

Burgess/Yarboro Grip strength study:

Background:

Decreased hand grip strength has been established as a marker of frailty in peri-operative patients<sup>1,2</sup>. Prior studies have found decreased pre-operative grip strength to correlate with an increased risk of complications following surgery for hip fractures and a longer hospital stay in primary arthroplasty patients<sup>3,4</sup>.

Clinical question:

Does pre-operative grip strength correlate to length of stay or likelihood of nursing facility discharge in patients undergoing surgical fixation of proximal femur fractures?

Study type:

Prospective, observational

Methods and materials:

After obtaining informed consent, a hand dynamometer will be used to measure the dominant hand grip strength of patients seen in consultation for proximal femur fractures. Chart review will be used to collect additional data including pre-operative laboratory values, patient height/weight, and medical comorbidities.

Inclusion criteria:

- age >55
- fracture of proximal femur (femoral neck or intertrochanteric fractures)

Exclusion criteria:

- pathologic fracture
- significant functional impairment limiting use of hand (stroke, prior hand injury with residual impairment)
- residence in nursing facility at time of injury (excluded from discharge to nursing home analysis)

Data analysis:

Statistical analysis will be performed to determine if there is a significant difference in grip strength that correlates to:

- ambulation on POD 1
- length of stay
- discharge to nursing facility

Subgroup analysis will also be performed as appropriate for age groups, gender, etc.

Additional analysis will integrate control group (normative reference data) to determine if there is a threshold predictive for the outcome measures.

1. Denk K, Lennon S, Gordon S, Jaarsma RL. The association between decreased hand grip strength and hip fracture in older people: A systematic review. *Exp Gerontol.* 2018;111:1-9. doi:10.1016/j.exger.2018.06.022
2. Sultan P, Hamilton MA, Ackland GL. Preoperative muscle weakness as defined by handgrip strength and postoperative outcomes: a systematic review. *BMC Anesthesiol.* 2012;12:1. doi:10.1186/1471-2253-12-1
3. Shyam Kumar AJ, Beresford-Cleary N, Kumar P, et al. Preoperative grip strength measurement and duration of hospital stay in patients undergoing total hip and knee arthroplasty. *Eur J Orthop Surg Traumatol.* 2013;23(5):553-556. doi:10.1007/s00590-012-1029-5
4. Davies CW, Jones DM, Shearer JR. Hand grip--a simple test for morbidity after fracture of the neck of femur. *J R Soc Med.* 1984;77(10):833-836. doi:10.1177/014107688407701006