to Zhu, Haegele, & Healy (2019) a study of children ages 6-17 years old showed that some physical activity is better than none in reducing the likelihood of developing anxiety and depression. Mobility can also allow a person to have independence. A sense of independence is important for positive feelings and helps to maintain good mental health.

Musculoskeletal

Mobility is important for one's musculoskeletal system because movement and weight bearing help to build bone and muscle mass in children and adults. As one gets older, movement and weight bearing helps to slow bone loss decreasing the risk of osteoporosis and fragility fractures, maintaining muscle mass, increasing the circulation of synovial fluid in joints, and helping to improve coordination and balance (AAOS, 2012). Lack of movement has detrimental effects on the human body including muscle atrophy, joint stress, changes in gait patterns, and loss of upright standing and or motion. Assistive devices can be utilized to enhance one's capabilities and mobility if appropriate (Grimmer, Riener, Walksh, & Seyfarth, 2019). Mobility is also important for persons who are bedridden to decrease the likelihood of developing or

the extent of detrimental effects that can occur. One study reviewed was performed over a 60-day period in which bedrest patients did 3 minutes of light jumping exercises. This study showed that those performing the exercises maintained leg muscle strength while the patients who did not perform exercises lost around 40% of the leg muscle strength (Grimmer, Riener, Walksh, & Seyfarth, 2019).

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REFERENCES

- American Academy of Orthopaedic Surgeons. (2012). Exercise and bone health. Retrieved from <https://orthoinfo.aaos.org/en/staying-healthy/exercise-and-bone-health/>
- Center for Disease Control and Prevention. (2018). Physical activity facts. Retrieved from <https://www.cdc.gov/healthyschools/physicalactivity/facts.htm>
- Center for Disease Control and Prevention. (2019). Lack of physical activity. Retrieved from <https://www.cdc.gov/chronicdisease/resources/publications/factsheets/physical-activity.htm>
- Department of Health and Human Services. (2017). Facts and statistics. Retrieved from <https://www.hhs.gov/fitness/resource-center/facts-and-statistics/index.html>
- Grimmer, M., Riener, R., Walksh, C., & Seyfarth, A. (2019). Mobility related physical and functional losses due to aging and disease - a motivation for lower limb exoskeletons. Retrieved from <https://jneuroengrehab.biomedcentral.com/articles/10.1186/s12984-018-0458-8>
- Knight, J. et al. (2018a) Effects of bedrest 1: introduction and the cardiovascular system. *Nursing Times* [online]; 114: 12, 54-57. Retrieved from <https://www.nursingtimes.net/clinical-archive/cardiovascular-clinical-archive/effects-of-bedrest-1-introduction-and-the-cardiovascular-system-26-11-2018/>
- Knight J et al (2018b) Effects of bedrest 2: respiratory and haematological systems. *Nursing Times* [online]; 115: 1, 44-47. Retrieved from <https://www.nursingtimes.net/clinical-archive/respiratory-clinical-archive/effects-of-bedrest-2-respiratory-and-haematological-systems-02-01-2019/>
- Knight, J., et al (2018c). Effects of bedrest 3: gastrointestinal, endocrine and nervous systems. *Nursing Times* [online]; 115: 2, 50-53. Retrieved from <https://www.nursingtimes.net/clinical-archive/gastroenterology/effects-of-bedrest-3-gastrointestinal-endocrine-and-nervous-systems-21-01-2019/>
- Knight, J., et al (2019). Effects of bedrest 4: renal, reproductive and immune systems. *Nursing Times* [online]; 115: 3, 51-54. Retrieved from <https://www.nursingtimes.net/clinical-archive/immunology/effects-of-bedrest-4-renal-reproductive-and-immune-systems-18-02-2019/>
- Musich, S., Wang, S., Ruiz, J., Hawkins, K., & Wicker, E. (2018). The impact of mobility limitations on health outcomes among older adults. *Geriatric Nursing*, 39, 162-169.
- Registered Nursing (2020) Complications of immobility. Retrieved from <https://www.registerednursing.org/nclex/mobility-immobility/#identifying-complications-immobility>
- Sanguineti, V. A., Wild, J. R., & Fain, M. J. (2014). Management of postoperative complications: general approach. *Clinics in Geriatric Medicine*, 30(2), 261-270. <http://dx.doi.org/http://dx.doi.org/10.1016/j.cger.2014.01.005>
- Society for Endocrinology. (2018a). Growth hormone-releasing hormone. Retrieved from <https://www.yourhormones.info/hormones/growth-hormone-releasing-hormone/>
- Society for Endocrinology. (2018b). Adrenal glands. Retrieved from <https://www.yourhormones.info/glands/adrenal-glands/>
- Wu, X., Li, Z., Cao, J., Jiao, J., Wang, Y., Liu, G., et al. (2018). The association between major complications of immobility during hospitalization and quality of life among bedridden patients: A 3 month prospective multi-center study. *PLoS ONE* 13(10): e0205729. Retrieved from <https://doi.org/10.1371/journal.pone.0205729>
- Yang, L., Cao, C., & Kantor, E. (2019). Trends in sedentary behavior among the US population, 2001-2016. *Journal of the American Medical Association*, 321(16), 1587-1597. DOI:10.1001/jama.2019.3636
- Zhu, X., Haegele, J., & Healy, S. (2019). Movement and mental health: Behavioral correlates of anxiety and depression among children of 6-17 years old in the U.S. *Mental Health and Physical Activity*, 16, 60-65. DOI: 10.1016/J.MHPA.2019.04.002.