SCOAP SURGICAL CARE AND OUTCOMES ASSESSMENT PROGRAM

Best Strategies to Avoid Leaks after Colon Surgery: Assessing and Addressing Malnutrition

Why is it important for SCOAP hospitals to measure albumin and manage hypoalbuminemia?

- Albumin reflects the patient's nutritional status
- Serum albumin concentration is a better predictor of surgical outcomes than most other preoperative patient characteristics.
- It is a relatively low-cost prognostic tool to detect malnutrition and risk of adverse surgical outcomes, particularly in populations in whom co-morbid conditions are relatively frequent.
- Albumin levels are used for risk adjustment of SCOAP data

Albumin

Reference serum values range from 3.5-4.5 g/dL, with a total body content of 300-500 g.

- Synthesis occurs only in hepatic cells at a rate of approximately 15 g/d in a healthy person, but the rate can vary significantly with various types of physiologic stress.
- The half-life of albumin is approximately 21 days, with a degradation rate of approximately 4% per day.
- Following surgery and under stress, such as sepsis, the value can drop rapidly.

National VA Surgical Risk Study

- 54,215 cases from the National VA Surgical Risk Study database with recorded preoperative serum albumin values were analyzed.
- This was a multi-center, prospective observational study. Patients at 44 tertiary-care VA Medical Centers who underwent non-cardiac surgery under general, spinal, or epidural anesthesia were entered in the study.
- The major outcome measures were 30-day postoperative mortality and 30-day postoperative morbidity.

National VA Surgical Risk Study-Findings

Mortality vs. Serum Albumin

Mortality increases as albumin declines

61 other preoperative variables were examined and none correlated as closely with mortality (through multiple regression analyses)

National VA Surgical Risk Study - CONCLUSIONS

- Serum albumin level is an excellent predictor of surgical outcome. It is a relatively low-cost test in relation to its prognostic value and appears to be underutilized by some surgeons. In addition, it is a cost-effective component of nutritional screening.

- Despite the high value of knowing a patient's albumin level, there was wide variation among the 44 VA surgical services in the rate of preoperative serum albumin testing.

UWMC Albumin Data

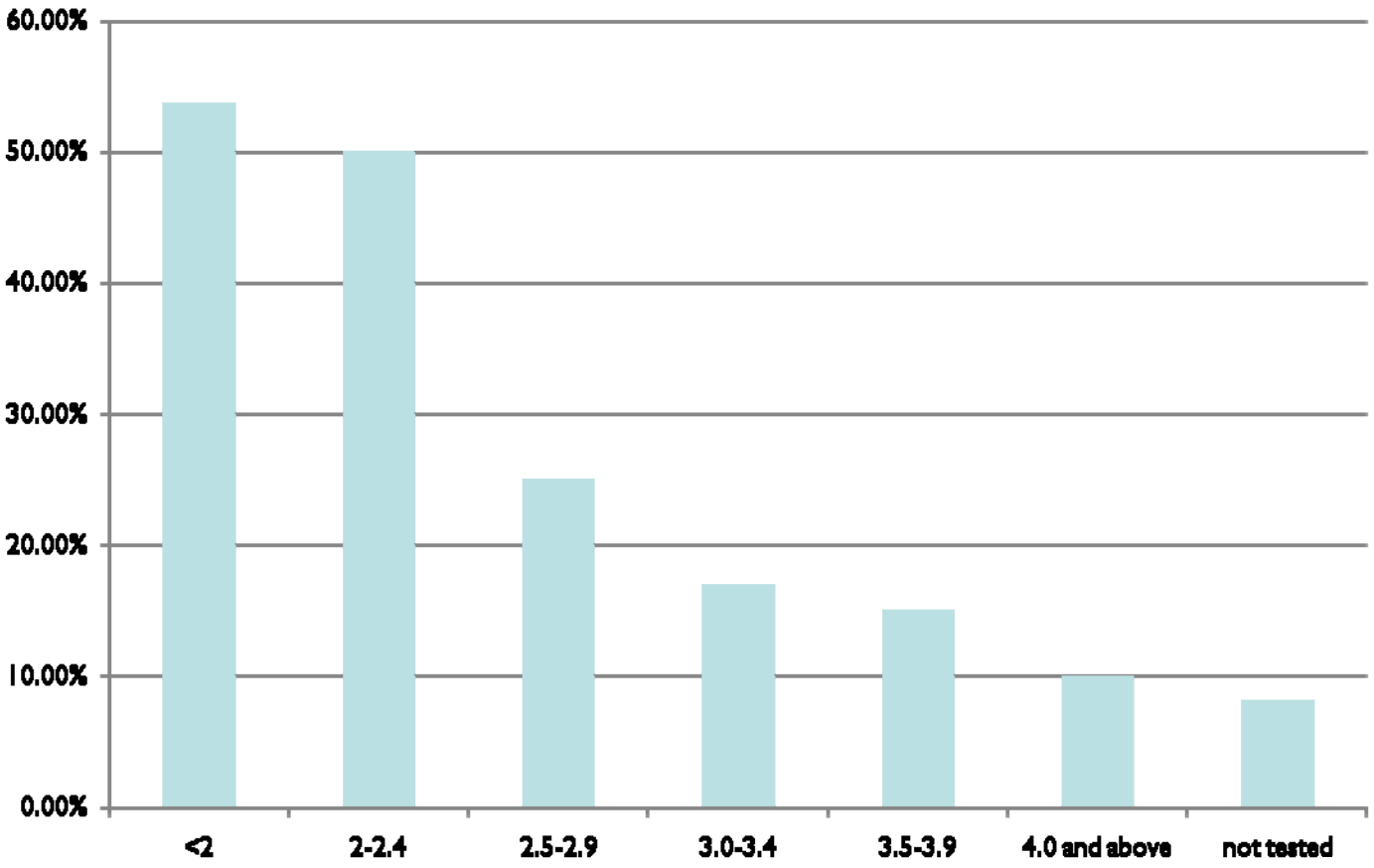
Albumin Testing Rates

- Data Collected from NSQIP from September 18, 2006 to July 1, 2009
- 3867 total cases
  - 50% had albumin tested
- 3510 non-emergent cases
  - 46% had albumin tested

Albumin Values in Elective Cases at UWMC

- Of the 1628 Non-Emergent Cases with Albumin Testing:
  - Albumin <2 in 3.3% of cases
  - Albumin <2.5 in 7.2% of cases
  - Albumin <3 in 14% of cases
  - Albumin <3.5 in 31.1% of cases
  - Albumin <4 in 72.3% of cases

Complication Rates by Albumin



Review of Literature

- 4 meta-analyses examining prospective randomized controlled trials (PRCTs) of parenteral nutrition in preoperative patients.
  - 59 Prospective randomized controlled trials
  - TPN improves surgical outcomes but increases infectious complications
- 6 PRCTs of enteral nutrition in preoperative patients.

Evidence on preoperative enteral nutrition

Study	Patients/Dx	Randomization	Type of intervention	Findings
Shukla et al. 1984	110 pts with benign or malignant GI, breast, or oropharyngeal dx	1). 55 pts standard oral diet 2). 55 pts NG enteral nutrition	10 days of NG enteral nutrition vs 10 days of routine diet	Postop mortality: 50% reduction in the treated group (6% vs. 11.7% controls) wound infx: 10.4% vs 37.2% controls
Foschi et al. 1986	68 pts with obstructive jaundice (Pancreatic CA, CBD CA, CBD gallstones, CBD benign stricture)	1). Percutaneous transhepatic biliary drainage alone (n=32) 2). Percutaneous transhepatic biliary drainage and alimentation (n=28)	Of 28 pts w/ nutrition support: 19 pts enteral nutrition 4 pts TPN 5 pts both Caloric intake of 140% of REE. Given at least 12 days before (mean 20+/-6 days).	Postop complication: 46.8 vs. 17.8%. Infectious complication: 28.1 vs. 14.2%. Non-infectious complication: 18.8% vs. 3.6%
Flynn et al. 1987	61 pts with head and neck SCC	1). 25 patients nutritionally healthy 2). 36 pts malnourished: (a) 19 patients placed in supplemented group (b)17 given only nutritional counseling.	Supplemented group-Given specific regimen or nutritional supplements to meet needs. Interval varied 10 to 21 days. vs Control group- Nutritional counseling only.	Postop complications: 50% reduction in the supplemented group (32% vs. 59% controls) LOS: 18 days vs 21 days

Evidence on preoperative enteral nutrition

Study	Patients/Dx	Randomization	Type of intervention	Findings
von Meyenfeldt et al. 1992	200 pts with gastric or colorectal CA	1). Preop TPN 2). Preop enteral nutrition 3). Depleted group, surgery without delay 4). Non-depleted group, surgery without delay	Preop TPN-150% of BEE for at least 10 days Preop enteral nutrition-150% of BEE for at least 10 days either by NG tube or by mouth	Reductions in intra-abd abscess: 16%(depleted) vs 7.8%(TPN) and 8%(enteral) Sepsis: 8%(depleted) vs 1.9%(TPN) and 2%(enteral)
Le Cornu et al. 2000	82 pts with end-stage liver disease awaiting liver transplantation	1). 41 patients supplemented group. 2). 39 patients control group	Intervention group -500 ml of supplement each day. Mean duration 77 days (range 1-395) vs Control group- Usual care	No significant difference in terms of outcome measures such as time on vent support, time spent in the ICU, LOS, infectious and noninfectious
Braga et al. 2002	150 pts with malignancy of GI tract.	1). Control group 2). Pre-op group 3). Peri-op group	1). Received postop enteral feeding w/ standard diet. vs 2). 7 days(1L/day) of diet enriched with arginine/omega-3 FAs/RNA. After surgery, given same standard enteral formula as controls. 3). 7 days(1L/day) of the enriched liquid diet and continued same formula after surgery.	Total complication : Control group 42%, preop group 28%, periop group 18%. Significant btw control and periop groups. Postop LOS significantly shorter in preop(13.2 days) and periop(12.0 days) than in the control(15.3 days).

Albumin Supplementation

- Timing – requires a minimum of two weeks preoperatively
- Enteral nutrition
- TPN

Conclusion

Albumin may well be a modifiable variable with a strong influence on surgical outcome

Best Practices

- Check albumin in all patients planning for inpatient colorectal surgery
- Define what is considered "low" for your institution (3.0 and below in SCOAP)
- If low:
  - Consider whether surgery can be postponed for elective, non-cancer cases
- If postponing:
  - Order pre-albumin
  - Refer for Nutrition Consult
  - When pre-albumin trends up, reschedule operation
  - (generally requires 2-6 weeks of nutritional supplementation)

Surgical Specialty Clinic Form Sample

SSC Check-Out Sheet

Medical Necessity: _____ Phone: (206) 598-4477 Fax: (206) 598-9470

Diagnosis: _____ Next Appointment: _____

_____ _____

Appointment Type				Location
RADIOLOGY				
☐ CTUS Biopsy	206-598-8790	☐ Interventional Radiology	206-598-6209	Radiology Department – 2nd Floor of the Pacific Elevators
☐ MRI/CT	206-598-6214	☐ Ultrasound	206-598-6211	
☐ Pet Scan / CT	206-598-4240	☐ Nuclear Medicine	206-598-4240	
☐ X-Ray	206-598-6209	☐ _____		
☐ Vascular Diagnostic	206-598-4449	☐ _____		1st Floor of the Surgery Pavilion
LABS				
☐ PFT	206-598-4265	☐ EKG		BC-236 - Next to the E.R. on the 2nd Floor
☐ Blood (CBC, BMP, PT, PTT)		Albumin – If results are less than 3.2		206-598-6153 / EE-311 - Behind the Pharmacy on the 3rd Floor
☐ Urine		☐ Check pre-albumin ☐ Nutrition Consult		
☐ Review at Next Clinic Visit		☐ RN to Follow-Up		
☐ _____				

Reason for tests: _____

CONSULT/REFERRAL to Clinic/Physician: _____					
☐ Consult	☐ Assume Care	☐ Emergent	☐ Urgent	☐ Routine	☐ Procedure

Reason:

Patient Education

Patient Education

Surgical Specialties Center

Nutritional Assessment Prior to Surgery

Before your operation you will have your blood protein level checked

Your doctor wants you to be in the best nutritional health for your operation.

- Patients with a low protein (albumin) level before their operation are at higher risk for healing problems, and complications.
- If you have a normal albumin level it will be easier for your body to heal after your operation.
- If you have a low albumin level a nutritionist can help you improve your nutritional level before surgery.

Before your Operation:

- **We will have you get a blood draw to find out what your albumin level is**
- **If your albumin level is low we will teach you how to increase your level before your operation.**
- **You will meet with a Nutritionist who is a Registered Dietitian. They will help you develop a customized nutritional plan.**

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Improvement Strategies

- Review your SCOAP data for patterns and trends
- To improve testing rate, look at your pre-admission process and standing orders and make process or form changes to ensure reliable testing
- Educate surgeons to consider postponement of elective non-cancer colon or rectal surgery if possible
- Work with nutrition staff to set up consultation pathways
- Educate your patients about why this is important

One Hospital's Story

- Established a work group with key staff and a surgeon champion
- Worked with pre-admission clinic to revise the order set
- Checked data weekly
- When improvement did not occur, added reminder notes on the order packet
- Gave regular feedback to surgeons with outliers

Another Hospital

- No pre-admission clinic, pre-admission testing done by the physician's office
- Worked with the two main surgery groups to change their orders at the clinic level
- Albumin testing improved by 50% in one quarter

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