Upper extremity DVT associated with central lines resolves better after catheter removal.

**Background:** Upper extremity deep venous thrombosis (DVT) is commonly associated with central venous lines. The clinical significance of upper extremity DVT continues to be elucidated. Since central venous access is ubiquitous in our patients, having an understanding of the natural history of these DVT cases would be helpful.

**Objective:** To determine how often an upper extremity DVT resolves and what factors influence resolution.

**Design:** Retrospective chart review of patients with symptomatic upper extremity DVT who had an ultrasound evaluation.

**Participants:** 243 patients (14%) had an upper extremity DVT in a population of 1761 patients. Overall, 101 patients had their DVT associated with a central venous catheter.

**Methods:** Charts were reviewed for demographics, types of catheter, placement of catheter, management of catheter including anticoagulants, and outcomes.

**Results:** Diagnosis in the 101 patients included malignancy (34%), injury (34%), and hypercoagulable state (11%). The 2 most common catheters were a peripherally inserted central line (40) and central venous access line (30). The average number of ultrasound exams was 1.7 (range, 1.0 to 10.0). Complete resolution of the thrombus occurred in 52% of patients when the catheter was removed. Resolution occurred in 38% of catheters treated with anticoagulants. Use of anticoagulation and catheter removal did not increase resolution rates. Renal failure predicted a lower resolution rate. Duration of catheter use did not correlate with resolution rates. Pulmonary embolus was found in 5 patients and 3 of these patients also had a lower extremity DVT.

**Conclusions:** Catheter removal is the best method to resolve an upper extremity central vein clot or DVT.

**Reviewer's Comments:** While our use of central venous access has decreased in critical care areas, use of peripherally inserted central venous catheters has increased, at least in our institution. Additionally, access for renal dialysis adds another patient group that needs central access. Thus, we are all seeing more upper extremity DVT and how we manage this condition is anything but clear. It is common and it can be symptomatic as the patients were in this study. It can also be asymptomatic. It can cause a pulmonary embolism, although this risk is poorly documented. Does anticoagulation play any role in the management of these catheters? There are lots of questions and few answers. Our approach is not standardized and we have people who always use anticoagulants when these catheters are in place and those who do not use anticoagulants if a large clot is found. The one take-home message from this report seems to exude common sense. Clot resolution is best achieved by catheter removal. This is the first step if at all possible. The rest of an evidence-based management scheme will just have to wait for more data. (Reviewer-John A. Weigelt, MD).

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Keywords: Upper Extremity DVT, Resolution

Print Tag: Refer to original journal article
Time for a Change of Surgical Prep?

Chlorhexidine-Alcohol Versus Povidone-Iodine for Surgical-Site Antisepsis.

Darouiche RO, Wall MJ Jr, et al:


Chlorhexidine scrub lowers SSI rates compared to prep with povidone-iodine.

**Background:** Surgical site infection (SSI) remains a major nosocomial threat to surgical patients. Proper antibiotic use, preoperative showering with antiseptics, and appropriate skin preparation are mainstays in preventing SSI. Chlorhexidine scrubs lower catheter-related bloodstream infection, and perhaps the same product would lower SSI rates over povidone-iodine skin preparations.

**Objective:** To compare SSI rates when skin preparation is performed with povidone-iodine or chlorhexidine-alcohol.

**Design:** Prospective randomized multi-institutional clinical trial.

**Participants:** 849 patients having an elective surgical procedure that was classified as clean-contaminated. Overall, 409 patients received chlorhexidine and 440 received povidone skin preps.

**Methods:** Patients were followed for 30 days. Phone contact was maintained weekly after discharge. Perioperative care including antibiotics and showering was monitored and similar between groups. The primary outcome was SSI rates at 30 days using CDC definitions. Secondary outcomes included assessment of infection rates by procedure and microbiology of the SSIs.

**Interventions:** Chlorhexidine was applied as a 2% solution in alcohol and the povidone-iodine (10%) was applied as a scrub and paint. Baseline infection rate was 14% at the 6 participating hospitals.

**Results:** The overall rate of SSI was 9.5% in the chlorhexidine patients compared to 16% in the povidone-iodine patients. Superficial SSI rates were 4% for chlorhexidine and 9% for povidone-iodine. Deep SSI rates were 1% for chlorhexidine and 3% for povidone-iodine. Organ space infections were not different between groups. Adverse events were similar. There was a 3-fold increase in SSI among patients having small intestinal procedures after povidone-iodine skin prep. Most common bacteria isolated were gram positives, although 38% were polymicrobial. No difference in isolated bacteria was found between groups.

**Conclusions:** Patients having a surgical prep using chlorhexidine-alcohol had lower SSI rates than patients who had povidone-iodine prep.

**Reviewer's Comments:** This is an interesting study that I suspect will be--or is being--debated in a number of institutions right now. We have changed our prep for central venous line insertion, so do we now change our surgical prep? The explanation offered for chlorhexidine superiority is quicker kill, less inactivation secondary to protein substances, and residual effect--all possibilities. The methods appear to be valid although the infection rates in some procedures seem mighty high--30% for small intestinal procedures with povidone. A closer look at the appendices in this paper may be necessary to convince all of us that a change is necessary. Of note, we are reminded again that perioperative management does not appear to have an effect on organ space infections since the rate is equivalent in both patient groups. (Reviewer-John A. Weigelt, MD).

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Keywords: Surgical Antisepsis

Print Tag: Refer to original journal article
Decolonization of MRSA Carriers Reduces SSI Rates

Preventing Surgical-Site Infections in Nasal Carriers of Staphylococcus aureus.

Bode LG, Kluytmans JA, et al:

Rapid screening for *S aureus* and decolonization with mupirocin and chlorhexidine can reduce SSI rates.

**Background:** *Staphylococcus aureus*, whether methicillin-sensitive or resistant, remains one of the most common pathogens for surgical patients. This bacterium is ubiquitous on our skin and nares.

**Objective:** To determine whether decolonization with mupirocin and chlorhexidine of patients could reduce surgical site infections (SSI).

**Design:** Randomized double-blind placebo-controlled multicenter trial.

**Participants:** 6771 patients were screened for *S aureus* by polymerase chain reaction (PCR) and 1251 were positive. Overall, 917 patients were enrolled in this study--504 were decolonized and 413 were placebo-treated.

**Methods:** Patients were screened on admission or the week before admission. PCR results were used to enroll patients and nasal swabs were sent for culture. Patients were followed for any hospital-acquired infection while in the hospital and cultures were obtained. Follow-up was for 6 weeks. The primary outcome was the incidence of SSI and comparing infecting strains of *S aureus* to the nasal strains.

**Interventions:** Mupirocin was given nasally twice daily and chlorhexidine was used as a whole body wash daily for 5 days.

**Results:** All strains isolated on nasal swabs were sensitive to methicillin and mupirocin. *S aureus* SSI occurred in 17 treated patients (3.4%) compared to 32 of the placebo patients (7.7%). The mupirocin/chlorhexidine had the greatest effect on deep SSI (0.9% vs 4.4%). The time to infection was also shorter in the placebo patients. In total, 47 of 49 infecting *S aureus* strains were available for molecular testing and 37 were endogenous. The number of patients who would need to be screened was 250 and the number treated was 23 to prevent 1 hospital-acquired infection.

**Conclusions:** Rapid screening for *S aureus* and decolonization with mupirocin and chlorhexidine can reduce SSI rates.

**Reviewer’s Comments:** This will certainly raise the question again about universal screening for surgical patients. While no cost-effective analysis was offered, the suggestion that screening 250 patients and treating 23 would prevent a hospital-acquired infection is certainly a strong impetus to adopt this strategy to reduce SSI rates. A number of issues should be thought through carefully. The first is that no MRSA strain was isolated. Mupirocin and chlorhexidine should be effective against this strain, but criticism could be raised regarding effectiveness if MRSA is the predominant pathogen. The time of the infection is also interesting. The 2 groups appear to diverge at approximately 10 to 13 days based on Figure 3 of the article. This suggests a residual effect of the decolonization, which is not addressed by the authors and is confusing to me. Thus, the 5-day decolonization did not reduce the SSI rate in the first 2 weeks--but after this. I’m not sure why that would be. Regardless, this is a well-done study and one that will force most of our hospitals to rethink decolonization. (Reviewer-John A. Weigelt, MD).

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Keywords: Surgical Site Infections, *S aureus*, Rapid Screening, Decolonization

Print Tag: Refer to original journal article
Mesh Choice Does Make a Difference

In Vivo Evaluation of Bacterial Infection Involving Morphologically Different Surgical Meshes.

Engelsman AF, van Dam GM, et al:

Ann Surg 2010; 251 (January): 133-137

Monofilament mesh reduces bacterial persistence and spreading compared to multifilament and PTFE (hydrophobic) meshes in this animal model.

Background: Mesh is used in hernia repairs at least 50% of the time. Infection remains a lifetime risk once the mesh is implanted. That infection risk is reported to range from 1% to 16% in clinical reports with limited follow-up. Whether one mesh is better than another in resisting infection remains a debate.

Objective: To determine if different meshes have different characteristics regarding bacterial proliferation after inoculation.

Design: Prospective animal study in which 60 mice were divided into 6 groups of 10.

Methods: 6 different mesh products were studied. A monofilament polypropylene (SurgiProMesh), a multifilament polypropylene (SurgiPro), a titanium-coated monofilament polypropylene (TiMESH TC), a multifilament polyester (Mersilene), a multifilament polytetrafluoroethylene (PTFE-Bard), and an expanded PTFE (Gore-Tex). The surface area ranged from 4.29 to 0.077 per cm2. The mesh was contaminated with a bioluminescent strain of Staphylococcus aureus before implantation. A threshold value for the bioluminescence was determined immediately after implanting the mesh and a 10-fold increase was used to identify areas of bacterial activity. The degree of infection was determined by the amount of bioluminescence: the intensity was used to determine amount of bacterial growth and the area was used to determine spread of the infection. Follow-up was for 10 days.

Interventions: The mesh was implanted into subcutaneous pockets that were 2 cm in depth via a 1-cm incision.

Results: The polyester mesh showed a radiance that fell below threshold values in 9 of 10 mice. Compared to polyester mesh, the other meshes showed a high bioluminescent signal for a longer period of time, which was statistically significant. The signal actually increased over the 10-day period for the PTFE meshes. Monofilament polypropylene mesh had a lower signal for spread of the infection compared to all other meshes except the expanded PTFE.

Conclusions: Monofilament mesh reduces bacterial persistence and spreading compared to multifilament and PTFE (hydrophobic) meshes in this animal model.

Reviewer's Comments: Mesh infection is a complication neither patient nor surgeon wishes to confront. Recent clinical observations suggest that monofilament mesh may provide some protection against infection compared to other mesh types. While I do not routinely include animal studies in PRGS, this report seemed timely and important. I doubt if we will ever see a randomized clinical study of different mesh products, so this study may be the closest we get to objectively reviewing the infection potential of mesh types. The authors suggest that the greater surface area with multifilament meshes is a reason for this difference. They also suggest that the lack of incorporation of the PTFE products makes bacterial spreading easier. Only time will tell how this information will play out in the clinical arena. (Reviewer-John A. Weigelt, MD).

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Keywords: Mesh Choice, Bacterial Challenge

Print Tag: Refer to original journal article
Clinical presentation correlates with presence of invasive cancer in patients with intraductal papillary mucinous neoplasm of the pancreas.

**Background:** The optimal treatment for patients with intraductal papillary mucinous neoplasm of the pancreas (IPMN) has not been established. In retrospective series, 40% to 60% of IPMN patients have invasive cancer. **Objective:** To correlate preoperative clinical presentation and diagnosis (benign IPMN vs invasive) and ultimate patient outcome. **Methods:** Patients surgically treated for IPMN from 2002 to 2008 and patients from a pathological revision of pancreatic cancer specimens from 1995 to 2001 were included. Three groups were created and compared based on preoperative diagnosis. Group 1 included asymptomatic incidental IPMN, group 2 contained symptomatic IPMN, and group 3 included symptomatic patients with IPMN and pancreatic cancer (mass or endoscopic ultrasound-guided biopsy demonstrating adenocarcinoma). **Results:** Of 62 total patients, group 1 contained 19 patients, group 2 had 23 patients, and group 3 included 20 patients. The age difference between benign and invasive IPMN was 66.7 years versus 73.8 years; \( P = 0.018 \). Clinical presentation for groups 2 and 3 included abdominal pain (56% vs 32%), weight loss (8% vs 52%), jaundice (4% vs 60%), pancreatitis (22% vs 5%), and new-onset diabetes (14% vs 44%). There were 3 perioperative deaths (4.8%). IPMN was found in the background of 23 of 217 (10.6%) ductal adenocarcinomas. One patient in group 1 (5.2%), 2 in group 2 (8.6%), and all in group 3 had invasive cancer. Five-year disease-free survival and overall survival for patients with noninvasive IPMN was both 92% compared with 47% and 41%, respectively, for those with invasive IPMN (mean follow up, 37.6 months). **Discussion:** 37% had invasive cancer within IPMN. Median age difference between benign and invasive IPMN patients suggests a 5- to 10-year interval to development of invasive cancer. No single imaging modality differentiates benign from malignant IPMN with absolute accuracy. Patients with asymptomatic lesions and IPMN without a suspicious lesion are at low risk (5%) for harboring invasive cancer. Symptomatic patients have a higher risk for cancer (approximately 50% in groups 2 and 3). However, lack of symptoms and radiological stigmata of cancer does not exclude the presence of invasive cancer, nor future malignant transformation. Patients with noninvasive IPMN have a small, but real, risk of developing invasive or noninvasive IPMN in the remaining pancreas after complete margin-negative resection. **Conclusions:** Benign IPMN can usually be differentiated from adenocarcinoma preoperatively and clinical presentation correlates well with disease course. **Reviewer's Comments:** This small study included only patients with presumed IPMN treated surgically and raised more questions than it answered. Intraoperative methods to determine resection extent were not routinely used nor was re-resection of positive margins (high-grade dysplasia or adenocarcinoma [18%]) mentioned. Ten percent were pathology other than IPMN. The key to managing IPMN is catching the disease prior to malignant transformation (molecular level). Waiting for symptoms or a mass lesion to arise means that, in this study, approximately 50% will already have invasive cancer. (Reviewer-Kathleen Christians, MD).

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Keywords: Pancreatic Cancer, IPMN, Clinical Presentation

Print Tag: Refer to original journal article
Asymptomatic cysts with benign radiologic and/or EUS features may be safely followed clinically and with serial high-resolution imaging.

**Background:** Management of incidental pancreatic cysts is not well established due to lack of information on their natural history.  

**Objective:** To characterize outcomes of asymptomatic patients with incidental pancreatic cysts who underwent endoscopic ultrasound (EUS) ± fine needle aspiration (FNA).  

**Methods:** Only asymptomatic patients with incidental pancreatic cysts were included. Those meeting study criteria were contacted by telephone, or their referring physicians were contacted. Follow-up imaging was reviewed to assess lesion progression. Size >3 cm, solid component, pancreatic duct (PD) >3 mm, or abnormal appearing and macrocystic septation were considered malignant EUS features. Cyst fluid was analyzed for carcinoembryogenic antigen (CEA) and cytology. Follow-up CT, MRI, and EUS were analyzed and presence of any change in morphology, solid component, PD dilatation, biliary obstruction, involved adjacent organ, or size increase were considered malignant features.  

**Results:** Of 317 patients who underwent EUS, 97 were asymptomatic and 93 were contacted. Seventy-one of 93 were not operated on and 69 of 71 were alive and asymptomatic (mean follow-up, 44 months, range, 6 to 123). Two died of unrelated causes. Twenty-two were resected and excluded. Of the asymptomatic patients, most (76%) were female with a mean age of 68 years. FNA was performed in 33 of 71 (46%) and 94% had CEA levels <192 ng/mL. Two with CEA levels >192 (5000 ng/mL and 7720 ng/mL) have remained asymptomatic for 7 and 2 years, respectively. Of the 71 patients, 45 had follow-up imaging and none had progression. Four had complete lesion resolution. Twenty-two of 93 contacted patients underwent surgery, 60% of lesions were premalignant and 2 were adenocarcinomas. **Discussion:** Incidental pancreatic cysts with benign EUS features, size <3 cm, lack of solid component, normal-appearing PD, and CEA <192 ng/mL had favorable outcomes with absence of symptoms and death in a mean follow-up of 44 months.  

**Conclusions:** EUS provides prognostic information for patients with small incidental pancreatic cysts. Asymptomatic cysts with benign radiologic and/or EUS features may be safely followed clinically and with serial high-resolution imaging.  

**Reviewer's Comments:** The discussion contains a nice literature review and conclusions follow general national consensus; however, the study lacks supporting data. EUS/FNA was only performed in 46%, final pathology was only available for 24%, and only 63% had follow-up imaging to review. It is difficult to draw definitive conclusions when so much information is missing. (Reviewer-Kathleen Christians, MD).
Antibiotics may be used as primary treatment for uncomplicated appendicitis in selected patients, but due to methodological issues and a high crossover rate, antibiotics are unlikely to become the gold standard over traditional surgical treatment.

**Objective:** To perform a meta-analysis comparing antibiotic therapy alone versus surgical treatment for appendicitis.

**Methods:** Medline, Cochrane, and EMBASE were searched for all randomized controlled trials comparing antibiotic therapy to surgical therapy for uncomplicated appendicitis. Patients with peritonitis or suspected perforation were excluded. Primary outcome of the meta-analysis was complications, which included major complications such as reoperation, abscess, hernia, small bowel obstruction, thromboembolic complication, cardiac complications, and need for ileocecal resection. It also included minor complications, including *Clostridium difficile* infection, wound infection, anesthetic complications, bladder dysfunction, diarrhea, fungal infection, and prolonged postoperative course. Review Manager Version 5 software was used to perform the analysis; the “related article” function was used to identify articles not captured with the search strategy.

**Results:** There were 3 randomized controlled trials with 669 patients that met inclusion criteria. In total, 350 patients were initially randomized to antibiotic therapy. These patients received 1 to 2 days of intravenous antibiotics (cefotaxime and metronidazole or cefotaxime and tinidazole) followed by 8 to 10 days of oral antibiotics. Patients with increasing pain, peritonitis, or other signs of perforation underwent operation. Overall, 238 patients successfully completed this treatment. In 1 of the trials, 96 patients initially randomized to antibiotic treatment crossed over to the surgery arm prior to any treatment. In the other 2 studies, patients crossed over to surgery only after failure of antibiotic therapy. There were 38 recurrences in the 238 patients with successful initial treatment; 35 of these underwent appendectomy and 3 were treated with antibiotics. Two hundred patients remained asymptomatic at 1 year of follow-up. The 394 patients randomized to surgery underwent either open or laparoscopic appendectomy. Ten patients initially randomized to surgical treatment in 1 trial crossed over to the antibiotic arm. A total of 357 patients had appendicitis on pathologic diagnosis. There was no difference in complications by treatment, with a relative risk for treatment with antibiotics of 0.43 (0.16 to 1.18). There was no difference in hospital length of stay, with an average of 3 days.

**Conclusions:** Antibiotics may be used as primary treatment for uncomplicated appendicitis in selected patients, but due to methodological issues and a high crossover rate, antibiotics are unlikely to become the gold standard over traditional surgical treatment.

**Reviewer’s Comments:** One of the problems with this dataset is that it is difficult to tell which patients will be successful with antibiotic treatment alone--there are not enough patients in this study for adequate subgroup analysis. It is somewhat reassuring to know that there is an alternative option in patients with a relative contraindication to surgery. However, this meta-analysis is unlikely to affect current practice patterns or recommendations for patients with uncomplicated appendicitis. (Reviewer-Karen J. Brasel, MD).

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Keywords: Antibiotic Treatment, Meta-Analysis, Appendicitis

Print Tag: Refer to original journal article
The Predictive Ability of the Revised Cardiac Risk Index

Systematic Review: Prediction of Perioperative Cardiac Complications and Mortality By the Revised Cardiac Risk Index.

Ford MK, Beattie WS, Wijeysundera DN:

Ann Intern Med 2010; 152 (January 5): 26-35

The RCRI discriminates moderately well between patients at low versus high risk for cardiac events after mixed noncardiac surgery, but it does not perform well at predicting cardiac events after vascular noncardiac surgery or at predicting death.

**Objective:** To perform a systematic review to determine how valuable the Revised Cardiac Risk Index (RCRI) is in predicting perioperative cardiac risk.

**Methods:** Medline and EMBASE were searched using key words: Detsky index, Lee index, Goldman index, and RCRI. In addition, the ISI Web of Science was searched for articles citing the original study that developed the RCRI. Studies were reviewed independently by 2 reviewers, and all data were independently abstracted. Disagreements were resolved by a third reviewer. All cohort studies reporting the association of the RCRI with major cardiac complications in surgical patients were included. Information abstracted included number of participants in each study, type of noncardiac surgery, outcome definitions, demographic characteristics, and comorbid conditions (coronary artery disease, heart failure, cerebrovascular disease, diabetes mellitus, hypertension, and renal insufficiency). The primary outcome was the ability of the RCRI to discriminate between low-, medium-, and high-risk patients. Predictive accuracy was summarized as the area under the receiver-operating characteristic curve (AUC) for the RCRI. Due to the expectation of significant heterogeneity in the group of studies identified, fairly complex statistical analyses were performed. Secondary analysis calculated sensitivity, specificity, and positive and negative likelihood ratios.

**Results:** The initial search strategy identified 412 studies, narrowed to 24 that met inclusion criteria. These studies included 792,740 patients. Twelve studies were prospective, and 10 were focused on vascular operations. Six used the RCRI to predict all-cause mortality, while the remainder focused on cardiac complications. Follow-up ranged from 3 to 30 days (or to hospital discharge). Only 6 studies met the strictest definition for high quality. Overall median AUC for predicting cardiac risk was 0.69 (interquartile range, 0.62 to 0.75). For the vascular studies, the median AUC was 0.64 (interquartile range, 0.61 to 0.68). For the mixed noncardiac studies, the AUC was 0.74 (interquartile range, 0.65 to 0.78). The AUC for predicting all-cause mortality was 0.62 (interquartile range, 0.54 to 0.78).

**Conclusions:** The RCRI discriminated moderately well between patients at low versus high risk for cardiac events after mixed noncardiac surgery, but it did not perform well at predicting cardiac events after vascular noncardiac surgery or at predicting death.

**Reviewer's Comments:** Although the RCRI performed reasonably well in the initial study population, it fares less well in a more heterogeneous population. It is particularly poor in vascular patients, and does not do well in predicting overall mortality (which it was not designed to do). It is apparent that further work is indeed necessary in this area. In the meantime, careful assessment of the need for perioperative beta-blockade as well as careful risk assessment should be done. (Reviewer-Karen J. Brasel, MD).

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Keywords: Cardiac Risk Prediction, Revised Cardiac Risk Index, Perioperative Cardiac Risk

Print Tag: Refer to original journal article
Compared to the EAAF, the AFP appears to be similarly effective and is a cost-saving procedure for complex anal fistulas.

**Background:** The anal fistula plug (AFP) has been used for the treatment of complex anal fistulas of cryptoglandular origin since 2006 to avoid sphincter division. However, to date no cost-effective analysis has been performed.

**Objective:** To evaluate the cost-effectiveness of AFP compared to endoanal advancement flap (EAAF) as an alternative sphincter-preserving option for complex anal fistulas.

**Design:** Prospective nonrandomized trial with comparison to a retrospective cohort.

**Methods:** The first cohort included 12 consecutive patients who prospectively underwent AFP. This group was compared to a retrospective cohort of 12 patients who underwent EAAF. Inclusion criteria were complex anal fistula not amenable to fistulotomy. Exclusion criteria were uncomplicated fistula, rectovaginal fistula, local sepsis, pregnancy, or inflammatory bowel disease. AFP patients did not require antibiotic or deep venous thrombosis prophylaxis, and had the procedure as outpatient surgery. The EAAF cohort underwent mechanical bowel prep, antibiotic and DVT prophylaxis, and was admitted to hospital. Clinic follow-up was at 10 days, 6 weeks, and 6 months for the AFP group and at 10 days and 3 months for the EAAF group. Study end points were the healing rate at 6 months and the total cost of surgery.

**Results:** Patient demographics and fistula characteristics of the 2 groups were not statistically different. Overall, fistula healing occurred in 6 of 12 (50.0%) patients--at 6 months, 8 of 12 patients healed after AFP; however, 2 patients failed later than 6 months--and 4 of 12 (33.3%) patients healed in the EAAF group ($P = 0.680$). There was no difference in healing rates between the 2 groups when adjusting for gender and age ($P = 0.064$). There were no abscesses in either group. For the AFP cohort, median clinical follow-up was 28 weeks and median recurrence time was 17.6 weeks (range, 0.4 to 43.9) for this group. For the EAAF group, median clinical follow-up was 14 weeks and median recurrence occurred at 12.6 weeks (range, 2.0 to 34.3). Use of AFP saved $1588 (95% confidence interval [CI], $1211 to $1,965; $P < 0.0001$), and 1.5 hospital days per healed fistula compared to the use of EAAF ($P = 0.0002$). When adjusted for reduction in hospital length of stay, the cost savings was $825 (95% CI, $133 to $1517; $P = 0.022$). The cost-effectiveness of AFP was maintained even when modeling considered a broad range of fistula healing rates.

**Conclusions:** Compared to EAAF, AFP appears to be similarly effective and is a cost-saving procedure for complex anal fistulas.

**Reviewer's Comments:** The cost of repeat procedures after failed fistula repair was not modeled. The authors do not explain the impact of the differences in follow-up between the 2 groups; this is especially important given that 2 AFP fistula repairs failed after 6 months. A randomized controlled trial with longer follow-up is needed to definitively determine the effectiveness of the AFP. (Reviewer-Todd A. Kellogg, MD).

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Keywords: Anal Fistula, Fistulotomy, AFP, Endoanal Advancement Flap, Cost-Effectiveness

Print Tag: Refer to original journal article
US-VAR Conservatively Manages Low-Risk Breast Masses

Long-Term Follow-Up Results for Ultrasound-Guided Vacuum-Assisted Removal of Benign Palpable Breast Mass.

Kim MJ, Park BW, et al:


Ultrasound-guided vacuum-assisted removal may be a useful alternative to surgical excision in the management of palpable breast masses.

**Background:** The safety, efficacy, and patient acceptance of an ultrasound-guided vacuum-assisted removal (US-VAR) device (Mammotome) for percutaneous removal of low-risk palpable breast masses have been previously reported in the literature. However, the long-term outcome of this technique is unknown.

**Objective:** To evaluate the long-term follow-up results from US-VAR of palpable benign breast mass and to identify patient characteristics that correlate with recurrence or residual lesions.

**Design:** Retrospective review of a prospectively maintained database.

**Methods:** Between 2002 and 2005, 188 consecutive patients with palpable breast lesions underwent US-VAR. After exclusion of 93 lesions due to malignancy and other reasons, 95 eligible lesions in 93 patients were included in the analysis. Mean patient age was 33.2 years (range, 14 to 60 years). Both bilateral mammography and ultrasound were initially performed. An 8- or 11-gauge probe was used based on lesion size and radiologist preference. All VAR procedures were performed by experienced board-certified radiologists. Follow-up sonography was performed at 6 and 12 months; minimum follow-up was 2 years.

**Results:** Indications for VAR were: core-needle biopsy-proven, benign nodule (n=51), benign-appearing nodule (n=45), large tissue sampling for papillary lesion (n=1), imaging-histologic discordance (n=2), and low suspicion for malignancy (n=6). The mean lesion size was 19 mm (range, 8 to 33 mm). Seven lesions (7.4% of 95 lesions) in 7 patients were incompletely removed. Incomplete removal was attributed to bleeding (n=4) and technical problems (n=3). The remaining 88 lesions were completely excised at initial VAR. During VAR, none of the patients experienced serious adverse events. Additional delayed intervention was required in 6 of 95 lesions (6.3%) at a median interval of 19 months (range, 7 to 26 months); 2 underwent repeat VAR and 4 underwent subsequent excisions. All were palpable and at repeat intervention were 13 to 37 mm (mean, 20 mm) in size. All had benign histology. The remaining 89 lesions underwent imaging follow-up only (mean, 35 months; range, 24 to 60 months). Of 89 lesions, 31 (32.6%) were sonographically visible but not palpable. The remaining 58 lesions (61.1%) showed no residual mass. No malignancies developed at the VAR site. On multiple logistic regression analysis, the initial size was the only significant factor associated with recurrence or residuals (P = 0.001; odds ratio, 1.238).

**Conclusions:** US-VAR may be a useful alternative to surgical excision in the management of palpable breast masses.

**Reviewer's Comments:** I am not sure of the utility of such a technique in real practice since benign breast masses don't typically need to be treated. Perhaps unintentionally, this study does reveal that, in its current form, the VAR technique is not appropriate for use in suspected malignancies, which I suppose is where this technique will be taken at some point by someone. A final concern is that of radiologists excising lesions. (Reviewer-Todd A. Kellogg, MD).

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Keywords: Palpable Benign Breast Mass, US-VAR, Recurrence, Residual, Patient Characteristics

Print Tag: Refer to original journal article
Peptic ulcer disease-related hospitalizations, surgical treatment with gastrectomy and vagotomy, and mortality have all decreased since 1993 while endoscopic therapy of ulcer hemorrhage has increased.

**Background:** There have been many advances in peptic ulcer disease (PUD) prevention, diagnosis, and treatment over the last 20 years. It remains unclear how these advances in medical therapy have impacted hospitalizations and associated procedure-based therapies.

**Objective:** To quantify over time the trends in hospitalizations and operations for PUD in the United States from 1993 to 2006.

**Design:** Retrospective review of an administrative database.

**Methods:** The Healthcare Cost and Utilization Project Nationwide Inpatient Sample is a stratified sample of all hospitalizations in the United States. Using PUD as the main diagnosis, this database was used to analyze hospitalizations in the U.S. from 1993 to 2006. Data collected included ulcer site, procedures, morbidity, and mortality. Statistical methods included the Chi-squared test and multivariate logistic regression.

**Results:** This national estimate identified a 29.9% decrease in hospitalizations for PUD from 222,601 to 156,108 from 1993 to 2006. There was a larger decrease in hospitalizations for duodenal ulcers (95,552 in 1993 vs 60,029 in 2006; -37.2%) relative to gastric ulcers (106,987 in 1993 vs 86,064 in 2006; -19.6%). During this time interval, the mortality rate of hospitalized PUD patients decreased from 3.8% to 2.7% (P <0.001). PUD complicated by perforation had the highest mortality (15.1% in 1993; 10.6% in 2006), while hemorrhage remained the most frequent complication. The utilization of procedure-based therapies in patients hospitalized for PUD changed from 1993 to 2006; endoscopic control of hemorrhage increased (12.9% vs 22.2%; P <0.001); surgical oversewing of ulcer was unchanged (7.6% vs 7.4%); gastrectomy was decreased (4.4% vs 2.1%; P <0.001); and vagotomy decreased (5.7% vs 1.7%; P <0.001). There was no difference in the causes of mortality for patients hospitalized in 1993 compared to 2006 when the data were analyzed by multivariate logistic regression.

**Conclusions:** From 1993 to 2006, hospitalizations for PUD in the U.S. have decreased. In addition, PUD mortality has decreased significantly. The use of endoscopic techniques for the treatment of PUD-associated hemorrhage has increased, while the use of gastric resection and vagotomy has decreased significantly. Ulcer oversewing remains unchanged.

**Reviewer’s Comments:** This descriptive study leaves the reader to guess somewhat at the causes of what is being described. Even so, it describes phenomena that most of us ourselves have observed, mainly the decrease in the need for surgical therapy for complications of PUD. As acknowledged by the authors, limitations of the study include the inability to determine and consider changes in PUD prevalence, the potential inaccuracies of an administrative database including the inability to examine the medical record for details regarding the medical treatment history of PUD in the patient sample, and the increased stringency of hospital admission criteria that has occurred over the past 17 years. (Reviewer-Todd A. Kellogg, MD).

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Keywords: Peptic Ulcer Disease, Outcomes, Hospitalizations, United States

Print Tag: Refer to original journal article
This study found no improvement in outcomes using telemonitoring for ICU patients.

**Background:** Critical care is expensive and is associated with high morbidity and mortality. Care by intensivists results in better outcomes; however, there is a recognized shortage of intensivists. ICU telemedicine is one proposed solution to this shortage.

**Objective:** To evaluate the effect remote monitoring of ICU patients has on morbidity and mortality.

**Design:** Observational study in 6 ICUs with a pre-intervention and post-intervention design.

**Participants:** 2034 patients were sampled in the pre-intervention and 2108 patients were sampled in the post-intervention period. Each sampling period was for 60 days.

**Methods:** Charts were reviewed to collect the data by trained nurse abstractors. Eight complications were specifically reviewed: ventilator-associated pneumonia, catheter-associated bloodstream infection, stress gastritis bleeding, acute renal failure, cardiopulmonary resuscitation need, venous thromboembolic events, and readmission to the ICU. Patients were stratified for severity of illness using the Simplified Acute Physiology Score II (SAPS II). Mortality was captured as ICU and hospital deaths as well as ICU and hospital length of stay. The primary outcome was to identify improvement in the post-intervention phase.

**Results:** Interventions by tele-ICU physicians ranged from 5 to 19 orders per day. ICU mortality was 9% in the pre-intervention and 8% in the post-intervention phase. Hospital mortality was 12% in the pre-intervention and 10% in the post-intervention phase. No differences were found in complication rates or length of stays between the pre- and post-intervention patients. There did appear to be a survival benefit for the sickest patients based on the SAPS II score.

**Conclusions:** Telemedicine did not improve patient outcomes for ICU patients.

**Reviewer's Comments:** Telemonitoring of critically ill patients has many supporters. This report suggests that an outcome benefit may not easily be obtained. These data are at odds with previous reports using administrative data. The use of clinical data in this study could be one reason for this difference. The authors also suggest 3 other reasons--the first is that only a third of the patients were managed by the tele-ICU intensivists. The second was a lack of acceptance by physicians caring for patients in the 6 ICUs. Finally, was the lack of an electronic medical record for data sharing. The authors caution that how this system is implemented will impact its success. The remaining question is if all 3 reasons were resolved, would the outcomes improve? Some firmly believe yes, others no, and there is of course the wait and see group--sounds just like the health care reform debate! (Reviewer-John A. Weigelt, MD).
There appears to be a disparity in the treatment of elderly patients with differentiated thyroid cancer in that these patients receive less aggressive surgical and adjuvant treatment despite demonstrated survival benefits.

**Background:** The elderly population is increasing and the incidence of differentiated thyroid cancer (DTC), which includes papillary, follicular, and Hurthle cell subtypes, increases with age. Patients with tumors ≥1 cm in size are advised to undergo total or near-total thyroidectomy, often followed by radioactive iodine (RAI).

**Objective:** To determine patterns of treatment with thyroidectomy and RAI among elderly patients with DTC and to assess the effects on survival.

**Design:** Retrospective review of an administrative (the Surveillance, Epidemiology, and End Results [SEERS]) database.

**Methods:** The SEERS database was searched for patients aged ≥45 years with DTC ≥1 cm from 1988 to 2003. Demographic, clinical, and pathologic characteristics were analyzed. The likelihood of receiving standard-of-care treatment was determined using associations determined from bivariate and multivariate analyses.

**Results:** 8899 patients were included in the analysis; 2271 (26%) were ages 65 to 79 years, and 444 (5%) were age ≥80 years. Mean tumor size was 3.0 cm (1.0 to 9.9 cm) and 23% had extrathyroid extension. Reasons for not undergoing surgery (n=87) were: contraindicated in 15%, not recommended in 37%, refused by the patient or guardian in 24%, and unknown in 30%. In total, 58% had adjuvant radiation, including RAI to 52%. Mean survival after diagnosis was 14.5 years (0 to 17.9 years). Ten-year survival rate after diagnosis was: 88% for ages 45 to 64 years, 62% for ages 65 to 79 years, and 18% for age ≥80 years. Bivariate analysis demonstrated that patients aged ≥65 years were more likely than patients aged 45 to 64 years to have larger tumors, advanced (stage IV) disease, extrathyroid extension, and non-papillary histology. Patients aged ≥65 years were less likely than patients aged 45 to 64 years to have undergone total or near-total thyroidectomy (74% vs 80%, respectively; P<0.001). Elderly patients were also less likely to receive RAI (47% vs 54%; P<0.001). These patterns increased with age and were more prominent for those aged ≥80 years. Those elderly patients not undergoing thyroidectomy did not have more contraindications for surgery. Multivariate analysis verified these findings: patients aged 65 to 79 years and ≥80 years had lower rates of total or near-total thyroidectomy (OR, 0.77 and 0.43, respectively; P<0.001) and RAI treatment (OR, 0.85 [P<0.01] and 0.39 [P<0.001], respectively). Predictors of worse survival among elderly patients included no surgery (HR, 5.51; P<0.001) and no RAI (HR, 1.36; P<0.001) as was older age at diagnosis.

**Conclusions:** Elderly patients with DTC present with more advanced disease. Nonetheless, there appears to be a disparity in care in that these patients receive less aggressive surgical and adjuvant treatment despite demonstrated survival benefits.

**Reviewer's Comments:** As indicated by the authors, long-term outcomes need to be measured to answer the most important question of whether there is any long-term benefit to aggressive treatment of elderly patients with DTC. (Reviewer-Todd A. Kellogg, MD).

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Keywords: Differentiated Thyroid Cancer, Elderly Survival, Thyroidectomy, Radioactive Iodine

Print Tag: Refer to original journal article
Remote Infection Can Alter Outcome in PEG Placements

Airway Infection Predisposes to Peristomal Infection After Percutaneous Endoscopic Gastrostomy With High Concordance Between Sputum and Wound Isolates.

Chuang CH, Hung KH, et al:

J Gastrointest Surg 2010; 14 (January): 45-51

Active airway infection increases infectious complications associated with a PEG.

Background: Percutaneous endoscopic gastrostomy (PEG) tubes are commonly used for feeding access. The most common approach for placement uses the pull technique. The incidence of peristomal infection may be as high as 36%. Since the tube is passed via the aerodigestive tract, contamination with bacteria is possible and could relate stomal infection.

Objective: To determine if the bacteria causing a PEG stomal infection correlate with bacteria isolated from the aerodigestive tract.

Design: Prospective clinical trial.

Participants: 112 patients had a pull PEG tube placed. Any patient with active airway infection was excluded and acid suppression drugs were held for 48 hours before the procedure.

Methods: All patients received routine antibiotic prophylaxis before their PEG. PEG sites were followed and graded for infection. All infected wounds were cultured. When bacteria were present from sputum and a PEG infection, they were compared for DNA and antibiotic susceptibility. The primary outcome was to see if the bacteria from the 2 sites correlated. A secondary outcome was to evaluate whether the preoperative antibiotic was effective against the bacteria isolated from each patient.

Results: 30 patients (27%) developed a stomal infection within 1 week of the procedure. There were 31 patients with a positive airway culture and these patients had a 10-fold higher risk of stomal infection than patients with no bacteria isolated. Among these 31 patients, 13 had antibiotics that were effective against their airway bacteria and their infection rate was 35% compared to a rate of 78% among the other 18 patients who received antibiotics that were not effective against their airway pathogen. Nineteen patients had paired bacterial samples and 84% of these had similar DNA profiles; 18 of 19 had similar antibiotic susceptibilities.

Conclusions: Airway infection at the time of PEG increases the rate of stomal infection.

Reviewer's Comments: This is an interesting correlation that most of us may not consider, but appears to be present reviewing this data set. Patient profile might have some effect on these results, and unfortunately the patient conditions are not provided. The most common organism isolated was Pseudomonas, which makes me think that most patients had a cancer diagnosis or had been treated with antibiotics before the PEG. This could impact the results. However, their observation that inappropriate antibiotic selection impacted the infection risk cannot be denied. It is very possible that we should consider patient profile when we select our preoperative antibiotics. We commonly use a first-generation cephalosporin for these procedures. These data suggest that broader spectrum drugs may be indicated in some patients having this procedure. (Reviewer-John A. Weigelt, MD).

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Keywords: SSI Rates, Percutaneous Endoscopic Gastrostomy

Print Tag: Refer to original journal article
Rather than a single intervention such as parathyroidectomy, a multidisciplinary approach involving early diagnosis, aggressive medical management, operative debridement, and parathyroidectomy may improve survival in calciphylaxis.

**Background:** Calciphylaxis implies a syndrome of skin ulcerations in uremic patients associated with calcification of medium-sized blood vessels. Risk factors include elevated phosphate levels and high parathyroid hormone level associated with secondary hyperparathyroidism. Management has been directed at controlling the hyperparathyroidism, although mortality remains high.

**Objective:** To determine the patient profile for calciphylaxis and to identify factors that might impact survival.

**Design:** Retrospective review of patient records.

**Participants:** 26 patients with calciphylaxis were retrieved from an institutional pathology database.

**Methods:** Charts were reviewed for demographics, lesion location, management, and outcome.

**Interventions:** Interventions most commonly used included parathyroidectomy, vascular procedures, local debridement, and combination therapy.

**Results:** 64% of patients had secondary hyperparathyroidism. Renal disease was present in 21 patients (81%). Mean age was 56 ± 13 years. Mean duration of ulcers before biopsy was 14 weeks. Parathyroidectomy was done in 9 patients, revascularization procedure was done in 5 patients (19%), and debridement was done in 15 patients (58%). Follow-up was available on 24 patients at a median of 6.5 months. Twenty-two of these 24 patients (92%) died. Seven patients were assessed as dying from their calciphylaxis. Poor survival was predicted by female gender, obesity, and need for a vascular procedure. Survival was not related to parathyroidectomy. Debridement improved survival.

**Conclusions:** Debridement was the only single intervention that improved survival, but overall survival once a patient develops calciphylaxis is poor.

**Reviewer's Comments:** This review emphasizes the poor outcome of patients with calciphylaxis. It also suggests that maybe we can do better. The time to diagnosis was 3 months, suggesting that earlier biopsy might have allowed earlier intervention--although whether this would change outcome is unknown. The lack of a response to parathyroidectomy suggests that this condition is not simply related to high calcium or phosphate levels. The benefit from debridement is interesting, as many times these wounds seem to get worse after debridement. The plea from the authors is that no one intervention is sufficient and that early and aggressive medical and surgical management should be pursued. Seems like a common sense recommendation. (Reviewer-John A. Weigelt, MD).

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Keywords: Calciphylaxis, Determinants of Survival

Print Tag: Refer to original journal article
CRS With PIC Potentially Curative in Patients With Otherwise No Hope for Survival

Chua TC, Saxena A, et al:
Ann Surg 2010; 251 (January): 101-106

Morbidity and mortality rates for cytoreductive surgery and perioperative chemotherapy are within acceptable range for major gastrointestinal surgery performed for curative intent.

Background: Cytoreductive surgery (CRS) with perioperative intraperitoneal chemotherapy (PIC) is a treatment option for peritoneal surface malignancy (PSM), but outcomes are jaded by high morbidity and mortality rates.
Objective: To report single-institution perioperative outcomes of CRS and PIC reviewing factors associated with poor perioperative outcomes.
Methods: Patients undergoing CRS and PIC for PSM from 1997 to 2008 were included. Patients were adults of WHO Performance Status <2 without extra-abdominal metastasis or prior CRS. Operations were done by the same team led by a single surgeon. Volume and disease extent were recorded using the Peritoneal Cancer Index (PCI). Completeness of cytoreduction (CC) was recorded using CC score (CC0 = zero macroscopic disease; CC3 = nodules >2.5 cm remained). After CRS, heated chemoperfusate was instilled at 42°C for 90 minutes. Pseudomyxoma peritonei and colorectal cancer patients received early postoperative intraperitoneal chemotherapy (EPIC) on days 1 through 5. Unstable patients or those with early complications had EPIC withheld. Dose reduction for high-risk patients was implemented in the last 4 years. Postoperative complication was assigned based on the National Cancer Institute's Common Toxicity Criteria.
Results: The 243 consecutive patients studied (median follow-up 18 months [0 to 135]) included 136 with pseudomyxoma peritonei, 55 colorectal cancers, 30 peritoneal mesotheliomas, and 22 other neoplasms. Mean PCI was 17. Hyperthermic intraperitoneal chemotherapy was given to 197 (81%) and 176 (72%) received EPIC. Mean length of stay was 33 days. Mortality was 3% (7 of 243). All 7 died of sepsis and multigorgan failure. There were 37 (15%) uneventful recoveries. Seven (3%) had grade I, 88 (36%) grade II, 51 (21%) grade III, and 53 (22%) grade IV postoperative complications. Forty (16%) were reoperations (30% anastomotic leak/perforation). Poor perioperative outcomes were associated with operative duration >9 hours, carcinomatosis origin, blood products >6, PCI >17, and procedures (anterior, right upper quadrant, and left upper quadrant (LUQ) peritonectomy, small bowel resection (SBR), number of visceral resections >2, and number of peritonectomy procedures >4. Multivariate analysis shows that LUQ peritonectomy (HR, 3.2; \( P <0.001 \)) and SBR (HR, 2; \( P =0.01 \)) predicted poor perioperative outcome. Discussion: Heterogeneity in the literature is explained by surgeon variables and lack of standardized postoperative management plans and outcomes documentation. High-volume specialty centers report major morbidity of 12.0% to 52.0% and mortality rates of 0.9% to 5.8%, which is congruent with this study.
Conclusions: Morbidity and mortality rates of CRS and PIC are within acceptable range for major gastrointestinal surgery performed for curative intent. Patient selection is important. CRS with PIC is potentially curative in patients with otherwise extremely poor prognoses.
Reviewer's Comments: This large series of patients was treated with standardized perioperative care and analyzed by objective parameters. CRS with PIC is an evolving technique for patients who otherwise have no hope for survival. The best way to determine those most likely to benefit from this aggressive therapy is to conduct studies as well done as this one. (Reviewer-Kathleen Christians, MD).

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Keywords: Cytoreductive Surgery, Peritoneal Surface Malignancy, Intraperitoneal Chemotherapy

Print Tag: Refer to original journal article
Continuous ASA During Peptic Ulcer Bleeding Offers Advantages, Disadvantages

**Background**: Normally, peptic ulcer bleeding is treated endoscopically, antisecretory medicine is given, and aspirin (ASA) is discontinued despite the risk for cardio- or cerebrovascular events and death.

**Objective**: To determine if, after successful endoscopic control of peptic ulcer bleeding, continuous ASA is not inferior to stopping ASA in terms of risk for recurrent bleeding in the presence of proton-pump inhibitors (PPIs).

**Design**: Parallel, randomized, placebo-controlled, double-blinded single-institution study.

**Participants/Methods**: Eligible patients included those with peptic ulcer bleeding, visible vessels or adherent clot successfully treated endoscopically, and who required continued low-dose aspirin (prophylaxis vs cardio- or cerebrovascular disease). All patients underwent endoscopy with epinephrine injection and thermal coagulation. All received bolus pantoprazole (80 mg) followed by infusion at 8 mg/hour for 72 hours followed by oral pantoprazole until the study’s end. Patients were randomized post-endoscopy to aspirin 80 mg/day or placebo for 8 weeks. Follow-up was 56 days. The primary end point was recurrent peptic bleeding within 30 days, and endoscopy was done for the following: hematemesis, melena, hemoglobin drop of >2 g/dL in 24 hours despite >2 U of packed red blood cells, or unstable hemodynamics. Secondary end points were all-cause mortality, blood transfusions, length of stay (LOS), need for surgery, and acute ischemic events.

**Results**: Of 3412 patients, 267 bleeds were related to aspirin and 156 were enrolled, with 78 patients randomized to aspirin and 78 others to placebo. More than 87% had >90% drug compliance. There were 12 cases of recurrent bleeding (8 ASA, 4 placebo). The 30-day cumulative incidence of recurrent bleeding was 10.3% in the ASA group and 5.4% in the placebo group. Ten others did not meet criteria for rebleed (8 not bleeding on endoscopy, 2 bled out prior to rescoping). Transfusions and LOS was similar. One patient (placebo) required surgery (perforation). The 30-day mortality rate was lower for the ASA group (1.3% vs 9.0%), and the Kaplan-Meier estimate of all-cause mortality at 8 weeks was also lower in the ASA group (1.3% vs 12.9%). Mortality associated with cardiovascular, cerebrovascular, or gastrointestinal (GI) complications was lower in the ASA group (1.3% vs 10.3%). **Discussion**: Risk for rebleeding on ASA was 50% higher but was mild, and it did not affect clinical outcome. Mortality was higher when ASA was stopped, and most deaths were cardiovascular. Protective effects of antiplatelet agents outweighed GI toxicity. The data infer that ASA can be discontinued for 3 to 5 days after the index bleed and resumed after stabilization.

**Conclusions**: Among recipients of low-dose ASA with peptic ulcer bleeding, continuous ASA may increase the risk for recurrent bleeding but could potentially reduce mortality.

**Reviewer's Comments**: The results of this well-designed study need to be interpreted knowing that the sample size was small, the ASA dose was 80 mg, and it was always given with pantoprazole. Larger trials are needed to confirm these clinical observations. (Reviewer-Kathleen Christians, MD).

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Keywords: Peptic Ulcer, Bleeding, Proton Pump Inhibitors, Aspirin

Print Tag: Refer to original journal article
Communication Errors Occur Most Often at Night, Lead to Worse Outcomes


Williams M, Hevelone N, et al:


Most communication errors between residents and fellows in the surgical ICU occur at night and are associated with worse short-term outcomes.

**Background:** Errors in communication have been highlighted as one of the most common in the care of the surgical patient. Nowhere is this more important than in the ICU, where patients have multiple care providers and are the sickest.

**Objective:** To investigate the relationship of communication patterns between residents and fellows in the ICU to short-term patient outcomes.

**Design:** Prospective interventional trial.

**Methods:** 4 cardiorespiratory events were defined as short-term outcomes of interest: hypotension, new arrhythmias, tachypnea, and desaturation. Improvement in these outcomes was defined as resolution of the event. On daily rounds, the fellow determined if an event was communicated correctly, not communicated, or miscommunicated by the resident. After an initial observational period of 68 days, residents received a communication seminar. During the interventional phase, the fellow also called in between 10 pm and 2 am to check in with the resident.

**Results:** There were 312 events in 114 patients during the study period. Of events, 166 occurred in the observational phase of the study and 146 in the interventional phase. The most common event was postoperative hypotension (59%). Communication errors were associated with 33% of events. Postgraduate year (PGY) 3 residents committed most of the communication errors; they were responsible for 59% of calls but the majority of errors in both the observational and interventional phases of the study (73% and 59%). PGY1 residents were responsible for the least number of errors. Of communication errors, 77% occurred during the late shift. Of events, 65% were communicated during the observational phase of the study and 67% during the interventional phase. Communication of cardiorespiratory events improved significantly during the interventional phase. Communication was associated with improvement in short-term outcomes; if an event was communicated, improvement occurred in 90%, compared to 75% if it was not communicated (P < 0.0002).

**Conclusions:** Most communication errors occur at night and are associated with worse short-term outcomes.

**Reviewer’s Comments:** The authors have described communication patterns in the ICU and have related them to short-term patient outcomes. It should not be a surprise that PGY3 residents communicate less with the fellow than do PGY1 residents; hopefully, PGY3 residents have a greater knowledge base as well as more experience and should not need as much guidance. It should also not be a surprise that most communication failures occur at night; there is a reluctance to bother someone who might be sleeping. It would be interesting to see whether these results would be replicated with 12-hour call shifts rather than 24-hour call shifts. It appears that the intervention was primarily educational rather than emphasizing new processes designed to improve communication; automatic triggers or processes might have a greater impact. (Reviewer-Karen J. Brasel, MD).

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Keywords: Communication, Team Performance, Surgical ICU

Print Tag: Refer to original journal article
Low-molecular-weight heparin is better than use of mechanical devices in reducing the risk for deep vein thrombosis in postoperative and post-injury patients.

**Background:** Thromboembolic disease is a relatively common postoperative and post-injury complication. Great effort is expended to ensure appropriate prophylaxis in these patients, and consensus guidelines are available.

**Objective:** To compare mechanical prophylaxis to subcutaneous heparin in this population of patients.

**Methods:** A detailed search strategy of PubMed and EMBASE was performed for articles between 1966 and 2008, and topic experts were contacted to determine if any relevant articles had been missed by the search strategy. Inclusion criteria were a postoperative or post-injury population; randomized controlled trial investigating mechanical compression compared to subcutaneous heparin; and outcomes measured in deep vein thrombosis (DVT), pulmonary embolism (PE), and/or bleeding. The primary outcome evaluated was risk of DVT. Secondary outcomes were risks of PE and bleeding.

**Results:** There were 246 potentially eligible articles, with 41 randomized controlled trials identified. Of these, 16 met the remaining inclusion criterion, with a publication year from 1978 to 2008. In total, 3778 patients were included, with individual trials containing between 40 and 1761 patients. There were 3 trials focused on trauma patients, 4 in general surgery patients, 6 in orthopedic patients, 1 in urology patients, and 2 in gynecology patients. Eight trials used low-molecular-weight heparin (LMWH), and 8 used unfractionated heparin. Three studies used compression stockings, 4 used a foot pump, 1 used a combination of stockings and a pneumatic device, and the remainder used a non-foot pneumatic compression device. There were no significant results from any of the trials, and the results of the meta-analysis also show no significant difference in DVT or PE with mechanical or pharmacologic prophylaxis. There was a significantly decreased risk of bleeding with mechanical prophylaxis (risk ratio, 0.47; 95% CI, 0.31 to 0.70). Subgroup analysis identified that LMWH was associated with a decreased risk of DVT compared to mechanical prophylaxis (relative risk for compression 1.80; 95% CI, 1.16 to 2.79).

**Conclusions:** The authors suggest that the bleeding profile favors use of mechanical over pharmacologic prophylaxis in postoperative and post-injury patients.

**Reviewer’s Comments:** The quality of data investigating mechanical prophylaxis and unfractionated heparin for thromboembolic prophylaxis is poor. Compliance with mechanical prophylaxis is difficult to measure, and the equivalence of compression stockings and pneumatic devices is questionable. The majority of studies have used twice-daily dosing for unfractionated heparin, which is likely inadequate. Although including only randomized controlled trials ensures better homogeneity for a meta-analysis, recommendations such as those provided by the American College of Chest Physicians are based on the entire body of literature investigating this topic. The preponderance of evidence is not from randomized controlled trials, which does not mean that it should be ignored. At this point, I would recommend following guidelines published in *Chest* (2008), which include pharmacologic prophylaxis for moderate and high-risk patients in whom it is not contraindicated. (Reviewer-Karen J. Brasel, MD).

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Keywords: Deep Vein Thrombosis Prophylaxis, Mechanical Compression Device, Heparin

Print Tag: Refer to original journal article
A chemotherapy regimen (cyclophosphamide, doxorubicin, and fluorouracil) in addition to tamoxifen appears to be beneficial in postmenopausal women with positive nodes.

**Background:** Adjuvant chemotherapy is standard for premenopausal women with breast cancer, as well as for postmenopausal women with estrogen receptor (ER)-negative tumors. However, for postmenopausal women with ER-positive tumors, tamoxifen alone is standard therapy; the addition of adjuvant chemotherapy is of unclear benefit.

**Objective:** To investigate the role and timing of adjuvant chemotherapy in the treatment of postmenopausal women with ER-positive breast cancer and positive nodes.

**Design/Participants:** Open-label, randomized controlled trial of postmenopausal women with T1-3, N1-2 breast cancer.

**Methods:** In a 2:3:3 ratio, researchers compared (1) tamoxifen alone, (2) cyclophosphamide, doxorubicin, and fluorouracil (CAF) followed by daily tamoxifen, and (3) CAF with concurrent tamoxifen. Surgical treatment was either mastectomy or breast conservation treatment. Six cycles of chemotherapy were given on an every-4-week cycle. Tamoxifen was given as 20 mg daily for 5 years. The primary end point was disease-free survival. The secondary end point was overall survival.

**Results:** 1558 women were randomized, of which 1477 were eligible. Of patients randomized to receive chemotherapy, 15% did not complete treatment due to death, disease progression, or toxicity. Median follow-up was 8.94 years (maximum, 13.0 years). Both CAF plus tamoxifen groups combined were superior to tamoxifen alone for the primary end point of disease-free survival (adjusted Cox regression hazard ratio [HR] 0.76; 95% CI, 0.64 to 0.91; \( P =0.002 \)) but only marginally for the secondary end point of overall survival (HR, 0.83; 95% CI, 0.68 to 1.01; \( P =0.057 \)). There was no difference when comparing concurrent tamoxifen to chemotherapy followed by tamoxifen. Advantages were greatest in women with ≥4 positive nodes and in women aged <65 years. Adverse events, including neutropenia, stomatitis, thromboembolism, congestive heart failure, and leukemia, were more common in the groups receiving chemotherapy.

**Conclusions:** Anthracycline-based chemotherapy in addition to tamoxifen is beneficial in postmenopausal women with ER-positive tumors and positive nodes. Additionally, there may be subsets of patients who do not benefit from this additional therapy.

**Reviewer’s Comments:** This study benefits from long follow-up and large numbers. It does not consider HER2 neu status. The benefit of chemotherapy is not without risk, as adverse events are more common in this group, and there are some subsets of patients who do not benefit from the increasingly aggressive therapy. However, patients with ≥4 positive nodes, aged <65 years, and in relatively good health should be counseled about the advantage of chemotherapy in addition to tamoxifen. (Reviewer-Karen J. Brasel, MD.)
Limited PTX May Be Enough in Tertiary Hyperparathyroidism

Pitt SC, Panneerselvan R, et al:

Surgery 2009; 146 (December): 1130-1137

Limited parathyroidectomy resection appears to be appropriate for selected patients with tertiary hyperparathyroidism due to 1- or 2-gland disease, with no significant difference in long-term outcomes compared with standard total or subtotal parathyroidectomy.

**Background:** The majority of patients with tertiary hyperparathyroidism (3-HPT) have hyperplastic glands necessitating subtotal or total parathyroidectomy (PTX). However, a subset of patients has disease limited to 1 or 2 glands. Reports of high recurrence rates after limited PTX have led surgeons away from this approach.

**Objective:** To determine the appropriateness of a limited resection in patients with 3-HPT by analyzing outcomes of patients undergoing resection of 1 or 2 parathyroid glands.

**Design:** Retrospective review.

**Methods:** Medical records were reviewed of 140 patients with 3-HPT who underwent PTX at an academic tertiary care institution from 1984 to 2008. A cohort of patients with 3-HPT who underwent limited PTX were compared with a cohort who underwent total or subtotal PTX. A limited resection was performed when 1 or 2 of 4 glands was abnormally enlarged (weight >50 g), and the remaining glands were normal-appearing. Intraoperative parathyroid hormone (PTH) monitoring was used during later cases. Success or failure of treatment with PTX was defined by persistent or recurrent hypercalcemia.

**Results:** 140 PTX operations were performed in 140 patients with 3-HPT. Patients in the limited PTX group (n=29) underwent resection of 1 (n=12) or 2 (n=17) parathyroid glands. Patients in the total or subtotal PTX group (n=111) underwent 119 operations, of which 104 were subtotal PTX, 3 were total PTX with autograft, and 12 were reoperative PTX. Eight patients in the subtotal or total PTX group required reoperation: 7 after initial 3.5-gland resection and 1 after 2.5-gland resection. Mean and median durations of follow-up for the entire cohort were 78.7 and 60.4 months, respectively (range, 0.1 to 22.9), with 92% having >6 months of follow-up. 3-HPT was symptomatic in 59% (n=17) of limited PTX patients and 70% (n=77) of subtotal or total PTX patients (P =0.26). Calcium normalized in 94% of all patients; 2 patients developed persistent hypercalcemia after subtotal PTX and no patients after limited PTX, although this difference was not statistically significant. Using logistic regression, there was no association between extent of operation and persistent or recurrent hypercalcemia. Although not statistically significant, limited resection did not result in any cases of permanent hypocalcemia, while the incidence was 7% after subtotal or total PTX.

**Conclusions:** Limited PTX resection appears to be appropriate for selected patients with 3-HPT due to 1- or 2-gland disease, with no significant difference in long-term outcomes compared with standard total or subtotal PTX.

**Reviewer's Comments:** The authors provide a moderately convincing argument that limited PTX is safe and effective in selected patients with 3-HPT. Clearly, proper patient selection is of paramount importance for success. It may be that intraoperative PTH testing will help select appropriate patients for limited resection. (Reviewer-Todd A. Kellogg, MD).

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Keywords: Tertiary Hyperparathyroidism, Resection, Subtotal, Long-Term Outcomes

Print Tag: Refer to original journal article