MICHIGAN SPINE SURGERY
IMPROVEMENT COLLABORATIVE (MSSIC)
WORKING TOGETHER FOR BETTER PATIENT OUTCOMES

ERAS – LITERATURE REVIEW

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August 2, 2019
MSSIC & ERAS...

- **2021** Performance Index - ERAS Performance Measures
- This is the time to research, strategize, align with current ERAS pathways that may already exist at your site, and begin implementation
ERAS for Spine – Literature Resources

- Key articles emailed prior to meeting
- Key articles plus more posted on MSSIC site under “Resources”
- Email Kari Jarabek for assistance:
  - kjarabe1@hfhs.org
Literature Common Threads - Recap

• 3 phases of the surgical journey
  – Pre-operative
  – Peri-operative: just prior to admission, intra-op, and immediate postop at hospital
  – Post-operative: following discharge from the hospital
Pre-operative Phase

• Engage and educate patient
  – Comprehensive education results in well informed patients that are more likely to have a better postoperative outcome and realistic expectations
  – Patient-Centered approach: dynamic participation throughout his/her care

• Risk assessment and intervention
  – Optimize the physical, mental and functional status
  – Reduce the dramatic stress response of surgery
Peri-operative Phase

• Limited fasting and Carbohydrate beverage up to 2 hours before surgery
• Opioid sparing, multimodal analgesia
  – Before, during, after surgery
• Normovolemic
• Normothermia
• Nausea prevention
Peri-operative Phase

- Normoglycemia
- Avoid tubes and drains
- Early nutrition
- Early mobilization (no later than 6-8 hours in review of literature)
- Rare Foley catheter use
Post-operative Phase

- Clinical team communication with the patient post-discharge
  - Pain, concerns, clarification of post-op instructions, etc.
- Mobility/therapy/rehab
- Wound care
- Follow-up: surgeon, primary care and/or specialty care
Literature Review Findings

Articles with additional considerations
Development and implementation of a comprehensive spine surgery enhanced recovery after surgery protocol: the Cleveland Clinic experience

Vikram B. Chakravarthy, MD,1 Hana Yokoi, BS,3 Daniel J. Coughlin, MD,1 Mariel R. Manlapaz, MD,2 and Ajit A. Krishnaney, MD1
Pre-operative Risk Assessment & Intervention

- **Pt smokes**
  - Surgeon counsels patient on smoking cessation

- **Known Diabetes Mellitus or BMI> 35**
  - Assess HbA1c
  - HbA1c >8 refer to Endocrinology
  - Surgery > 2 weeks after endocrine consult

- **Anemic or Hgb < 11.5**
  - Refer to blood management
  - Surgery > 2 weeks after consult

- **BMI>30**
  - Refer to bariatrics
  - BMI > 40
  - Recommend avoiding elective surgery

- **>75 yo**
  - Refer to geriatrics for frailty assessment
  - Surgery >6 weeks
  - Follow as needed (e.g. delirium)

**FIG. 2.** Preoperative benchmarks for ERAS. EPO = erythropoietin; Hgb = hemoglobin; Pt = patient.
Age/Frailty – All patients ≥75 yrs.

- **Frailty** - independent predictor of postop complications, mortality and reoperations. High frailty index - correlated with an increased risk of complications and LOS
- Referral to geriatric medicine clinic for frailty assessment: deconditioning, sarcopenia/malnutrition, dementia, and polypharmacy
- Prehabilitation, nutritional supplementation, medication changes, and postoperative pain control planning to minimize delirium
Anemia/Blood Mgmt. – Hgb < 11.5

• Referral to blood management clinic: oral iron, iron infusion, or erythropoietin to reach target Hgb of 13.
• If necessary, referral to hematology for assessment
FIG. 3. Principles of intraoperative blood and fluid management.
Tranexamic Acid (TXA) Bolus

- Tranexamic acid (TXA), standardized transfusion parameters, and the use of adjunctive devices to minimize blood loss.
- TXA has been shown to reduce total blood loss and the need for blood transfusion.
- All patients undergoing major and complex spine surgery receive a bolus of TXA and an additional infusion during the case.
An enhanced recovery after surgery pathway: association with rapid discharge and minimal complications after anterior cervical spine surgery

Ellen M. Soffin, MD, PhD,1,2 Douglas S. Wetmore, MD,1,2 Lauren A. Barber, MD,3
Avani S. Vaishnav, MBBS,3 James D. Beckman, MD,1,2 Todd J. Albert, MD,3,4
Catherine H. Gang, MPH,3 and Sheeraz A. Qureshi, MD3,4
Anterior Cervical Discectomy and Fusion (ACDF) & Cervical Disc Arthroplasty (CDA)

- IV fluid administration not performed via strict goal-directed parameters. Mild fluid-restricted regimen associated with protection against post-ACDF airway compromise.
- At conclusion of procedure, before skin closure, 1 ml of 40 mg/ml methylprednisolone directly delivered onto the outer wall of esophagus where the retractors had been used.
Anterior Cervical Discectomy and Fusion (ACDF) & Cervical Disc Arthroplasty (CDA)

- 5-hour mandatory PACU stay for observation and 2 swallow tests prior to discharge
  - Most complications occur in the immediate period after ACDF (<6 hours)
- Ambulation within 2 hours in PACU
ERAS + Mobile App = Enhanced ERAS Patient Experience (Multiple Vendors – Customizable)

Benefits of Enhanced Recovery After Surgery for fusion in degenerative spine surgery: impact on outcome, length of stay, and patient satisfaction

Bertrand Debono, MD,1 Marco V. Corniola, MD,2 Raphael Pietton, MD,1 Pascal Sabatier, MD,1 Olivier Hamel, MD, PhD,1 and Enrico Tessitore, MD2
ERAS + Mobile Apps: Pre-op

- Mobile text message reminders
- Web link resources on nutrition, exercise, smoking cessation, and mindfulness via Mobile text messages
ERAS + Mobile Apps: Post-op

- Example assessments:
  - VAS pain scales
  - Body temperature
  - Motor disorder
  - Blood or discharge on dressing
  - Painful urination
  - Online Surveys

- Alarms to ERAS team:
  - Nonresponse within designated time frame
  - Abnormal values
Is there a bleeding spot on your band-aid?

- No bleeding
- Stable bleeding spot
- Growing bleeding spot
- Bleeding spot overflowing band-aid

Any shivering?

- No
- Yes
ERAS + Mobile Apps: Patient Satisfier
(808 Responses)

• Concerning the satisfaction with overall care, 699 patients (86.5%) were satisfied or very satisfied.
• Stay preparation, 750 patients (92.8%) were satisfied or very satisfied.
• Appreciation of the mobile e-health app in the perceived optimization of care management, 665 patients (82.3%) were satisfied or very satisfied.
Take-away Message:

- Past decade: ERAS has been the object of >3,000 PubMed-listed publications in various surgical fields – poorly discussed in spine
- Substantial body of literature supporting its benefits – outcomes, satisfaction, LOS, reduction in opioids, etc.
- MSSIC Sites have 1 year to research, strategize, align, and implement