

MOBILITY AND MUSCLE RETENTION

CHOOSING YOUR ICU WISELY

Mobility is a key factor which advances healing during any hospitalization. In fact, the lack of mobility creates many problems that have for far too long been ignored by medical facilities. It is important to choose your ICU wisely and to ask if they have implemented, or are moving to implement, early mobility protocols as a standard practice. Have the conversation, your health and the health of your loved ones depend upon it.

KEY FACTS:

- Trauma patients who are immobilized in bed for more than 72 hours are very likely to develop musculoskeletal complications. (Saunders 2015)
- Healthy people who stay in bed for more than 24 hours lose 1%-1.5% of their quadriceps muscle strength every day. (Drummond 2013)
- Inflammation exaggerates the effects of immobility and causes even greater muscle loss in patients whose immune systems are under stress. (Saunders 2015)
- In older patients, immobility may also increase inflammation caused by traumatic injury. (Drummond 2013)
- Muscles that help hold the body upright (skeletal muscles) are the first to be damaged by bed rest; this is worrying because skeletal muscle strength helps prevent falls. (Drummond 2013, Mirzoev 2018)
- Muscle atrophy can also impact metabolism, decreasing the body's ability to process proteins which are necessary to maintain healthy muscle and make new muscle tissue. (Drummond 2012)
- Before surgery, a strategic exercise regime can help mitigate the effects of immobility after surgery. (Topp 2002)
- Human bones constantly regenerate, but without regular stress (movement and exercise) bones tend to degrade, especially in older patients. (Ferrando 2006)
- Children can also suffer from intensive care unit acquired weakness (ICU-AW) and Post-Intensive Care Syndrome (PICS), but early mobility programs have been successfully implemented without serious adverse effects, even for children who need mechanical assistance to breathe. (Betters 2017)
- Early mobilization decreases the incidence of intensive care acquired unit weakness. (Ding 2019)
- Extensive clinical reviews suggest that early mobilization is safe, even for patients who are critically ill or who require mechanical assistance with breathing. (Fuest 2019, Ding 2019, Zang 2019)

BIBLIOGRAPHY

Saunders C. Preventing secondary complications in trauma patients with implementation of a multidisciplinary mobilization team. *J of Trauma Nursing*. 2015 May-June;22(3),170-175.

Drummond MJ, Timmermann KL, Markofski MM, et al. Short- term bed rest increases TLR4 and IL-6 expression of skeletal muscle of older adults. *Am J Physiol Regul Integr Comp Physiol*. 2013 Aug 1;305(3):R216-23.

Mirzoev TM, Shenkman BS. Regulation of protein synthesis in inactivated skeletal muscle: signal inputs, protein kinase cascades, and ribosome biogenesis. *Biochemistry (Mosc)*. 2018 Nov;83(11):1299-1317.

Drummond MJ, Dickinson JM, Fry CS, et al. Bed rest impairs skeletal muscle amino acid transporter expression, mTORC1 signaling, and protein synthesis in response to essential amino acids in older adults. *Am J Physiol Endocrinol Metab*. 2012 May 15;302(9):E1113-22.

Topp R, Ditmyer M, King K, Doherty K, Hornyak J IIIrd. The effect of bed rest and potential of prehabilitation on patients in the intensive care unit. *AACN Clin*. 2002;13:263-276.

Ferrando AA, Paddon-Jones D, Wolfe RR, et al. Bed rest and myopathies. *Curr Opin Clin Nutr Metab Care*. 2006 Jul;9(4):410-5.

Bettors KA, Hebbert KB, Farthing D, et al. Development and implementation of an early mobility program for mechanically ventilated pediatric patients. *J Crit Care*. 2017;41:303-308.

Zang K, Chen B, Wang M, et al. The effect of early mobilization in critically ill patients: A meta-analysis. *Nurs Crit Care* 2019 (advance epub)

Fuest K, Schaller SJ. Early mobilization on the intensive care unit: What we know. *Med Klin Intensivmed Notfmed* 2019. (advance epub)

Ding N, Zhang Z, Zhang C, et al. What is the optimum time for initiation of early mobilization in mechanically ventilated patients? A network meta-analysis. *PLoS One* 2019;14(10):e0223151.