Perioperative Optimization

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Disclosures

- Faris Medical – consultant
- DJO - consultant
Topics

- What is a Orthopedic Perioperative Specialist?
- Diabetes Screening
- Inpatient Diabetes Management
- Nutrition Screening
Perfect Patient

- Ideal weight
- Non-smoker
- Exercises regularly
- Proper nutrition
- Controlled cholesterol
- Controlled BP
- Controlled medical problems
- See MDs regularly
Typical Patient

- Obese
- Sedentary
- Non-compliant
- Diabetes
- CAD
- Poor nutrition
Good old days
HOME MEDICATIONS:

1. Aspirin 3.25mg po q4h
2. Metoprolol succ ER 25mg po qpm
3. Cozaar 100mg po qpm
4. Simvastatin 40mg po qhs
5. Cytomegal 5mg po bid plus 1 more
   tab po q Wed & Sun
6. Temazepam 30mg po qhs
7. Bupropion HCL 100mg po tid
8. Flurazepam 30mg po qhs
9. Alprazolam 0.5mg 1-2 tabs po q4h
   prn anxiety
10. Sleep Aid Maximum Strength
diphenhydramine HCL 50mg po qhs
11. Dicyclomine 20mg po qpm
12. Wal-finite allergy tablets
    chlorpheniramine maleate 4mg po
    q4-6h prn allergy symptoms
13. Mupirocin 2% ointment apply bid
    prn impetigo
14. Hydrocortisone ointment 2.5% apply
    sparingly to affected area 1-4x daily
    prn itching
15. Ketoconazole 2% cream apply bid
    prn groin irritation
16. Nicotine Gum polacrilex 2mg chew
    prn
17. Antibiotic & Pain Relief Maximum
    Strength Cream neomycin
    sulfate/polymyxin B
    sulfate/pramoxine HCL
    3.5mg/10,000 units/10mg apply 1-3x
    daily to affected area prn
    cuts/scrapes
18. Propoxyphene/APAP 100/650mg 1-2
    tabs po q6h prn pain
19. Herbal Healing Salve apply to
    wounds and irritations
20. Chelated Iron 27mg
21. Vit. C 1000mg
22. B-Complex 100
23. Vit. E 400
24. CoQ10 30mg
25. Folic Acid 800mcg
26. Phosphatidyl Choline with B-12 &
    Folic Acid
27. Omega-3 Fatty Acids Fish Oil
    1200mg
28. D-3 1000
29. Zinc 75mg
30. Digest Gold
31. L-Lysine 500mg
32. L-Carnitine 500mg
33. Chromium 200mcg
34. Selenium 200mcg
35. Biotin 5000mcg
36. CO-B-Plex B-Complex Co-Enzyme
37. CO-ZYME 6
38. No-Flush Niacin 400mg
39. Food Carotene 10,000
40. Methy1 B-12 3000mcg
41. Ginkgo Biloba Plus 60mg
42. Malic Acid with Magnesium Plus 5-
    HTP
43. Evening Primrose Oil
44. NU Plus Concentrated Herbal Food
45. Metabolol II High-Energy Meal
    Supplement
46. Pre-Load Creatine Complex
47. Spiru-tein High Protein Energy Meal
48. Superior Amino 2222
49. 4Life Transfer Factor
50. Copper Sebacate 22mg
51. Choline Cocktail Energy Drink with
    DMEA & Ginkgo Biloba
52. Me-Cofactors
53. Aangamik DMG 125mg
54. Action Caps
55. Phosphatidylserine DMAE Complex
56. Royal Jelly 500mg
57. Z-88
58. Wild Yam 400mg
59. Ginger Root
60. ImmoPlex Glandular
61. Scullcap 425mg
What is a Orthopedic Perioperative Specialist?
Perioperative Medicine

• Improved outcomes
• Fewer delays/cancellations
• Decreased length of stays
• Reduced testing
• Increased patient satisfaction
The challenge is not how to manage a medical problem but rather how to manage the problem with an orthopedic patient.
The Effects of a Hospitalist Comanagement Model for Joint Arthroplasty Patients in a Teaching Facility

“Any potential benefit of a hospitalist comanagement model for this patient population may be outweighed by increased cost.”
Routine Workup of Postoperative Pyrexia Following Total Joint Arthroplasty Is Only Necessary in Select Circumstances

- 25k patients
- POP occurred 46% of TJA
- 0.2% had positive CXR
- CXR responsible for $4,613,182.00 (99.5% of total workup costs)
- $384,431.83/year
Number of tests/procedures/consults ordered on 1,000+ patients:

- CT angiograms: less than 5
- Renal ultrasounds: less than 5
- Head CT: less than 5
- Cardiology consults: less than 5
- Non dialysis renal consults: less than 5
- Hematology consults: less than 5
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Topics

- What is a Orthopedic Perioperative Specialist?
- Diabetes Screening
- Inpatient Diabetes Management
- Nutrition Screening
Diabetes and Hyperglycemia
Diabetes and Hyperglycemia

- There have been many studies linking diabetes with increased risk.
  - Deep infection
  - MI
  - DVT
  - PE
  - Readmission
  - Mortality
  - Length of stay
  - Cost
Diabetes and Hyperglycemia

Study limitations:

- Retrospective studies
- Wide variance of study designs and outcome measures
- Lack of correction for comorbidities
- Inconsistent patient populations
- Small N of complication rates
Diabetes and Hyperglycemia

Two questions:

- Is it truly a risk factor?
- What *is* the risk factor?
  - Hyperglycemia
  - Diabetes
  - Uncontrolled diabetes
  - Diabetes with secondary disease
Diabetes and Hyperglycemia

Surgical Outcomes of Total Knee Replacement According to Diabetes Status and Glycemic Control, 2001 to 2009.


Conclusions: No significantly increased risk of:

- Revision
- Deep infection
- DVT
- Incident MI
- All cause rehospitalization
Diabetes and Hyperglycemia

Relationship of Hyperglycemia and Surgical-Site Infection in Orthopaedic Surgery.


- Retrospective study of fractures in NON diabetic patients
- Hyperglycemia (BS>200 x 2) *was* an independent risk factor for thirty-day surgical-site infection
Diabetes and Hyperglycemia

What’s a good minimum preoperative cutoff?
Diabetes and Hyperglycemia

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- A1c <8.0 (Average BS of 180 last 2-3 months)
Diabetes and Hyperglycemia

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- A1c <8.0 (Average BS of 180 last 2-3 months)
- 90% of qid BS <180 for one week
Diabetes and Hyperglycemia

What’s a good minimum preoperative cutoff?

- A1c <8.0 (Average BS of 180 last 2-3 months)
- 90% of qid BS <180 for one week
- Fructosamine (Average BS last 1-2 weeks)
Diabetes and Hyperglycemia

Who should be screened?
Diabetes and Hyperglycemia

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ADA Standards of Medicare Care in DM - 2017

- Suggest that all patients with a prior diagnosis of diabetes or hyperglycemia have A1c if not performed in the prior 3 months.
Diabetes and Hyperglycemia

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Diabetes and Hyperglycemia

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- 33.6% of pts. had previously undiagnosed dysglycemic patients
Diabetes and Hyperglycemia

Who should be screened?

ADA: BMI > 25kg/m2 AND one risk factor (45, 1st degree relative, sedentary, HTN, high risk group, GDM, dyslipidemia, PCO, vascular disease)

USPTF: 40 to 70 AND overweight

CDC: 45 OR 1st degree relative, sedentary, GDM, high risk ethnic group, risk factors
Topics

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Diabetes and Hyperglycemia

Postoperative Inpatient Management:

ADA Standards of Medicare Care in DM - 2017
Diabetes and Hyperglycemia

Postoperative Inpatient Management:

ADA Standards of Medicare Care in DM - 2017

- Withhold oral medications starting the morning of surgery
Diabetes and Hyperglycemia

Postoperative Inpatient Management:

ADA Standards of Medicare Care in DM - 2017

- Withhold oral medications starting the morning of surgery
- Insulin with basal, correctional, and carb coverage
Diabetes and Hyperglycemia

Postoperative Inpatient Management:

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- Withhold oral medications starting the morning of surgery
- Insulin with basal, correctional, and carb coverage
  - CPOE recommended
Diabetes and Hyperglycemia

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Diabetes and Hyperglycemia

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  - Could resume orals when stable
Diabetes and Hyperglycemia

**Postoperative Inpatient Management:**

ADA Standards of Medicare Care in DM - 2017

- Withhold oral medications starting the morning of surgery
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  - Reduce chronic meds at d/c if needed
Diabetes and Hyperglycemia

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- Withhold oral medications starting the morning of surgery
- Insulin with basal, correctional, and carb coverage
  - CPOE recommended
  - Sliding scales strongly discouraged
  - Could resume orals when stable
  - Reduce chronic meds at d/c if needed
- Target glucose range for the perioperative period should be 80–180 mg/dL (4.4–10.0 mmol/L).
Diabetes and Hyperglycemia

Postoperative Inpatient Management:

ADA Standards of Medicare Care in DM - 2017

- Strong emphasis on avoiding hypoglycemia but using long acting basal insulin when needed
Diabetes and Hyperglycemia

Postoperative Inpatient Management:

ADA Standards of Medicare Care in DM - 2017

- Strong emphasis on avoiding hypoglycemia but using long acting basal insulin when needed
- ADA now defines clinically significant hypoglycemia as glucose values <54mg/dL (70 trigger for adjustment)
Diabetes and Hyperglycemia

Postoperative Inpatient Management:

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- Strong emphasis on avoiding hypoglycemia but using long acting basal insulin when needed
- ADA now defines clinically significant hypoglycemia as glucose values <54mg/dL (70 trigger for adjustment)
- Severe hypoglycemia is defined as that associated with severe cognitive impairment regardless of blood glucose level
Diabetes and Hyperglycemia

Postoperative Inpatient Management:

ADA Standards of Medicare Care in DM - 2017

- Strong emphasis on avoiding hypoglycemia but using long acting basal insulin when needed
- ADA now defines clinically significant hypoglycemia as glucose values <54mg/dL (70 trigger for adjustment)
- Severe hypoglycemia is defined as that associated with severe cognitive impairment regardless of blood glucose level
- The ADA does not endorse any single meal plan or specified percentages of macronutrients, and the term “ADA diet” should no longer be used.
Topics

- What is a Orthopedic Perioperative Specialist?
- Diabetes Screening
- Inpatient Diabetes Management
- Nutrition Screening
Nutrition

The Questions:
Nutrition

The Questions:

- How is malnutrition defined?
Nutrition

The Questions:

- How is malnutrition defined?
- How much malnutrition increases postop complications?
Nutrition

The Questions:

- How is malnutrition defined?
- How much malnutrition increases postoperative complications?
- Does correcting malnutrition decrease complications?
Nutrition

How is malnourishment diagnosed?
How is malnourishment diagnosed?

- Academy of Nutrition/ASPEN recommend 2 or more for diagnosis:
How is malnourishment diagnosed?

- Academy of Nutrition/ASPEN recommend 2 or more for diagnosis:
  - Insufficient energy intake
  - Weight loss
  - Localized or generalized fluid that may mask weight loss
  - Loss of subcutaneous fat
  - Loss of muscle mass
  - Decreased hand strength
Nutrition

How is malnourishment diagnosed?

- Academy of Nutrition/ASPEN recommend 2 or more for diagnosis:
  - Screening tools
Nutrition

How is malnourishment diagnosed?

- Academy of Nutrition/ASPEN recommend 2 or more for diagnosis:

  - Screening tools
    - Mini Nutrition Assessment Short Form (MNA-SF)
    - The Malnutrition Universal Screening Tool (MUST)
    - The Subjective Global Assessment of Nutritional Status
    - The Nutritional Risk Screening Tool
    - Rainey-MacDonald nutritional index
Nutrition

Screening Tools
Comparing the adequacy of the MNA-SF, NRS-2002 and MUST nutritional tools in assessing malnutrition in hip fracture operated elderly patients

- All screening tools were adequate in assessing malnutrition parameters in hip fracture operated elderly patients
- Only the MNA-SF could also predict readmissions and mortality

How is malnourishment diagnosed?
- Academy of Nutrition/ASPEN recommend 2 or more for diagnosis:
- Screening tools
How is malnourishment diagnosed?

- Academy of Nutrition/ASPEN recommend 2 or more for diagnosis:
  - Screening tools
  - LABS (albumin, transferrin, pre-albumin, lymphocytes)
Nutrition

There are many recent studies showing low albumin (<3.5 g/dl) have worse outcomes:

- Hypoalbuminaemia-a marker of malnutrition and predictor of postoperative complications and mortality after hip fractures - Injury 2017 Feb
- Hypoalbuminemia independently Predicts Surgical Site Infection, pneumonia, LOS, and radimission after Total join arthroplasty -J. of Arthroplasty 8-2016
- Malnutrition and Total Joint Arthroplasty- J Nat Sci 6-2016
- Malnutrition Increases With Obesity and Is a Stronger Independent Risk Factor for Postoperative Complications A Propensity- J. Of Arthroplasty 4-2016
- Malnutrition a marker for increased complications, mortality, and length of stay after total shoulder arthroplasty-J Shoulderand Elbow Surgery 2-2016
Nutrition

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- Screening tools
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How is malnourishment diagnosed?

- Academy of Nutrition/ASPEN recommend 2 or more for diagnosis:
  - Screening tools
  - LABS (albumin, transferrin, pre-albumin, lymphocytes)
    - Nutrition labs falsely abnormal
      - Associated with inflammatory processes
      - Negative acute phase reactants
      - Can be low for other non-diagnosed illnesses
Nutrition

Does routine supplementation or correcting “malnutrition” decrease complications?
Nutrition

Does routine supplementation or correcting “malnutrition” decrease complications?

- There are studies showing benefit with immunonutrition supplementation with GI surgery
Nutrition

Does routine supplementation or correcting “malnutrition” decrease complications?

- There are studies showing benefit with immunonutrition supplementation with GI surgery
  - Methodological flaws
    - Variance of supplementations
    - Surgical patients with highest risks were excluded
Nutrition

Does routine supplementation or correcting “malnutrition” decrease complications?

- There are studies showing benefit with immunonutrition supplementation with GI surgery
  - Methodological flaws
    - Variance of supplementations
    - Surgical patients with highest risks were excluded
- Minimal/no studies showing correction of the malnutrition parameter improves outcomes with TJA
Nutrition

Conclusions?

- Variability of defining “malnutrition”
Nutrition

Conclusions?

- Variability of defining “malnutrition”
- Minimal supportive studies showing correction lead to improve outcomes with TJA
Nutrition

Conclusions?

- Variability of defining “malnutrition”
- Minimal supportive studies showing correction lead to improve outcomes with TJA
- Supplements choice? Cost?
Nutrition

Conclusions?

- Variability of defining “malnutrition”
- Minimal supportive studies showing correction lead to improve outcomes with TJA
- Supplements choice? Cost?
- Until higher quality data demonstrating unequivocal benefit are available, nutritional supplementation cannot be recommended as a routine addition to surgical patients.
Thank you.

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