ERAS and Rehabilitation in Geriatric Hip Fractures

Diren Arsoy, MD, MSc

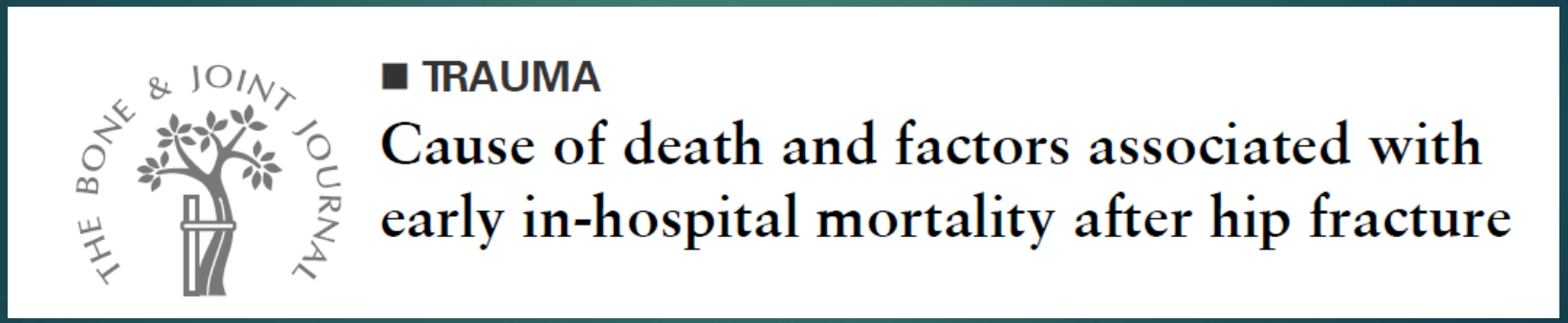
October 2017

Presentation Goals:

- ERAS in Orthopedic Trauma/Hip fx
- Implications in Hip Fracture Rehabilitation Management
- Optimizing Geriatric Fracture Outcomes

Hip fx Ortho data

- Scope of problem:
- **70,000 cases/year in the UK**
- **Stagnant Mortality rates**
  - **8%**



Chatterton et al.

Postop Plan

- Weight Bear as Tolerated

Postop[illegible]n

- Weig[illegible]erated

Can ERAS help Postop Rehab?

- "early recovery after surgical procedures by maintaining pre-operative organ function and reducing the profound stress response following surgery."

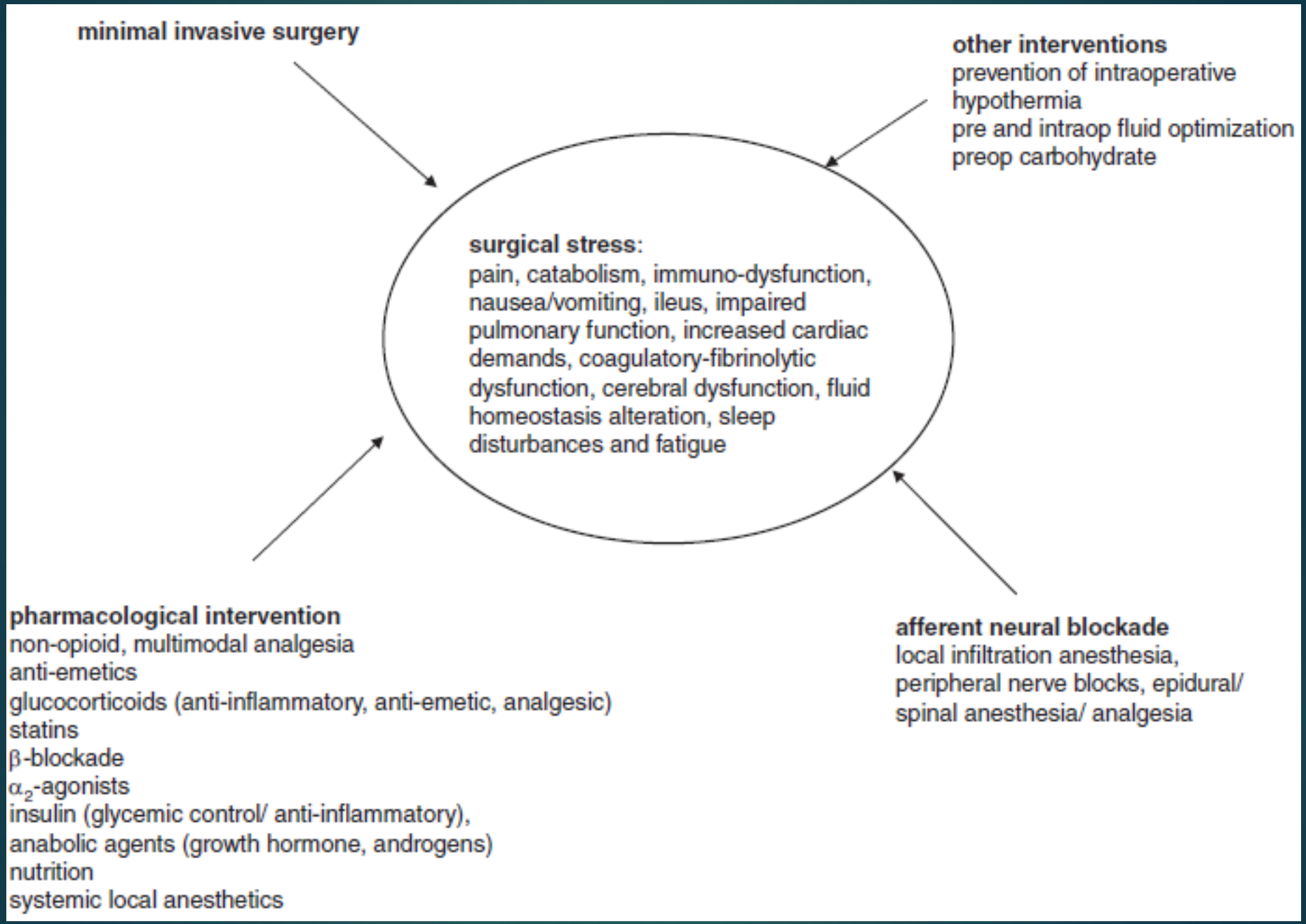
Soffin et al.

It works elsewhere in the body…

- Colorectal
- Urology
- GYN
- Transplant
- Thoracic

Evidence-Based Surgical Care and the Evolution of Fast-Track Surgery

- Henrik Kehlet, M.D., Ph.D.
  - American Society of Anesthesiologists 2014 Excellence in Research Award.


minimal invasive surgery
other interventions
prevention of intraoperative hypothermia
pre and intraop fluid optimization
preop carbohydrate
surgical stress:
pain, catabolism, immuno-dysfunction, nausea/vomiting, ileus, impaired pulmonary function, increased cardiac demands, coagulatory-fibrinolytic dysfunction, cerebral dysfunction, fluid homeostasis alteration, sleep disturbances and fatigue
pharmacological intervention
non-opioid, multimodal analgesia
anti-emetics
glucocorticoids (anti-inflammatory, anti-emetic, analgesic)
statins
β-blockade
α_2-agonists
insulin (glycemic control/ anti-inflammatory),
anabolic agents (growth hormone, androgens)
nutrition
systemic local anesthetics
afferent neural blockade
local infiltration anesthesia, peripheral nerve blocks, epidural/ spinal anesthesia/ analgesia

Orthopedics – Late to the party?

Colorectal Surgery

- Reduced Length of Hospital Stay
- Decreased Complication Rates
- Decreased Cost
- No differences
  - Readmission
  - Mortality

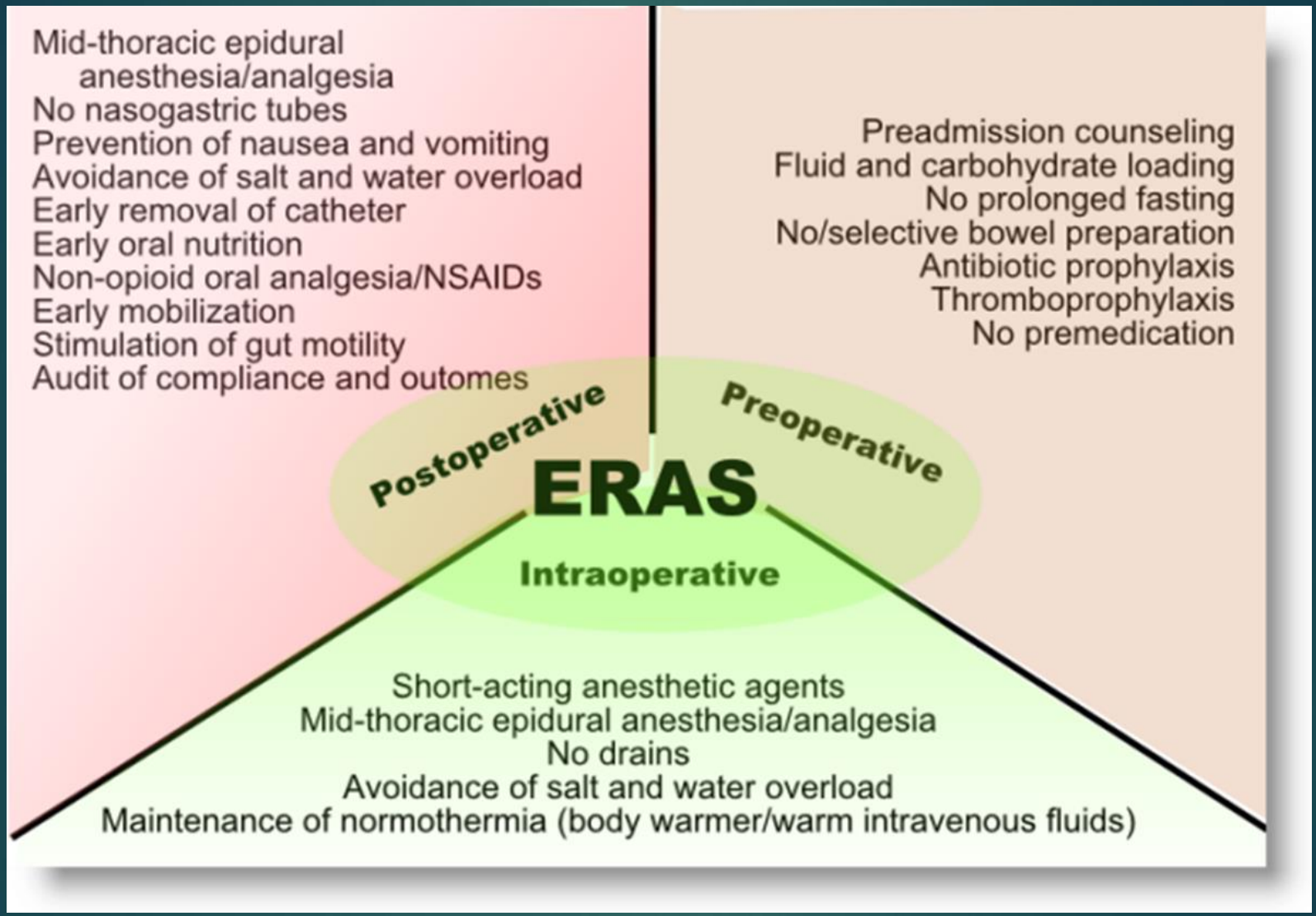
Miller et al Anesth Analg 2014

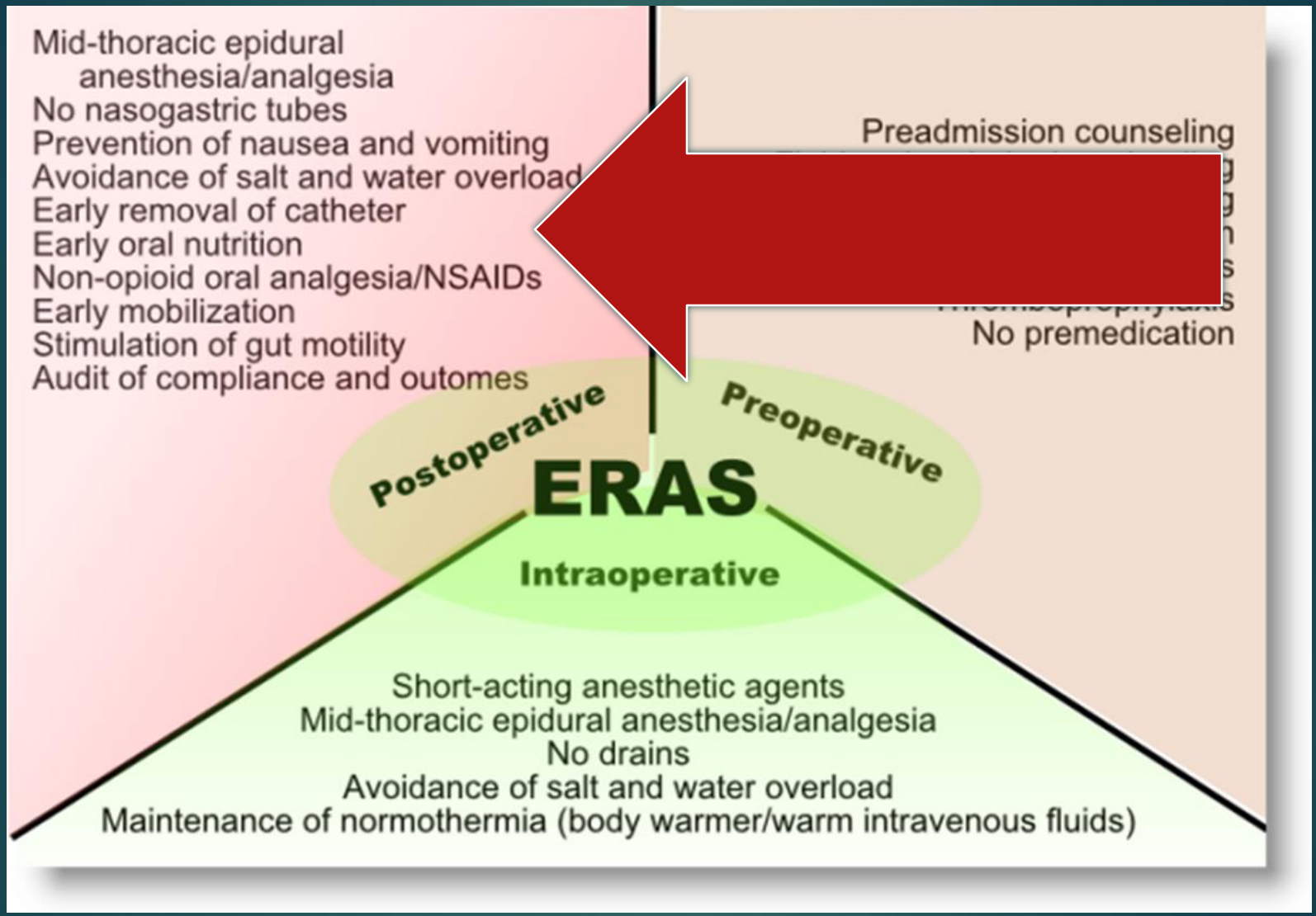
Varadhan et al Clinical Nutrition 2010, Meta analysis of RCT's

How does it work?

To understand recovery, understand the stress response

Surgery changes		**predictable**
Physical trauma	→	inflammation; cytokines
Catabolic state	→	insulin:glucagon; GH
Immobility	→	wasting; weakness
Immunosuppression	→	infection; poor healing
Pain	→	impairs all recovery


Mid-thoracic epidural anesthesia/analgesia
No nasogastric tubes
Prevention of nausea and vomiting
Avoidance of salt and water overload
Early removal of catheter
Early oral nutrition
Non-opioid oral analgesia/NSAIDs
Early mobilization
Stimulation of gut motility
Audit of compliance and outomes
Preadmission counseling
Fluid and carbohydrate loading
No prolonged fasting
No/selective bowel preparation
Antibiotic prophylaxis
Thromboprophylaxis
No premedication
Postoperative
Preoperative
ERAS
Intraoperative
Short-acting anesthetic agents
Mid-thoracic epidural anesthesia/analgesia
No drains
Avoidance of salt and water overload
Maintenance of normothermia (body warmer/warm intravenous fluids)


Mid-thoracic epidural anesthesia/analgesia
No nasogastric tubes
Prevention of nausea and vomiting
Avoidance of salt and water overload
Early removal of catheter
Early oral nutrition
Non-opioid oral analgesia/NSAIDs
Early mobilization
Stimulation of gut motility
Audit of compliance and outomes
Preadmission counseling
No premedication
Postoperative
Preoperative
ERAS
Intraoperative
Short-acting anesthetic agents
Mid-thoracic epidural anesthesia/analgesia
No drains
Avoidance of salt and water overload
Maintenance of normothermia (body warmer/warm intravenous fluids)

Applications in Orthopedics:

Reduced Length of Hospitalization in Primary Total Knee Arthroplasty Patients Using an Updated Enhanced Recovery After Orthopedic Surgery (ERAS) Pathway

Auyong et al.

Malek et al

Can we Apply to Hip Fractures?

JAMA Surgery

JAMA Surgery | Original Investigation

Enhanced Recovery After Surgery Program Implementation in 2 Surgical Populations in an Integrated Health Care Delivery System

- May 2017
  - >5,000 hip fracture patients
  - Decreased Length of Stay and Complications

What did they change?

- 1) Pain Management
- 2) Mobility
- 3) Nutrition
- 4) Patient Engagement

#1 Multimodal Anesthesia

- IV acetaminophen
- NSAIDS
- Peripheral Nerve Blocks
- Limit Opiates

Evidence of Benefits?

- REGIONAL ANESTHESIA
  - Reduces Preoperative Pain
    - Fascia Iliaca or Femoral Nerve
  - Lowers Opioid Use
  - Reduced Postoperative Delirium
  - Matot et al - Reduced Cardiac Events

Fletcher et al., Haddad et al., Mouzopoulos et al., Yun et al.

More Far Reaching Effects

- Improved Satisfaction
- Improved Function
- Reduced Nausea/Vomiting
- Reduced Complications

Mouzopoulos et al., Matot et al., Lamb et al., Kang et al., Gorodetskyi et al.

#2 Mobility

- Ambulation within 12 hours of surgery
- Remove Urinary Catheter within 24 hrs
- 21 feet of walking within 3 days
- Postop Program

Evidence of Success?

- Intense Postop Strengthening programs
  - Improved Strength
  - Improved Balance
  - Improvements in Mobility and ADL's

  *Add Motivational Videos and Peer Support

Mangione et al.
Syliaas et al.

Sample Protocol

- 2x per week PT – 45 Minutes
  - Treadmill x 15 min
  - 2 exercises Standing Position
    - Knee flexion, Lunge
  - 2 exercises Seated Position
    - Leg Extension, Knee extension
- Home Exercise Program – 1x per week

Sylliaas et al

#3 Nutrition

- High Carbohydrate Beverage 2-4 hrs BEFORE
- Solids within 8 Hours of Surgery BEFORE
- Meal within 12 hours AFTER
- Postop Supplementation

Pre Op Carbohydrate

Giannotti et al.

- Preoperative Oral Carbohydrate Load Versus Placebo in Major Elective Abdominal Surgery
  - RCT
  - Decreased insulin requirements postoperatively
  - Not dangerous preoperatively, no change in morbidity

Evidence of Success?

- Postop Protein Deficiency Intervention
  - Decreased MORTALITY by half at 4 months
    Duncan et al.
  - Fracture related Complications
    - 15% vs 70%

    Espaullela et al.
  - Compliance 100% in intervention group

    Eneroth et al.

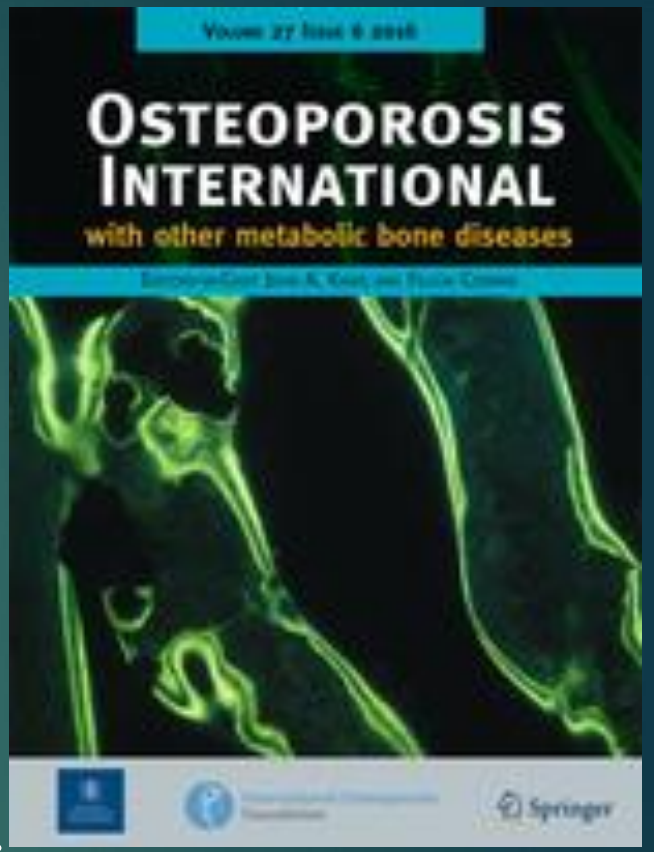
#4 Patient Engagement

- Handouts with expected goals
- Videos detailing expectations

How to Coordinate?

Benefits of Interdisciplinary Care

- Marcantonio et al
  - RCT to reduce delirium
  - Geriatrics Consult
    - 77% adherence to recs
    - 1 case prevented per 5.6 admissions

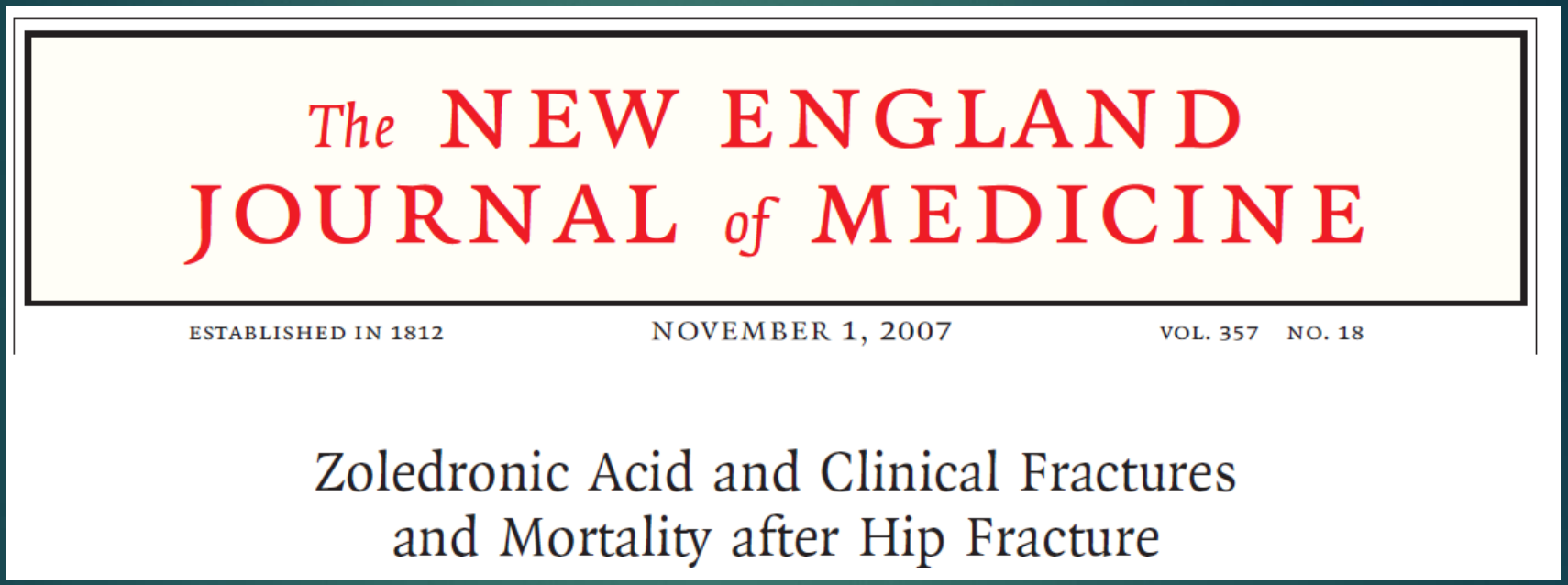


- Berggren et al , Shyu et al
  - Fall Prevention Program
    - Geriatrics Consult
    - Rehabilitation Consult
    - Postop Services Coordination
  - Results
    - Falls reduced, New Fractures Reduced

Best Rehab = Prevention

- After Hip Fracture

AFTER the FRACTURE



The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 NOVEMBER 1, 2007 VOL. 357 NO. 18

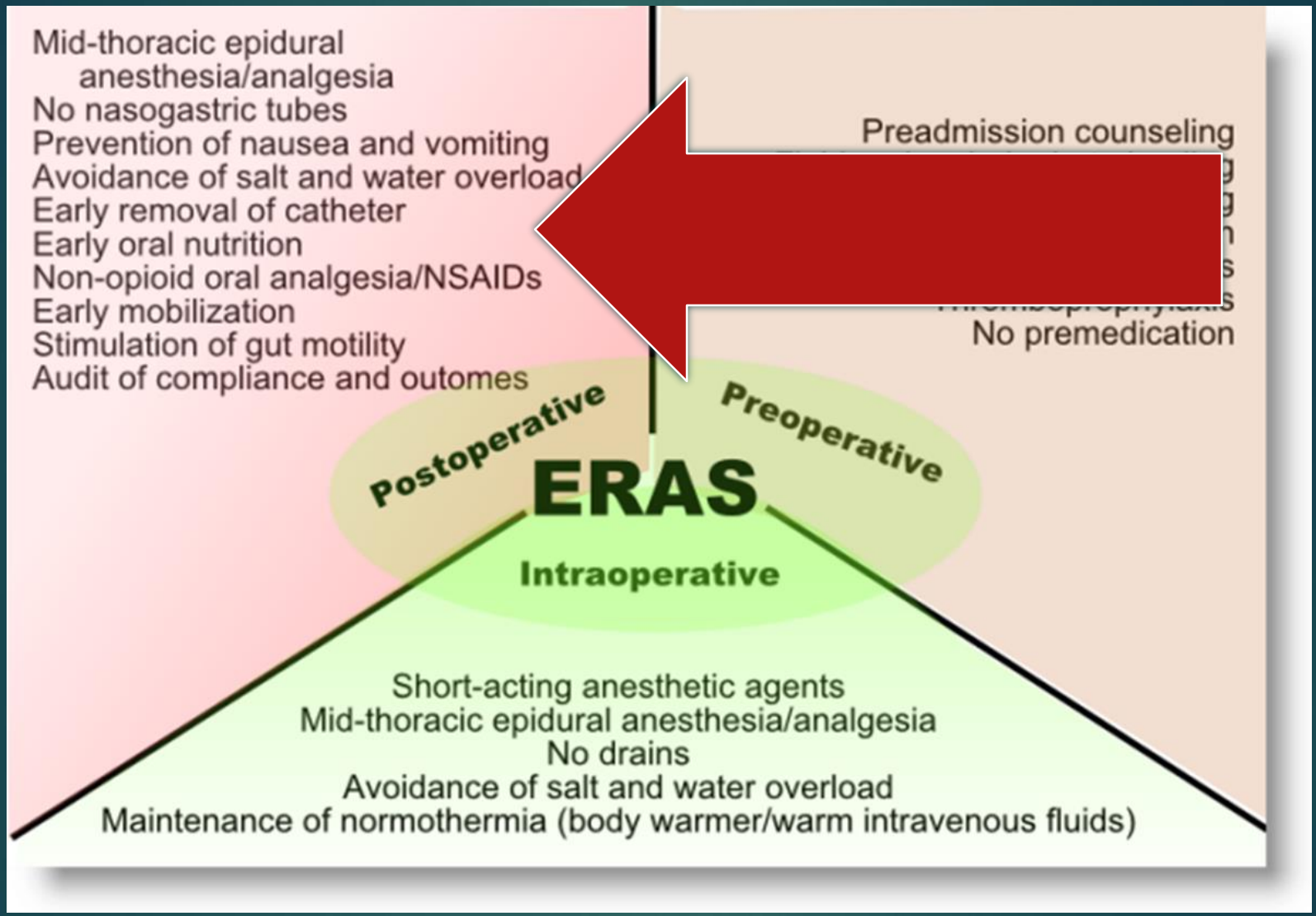
Zoledronic Acid and Clinical Fractures and Mortality after Hip Fracture

Lyles et al.

Lyles et al
Zoledronic acid, Ca++/Vit D

- 35% risk reduction of new fractures
- 28% fewer deaths
- No adverse healing effects noted
- Similar Medical complications btw groups

Putting it all together…


Mid-thoracic epidural anesthesia/analgesia
No nasogastric tubes
Prevention of nausea and vomiting
Avoidance of salt and water overload
Early removal of catheter
Early oral nutrition
Non-opioid oral analgesia/NSAIDs
Early mobilization
Stimulation of gut motility
Audit of compliance and outomes
Preadmission counseling
No premedication
Postoperative
Preoperative
ERAS
Intraoperative
Short-acting anesthetic agents
Mid-thoracic epidural anesthesia/analgesia
No drains
Avoidance of salt and water overload
Maintenance of normothermia (body warmer/warm intravenous fluids)

TEAM FOCUS

- 1) Pain Management
- 2) Mobility
- 3) Nutrition
- 4) Patient Engagement

Protocol

HOSPITAL FOR SPECIAL SURGERY

- Proximal femoral Nerve Block in the ER
- Surgery within 48 Hours, Regional Anesthesia
- Admission to General Medicine/Ortho Svc
- Nutrition Consultant
- Physical Therapy Consultant
- Discharge to Rehabilitation Facility, Osteoporosis Evaluation Organized


Thank
you