REGIONAL ANESTHESIA IMPROVES OUTCOMES IN THE ELDERLY
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DEFINITION OF REGIONAL
- Neuraxial
  - Epidural
  - Spinal
- Paraxial
  - Paravertebral
- Peripheral Nerve Block

GENERAL VS SPINAL
- 9 studies compared spinal anesthesia to general anesthesia in patients undergoing hip fracture surgery.
- Two high strength (Casati et al, Davis et al)
- 7 moderate strength (De Visme et al, Honkonen et al, Koval et al, McKenzie et al, Sutcliffe et al, and Valentin et al)
- Meta-analysis showed no difference in mortality. Casati et al demonstrated a decreased mortality rate in the spinal group compared to the general group, whereas De Visme et al did not demonstrate a difference in mortality between the two groups.
- McKenzie et al demonstrated decreased mortality at two weeks postoperatively in the spinal group; however, this difference did not persist at two months. Valentin et al, Sutcliffe et al, and Koval et al did not demonstrate a difference in mortality between the two groups.
- De Visme et al and Casati et al found no differences in postoperative confusion.
- Casati et al, McKenzie et al, and Valentin et al demonstrated decreased blood loss in the spinal anesthesia group.
- Koval et al, Valentin et al, Sutcliffe et al, McKenzie et al, and Casati et al did not demonstrate a difference in hospital length of stay.

*Risks and Harms of Implementing this Recommendation*
Both general anesthesia and spinal anesthesia carry risks and benefits, which should be assessed on an individual basis. Because both forms of anesthesia appear to have similar mortality profiles, providers can consider specific circumstances that would favor one form or the other for their particular patient.

Future Research
Future research involving appropriately randomized patients may yet delineate which anesthesia technique is more appropriate in this patient population.

INFLUENCES ON OUTCOMES
- Type, duration and invasiveness of the operation
- Co-existing medical and mental status of the patient
- The skill and expertise of the anesthesiologist and surgeon

ADVANTAGES OF PNB OVER NEURAXIAL
1. Avoid spinal hematoma (paraplegia)
2. Avoid PDPH and backache
3. Avoid hypotension or IV fluid load: elderly, CAD, LV outflow tract obstruction (AS)
4. Avoid narcotic related side effects: PONV, dizziness and urinary retention
5. Provide site specific anesthesia and analgesia one leg anesthesia
PROBLEMS WITH ELDERLY PATIENTS

- Pain
- Polypharmacy
- POCD
- High morbidity & mortality

PAIN

- Systematic review
  - 31 trials updated 2017
  - 1760 participants with hip fractures;
    - 992 randomized to PNB and 768 to no PNB
  - Results of eight trials with 253 participants show the PNB reduced pain on movement within 30 minutes of block placement
    - standardized mean difference (SMD) - 1.41, 95% confidence interval (CI) - 2.14 to -0.67
    - I² = 90%
    - high quality of evidence


PAIN

- Systematic review
  - 23 studies
  - 1571 participants
    - 19 studies: PNB adjunctive to systemic vs systemic
    - 3 studies: PNB w local
    - 1 study: PNB w epidural
  - Conclusion: use of PNB as adjunct to systemic analgesia reduced pain intensity when compared with systemic analgesia alone after major knee surgery.


AAO ON REGIONAL ANESTHESIA

- 6 high strength studies (Fletcher et al, 10 Foss et al, 11 Haddad et al, 12 Haddad et al, 13 Monzon et al, 13 Mouzopoulos et al, 14 and Yun et al 15) and one moderate strength study (Matot, 2003 16) showed beneficial outcomes.
  - 593 in 6 prospective randomized clinical trials
  - regional analgesia (fascia iliaca or femoral) in reducing preoperative pain after hip fracture (Fletcher et al, Foss et al, Haddad et al, Monzon et al, Mouzopoulos et al, and Yun et al).
  - In each study the patients who received this agent reported significant reduction in reported postoperative pain on a VAS.
  - In all of these trials pain recorded with VAS is a reported outcome (Fletcher et al, Foss et al, Haddad et al, Matot, et al, Monzon et al, Mouzopoulos et al, and Yun et al).
  - Reported outcomes in five of the trials were limited to the preoperative episode of care for the study patients (Fletcher et al, Foss et al, Haddad et al, Monzon et al, and Yun et al).
  - Two trials reported effects beyond this initial preoperative period.
    - One trial reported a reduction in the incidence of postoperative delirium in addition to a reduction in postoperative pain levels in the population who received regional analgesia. Incidence of delirium, with the regional analgesia group was 11/102 (11%) and 24/105 (22.5%) in the control group [relative risk 0.45, 95% CI 0.23-0.87] (Mouzopoulos et al).
    - The seventh study reported the use of epidural anesthesia administered preoperatively in hip fracture patients with known cardiac disease or who were at high risk for cardiac disease was associated with reduction of postoperative ischemic events. Adverse postoperative ischemic events occurred in 7 of 34 patients in the control group and 0 of 34 patients in the treatment group (p = 0.01) (Matot et al).

MORBIDITY & MORTALITY

- No substantial effect on periop morbidity & mortality.

- Multifactorial
  - Type, duration & invasiveness of operation
  - Coexisting medical problems
  - Mental status of patient
  - Skill & Expertise of anesthesiologist & surgeon

CONS

- Nerve injury
- Immobility
- Cost
- LAST
- Neuraxial complications
  - epidural hematoma
  - pdpha

- Complications from PNB
  - Ptx
  - Bleeding
  - Infection
LOCAL ANESTHETICS

- Aging affects the pharmacokinetics and pharmacodynamics of local anesthetics
- Changes that lead to increased sensitivity
  - systemic absorption
  - distribution
  - clearance
- Decreased dose requirement and a change in the onset and duration of action in the elderly.
- Decreases in neural population, neural conduction velocity and inter-Schwann cell distance can lead to an increased sensitivity.

ASA

Regional vs. General

Goals:
1. Understand the risk/benefit ratio of regional vs. general anesthesia in the elderly.
2. Understand the potential anatomical differences that may influence block placement in the elderly.
3. Understand the differences with regard to neuraxial drug distribution in the elderly.

Objectives:
1. Utilize an evidenced-based approach to anesthetic selection.
2. Describe anatomical changes in the older spine relevant to the administration of neuraxial anesthetic agents.
3. Describe the influence of advanced age on neuraxial drug distribution.