Long-term morbidity with endovascular and open repair of AAAs appears to be similar.

Background: The role of endovascular versus open repair of abdominal aortic aneurysms (AAAs) continues to be examined and debated. Outcome data beyond the peri-procedure period are becoming available.

Objective: To report outcomes of elective open and endovascular repairs of AAAs.

Design: Randomized, multicenter trial performed at 42 Veterans Administration hospitals.

Participants: 881 patients had an elective repair of an AAA; endovascular repair was performed in 444 patients and open repair was performed in 437 patients.

Methods: Randomization was done after patients were deemed eligible based on aneurysm size and characteristics. Outcomes of both procedures were compared. The primary outcome was long-term mortality at 5 to 9 years, while secondary outcomes included procedure failure, short-term morbidity, hospital days, ICU days, long-term morbidity, quality of life (QOL), and erectile function. QOL scores were recorded at baseline and at all follow-up visits. This report was planned as a 2-year follow-up.

Interventions: Patients underwent endovascular or open repair of their aneurysm.

Results: The mean follow-up was 1.8 years, with 80% of patients having a follow-up of 2 years. All-cause mortality was not different between the 2 groups. Thirty-day perioperative mortality was 2.3% for open repair and 0.2% for endovascular repair (a significant difference). Mortality after 30 days was similar, although 4 of the 27 deaths after endovascular repair were secondary to the aneurysm. No such deaths occurred in the open repair patients. Procedure failure and secondary procedure rates were similar between the groups. Incisional hernia was the most common reason for a secondary procedure in 5% of open repairs. The most common secondary procedure among endovascular patients was correction of an endoleak. Hospital and ICU stays were shorter for endovascular-repair patients. Radiation and contrast exposure was greater for endovascular repairs. No differences in QOL scores at 1 and 2 years were found, and there was no difference in erectile function present.

Conclusions: Endovascular repair of an abdominal aortic aneurysm was associated with a lower perioperative mortality rate and no increase in morbidity during almost a 2-year follow-up.

Reviewer's Comments: This report makes a stronger case for endovascular repair for appropriate AAAs. Peri-procedural mortality was lower and secondary procedures were similar. This is different from previous reports that have suggested that secondary procedures were higher in endovascular repairs. In addition, QOL and other morbidities were no different. While cost was not reported in this article, the shorter length of stay in the ICU and the hospital will help offset the cost of the endovascular graft. Whether the endovascular repair will prove to be cost effective long term will have to wait for further analysis. This report will give support to an increased use of endovascular repair for elective repair of AAAs. (Reviewer-John A. Weigelt, MD).
Abscesses and Antibiotics – What You Need to Know

Twelve Hundred Abscesses Operatively Drained: An Antibiotic Conundrum?

Zimmerman LH, Tyburski JG, et al:

Surgery 2009; 146 (October): 794-800

MRSA continues to be a common pathogen for complicated cSSTIs.

**Background:** Complicated skin and soft tissue infections (cSSTIs) remain a common reason for patient hospitalization. Most are caused by *Staphylococcus aureus*, and methicillin-resistant *S. aureus* (MRSA) is being reported more frequently.

**Objective:** To determine the bacterial cause of soft tissue infections requiring surgical drainage.

**Design:** Retrospective chart review.

**Participants:** 1,200 patients who had an abscess drained. Perirectal, postoperative site, and hidradenitis cases were excluded.

**Methods:** Patients were stratified by age, anatomic location of the abscess, the presence of diabetes, and use of IV drugs. Intraoperative culture results were also examined. The primary end point was to determine the bacterial cause of these surgically drained abscesses.

**Interventions:** Patients received preoperative antibiotics before drainage in the operating room; 69% received ampicillin/sulbactam.

**Results:** The mean age of the 1,200 patients who underwent operative incision and drainage (I&D) was 44 years, and 51% were male. The mean hospital stay was 3.2 days ± 5.1 days. The most common sites were the upper or lower extremity (58%), groin (19%), trunk (14%), breast (7%), and head/neck (3%). A total of 1,005 cultures were taken, and 963 were positive. Sixty percent had 1 bacteria isolated, and 43% had >1 bacterium isolated. The most common organism was MRSA being isolated in 432 patients. Breast abscesses had the lowest rate of MRSA (20%), while other sites had rates of MRSA that were usually >50%. Anaerobic organisms were more common in IV drug abusers. Initial antibiotic coverage did not cover MRSA in 82% of patients and anaerobes in 26% of patients. Readmission rates were low and did not correlate with initial inappropriate antibiotic therapy.

**Conclusions:** Empiric coverage for MRSA and anaerobes should be used for patients having operative drainage of a complicated skin and soft tissue abscess.

**Reviewer’s Comments:** Here is another report documenting a high rate of MRSA in soft tissue infections. MRSA simply cannot be ignored in this condition anymore. The authors’ finding of a lower rate in breast abscesses suggests that MRSA coverage may be avoided, but 20% is still a rather high rate of isolation. The high anaerobic bacteria recovery could be related to the rate of IV drug use among these patients. It was encouraging that the lack of coverage for either MRSA or anaerobes could not be correlated with readmission rate if readmission is used as a marker for recurrence. The duration of treatment was not addressed, although our practice is a total treatment course of 5 to 7 days after drainage, especially when cellulitis is present. This is usually done with oral drugs as an outpatient. These authors suggest clindamycin and vancomycin as MRSA drugs. We would only use doxycycline, as most of these infections are caused by community-acquired MRSA in our experience, and anaerobes are not usually covered. However, we do routinely culture these abscesses to make sure the appropriate antibiotics are being used. (Reviewer-John A. Weigelt, MD).

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Keywords: Complicated Skin/Soft Tissue Infection, Bacteria, Treatment

Print Tag: Refer to original journal article
Colostomy Is Making a Comeback for Destructive Colonic Wounds

Management of Colon Wounds in the Setting of Damage Control Laparotomy: A Cautionary Tale.

Weinberg JA, Griffin RL, et al:

J Trauma 2009; 67 (November): 929-935

Repairing destructive colonic wounds after damage control laparotomy increases the incidence of complications.

**Background:** Damage control laparotomy (DCL) with delayed restoration of bowel continuity is commonly done for patients with acidosis, hypothermia, and coagulopathy. The success of this approach is generally accepted, although data on the outcome of colon repairs in this group are mostly retrospective and anecdotal. **Objective:** To compare colon repairs done with and without DCL. **Design:** Retrospective review. **Participants:** 157 patients with colon wounds treated during a 7-year period. **Methods:** Patients were divided into 2 groups; 56 had a DCL and 101 had a single laparotomy. Patients in each group were further divided based on whether they had a primary repair, resection and anastomosis, or resection and colostomy to repair the colon injury. Primary outcomes included colon-specific complications including intra-abdominal abscess, repair leak, and stomal ischemia. Mortality was compared based on management approach. Clinical variables were compared to determine any that were associated with adverse outcomes. **Interventions:** Patients had colon repairs done by a suture or staple technique. All DCL repairs were done at the first take-back. **Results:** DCL patients had worse base deficits and more transfusion requirements than single laparotomy patients. When a primary repair was done, the leak rate was 19% for DCL patients and 2% for single laparotomy patients. The leak rate was 12% among 33 patients who had resection and anastomosis after DCL compared to 4% for the same procedure done at a single laparotomy. Neither of these differences was statistically significant, and abscess formation among these patients was not different. Overall mortality was higher for DCL patients, but no difference in mortality or complications was observed among DCL patients who had resection and anastomosis (n=33) compared to those who had resection and colostomy (n=7). Complication rates were also not different. **Conclusions:** After DCL, resection and colostomy might be safer than resection and colon anastomosis. **Reviewer’s Comments:** The question of how to manage a destructive colon wound after a DCL has evolved as comfort with DCL procedures has grown. Most recommendations suggest that a colon anastomosis can be performed once the patient’s acidosis, hypotension, hypothermia, and coagulopathy are corrected. This implies that tissue perfusion is normal. This report, like others, is plagued by small numbers without statistical significance and by the lack of a measure of tissue perfusion when the anastomosis is done. It is also interesting that 2 recent papers on this topic come to different conclusions. This paper, with a 12% leak rate, says to please be careful, while a second report, with a 20% leak rate, says the procedure can be done in the majority of patients. The conclusion is truly "in the eyes of the beholder." We can obviously choose our approach from either side of the argument and use 2 current reports to defend our position, which is always comforting but often not satisfying. (Reviewer-John A. Weigelt, MD).

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Keywords: Colon Injury, Damage Control Laparotomy, Outcomes

Print Tag: Refer to original journal article
Primary Colon Repair After Damage Control Laparotomy--Is It Safe?

Primary Repair of Civilian Colon Injuries Is Safe in the Damage Control Scenario.

Kashuk JL, Cothren CC, et al:

Surgery 2009; 146 (October): 663-670

Anastomotic leaks increase after colon repairs following a damage control laparotomy.

**Background:** Primary colon repair is accepted even when resection is required. The remaining controversy surrounds the management of colon injuries after a damage control procedure. When the patient is brought back for closure, should the colon be repaired or is colostomy the appropriate management approach?

**Objective:** To determine if resection and primary anastomosis of colon injuries is safe after an initial damage control procedure.

**Design:** Retrospective chart review.

**Participants:** 113 patients underwent damage control laparotomy and 29 had a colon injury. During the same period, 280 patients had primary repair of a colon injury, although 2 also had a diverting ileostomy.

**Methods:** The patients' medical records were reviewed for mechanism of injury, type of colon surgery, morbidity, and mortality. The primary end point was the outcome of colon repairs in patients having a damage control laparotomy.

**Interventions:** Primary repair of a colon injury.

**Results:** The mean injury severity score (ISS) was higher for patients who had a damage control laparotomy compared to those who did not. The leak rate for primary colon repair without damage control was 0.3%. Twenty-five of the 29 damage control patients with a colon injury had a resection and anastomosis done by post-injury day 3. Four other patients had suture repair of the colon injury at the time of damage control. Twenty-six patients had an open abdomen when their colon repair was done. Eight patients eventually received an ostomy. Two were done as a prophylactic measure and 6 for leaks (20%). Four of the 6 patients who leaked had a resection and anastomosis and 2 had suture repair only. A leak after colon repair increased ICU stay and ventilator days. There were no colon-related deaths.

**Conclusions:** Primary repair of colon injuries after damage control laparotomy is possible although it is associated with a high leak rate.

**Reviewer's Comments:** Damage control laparotomy after blunt or penetrating injury implies that the patient is severely injured and has perfusion abnormalities as well as coagulopathy and acidosis. Bowel discontinuity is common. When the patient has been resuscitated, definite repairs are done. This study suggests that primary colon repair is safe and should be done. However, the 20% leak rate in this group of patients might allow another decision. I believe the author’s qualifying statement "majority of patients" is true but unrevealing. When the patient returns for the second exploration and resuscitation is really complete and tissue edema is not excessive, I believe colon repair is possible. When resuscitation is ongoing and abdominal closure is not possible secondary to tissue edema, I suggest one should think twice before doing a primary colon repair. We believe that excessive tissue edema and marginal resuscitation are risk factors for anastomotic breakdown. Clinical judgment counts a lot in this scenario and when in doubt, we still divert. (Reviewer-John A. Weigelt, MD).

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Keywords: Colon Injury, Damage Control Procedures, Colon Repair, Colostomy

Print Tag: Refer to original journal article
Differential cyst fluid protein expression occurs between SCAs and IPMNs and can accurately discriminate the two 92% of the time.

**Background:** Cystic pancreatic neoplasms include serous cystadenomas (SCAs), mucinous cystic neoplasms (MCNs), and intraductal papillary mucinous neoplasms (IPMNs); current diagnostics do not reliably identify premalignant lesions.

**Objective:** To assess the diagnostic accuracy of proteomic profiling of pancreatic cyst fluid from patients with radiographically equivocal cysts.

**Methods:** Patients undergoing pancreatic resection for cystic lesions were eligible. Resection was performed, and specimen cyst fluid aspiration was completed. Histopathology was performed on the resected specimen. Only cyst fluid from SCAs and noninvasive IPMNs or MCNs was used. Multianalyte analysis of the cyst fluid using an antibody microsphere array panel designed and developed for pancreatic cancer was used and 54 proteins were measured. Data analysis was performed for samples that had successful measurement of ≥85% of the data points.

**Results:** Of the 59 eligible patients (15 SCA, 32 IPMN, and 12 MCN), all had CT imaging, 24 patients had MRI/magnetic resonance cholangiopancreatography (MRCP), and 32 patients (54%) underwent endoscopy with endoscopic ultrasound/fine-needle aspiration (EUS/FNA). The 32 IPMN patients included 3 (9%) with low-grade dysplasias, 23 (72%) with moderate dysplasias, and 6 (19%) with high-grade dysplasias. Isolated branch duct disease was observed in 21 patients (69%); of these, 3 patients had low-grade dysplasia, 16 had moderate dysplasia, and 2 had high-grade dysplasia. One (8%) of the 12 patients resected for MCN had high-grade dysplasia. Ten IPMN patients and 1 MCN patient were missing ≥15% of protein data and 2 patients had high-grade dysplasia. Five of 51 measured proteins were differentially expressed between excluded and included IPMN patients. No SCA patients had a ≥15% protein dropout. The 2 groups with the largest individual differences were SCA and IPMN, and differential protein expression was identified in 34/51 (66%) proteins evaluated versus 13/51 (25%) proteins evaluated between SCA and MCN. The only proteins significantly overexpressed in cyst fluid of IPMN and MCN were CEA and CA 72.4. Sample classification with 3 classes (SCA, IMPN, and MCN) resulted in a classification error rate of 27% in a 51-protein model. When limited to SCA and IPMN, the error rate decreased to 8% built on a 14-protein model. The error rate of CEA alone in discriminating between SCA and IPMN was 14%. **Discussion:** CT and MRI/MRCP accurately discriminate serous from mucinous neoplasms in approximately 40% of cases. EUS morphology discriminates mucinous from nonmucinous in 51% of cases, and cyst fluid cytology has a sensitivity of 28% to 60%. Cyst fluid CEA >200 ng/mL and extracellular mucin have a positive predictive value for mucinous lesions of approximately 75%.

**Conclusions:** Differential cyst fluid protein expression was observed between SCA and IPMN for the majority of proteins assessed, and multimarker sample classification accurately discriminated between SCA and IPMN 92% of the time.

**Reviewer's Comments:** These results are preliminary, and whether they can be validated with endoscopically acquired samples is unknown. The technique is limited by bead agglomeration in mucinous lesions. However, panel accuracy was compared to resected specimens, the study utilized lesions where diagnostic uncertainty exists, and results agree with single biomarker studies and are better than cyst fluid CEA alone. (Reviewer-Kathleen Christians, MD).

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Keywords: Pancreatic Cysts, Proteomic Profiling, Diagnostic Accuracy
Seromas After Ventral Incision Herniorrhaphy--The Whole Story

Seroma in Ventral Incision Herniorrhaphy: Incidence, Predictors and Outcome.
Kaafarani HMA, Hur K, et al:

The procedure and hernia characteristics rather than patient comorbidities predict seroma in VIH repairs.

Background: Up to 20% of patients undergoing major abdominal surgery develop incisional ventral hernias. Seroma is the most common complication, and causative factors are poorly understood.

Objective: To study the incidence, predictors, and outcomes of seromas following laparoscopic and open ventral incisional herniorrhaphy (VIH).

Design: Post hoc analysis of prospectively collected data from a multicenter, randomized, controlled trial.

Methods: Patients randomized to laparoscopic or open VIH between 2004 and 2006, who developed clinically apparent seromas within 8 weeks, were compared to those who did not. Surgical techniques were standardized to the Chevrel technique with component separation and polypropylene overlay mesh for the open repair and polytetrafluoroethylene Dualmesh for the laparoscopic repair. Hernia sacs were left in place. Drains were utilized only in the open approach and removed when output was <25 mL/d. Follow-up was at 2, 4 and 8 weeks postoperatively. Patients were assessed for seroma only if symptomatic, and diagnosis was by the surgeon's physical examination only. Seromas were aspirated for persistent symptoms. Infection was noted on all follow-up visits and hernia recurrence was assessed at 2 years.

Results: 146 patients had surgery (86 had open VIH and 60 had laparoscopic VIH). One patient was lost to follow-up. Twenty-four patients (16.6%) developed seromas, all within the first 4 weeks postoperatively, with 3 (12.5%) persisting to 8 weeks. Open VIH had a higher risk of seroma than laparoscopic repair (23.3% vs 6.8%; \( P = 0.011 \)). Most seromas (71%) resolved spontaneously, while 29% (n=7) required ≥1 aspiration. Infection rates were higher in seroma patients versus those without seromas (29.1% vs 11.6%; \( P = 0.0499 \)). Infection rates were higher in drained seromas (57.1%; n=4) than nondrained seromas (17.6%; n=3) \( (P = 0.134) \). Hernia recurrence rates at 2 years were 12.5% and 9.9%, for patients with and without seromas, respectively \( (P = 0.715) \). Seroma patients had hernias that never spontaneously reduced (0% vs 21%; \( P = 0.015 \)), had more incisions preoperatively (2.4 vs 1.8; \( P = 0.037 \)) and were less likely to have drains (30% vs 63.1%; \( P = 0.011 \)).

By multivariate analysis, open VIH predicted seroma (OR, 5.5) as well as the Veterans Administration hospital at which the procedure was performed.

Reviewer's Comments: This study utilized a standardized surgical approach and postoperative management. Also, the study only looked at symptomatic seromas, and this diagnosis was determined by the operating surgeon. There are also newer mesh products that are more porous and incorporate into fascia better than the Dualmesh used in the laparoscopic approach. I have found that seromas are common, especially in the laparoscopic approach, and all that is needed to treat them is tincture of time. (Reviewer-Kathleen Christians, MD).

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Keywords: Ventral Hernia, Seroma, Predictors

Print Tag: Refer to original journal article
Diagnostic decision-making for patients with suspected PE in an ED setting is significantly improved with the use of a handheld decision-support system.

**Background:** In practice, the work-up for pulmonary embolism (PE) frequently differs from that recommended by evidence-based guidelines. Clinical probability estimates have previously been shown to be efficient, accurate, and safe.

**Objective:** To evaluate whether the use of a handheld clinical decision-support system is effective at improving the work-up and diagnosis of patients with suspected PE in the emergency department (ED).

**Design:** Nonblinded, cluster randomized trial.

**Participants/Methods:** This study involved 20 EDs in France assessing consecutive outpatients with suspected PE. A 6-month preintervention period, involving 1103 patients, preceded the actual trial; during this time, providers grew accustomed to inputting clinical data into handheld devices, and investigators assessed baseline testing. EDs were then randomly assigned to either activation of a handheld decision-support system (10 centers, 753 patients) or use of posters and pocket cards that displayed validated diagnostic strategies (10 centers, 1015 patients). The primary study outcome was appropriateness of the diagnostic work-up as determined by any sequence of tests that yielded a diagnostic probability of <5% or >85%. Secondary outcomes were strict adherence to guideline recommendations, number of tests per patient, and clinical outcomes at 3 months.

**Results:** Data were inputted in real-time for 557 patients (80%) in the handheld-based guidelines group and 369 patients (39%) in the paper guidelines group. The frequency of appropriate diagnostic work-ups increased in both the handheld decision-support system group and the paper guidelines group from the pre-intervention period to the trial period. However, this increase was statistically and clinically more significant in the handheld decision-support system group, with an absolute change of 30.2% in the handheld-based group versus 10.9% in the paper guidelines group; adjusted mean difference in increase, 19.3 percentage points favoring handheld-based guidelines (95% CI, 2.9 to 35.6 percentage points; \( P = 0.023 \)). The improvement occurred primarily among patients in whom PE was ruled out (\( P = 0.018 \)). In an analysis of patients with appropriate work-ups, the handheld-based guidelines group underwent significantly fewer tests per patient compared to the paper guidelines group (mean, 1.76 [SD, 0.98] vs 2.25 [SD, 1.04]; \( P < 0.001 \)).

**Conclusions:** Diagnostic decision-making for patients with suspected PE in an ED setting is significantly improved with the use of a handheld decision-support system.

**Reviewer’s Comments:** There is a growing movement coming from many different directions to standardize health care delivery in a quest to contain costs and provide evidence-based standard-of-care treatment consistently. For example, most hospitals have algorithms directing the physician on how to treat community- and hospital-acquired pneumonias. Although superficially appearing to be a good idea, the precise impact on clinical outcomes is not as conclusive. Case-in-point: this study was not designed to show a difference in the clinical outcomes of patients during follow-up. (Reviewer-Todd A. Kellogg, MD).

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Keywords: Pulmonary Embolism, Clinical Decision-Support System, Diagnosis, Guidelines

Print Tag: Refer to original journal article
Sodium Bicarbonate Does Not Prevent CIN in High-Risk Patients

Systematic Review: Sodium Bicarbonate Treatment Regimens for the Prevention of Contrast-Induced Nephropathy.
Zoungas S, Ninomiya T, et al:


There is no compelling evidence to support the use of sodium bicarbonate for the prevention of CIN in high-risk patients.

Background: Contrast-induced nephropathy (CIN) is a leading cause of hospital-acquired acute renal failure. Intravenous sodium bicarbonate has been proposed as a means to reduce the risk of CIN.

Objective: To determine the efficacy and safety of sodium bicarbonate as a preventive strategy for the risk of CIN.

Design: Meta-analysis.

Methods: A search of on-line databases was performed that included MEDLINE, PubMed, EMBASE, and the Cochrane Central Register of Controlled Clinical Trials, conference proceedings, and ClinicalTrials.gov without language restrictions. Included in the analysis were randomized, controlled trials of IV sodium bicarbonate, with the predefined outcome of CIN as a 25% increase in baseline serum creatinine level or an absolute increase of 0.5 mg/dL (44 µmol/L) after IV radiocontrast administration. Two reviewers independently abstracted data. Extracted data included patient characteristics (including comorbid disease potentially affecting renal function), type of imaging, type and dose of contrast material, periprocedural hydration protocol, specific CIN definition, treatment dose, requirement for dialysis, and the incidences of heart failure and death.

Results: 23 published and unpublished trials with information on 3563 patients and 396 CIN events were eligible for inclusion in the analysis; 14 studies were not yet published in peer-reviewed journals, but were presented at scientific meetings and reported in abstract form. The pooled relative risk of all studies was 0.62 (95% CI, 0.45 to 0.86), with evidence of significant heterogeneity across studies (I²=49.1%; P =0.004) at least partially due to differences between the treatment effect reported by published studies (RR, 0.43; CI, 0.25 to 0.75) and unpublished studies (RR, 0.78; CI, 0.52 to 1.17). In addition, statistical testing confirmed the presence of publication bias (Egger test; P =0.009). Other sources of heterogeneity were determined by meta-regression, which demonstrated that small studies (<15 events, <200 participants) of poor quality that assessed outcomes <48 hours after radioccontrast administration were more likely to suggest benefit (P<0.05 for all). No benefit was noted with the coadministration of N-acetylcysteine on CIN, nor were there any clear effects of treatment on the risk for dialysis, heart failure, and total mortality.

Conclusions: There is no compelling evidence to support the use of sodium bicarbonate for the prevention of CIN in high-risk patients.

Reviewer's Comments: This meta-analysis suggests that there has been a substantial publication bias and likely an intent-to-treat bias associated with previous studies favoring the benefits of sodium bicarbonate. Earlier reports appear to have overestimated this benefit while larger, more recent trials have not demonstrated a benefit. Moreover, the analysis is underpowered to assess clinical endpoints such as risk of dialysis, heart failure, and total mortality. As the authors acknowledge, large multicenter trials are necessary to definitively determine whether sodium bicarbonate has any value. (Reviewer-Todd A. Kellogg, MD).

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Keywords: Contrast-Induced Nephropathy, Prevention, Sodium Bicarbonate, Risk Factors

Print Tag: Refer to original journal article
Pain and Sensory Disturbances Persist After Breast Cancer Surgery

Prevalence of and Factors Associated With Persistent Pain Following Breast Cancer Surgery.

Gärtner R, Jensen M-B, et al:


Clinically significant pain and sensory disturbances are common and can persist 2 to 3 years after surgery for primary breast cancer treatment in Danish women.

Background: Chronic pain and sensory disturbances are relatively common sequelae following surgical treatment of breast cancer and represent an important clinical problem.

Objective: To assess the prevalence, severity, and any factors associated with persistent pain and sensory disturbances after surgical treatment of primary breast cancer.

Design: A nationwide cross-sectional questionnaire study.

Methods: A study questionnaire was sent to 3754 women aged 18 to 70 years who underwent surgery with or without adjuvant therapy for primary breast cancer in Denmark between 2005 and 2006. Questionnaire responders and nonresponders were placed into 1 of 12 groups based on specific treatment. Outcomes evaluated included prevalence, location and severity of persistent pain, and sensory disturbances. A pain scoring scale of 0 to 10 (0=no pain, 10=maximal pain) was used; mean follow-up was 26 months. The adjusted odds ratio (OR) of pain and sensory disturbances in relation to age, surgical technique, chemotherapy, and radiotherapy was determined.

Results: The questionnaire was completed and returned by 3253 of 3754 (87%) eligible women. A total of 1543 women (47%) reported pain in ≥1 location; the pain was severe (pain score, 8-10) in 13% (n=201), moderate (pain score, 4 to 7) in 39% (n=595), and mild (pain score, 1 to 3) in 48% of the women (n=733). Two factors were associated with persistent pain: young age (18 to 39 years: OR, 3.62; 95% CI, 2.25 to 5.82; \( P <0.001 \)) and adjuvant radiotherapy (OR, 1.50; 95% CI, 1.08 to 2.07; \( P =0.03 \)). Chemotherapy was not associated with persistent pain (OR, 1.01; 95% CI, 0.85 to 1.21; \( P =0.91 \)). There was no significant association of mastectomy compared to breast-conserving surgery in frequency of reported pain. However, patients reporting pain after mastectomy had a higher risk of moderate or severe pain (OR, 1.37; 95% CI, 1.00 to 1.87; \( P =0.048 \)). Compared with sentinel lymph node dissection, axillary lymph node dissection (ALND) was associated with increased pain risk (OR, 1.77; 95% CI, 1.43 to 2.19; \( P <0.001 \)) and was found to be a risk factor for moderate to severe pain (OR, 1.39; 95% CI, 1.03 to 1.88; \( P =0.03 \)). ALND was also associated with risk of sensory disturbances (OR, 4.97; 95% CI, 3.92 to 6.30; \( P <0.001 \)) as was young age (18 to 39 years: OR, 5.00; 95% CI, 2.87 to 8.69; \( P <0.001 \)). The location of reported pain was: breast area 86% (n=1331), axilla 63% (n=975), arm 57% (n=872), and side of the body 56% (n=857). Those with pain involving other parts of the body were at increased risk for pain in the surgical area (\( P <0.001 \)).

Conclusions: Clinically significant pain and sensory disturbances persist 2 to 3 years after surgery for primary breast cancer treatment in Danish women.

Reviewer's Comments: This study serves to emphasize the clinical problem of persistent pain after breast cancer surgery. The incredible 87% response rate and analysis of the nonresponders are study strengths. The relative homogeneous Danish population may make for somewhat dubious extrapolation of these findings to other populations. (Reviewer-Todd A. Kellogg, MD).

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Keywords: Breast Cancer, Surgery, Postoperative Pain, Factors, Sensory Disturbances, Allodynia, Hyperpathia

Print Tag: Refer to original journal article
Significant Variation in Practice of Tracheostomy Is Identified

Examination of Non-Clinical Factors Affecting Tracheostomy Practice in an Academic Surgical Intensive Care Unit.

Freeman BD, Kennedy C, et al:

Crit Care Med 2009; 37 (12): 3070-3078

Liberal use of tracheostomy is at odds with perceptions.

Background: There are no clear guidelines available for the timing of tracheostomy due to the lack of clear evidence of benefit. As a result, practice patterns vary widely across ICUs and among practitioners in the same ICU.

Objective: To examine nonclinical factors affecting the use of tracheostomy in an academic surgical ICU.

Participants/Methods: Data were prospectively collected on 539 patients requiring mechanical ventilation for 72 hours or more during the 40 month study period. Clinical and demographic information, including performance on spontaneous breathing trials days 4 and 9 after intubation were abstracted. In addition to these data, a web-based survey of the 13 intensivists and surgical trainees was completed to ascertain perceptions and perceived practice patterns. Tracheostomy practice in the ICU under study was compared to practice recorded in the project IMPACT database, a multi-institutional critical care database.

Results: 292 of the 539 patients underwent tracheostomy. These patients stayed longer in the ICU (median days, 20 vs 9; \(P < 0.001\)), had a longer time on mechanical ventilation (median days, 16 vs 6; \(P < 0.001\)), and were more likely to be reintubated (43.8% vs 29.5%; \(P < 0.001\)). These patients were also more likely to have an underlying diagnosis of trauma (\(P = 0.006\)). Tracheostomy was performed a median of 8 days following the start of mechanical ventilation; 41.5% of patients had passed at least 1 spontaneous breathing trial but had not been extubated. This varied significantly by intensivist (\(P < 0.001\)). Among the patients in the Project Impact database, 13.9% underwent tracheostomy, which was significantly lower than the percentage in the ICU under study. The survey response rate was 77% for attending intensivists and 66% for surgical trainees. Approximately 90% of intensivists attending and 97.6% of postgraduate trainees reported relying on the results of a spontaneous breathing trial for extubation. Approximately 72.6% estimated that no more than 25% of patients would have passed a spontaneous breathing trial without being extubated (recall that 41.5% of patients fell into this category in reality). Abnormal mental status was cited as the most common reason patients would fall into this category. Among the respondents, 58.8% felt that an acceptable benchmark for tracheostomy performance was 10% or less.

Conclusions: The authors conclude that significant variation exists within their unit with respect to tracheostomy practice, as well as significant discrepancy between perception and practice.

Reviewer's Comments: The authors have identified an area of significant practice variation; reduction in variation in general results in improved outcome. Given that the optimal timing of tracheostomy is unclear it is not clear what the authors will target in an attempt to reduce variation. Greater reliance on the results of the spontaneous breathing trial might be one place to start, as practitioners appear to endorse this in principle but do not routinely follow it in practice. (Reviewer-Karen J. Brasel, MD, MPH).

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Keywords: Tracheostomy, Practice Variation, Process Improvement

Print Tag: Refer to original journal article
Differences Between Clinical and Administrative Databases

Predicted Risk of Mortality Models: Surgeons Need to Understand Limitations of the University HealthSystem Consortium Models.

Kozower BD, Ailawadi G, et al:


Administrative databases rely heavily on postoperative complications for accurate prediction of mortality.

Background: One important aspect of University HealthSystem Consortium (UHC) mortality models is that they are based on discharge data.

Objective: To provide some information on the limitations of these mortality models compared to the Society of Thoracic Surgeons (STS) database.

Participants/Methods: All patients undergoing cardiac surgery at a single institution between January 2003 and January 2008 were identified. Mortality risk scores from the STS database were compared to mortality risk scores from the UHC database. Observed perioperative mortality and postoperative complications were identified from the STS database. Logistic regression analysis was utilized to calculate the probability of perioperative death using the STS mortality risk score as well as the UHC mortality risk score. The C statistic was used to evaluate the performance of each model. Patients were also ranked into deciles of predicted mortality using each database. The proportion of patients differing by ≥2 deciles was used as a measure of model agreement. Each model was re-evaluated using only patients without complications to determine the influence of postoperative complications on predicted mortality risk.

Results: 2,171 patients undergoing cardiac surgery during the 5-year study period, with mortality risk scores in both the STS and UHC databases, were identified. Overall mortality rate was 2.7%. Complications occurred in 29.6% of participants. The STS risk-adjusted mortality model explained 13% of the log-likelihood of mortality, while the UHC model explained 27%. The C statistic for the UHC model was 0.88 compared to a C statistic of 0.81 for the STS model, demonstrating that the UHC model was better able to discriminate between survivors and nonsurvivors. However, the STS model was much more accurate in predicting mortality at the highest level of risk. In the population of patients without postoperative complications, the performance of the UHC model declined significantly while the performance of the STS model changed little. The proportion of variability explained by the UHC model decreased from 27% to 1% and the C statistic decreased from 0.88 to 0.49 (a level no different from chance). The proportion of variability explained by the STS model in the subpopulation decreased from 13% to 5%, but the C statistic remained essentially the same.

Conclusions: The authors conclude that the UHC model performs well in the overall population and better than the STS model. However, this performance reflects the inclusion of postoperative complications, and for this reason the authors argue against using the model for benchmarking.

Reviewer's Comments: The balance between administrative databases, which are cheaper and have the advantage of using data already being collected, and clinical databases, which are much more expensive to create and maintain with the advantage of more accurate data, cannot be obtained at the expense of using inadequate, inaccurate, and potentially dangerous standards or benchmarks. (Reviewer-Karen J. Brasel, MD, MPH).

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Keywords: Mortality Models, Prediction

Print Tag: Refer to original journal article
Excessive sleep deprivation of attending surgeons may increase complication rates for some procedures.

**Background:** Extended-duration work hours for physician trainees are currently a way of life, but they have had some restrictions implemented. The application of restrictions to attending physicians is discussed, but not implemented.

**Objective:** To determine if sleep deprivation for attending surgeons and obstetricians/gynecologists correlate with complications.

**Design:** Retrospective, matched cohort study.

**Participants:** 86 surgeons and 134 obstetricians/gynecologists, who had performed a nighttime procedure, were studied. The 86 surgeons performed 919 procedures after a nighttime procedure and had 3,552 matched control procedures that were done without an antecedent nighttime procedure.

**Methods:** Surgeons who performed a nighttime procedure were identified. The cases performed were matched with procedures done by the same surgeon without a previous nighttime procedure. Complications recorded included infection, bleeding, organ injury, and wound failure. The time of surgical procedures was also captured. Sleep opportunity was defined as 0 to 6 hours or >6 hours based on the operative times for procedures done during the night call. The primary outcome was to compare complication rates among the cases done after nighttime procedures with those cases done without a nighttime procedure.

**Interventions:** Complications were identified by an administrative data base, confirmed by chart review, and then assessed for severity and preventability.

**Results:** General surgery and orthopedic services accounted for 56% of the nighttime cases. Overall complications were 7.5% for cases after night call and 7.8% for cases without a nighttime procedure. Preventable complications were found in 6% of post nighttime cases and 7% of control cases. There was no difference in rates for infection, bleeding, organ injury, or wound failure with all being approximately 20% to 25% in both patient groups. Complication rates were 8.5% when sleep opportunity was 0 to 6 hours compared to 3% when sleep opportunity was >6 hours.

**Conclusions:** Complication rates for surgical procedures done after a night call procedure were not increased until sleep opportunity time fell to <6 hours.

**Reviewer’s Comments:** Discussion about work hours for attending physicians has not really begun, but these data will be used by both sides of the discussion. The data can support no work-hour restrictions for attending surgeons or it can be used to support work-hour restrictions. The discussion will revolve around patient safety. You may choose to disagree with their data collection and analysis, but it is one of the first attempts to quantify this argument. I have been a night surgeon for many years and learned a long time ago not to schedule big cases after a call night. It is also helpful to have a partner who can pinch hit in a jam. Both these solutions are mentioned by the authors. I would suggest we need to be evolving new methods to deal with attending call schedules that acknowledge patient safety before we are told how we must control them. (Reviewer-John A. Weigelt, MD).

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Keywords: Patient Safety, Physician Trainees, Work Hours, Attending Physicians

Print Tag: Refer to original journal article
Choice of Antibiotic for Sepsis Important to Patient Survival

Initiation of Inappropriate Antimicrobial Therapy Results in a Fivefold Reduction of Survival in Human Septic Shock.

Kumar A, Ellis P, et al:
Chest 2009; 136 (November): 1237-1248

Twenty percent of patients treated for sepsis receive antibiotics that are not effective against the inciting bacteria.

**Background:** Inappropriate initial antibiotic therapy (antibiotics not effective against the causative organism) increases mortality in a number of clinical conditions. Whether this relationship holds true for sepsis is unknown.

**Objective:** To determine if empiric antibiotic choice correlates with survival in septic patients.

**Design:** Retrospective, multicenter study involving centers in Canada, U.S., and Saudi Arabia.

**Participants:** 5,715 patients met inclusion definitions of septic shock.

**Methods:** Appropriate antibiotics were defined as being effective against the bacteria isolated from the site of infection or blood. When cultures were negative, appropriate antibiotics were defined by suspected source and current published recommendations. The primary outcome was to correlate appropriate empiric antibiotic use with survival.

**Interventions:** Empiric antibiotic administration.

**Results:** The mean age of the case participants with septic shock was 62.5 ± 16.3 years. The most common sites of infection included lung (38%), intraabdominal (30%), genitourinary (11%), skin (8%), and bloodstream (3%). Source control information was present for 2,480 cases. Gram-negative infections were present in 49%, gram-positive infections in 33%, yeast infections in 12%, and anaerobic infections in 4%. Appropriate antibiotics were given to 80% of the patients. Urinary and skin infections were treated with appropriate antibiotics more commonly than lung or abdominal infections. Catheter-associated bacteremia and primary bacteremia had the lowest rate (69%) of appropriate empiric antibiotics. Fungal infections had the lowest rate of appropriate coverage at 44%. Overall survival was 44%. Inappropriate antibiotic treatment had a survival rate of 10% compared to a 52% survival for appropriate antibiotic treatment. Multivariate regression analysis revealed inappropriate antibiotic choice to increase the chance of death the greatest (OR, 8.99). Patient-related factors for death included older age and comorbidities. Urinary- and catheter-related bloodstream infections significantly reduced the odds of death. Interestingly, the choice of pressor for treatment had no effect on mortality.

**Conclusions:** Inappropriate empiric antibiotic treatment for septic patients increases overall mortality.

**Reviewer's Comments:** It appears that how we choose empiric antibiotics for a patient with suspected sepsis impacts survival rates. Choose wisely is what we should be doing and the plea of these authors. However, this observational study and its discussion offer little advice to reduce the 20% rate of inappropriate antibiotic choice. We are cautioned that our antibiotic choices are more inappropriate for some types of infection, but those data are not necessarily available when antibiotics are chosen. It is very interesting that the wrong antibiotics seem to negatively impact outcome even greater than patient comorbidities. All one can probably say is that the initial antibiotic choice should be broad and once bacteria are identified, the coverage can be narrowed. This concept is certainly espoused by most antibiotic guidelines. (Reviewer-John A. Weigelt, MD).

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Keywords: Sepsis Treatment, Antibiotics, Mortality

Print Tag: Refer to original journal article
Breast MRI increases mastectomy rates in newly diagnosed breast cancer patients.

**Background:** MRI is used to define the extent of disease in the ipsilateral breast and any disease in the contralateral breast in patients with a known diagnosis of breast cancer. The affect this diagnostic test has on subsequent treatment plans is unknown.

**Objective:** To determine if MRI in newly diagnosed breast cancer patients alters surgical decision making and to assess whether mastectomy rates increase with the use of MRI.

**Design:** Retrospective review of newly diagnosed breast cancer patients.

**Participants:** 1,444 patients were identified, of which 492 had a preoperative MRI and 952 did not; 441 MRI patients had complete records.

**Methods:** MRI characteristics were collected. Criteria for suspicious lesions included size, morphology, and contrast kinetics. The number of new lesions on MRI was reported. A change in management was defined when an initial multidisciplinary plan was changed based on MRI findings. A comparison was made of mastectomy rates between patients who had and who did not have a preoperative MRI.

**Interventions:** MRI was done preoperatively and surgery was either breast conservation surgery or mastectomy.

**Results:** 200 (45%) of the 441 (45%) MRI patients had a new lesion found; 131 of these patients had additional imaging and 67 had a biopsy for a suspicious lesion. Of these 678 patients, 42% had an additional malignancy found. Thus, 15% of the 441 patients had additional preoperative biopsies. A total of 117 patients (29%) had a change in surgical plan based on the MRI results. Fifty-one patients had a mastectomy after a plan for breast conservation therapy had been set, and 65% of patients with no further biopsy to confirm multicentric disease had unicentric disease on final pathology. The size of the MRI lesion and the presence of a new lesion were the only 2 criteria that correlated with a change in treatment plan. The mastectomy rate for MRI patients was 44% compared to 32% for the non-MRI patients.

**Conclusions:** Breast MRI increases mastectomy rates, and biopsy of MRI-identified lesions is necessary to avoid overtreatment.

**Reviewer’s Comments:** Breast MRI screening criteria have specific guidelines. The use of MRI after a diagnosis of breast cancer is made is less defined. While MRI detects new lesions in the ipsilateral and contralateral breast, the clinical significance of the lesions remains unclear. No strong evidence exists that more aggressive surgery for the MRI lesions improves patients’ outcomes. These authors suggest that MRI use does drive mastectomy rates to increase. They document over-treatment based on unicentric disease found on pathology when the MRI suggested multicentric disease. They caution against using MRI to direct therapy without secondary studies, including biopsy of the MRI lesions. Sound judgment as this imaging technique creeps into the mainstream of breast cancer management. (Reviewer—John A. Weigelt, MD).

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Keywords: Breast, MRI, Treatment Plans, Mastectomy

Print Tag: Refer to original journal article
Mesh closure of the abdomen is more common when multiple wash-outs are required.

**Background:** Damage control laparotomy with an open abdomen is used for trauma patients who develop acidosis, coagulopathy, and hypothermia. It is also used in emergency surgical cases, most commonly secondary to intra-abdominal infection with sepsis.

**Objective:** To determine outcomes among elderly general surgery patients managed with an open abdomen.

**Design:** Retrospective chart review.

**Participants:** 88 patients, with a mean age of 63 years, were included. Gross contamination of the peritoneal space was present in 29 patients.

**Methods:** The patients’ medical records were reviewed for pertinent data. The primary outcomes sought were the method of closure, morbidity, and mortality.

**Interventions:** Four techniques were used to manage an open abdomen: skin closure; Bogota bag closure; vacuum closure with drains and plastic drapes; and, commercially available vacuum dressings.

**Results:** Bowel perforation was the most common indication for surgery. Thirty-two patients were left open as part of a planned laparotomy. Abdominal closure occurred after 1 washout in 61% of patients, and primary closure was achieved in 51% of these patients. When >1 washout was required, mesh was used for abdominal closure in 70% of patients. No difference in closure rates was noted among the 4 different methods of dressing the open abdomen. The mean hospital stay was 43 days, with 50% of the stay in the ICU. The most common complication was ventilator-associated pneumonia in 34% followed by acute renal failure in 30%. Fistula occurred in 13% of patients and hernias were noted in 12% at discharge. Overall mortality was 34%, but increased to 73% when the indication for the open abdomen was hemodynamic instability.

**Conclusions:** The open abdomen technique can be applied to elderly nontrauma general surgery patients with acceptable morbidity and mortality.

**Reviewer’s Comments:** This is an interesting clinical paper that affirms the open abdomen technique is useful in elderly patients with intra-abdominal conditions. The findings that the technique of open abdomen closure did not alter closure rates is reassuring and suggests that simple methods can be used instead of more costly commercial methods. We most commonly use plastic sheets and drains for our open abdomen closures. However, the actual numbers of each type of closure are not given in this comparison. The outcomes based on indication for leaving the abdomen open are also encouraging. Patients with gross contamination did as well as patients who had elevated intra-abdominal pressures, suggesting that in patient with intra-abdominal infection, this technique is useful. Finally, the morbidity is what we would expect in this type of patient population. While not a technique that will be commonly employed, this report gives us confidence that it can be used successfully in the general surgery population. (Reviewer-John A. Weigelt, MD).

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Keywords: Nontrauma Patients, Open Abdomen Technique, Morbidity, Mortality

Print Tag: Refer to original journal article
Background: Statins decrease hepatic cholesterol biosynthesis and may lower the risk of cholesterol gallstones by reducing cholesterol concentration in the bile.

Objective: To study the association between statins, fibrates, and other lipid-lowering agents and to evaluate the risk of gallstones followed by cholecystectomy.

Methods: A case control analysis of the UK-based General Practice Research Database was conducted. Patients, ≥20 years of age with first-time gallstone disease or cholecystectomy between 1994 and 2008, were identified. All had to have a diagnosis of gallstone disease or a complication thereof and a record of cholecystectomy within 2 years or a cholecystectomy alone. Those with <3 years of active history in the database, alcohol or drug abuse, cancer, or HIV were excluded. Controls had no gallstones, clinical complications of gallstones, or cholecystectomy. Exposure to statins, fibrates, or other lipid-lowering agents was assessed. Confounders were matched and odds ratios (Ors) adjusted for smoking status, body mass index (BMI), ischemic heart disease, stroke, and estrogen use.

Results: Of the 27,035 patients and 106,531 matched controls, 2396 patients and 8868 controls were taking statins. Of those studied, 11,264 were taking statins, 1514 were on fibrates, and 1038 were on other agents. Most (87%) treated with lipid-lowering agents were on statins alone. The adjusted OR (AOR) of developing gallstones with cholecystectomy was 0.78 for current statin use and 1.19 for past statin use. Compared with nonuse of statins, the AOR for 1 to 4 current prescriptions was 1.10, 0.85 for 5 to 19 prescriptions, and 0.64 for ≥20 prescriptions. Findings were similar between the sexes regardless of age. Current long-term use of fibrates revealed an increased OR of 1.39 for developing gallstones followed by cholecystectomy. For those with hypercholesterolemia, long-term statin use was compared to short-term use (AOR, 0.58). Stratified by BMI, long-term statin use AOR versus short-term use was 0.58 for normal weight, 0.63 for overweight (BMI, 25 to 29.9) and 0.65 for obese patients (BMI ≥30). The risk of gallstone disease followed by cholecystectomy decreases after 1 to 1.5 years of statin treatment. Patients with long-term statin use have a reduced risk of gallstone disease followed by cholecystectomy compared to those without. The OR was not decreased until after 5 prescriptions (ie, 1 to 1.5 years). Diabetes, heart disease, and stroke did not alter the risk. The effect of statins on gallstone formation was independent of hypercholesterolemia. The risk for gallstone disease was increased with high BMI, estrogen use, and fibrate use.

Conclusions: Long-term use of statins was associated with a decreased risk of gallstones followed by cholecystectomy.

Reviewer's Comments: These results are based on a large validated database allowing substantial power. Comorbidities, drugs, and BMI were available, and sensitivity analyses were possible. However, it does not address confounding parameters, such as physical activity, diet, use of thiazide diuretics, and socioeconomic status. It is also observational, so causality between statins and gallstone disease cannot be definitely made.

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Keywords: Statins, Gallstones, Cholecystectomy

Print Tag: Refer to original journal article
Surgical Approaches for Recurrent Inguinal Hernias

Management of Recurrent Inguinal Hernias.
Itani KMF, Fitzgibbons R, et al:


For recurrent inguinal hernias, a laparoscopic posterior approach is the preferred approach after failed anterior repair, and anterior repairs are best after failed posterior laparoscopic or open repairs.

Background: Recurrence rates for inguinal hernias range from 2.4% (Lichtenstein repair) to 6.2% after primary nonmesh repair to 8.8% for reoperation after repair of a recurrence.

Objective: To address surgical options for recurrent hernias based on current literature, the primary repair, and the surgeon's expertise.

Design: Literature review and expert opinion.

Results: Hernia complication (strangulation or bowel obstruction) rates are one-fifth of 1% per year (primary and recurrent). Watchful waiting yields more pain with activity and worse performance on the physical component of the SF-36 (statistically insignificant). There were no consequences for delaying surgery, and outcomes were the same compared with immediate operation. Watchful waiting of a recurrent hernia is acceptable until symptoms evolve. The goal in open repair of a recurrence is to identify the original failure in coverage of the myopectineal orifice and cover it. Five principles of recurrent anterior hernia repair include: (1) do not depend on fascia to close or reinforce the defect; (2) reinforce the entire floor irrespective of the hernia type; (3) avoid tension; (4) avoid scarred or devascularized tissue in the repair; and (5) use a prosthetic to permanently reinforce the entire floor. Repair choice depends on the initial repair used. If just tissue, then either anterior or posterior approaches are acceptable. Anterior approaches are best after a failed posterior approach. Anchoring mesh to healthy fascia and the inguinal ligament is imperative. Nine percent of recurrences are actually femoral hernias. For primary repair, plugs are associated with chronic pain (6%), scrotal and pelvic plug migration, and erosion into viscera. Laparoscopic posterior repair is preferable after a failed anterior repair, allowing operation through unscarrered tissue, a minimally invasive approach, and a panoramic view of all potential hernia spaces. The presence of prosthetic material in the preperitoneal space makes the laparoscopic approach difficult, and if a flat mesh is placed in a posterior approach, it is best to leave this in place and place mesh over it. The transabdominal preperitoneal (TAPP) approach is associated with more port-site hernias and visceral injuries, but the totally extraperitoneal (TEP) approach results in more conversions. Relative contraindications to the laparoscopic approach are the risk of bleeding if anticoagulated and increased difficulty with prior preperitoneal dissection. Patients with large scrotal hernias and those with ascites are better treated by open repair. Among women diagnosed with indirect or direct hernia at initial operation, 42% are found to have a femoral hernia at reoperation. The surgeon's training and experience with an anterior or posterior approach determines the best and safest repair for the patient.

Reviewer's Comments: This study is based on the relatively little published data and expert opinion. It does nicely outline some surgical pitfalls for primary and recurrent inguinal hernia repairs, challenges when recurrences need to be fixed, and offers suggestions for surgical approaches to recurrences. (Reviewer-Kathleen Christians, MD).

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Keywords: Recurrent Inguinal Hernias, Repair, Laparoscopy, Open Repair

Print Tag: Refer to original journal article
Routine Radiographs in Mechanically Ventilated Patients Are Unnecessary

Comparison of Routine and On-Demand Prescription of Chest Radiographs in Mechanically Ventilated Adults: A Multicentre, Cluster-Randomised, Two-Period Crossover Study.

Hejblum G, Chalumeau-Lemoine L, et al:

Lancet 2009; 374 (November 14): 1687-1693

On-demand radiographs reduce radiograph use without compromising patient care in mechanically ventilated ICU patients.

Background: In mechanically ventilated patients, the routine use of daily chest radiography is suggested to uncover unsuspected but potentially life-threatening conditions. However, it has not been rigorously compared to an on-demand strategy.

Objective/Design: To compare these 2 strategies in a multicenter study.

Methods: 21 ICUs in France participated in the study using a randomized, crossover design. Prior to the study, one unit used an on-demand strategy for daily chest radiographs, and the remainder used a routine strategy. Patients were eligible if they were mechanically ventilated for any part of the day for at least 48 hours. In the routine strategy, patients received a daily chest radiograph regardless of clinical indication. In the on-demand strategy, patients received a chest radiograph only when indicated by a change in clinical status. The primary outcome was the mean number of chest radiographs per day of mechanical ventilation. Secondary outcomes were days of mechanical ventilation, length of ICU stay, and mortality.

Results: 424 patients were randomized to the routine strategy and 425 to the on-demand strategy. There were no baseline differences in age, simplified acute physiology score, or gender. There were 4607 chest radiographs done in the routine strategy (1.09 per patient-day of mechanical ventilation) and 3148 done in the on-demand strategy (0.75 per patient-day of mechanical ventilation, a 32% decrease; P <0.0001). A total of 3779 of those in the routine strategy were done during morning rounds and 780 were unscheduled; 2224 of the radiographs in the on-demand strategy were done during morning rounds and 893 were unscheduled. The difference in the number of unscheduled radiographs was not statistically significant. There was no difference in the number of chest radiographs with new findings or those that led to diagnostic procedures or therapeutic interventions (728 radiographs leading to 824 interventions in the routine group and 729 radiographs leading to 834 interventions in the on-demand group). There was no difference in the days of mechanical ventilation, ICU length of stay, or mortality.

Conclusions: The authors conclude that an on-demand strategy is preferred to a routine strategy for chest radiographs as it reduces resource consumption without compromising patient care.

Reviewer's Comments: Although a formal cost analysis was not done in this case, the lack of a significant increase in unscheduled radiographs makes it unlikely that personnel costs would increase significantly. In an on-demand strategy, each study is ordered as a result of clinical signs and/or symptoms. In addition to the benefit from a resource consumption standpoint, this strategy is optimal from a physician practice standpoint and might very well benefit patient care. At the very least, we can be assured that patient care is not harmed from an on-demand strategy for obtaining chest radiographs in ventilated ICU patients. (Reviewer-Karen J. Brasel, MD, MPH).

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Keywords: Chest Radiographs, Mechanical Ventilation, Resource Consumption

Print Tag: Refer to original journal article
Extreme Variability in Practice of Sedative Use

Use of Intravenous Infusion Sedation Among Mechanically Ventilated Patients in the United States.

Wunsch H, Kahn JM, et al:

Crit Care Med 2009; 37 (December): 3031-3039

Propofol is used more often than benzodiazepines for IV sedation in mechanically ventilated patients.

**Background/Objective:** The Society of Critical Care Medicine (SCCM) has guidelines for the use of sedation in critically ill patients. Wunsch et al report on the current practice of IV sedation in mechanically ventilated patients in U.S. ICUs.

**Methods:** Data from the Project IMPACT database were retrospectively analyzed. This voluntary database is a clinical database with information collected by on-site data collectors certified to assure data accuracy. Patients entered from 2001 through 2007 and requiring mechanical ventilation were included, excluding patients from coronary care units and military hospitals. Readmissions, as well as patients <18 years of age, were also excluded. Data on bolus medication were incomplete, therefore only patients receiving IV infusions for sedation were included. Patients were grouped according to sedative received—no infusion, propofol only, benzodiazepines only, or a combination of medications.

**Results:** 109,671 patients received mechanical ventilation (this was 39.6% of all ICU patients in the database), and 56,443 patients received some type of IV infusion sedation. Propofol was used in 82.2%, benzodiazepines were used in 31.1%, and dexmedetomidine was used in 4%. Those receiving IV infusion were younger (57.1 vs 63.2 years; \( P < 0.001 \)), were more likely to have an underlying medical versus surgical diagnosis (60.7% vs 53.4%; \( P < 0.001 \)), and were ventilated for a longer period of time (median, 2.4 days vs 0.8 days; \( P < 0.001 \)). A total of 66.2% of patients received only propofol and 16.2% received only benzodiazepines. All variables examined, except race, were significantly associated with receiving an IV infusion; these included gender, admission type, presence of chronic comorbidities, diagnosis on admission, admission year, hospital location, type, and number of beds, and intensivist staffing model. The use of continuous sedation increased over time. The mean length of propofol use was 2.8 days compared to 4.2 days for midazolam and 4.5 days for lorazepam. Twenty-five percent of patients receiving propofol also received a narcotic infusion compared to 67% of patients receiving a benzodiazepine infusion.

**Conclusions:** Sedation with propofol is much more common than sedation with either benzodiazepines or dexmedetomidine, even in patients requiring mechanical ventilation for >96 hours.

**Reviewer's Comments:** These data highlight the extreme variability in the practice of sedative use, despite the guidelines recommended by the SCCM. It is unfortunate that information on bolus IV use was not available, as bolus benzodiazepine use is much more common than bolus propofol use and is one of the options recommended for longer-term sedation. The lack of these data makes it likely that benzodiazepine use is severely underestimated. Perhaps more important than the type of sedative used, particularly for short-term sedation, is the use of a sedative-free period and the use of targeted sedation in attempts to minimize time on the ventilator and ventilator-associated pneumonia. (Reviewer-Karen J. Brasel, MD, MPH).

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Keywords: IV Sedation, Mechanical Ventilation

Print Tag: Refer to original journal article
TEM is safe and effective in the treatment of adenoma and pT1 carcinoma and is associated with less morbidity and equivalent recurrence rates when compared to the conventional surgical approach.

**Background:** Transanal endoscopic microsurgery (TEM) is a potential alternative to transabdominal resection in select cases of rectal neoplasms.  

**Objective:** To validate a TEM approach to rectal neoplasms by determining disease recurrence and complication rates.  

**Design:** Retrospective review of a prospective database.  

**Methods:** Indications for TEM were adenoma, early carcinoma, rectal ulcers, carcinoid tumors, gastrointestinal stromal tumors, and leiomyosarcoma (extraperitoneal). A full-thickness excision was made on the rectal wall to the perirectal fatty tissue, and the wound was closed with running sutures. Patients with benign lesions were followed by digital examination and proctoscopy every 3 months for the first year and every 6 months thereafter. Patients with malignant lesions were followed by tumor markers every 3 months for the first year and annually thereafter; full colonoscopy was performed at 1 year, and endoscopic ultrasound and computed tomography were performed at 6, 12, and 24 months. Local recurrence was defined as any biopsy-proven recurrence diagnosed >6 months after TEM. Data collected included operating time, hospital length-of-stay (LOS), recurrence rate, oncologic outcome, and morbidity and mortality.  

**Results:** 300 patients underwent TEM between January 1993 and January 2007 at a single institution. Indications for TEM were adenoma (n=222), carcinoma (n=47), rectal ulcer (n=4), carcinoid tumor (n=2), gastrointestinal stromal tumor (n=1), and leiomyosarcoma (n=1); 23 tumors (5 adenomas and 18 carcinomas) were referred for TEM after failed attempts at complete endoscopic removal. The mean operating time was 66.4 ± 42.8 minutes (range, 15 to 240 minutes). Unintentional opening of the peritoneum occurred in 13 (4.3%) cases; 10 were treated with direct suturing and 3 required conversion to either a laparoscopic (n=1) or open (n=2) approach for anterior resection. The conversion rate was 1.0% (3/300). No intraoperative blood transfusions were necessary. The overall morbidity rate was 7.7% (n=23) and consisted of rectal bleeding (n=11), suture dehiscence (n=5), rectovaginal fistula (n=4), parietal abscess (n=1), major incontinence (n=1), and rectovesical fistula (n=1). Mortality at 30 days was nil. Mean hospital LOS was 5.0 days (range, 2 to 14 days). Histology confirmed carcinoma was observed in 90 patients. At a mean follow-up of 60 ± 33 months (range, 14 to 162; median, 51 months), the recurrence rate was zero in pT1, 24% in pT2, and 50% in pT3 cancers. The overall estimated 5-year survival rate was 87%, and the 5-year disease-free survival rate was 82%.  

**Conclusions:** TEM is safe and effective in the treatment of adenoma and pT1 carcinoma. Compared to the conventional surgical approach, TEM is associated with fewer complications and equivalent recurrence rates.  

**Reviewer’s Comments:** The low morbidity of TEM compares favorably to the abdominal approach while the local recurrence rates compare favorably to standard local excision via endoscopic visualization. Still, randomized trials will be necessary to determine whether this approach can be safely used for more advanced tumors. (Reviewer-Todd A. Kellogg, MD).  

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Keywords: Transanal Endoscopic Microsurgery; Rectal Adenoma; Rectal Adenocarcinoma.

Print Tag: Refer to original journal article
Perioperative IV glutamine administration has no impact on postoperative complications or mortality in well-nourished gastrointestinal cancer patients.

**Background:** Small randomized studies examining perioperative glutamine supplementation have demonstrated a nonstatistically significant trend in the reduction of postoperative infections.

**Objective:** To determine the effects of perioperative IV glutamine supplementation on postoperative morbidity in elective surgical patients.

**Design:** Nonblinded, randomized trial.

**Methods:** Between July 2005 and December 2007, 428 candidates for elective major gastrointestinal surgery for cancer were eligible. Eligible patients were >18 years of age, well-nourished (<10% weight loss in the 6 months preceding surgery), did not have substantial liver, kidney or pulmonary disease, did not have no active infection, and were not immunosuppressed. Patients received either IV infusion of L-alanine-L-glutamine dipeptide (0.40 g/kg per day; equal to 0.25 g of free glutamine; Ala-Glu group, n=212), or vehicle only (control group, n=216). Glutamine infusion began 1 day preoperatively and continued postoperatively for ≥5 days. Postoperative supplemental nutrition was provided if necessary after 7 days. Complications were assessed for 30 days postoperatively. A major complication was defined as necessitating the patient to return to the ICU or undergo reoperation.

**Results:** Patient characteristics (age, gender, body mass index [BMI], percentage of weight loss, nutritional parameters, comorbid disease, American Society of Anesthesiologists [ASA] score, surgical procedures, duration of operation, operative blood loss, and need for blood transfusion) were similar between the 2 groups. Glutamine was administered for an average of 7.1 days; postoperative plasma glutamine levels were significantly increased in the Ala-Glu group on days 1, 3, and 5. The overall rate of postoperative complications was 34.9% (n=74) for the Ala-Glu patients and 32.9% (n=71) for the control patients. Infectious complications occurred in 41 patients (19.3%) in the Ala-Glu group and 37 patients (17.1%) in the control group (P =0.55). Sixteen patients (7.5%) in the Ala-Glu group experienced a major complication, while 17 patients (7.9%) in the control group had a major complication (P =0.90). The mean hospital length-of-stay was 10.2 days for the Ala-Glu group and 9.9 days for the control group (P =0.90). There was no difference between the 2 groups in the number of patients requiring postoperative supplemental enteral or parenteral nutrition (Ala-Glu, 13.2% [n=28] vs controls, 12.0% [n=26]) (P =0.71). Four patients (1.9%) died in the Ala-Glu group and 3 patients (1.4%) died in the control group (−1.92 to 2.92, 95% CI; P =0.98).

**Conclusions:** Perioperative IV glutamine administration has no impact on postoperative complications or mortality in well-nourished gastrointestinal (GI) cancer patients.

**Reviewer’s Comments:** Theoretically, perioperative glutamine administration in surgical GI cancer patients seems like a potentially useful intervention. However, the quest for a use for supplemental glutamine seems like a treatment searching for a disease. So far, at least in this cohort of patients, a disease correctable by this intervention has not yet been discovered. As the authors suggest, perhaps glutamine supplementation in patients who have a higher glutamine demand will benefit, such as those with severe weight loss and a high risk of surgical morbidity. (Reviewer-Todd A. Kellogg, MD).

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**Keywords:** Perioperative Care, Glutamine, Complications, Major Abdominal Surgery

**Print Tag:** Refer to original journal article