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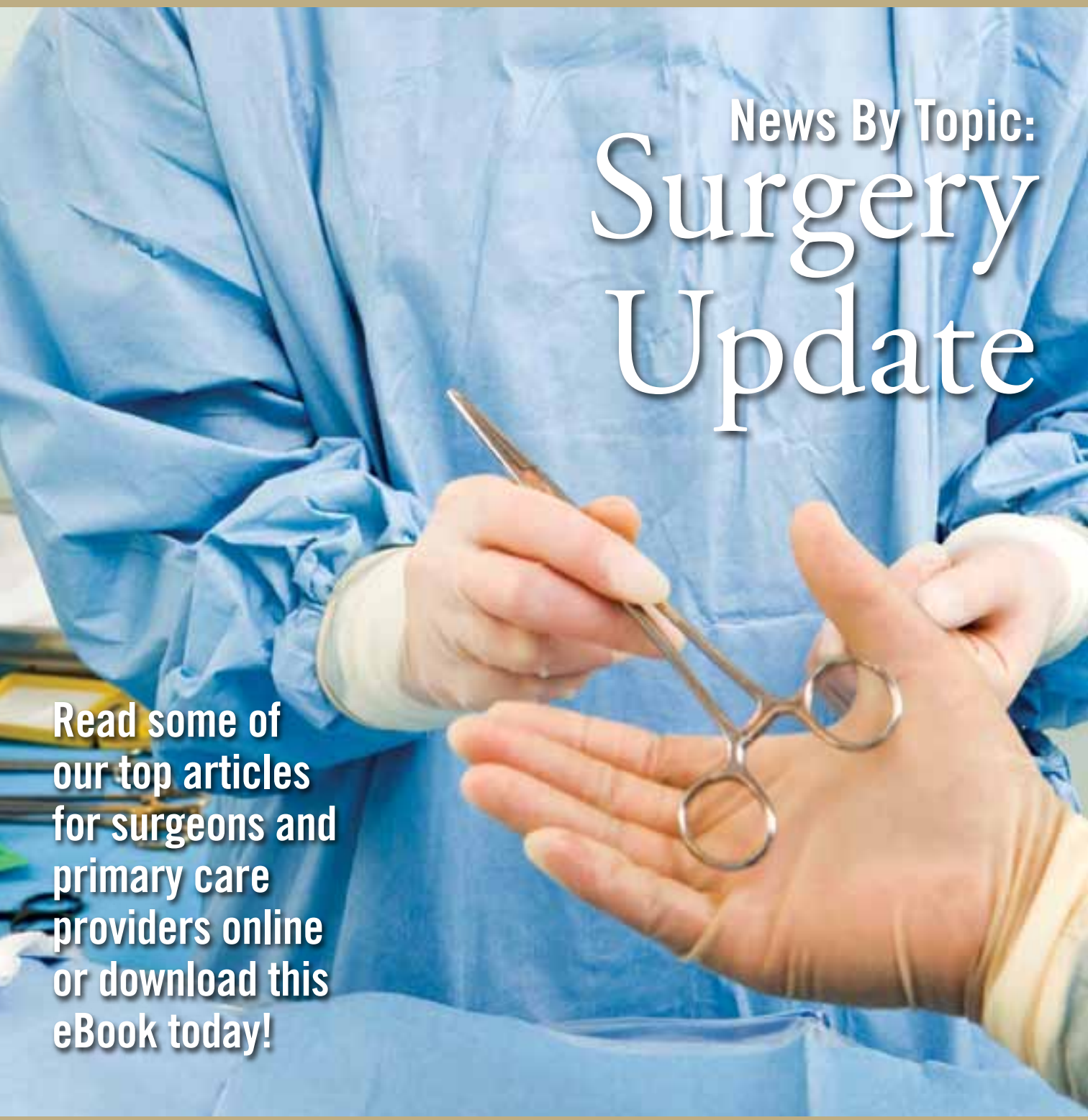

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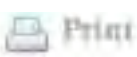

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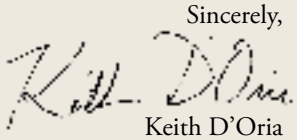
A Message From the Editor

We at *Physician's Weekly* are excited to present you with an eBook dedicated to feature stories we've covered on surgery-related topics. In recent months, our publication has published a variety of news items in this field, focusing on clinical and evidence-based research. The content in these articles relies on the expertise of our contributing physician authors. *Physician's Weekly* will continue to feature surgery news in the coming months, and we hope that you find this information useful in your practice. Please let us know your thoughts by contacting us at keithd@physweekly.com.

Sincerely,



Keith D'Oria
Managing Editor, *Physician's Weekly*

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New Insights in Treating SFA & Popliteal Arteries

John R. Laird, MD, FACC, FACP

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There is still considerable uncertainty about the best endovascular treatment strategies for patients with stenosis or occlusion of the superficial femoral artery (SFA) or popliteal artery. Percutaneous transluminal angioplasty (PTA) has been performed for over 30 years now, but there is an evolving body of literature that has documented suboptimal outcomes with PTA for all but only the most focal (<4 cm) femoropopliteal lesions. While there is considerable enthusiasm for atherectomy in some centers, there is a paucity of comparative data demonstrating superiority of any of the atherectomy devices over PTA.

Over the years, there has also been controversy about the role of stents in the SFA. Clinicians currently do not have enough data demonstrating the superiority of stenting over PTA, but more research is accumulating in this field. Two randomized trials comparing stenting with PTA in the SFA and proximal popliteal artery have recently been published. Schillinger et al randomized patients with SFA disease to balloon angioplasty with provisional/bailout stent implantation versus primary nitinol stent implantation. At 12 months, there was a significantly lower rate of restenosis in the primary stent group compared with the angioplasty group (37% vs 63%). Krankenberg et al randomized 244 patients with shorter SFA lesions to balloon angioplasty versus implantation of a single nitinol stent. At 12 months, there was no significant difference in restenosis between the treatment groups (31.7% vs 38.6%). The disparate results from these trials can likely be explained by the significant differences in lesion length as well as differences between the two stent designs.

The RESILIENT Trial

The RESILIENT trial (A Randomized Study Comparing the Edwards Self-Expanding LifeStent vs Angioplasty-Alone In Lesions Involving the SFA and/or Proximal Popliteal Artery) was a multicenter, international, randomized comparison of balloon angioplasty versus stenting with the LifeStent (Bard Peripheral Vascular) that has recently been

"Acute lesion success was superior for the stent group when compared with the angioplasty group."

completed. Patients were included in the trial if they had lifestyle impairing claudication and stenosis or occlusion of up to 15 cm in length in the SFA and proximal popliteal artery. Patients from 24 centers in the United States and Europe were randomized to implantation of the LifeStent or PTA.

Findings from the RESILIENT trial showed that primary implantation of the self-expanding nitinol stent was associated with better acute results and improved patency compared to balloon angioplasty alone. The mean total lesion length was 71 mm for the stent group and 64 mm for the angioplasty group. Acute lesion success—which was defined as less than 30% residual stenosis—was superior for the stent group when compared with the angioplasty group (95.8% vs 83.9%). Twenty-nine patients (40.3%) in the angioplasty group underwent bailout stenting because of a suboptimal angiographic result or flow limiting dissection. Bailout stenting was treated as a target lesion revascularization (TLR) and loss of primary patency in the final analysis. At 12 months, freedom from TLR was 87.3% for the stent group, compared with 45.1% for the angioplasty group. Duplex ultrasound which derived primary patency at 12 months, was also better for the stent group (81.3% vs 36.7%). Through 12 months, fractures occurred in 3.1% of stents implanted, but no stent fractures resulted in loss of patency or TLR.

The hope is that more analyses like the RESILIENT trial will be conducted in the future to further support previous research. Ideally, it would be helpful to provide clinicians with more data regarding the optimal management of lesions in the SFA and proximal popliteal arteries.

John R. Laird, MD, FACC, FACP, has indicated to Physician's Weekly *that he has worked as a consultant for Bard Peripheral Vascular, Cordis, Boston Scientific, Abbott Vascular, and Medtronic Vascular.*

References

Schillinger M, Sabeti S, Loewe C, et al. Balloon Angioplasty versus implantation of nitinol stents in the superficial femoral artery. *N Engl J Med.* 2006;354:1879-1888.

Schillinger M, Sabeti S, Dick P, et al. Sustained benefit a 2 years of primary femoropopliteal stenting compared with balloon angioplasty with optional stenting. *Circulation.* 2007;115:2745-2749.

Krankenberg H, Schluter M, Steinkamp H, et al. Nitinol stent implantation versus percutaneous transluminal angioplasty in superficial femoral artery lesions up to 10 cm in length: the femoral artery stenting trial (FAST). *Circulation.* 2007;116:285-292.

Laird JR, Katzen BT, Scheinert D, et al. Nitinol stent implantation versus balloon angioplasty for lesions in the superficial femoral artery and proximal popliteal artery: twelve-month results from the RESILIENT randomized trial. *Circ Cardiovasc Interven.* 2010 (in press).

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A Strategy to Prevent Postoperative Pneumonia

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Postoperative pneumonia continues to create a burden on healthcare systems, often leading to increases in morbidity, length of hospital stay, and costs. Postoperative pneumonia is the third most common complication among surgical patients and is the third most common infectious complication after urinary tract and wound infections. Despite the availability of effective antibiotics, published research indicates that mortality rates associated with hospital-acquired pneumonia due to gram-negative infection are between 25% and 50%. The overall prognosis for patients experiencing postoperative pneumonia is poor, due in part to comorbidities.

According to the Institute for Healthcare Improvement, a facility that performed 10,000 non-cardiac operations per year would be expected to have about 150 cases of postoperative pneumonia. In the ICU, this complication can translate into additional healthcare costs of as much as $40,000 per patient; the estimated mortality rate ranges from 20% to 70%. Throughout the country, pneumonia-prevention programs have been successfully implemented in ICU settings. However, there are currently no such programs in place for patients in surgical wards.

An Effective Pilot Program

In the April 2010 *Journal of the American College of Surgeons*, my colleagues and I reported a study in which we tested a pilot pneumonia-prevention program to assess its effect on reducing the incidence of postoperative pneumonia in a hospital surgical ward. The pilot prevention program was designed and implemented based on an extensive literature review of risk reduction interventions. In the program, physicians and ward staff received education on preventing pneumonia. Other components of the program included:

> *Our pilot pneumonia-prevention program significantly reduced postoperative pneumonia in a hospital surgical ward.*

- Cough and deep-breathing exercises with incentive spirometer.
- Twice daily oral hygiene with chlorhexidine swabs.
- Ambulation with good pain control.
- Head-of-bed elevation to at least 30° and csitting up for all meals.

Quarterly staff meetings were also initiated to discuss the results of and compliance with the program. Pneumonia bundle documentation and computerized pneumonia-prevention order sets in the physician order entry system were also key components in the program.

After the intervention, we calculated the incidence of postoperative pneumonia using the prospectively collected National Surgical Quality Improvement Project database, which captured data on approximately half of inpatient admissions. According to findings, our pilot pneumonia-prevention program significantly reduced postoperative pneumonia in a hospital surgical ward. There was a significant decrease in ward pneumonia incidence from 0.78% in the pre-intervention group, as compared with 0.18% in the post-intervention group. This represented an 81% decrease in the incidence of postoperative pneumonia from 2006 to 2008. Pneumonia was diagnosed in the surgical ward in 13 of 1,668 inpatient admissions before the pilot program was initiated. After program initiation, only three of 1,651 inpatient admissions with pneumonia were diagnosed in the ward.

Potential for Universal Implementation

In light of our findings, there is hope that this pilot program can be used in more institutions throughout the United States. If expanded to other VA or private hospitals, this program could help improve patient care and lower morbidity, mortality, and overall healthcare costs. The interventions were not costly, but did require ongoing communication and cooperation between physicians and nursing leadership to achieve compliance with the measures. The hope is that with more research we can optimize the potential of the pilot program and disseminate it to more hospital surgical wards.

Sherry M. Wren, MD, FACS, has indicated to Physician's Weekly *that she has no financial disclosures to report.*

References

Wren SM, Martin M, Yoon JK, Bech F. Postoperative pneumonia-prevention program for the inpatient surgical ward. *J Am Coll Surg.* 2010;210:491-495. Abstract available at: www.sciencedirect.com/science.html

Arozullah AM, Khuri SF, Henderson WG, et al. Development and validation of a multifactorial risk index for predicting postoperative pneumonia after major noncardiac surgery. *Ann Intern Med.* 2001;135:847-857.

Warren DK, Shukla SJ, Olsen MA, et al. Outcome and attributable cost of ventilator-associated pneumonia among intensive care unit patients in a suburban medical center. *Crit Care Med.* 2003;31:1312-1317.

Babcock HM, Zack JE, Garrison T, et al. An educational intervention to reduce ventilator-associated pneumonia in an integrated health system: a comparison of effects. *Chest.* 2004;125:2224-2231.

Hall JC, Tarala RA, Tapper J, Hall JL. Prevention of respiratory complications after abdominal surgery: a randomized clinical trial. *BMJ.* 1996;312:148-153.

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Balancing Life With a Career in Surgery

New data demonstrate that marital status, children, and gender appear to have a powerful effect on the career planning of general surgery residents.

Graduate surgical education has changed significantly during the past 20 years. Several events have changed the landscape considerably, including the elimination of the pyramidal training system in 1983, the institution of the Accreditation Council for Graduate Medical Education core competencies in 1999, and the 80-hour work week mandate in 2003. As a result, there have been many new fast-track residencies and a rapid increase in the number of specialty fellowships, especially in minimally invasive surgery. These changes reflect a growing interest in tailoring traditional general surgery to the desire of residents who want to obtain specialty training. This has created a generation gap between current trainees and experienced surgeons in practice.

In addition, specialization has emerged as a growing trend that might jeopardize the future of general surgery. According to published research, many factors play a role, including the changing demographics of medical schools and surgery residency programs, residency types, and early exposure through research that is performed during residency. "Gender-related studies on specialty training have historically focused on increasing the female surgeon pool," says Julie Ann Sosa, MD, MA. "These studies highlight issues surrounding maternity leave, child care, female faculty role models, and shorter training programs. Unfortunately, there's a paucity of research addressing the influence of external support systems, such as family, on surgical trainees' plans to specialize during or after their residencies."

Julie Ann Sosa, MD, MA

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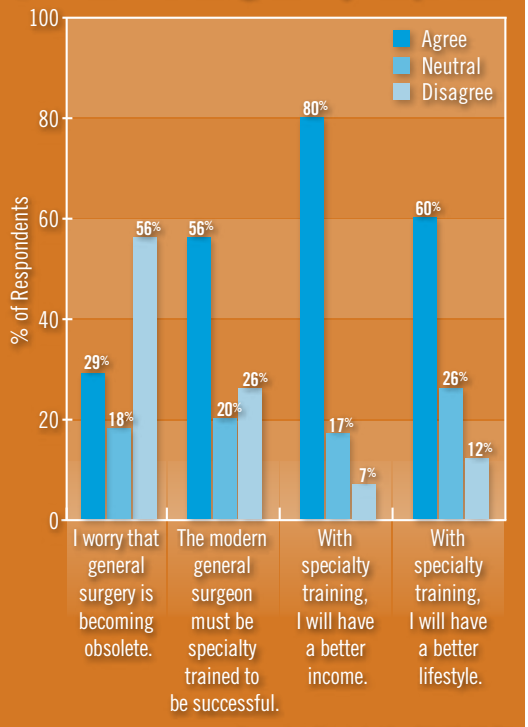
New Survey Highlights

In the May 2010 *Archives of Surgery*, Dr. Sosa and colleagues conducted a nationwide survey of all categorical general surgery residents in the United States to identify factors that motivate residents to specialize. "More specifically, we examined the influences of marriage, family, and gender on residents' perception of the need for specialization during and after residency," Dr. Sosa says. The survey asked general surgery residents about their motivations for pursuing surgery as a career, their views on specialization, self-assessments of their performance, and perceptions of the current and future status of general surgery.

More than half (51.3%) of general surgery residents who were surveyed in the study were married, while 23.6% were in a relationship and 22.6% were single. Another 25.4% of residents had children. More than a quarter (28.7%) of residents expressed concern that general surgery as a discipline was becoming obsolete, but women were less likely than men to agree with this statement. "A key finding was that 55.1% of respondents believed that the modern general surgeon must be specialty trained in order to be successful," says Dr. Sosa (Figure 1). "This feeling was more common among men than women, single residents than married residents, and residents without children tha those with children." Another 78.1% of respondents associated specialty training with a better income, and 62.3% associated it with a better lifestyle.

"Single residents and those without children were more likely to believe in the necessity of specialty training," Dr. Sosa notes. "Men and women with children believed that specialty training was associated with a better income, compared with colleagues without children. Overall, married women and women with children were twice as likely as their male counterparts to believe that specialty training has a positive effect on lifestyle [Figure 2]."

Figure 1 Summarizing Survey Responses

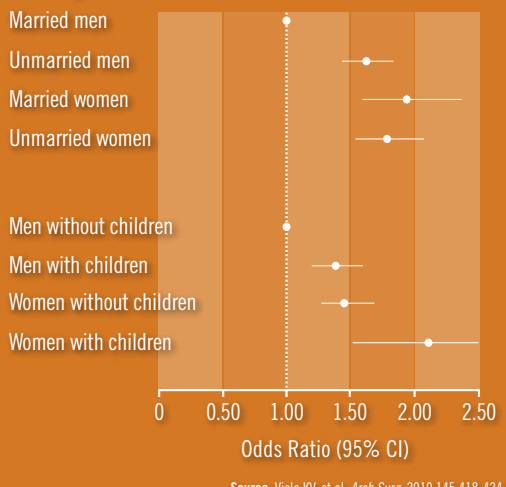


Source: Viola KV, et al. *Arch Surg.* 2010;145:418-424.

Interpreting the Data

The *Archives of Surgery* study by Dr. Sosa and colleagues raises some interesting questions about the beliefs of trainees and their intent to seek specialty training. "Each fellowship experience is unique," says Dr. Sosa, "and provides varying potential for greater income and flexibility with lifestyle desires. Studies on the role of external support systems and attitudes toward career decision-making has been limited in medicine. Much of the literature has

Figure 2 Interactions of Marriage, Children, & Gender Concerning Lifestyle



Source: Viola KV, et al. *Arch Surg.* 2010;145:418-424.

> *A key finding was that 55.1% of respondents believed that the modern general surgeon must be specialty trained in order to be successful.*
>
> — Julie Ann Sosa, MD, MA

focused on recommendations rather than research to promote a balance between professional careers in medicine—especially surgery—and family. It would be beneficial to conduct more research in which resident characteristics among those considering post-residency training were stratified with the impact of marriage and children on the rigors of residency and fellowship."

Dr. Sosa and colleagues note in their study that a pertinent follow-up analysis could seek to identify specific characteristics and trends of fellows in their designated specialty-training programs, which include marital status, family factors, and gender. "This additional information may help guide specialty programs in becoming sensitive to balancing surgical careers with lifestyle desires," Dr. Sosa says. "Ultimately, each trainee will seek a pathway in graduate surgical education that will give them the necessary skill sets for optimizing patient care, receiving adequate compensation, and achieving a flexible lifestyle. Understanding how these factors influence residents is critical to identifying, recruiting, and retaining the best and brightest candidates."

Julie Ann Sosa, MD, MA, has indicated to Physician's Weekly *that she has or has had no financial interests to report.*

References

Viola KV, Bucholz E, Yeo H, Piper C, Bell RH, Sosa JA. Impact of family and gender on career goals: results of a national survey of 4586 surgery residents. *Arch Surg.* 2010;145:418-424. Available at: http://archsurg.ama-assn.org/cgi/content/abstract/145/5/418

Hebert JC. Fellowship training: a self-fulfilling prophecy: comment on "Impact of family and gender on career goals." *Arch Surg.* 2010; 145:424-425. Available at: http://archsurg.ama-assn.org/cgi/content/extract/145/5/424

Borman KR, Vick LR, Biester TW, Mitchell ME. Changing demographics of residents choosing fellowships: longterm data from the American Board of Surgery. *J Am Coll Surg.* 2008;206:782-789.

Kwakwa F, Biester TW, Ritchie WP Jr, Jonasson O. Career pathways of graduates of general surgery residency programs: an analysis of graduates from 1983 to 1990. *J Am Coll Surg.* 2002;194:48-53.

Longo WE, Sumpio B, Duffy A, Seashore J, Udelsman R. Early specialization in surgery: the new frontier. *Yale J Biol Med.* 2008;81:187-191.

Borman KR, Vick LR, Dattilo JB, Tarpley JL, Mitchell ME. Factors in fellowship selection: effect of services and fellows. *J Surg Res.* 2009;154:274-278.

Wendel TM, Godellas CV, Prinz RA. Are there gender differences in choosing a surgical career? *Surgery.* 2003;134:591-598.

McCord JH, McDonald R, Leverson G; et al. Motivation to pursue surgical subspecialty training: is there a gender difference? *J Am Coll Surg.* 2007;205:698-703.

Snyder RA, Bills JL, Phillips SE, Tarpley MJ, Tarpley JL. Specific interventions to increase women's interest in surgery. *J Am Coll Surg.* 2008;207: 942-947, 947.e1-947.e8.

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A New Strategy to Manage Charcot Foot

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Each year in the United States, over 60,000 lower extremity amputations occur in patients with diabetes, and about a half million people have a diabetic foot infection. Charcot foot, a diabetes-associated neuropathic osteoarthropathy, has gotten increased recognition as a debilitating disease that frequently leads to severe disability and poor quality of life. The increasing incidence of morbidly obese patients with diabetes may be partially responsible for the increased prevalence of Charcot foot.

Over the past decade, it has been recognized that patients with diabetes who develop Charcot foot arthropathy often experience a significant decline in their quality of life—the disability associated with a foot ulcer, foot infection, or Charcot foot is comparable to that of a below-the-knee amputation. This potentially devastating condition consumes significant healthcare resources for multiple surgical procedures and often leads to lower extremity amputation and premature death.

Current Treatments Are Lacking

Traditionally, the primary intervention for treating Charcot foot has been non-weight-bearing immobilization with a total contact cast until the problem is resolved. This approach, however, can often lead to severe structural deformity of the foot and ankle. Additionally, obese patients may have difficulty walking in a cast and are often forced to confinement in a wheelchair. Following removal of the cast, patients are then accommodated with cumbersome, protective therapeutic shoes and braces, but these can significantly limit overall function.

Data have shown that surgical correction of foot deformities so that the foot remains flat on the ground can improve outcomes for sufferers of

"Identifying patients with diabetes who are at risk for Charcot foot is crucial to preventing potentially devastating complications of the disease."

Charcot foot. This procedure may also enable patients to wear standard therapeutic footwear rather than braces. In order to accomplish this end result, some treatment options involve internal fixation—similar to how fractures are surgically treated—and correcting deformities with internal plates, screws, and rods. Reconstructive surgery, however, can often lead to unique complications. Patients with diabetes tend to have underlying chronic osteomyelitis with poor bone quality and have impaired immunity. Furthermore, weakened bones could collapse under the heavy weight of Charcot patients who are obese.

Exploring a New Surgical Treatment

In a review published in the June 2010 issue of *Hospital Practice*, I described a surgical technique that appears to secure foot bones with an external frame. In the study, over 90% of patients were able to walk with commercially available diabetic shoes. A circular external fixator is a rigid frame made of stainless steel and aircraft-grade aluminum. Three rings surround the foot and lower calf and have stainless-steel pins extending off them and into the foot to secure the bones after surgery. The device has been shown to achieve a high potential for enhancing clinical outcomes with few incisions and a minimal risk for infection.

Identifying patients with diabetes who are at risk for Charcot foot is crucial to preventing potentially devastating complications of the disease. Patients at risk include those who have peripheral neuropathy and/or deformities of the foot. Patients who are at risk frequently present with painless swollen feet, and they are often misdiagnosed with tendonitis or gout. Physicians should maintain a heightened awareness for the disorder when patients with diabetes present to their institution with a swollen foot—with or without pain—and if they lack systemic signs of infection.

Michael S. Pinzur, MD, has indicated to Physician's Weekly *that he has the following financial disclosures to report: Small Bone Innovations, Inc. and Smith & Nephew, Inc.*

References

Pinzur MS. Circular fixation for the nonplantigrade Charcot foot. *Hosp Pract.* 2010;38:56-62.

Molines L, Darmon P, Raccah D. Charcot's foot: newest findings on its pathophysiology, diagnosis and treatment. *Diabetes Metab.* 2010 Jun 4. [Epub ahead of print].

Pinzur MS, Gurza E, Kristopaitis T, et al. Hospitalist-orthopedic co-management of high-risk patients undergoing lower extremity reconstruction surgery. *Orthopedics.* 2009;32:495.

Stuck RM, Sohn MW, Budiman-Mak E, et al. Charcot arthropathy risk elevation in the obese diabetic population. *Am J Med.* 2008;121:1008-1014.

Sohn MW, Stuck RM, Pinzur M, et al. Lower-extremity amputation risk after charcot arthropathy and diabetic foot ulcer. *Diabetes Care.* 2010;33:98-100.

Sohn MW, Lee TA, Stuck RM, et al. Mortality risk of Charcot arthropathy compared with that of diabetic foot ulcer and diabetes alone. *Diabetes Care.* 2009;32:816-821

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Identifying High Risk Patients for EVAR

New data suggest that using a simple scoring system can help quantify perioperative risk for patients who may be candidates for endovascular aneurysm repair, or EVAR.

Advanced cross-sectional imaging and enhanced screening efforts have enabled physicians to identify abdominal aortic aneurysms (AAAs) with greater frequency. Several studies have compared the outcomes of open repair with endovascular aneurysm repair (EVAR) for the treatment of AAAs. Although much of the data have indicated that EVAR is associated with significant benefits, there have been concerns as to whether the procedure is a sufficiently low-risk surgery for all patients. Of particular concern is a subset of high-risk patients with prohibitively high mortality.

"Every surgery requires a risk-benefit analysis before deciding whether or not to proceed," explains K. Craig Kent, MD. "Aneurysms are incredibly lethal and have been associated with an 85% chance of death when ruptures occur. Few people make it to the hospital in time, and 50% of those who do have an aneurysm rupture die during emergency surgery. The goal in treating aneurismal disease is to prevent the aneurysm from rupturing. However, the challenge is deciding what aneurysms should be repaired based on individual patient characteristics."

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Many patients who are at high risk for open repair can be safely treated with endovascular repair.

— K. Craig Kent, MD

Assessing EVAR in High-Risk Patients

EVAR for AAA has been shown to offer significant advantages. As a minimally invasive procedure, EVAR does not always require general anesthesia or ICU admission postoperatively. The procedure also eliminates the need for laparotomy and associated complications, decreases blood loss compared with open repair, and avoids the major perioperative intravenous fluid shifts that are observed with open repair. Moreover, it significantly reduces perioperative morbidity and mortality, compared with traditional open surgery.

According to Natalia Egorova, PhD, MPH, the quick adoption of EVAR was similar to that of any new technology in medicine that is deemed successful in clinical trials. She says that significant benefits of EVAR may have encouraged physicians to become more aggressive in treating aneurysms in patients whose comorbidities would have otherwise precluded a traditional operation.

Recently, a study from England has brought into question the safety of EVAR, suggesting that patients who were at high risk for open aneurysm repair who undergo the minimally invasive alternative have an incredibly high mortality, with a death rate as high as 7%. These authors concluded that no surgical intervention is warranted for high-risk AAA patients.

Despite some valuable insights from that data, Dr. Kent and Dr. Egorova (along with other co-investigators) had a study published in the December 2009 *Journal of Vascular Surgery* in which they analyzed nearly 67,000 patients who had EVAR. Contrary to findings from the English study, the overall 30-day mortality they observed was only 1.6%. "While there is indeed a subset of patients at very high risk for EVAR," says Dr. Kent, "this subset of patients was extraordinarily small compared to the number of patients treated for aneurysms. Our findings showed that many patients who are at high risk for open repair can be safely treated with endovascular repair."

A Scoring System for Physicians

Dr. Egorova says that EVAR is a safe technique that can be used relatively freely in patients with aneurysms, with notable exceptions. "Physicians should use a simple scoring system to help them identify high risk patients preoperatively," she adds. Dr. Egorova and her colleagues created a scoring system to identify individuals who fall into this small subset of high risk in order to determine who should not receive EVAR based on patient and institutional factors (Table). The scoring system provides physicians with criteria to quantify perioperative risk for EVAR candidates.

Table Risk Scores for 30-Day Mortality for EVAR Patients*

Risk Factor	Score
Renal failure w/dialysis	7
Lower extremity ischemia	5
Age ≥85 years	4
Liver disease	3
Congestive heart failure	3
Renal failure without dialysis	3
Age 80-84 years	2
Female	2
Neurological	2
Chronic pulmonary	1
Surgeon EVAR experience <3	1
Hospital annual volume <7	1
Age 75-79 years	1

*Patients with a score of 9 or higher should be considered high risk for EVAR.

Abbreviation: EVAR, endovascular aneurysm repair.

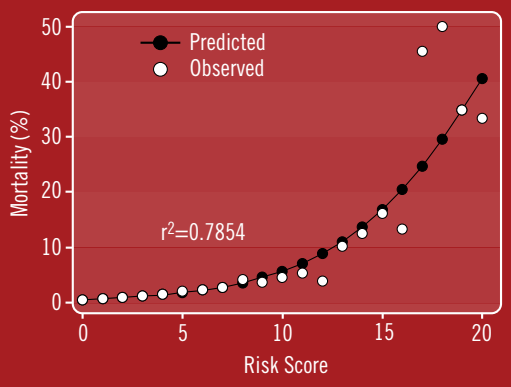
Source: Adapted from: Egorova N, et al. *J Vasc Surg.* 2009;50:1271-1279.

"Our scoring system depicts risk scores for all statistically significant risk factors identified in our study," says Dr. Egorova. "Risk scores can range from 1 point for chronic pulmonary disorders to 7 points for renal failure with dialysis. A score of 9 or less correlated with a mortality for patients of less than 5%. The scoring system is designed to assist interventionalists by assessing the surgical risk of patients with multiple comorbidities, a task which is often challenging. The system compares the impact of individual risk factors on mortality as well as a summation of their combined effects. The higher the score, the higher the likelihood of mortality [Figure]. A mortality of 5% is considered very high for endovascular AAA repair, corresponding with a score of 9 points. Patients who have scores of 9 and higher clearly belong to the high-risk group."

A limitation of the scoring system is that the Medicare database that was analyzed in the study was not able to provide patient anatomy, which is an important variable in making surgical decisions. "Along with anatomy, physicians should also take into consideration the predicted longevity of patients based on age and other comorbidities when deciding whether or not to perform a prophylactic aneurysm repair," says Dr. Kent. "The scoring system is a simple, predictive, validated model that uses information that is readily available to providers. However, at the end of the day, the decision on repairing an aneurysm should be individualized to each patient."

Figure Assessing Observed & Predicted Mortality

The figure below depicts the relationship between observed and predicted mortality by total score.



Source: Adapted from: Egorova N, et al. *J Vasc Surg.* 2009;50:1271-1279.

K. Craig Kent, MD, and Natalia Egorova, PhD, MPH, have indicated to Physician's Weekly *that they have no relevant financial interests to report.*

References

Egorova N, Giacovelli JK, Gelijns A, et al. Defining high-risk patients for endovascular aneurysm repair. *J Vasc Surg.* 2009;50:1271-1279.e1.

Kent KC. Endovascular aneurysm repair--is it durable? *N Engl J Med.* 2010;362:1930-1931.

Egorova N, Giacovelli J, Greco G, et al. National outcomes for the treatment of ruptured abdominal aortic aneurysm: comparison of open versus endovascular repairs. *J Vasc Surg.* 2008;48:1092-1100, 1100.e1-2.

Minor ME, Ellozy S, Carroccio A, et al. Endovascular aortic aneurysm repair in the octogenarian: is it worthwhile? *Arch Surg.* 2004;139:308-314.

Sicard GA, Zwolak RM, Sidawy AN, et al. Endovascular abdominal aortic aneurysm repair: long-term outcome measures in patients at high risk for open surgery. *J Vasc Surg* 2006;44:229-236.

Patterson BO, Holt PJ, Hinchliffe R, et al. Predicting risk in elective abdominal aortic aneurysm repair: a systematic review of current evidence. Eur *J Vasc Endovasc Surg.* 2008;36:637-645.

Giles KA, Schermerhorn ML, O'Malley AJ, et al. Risk prediction for perioperative mortality of endovascular vs open repair of abdominal aortic aneurysms using the Medicare population. *J Vasc Surg.* 2009;50:256-262.

Wilt TJ, Lederle FA, Macdonald R, et al. Comparison of endovascular and open surgical repairs for abdominal aortic aneurysm. *Evid Rep Technol Assess (Full Rep).* 2006;144:1-113.

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Reducing Cardiovascular Events After PCI

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Research has shown that when compared with moderate-dose statins, intensive statin therapy can reduce major adverse cardiac events among patients with acute coronary syndrome (ACS). However, the results of intensive-versus-moderate lipid-lowering therapy after PCI for ACS are not well established. Furthermore, no studies have compared the effect of different statin dosages on target vessel revascularization (TVR) and non-TVR. In this patient subgroup, clinicians often focus on treating the stent rather than the whole patient. Stenting only treats one focal spot, not the whole bed of the coronary tree. Clopidogrel and aspirin are often used to keep the stent open, but the role of intensive lipid-lowering therapy in PCI is frequently undervalued.

Support for Intensive Lipid Lowering

In the December 8, 2009 *Journal of the American College of Cardiology*, my colleagues and I conducted a study in which we compared outcomes in 2,868 patients who underwent PCI for ACS just prior to enrollment in the PROVE IT–TIMI 22 (Pravastatin or Atorvastatin Evaluation and Infection Therapy–Thrombolysis In Myocardial Infarction 22) trial. The PROVE IT–TIMI 22 randomized ACS patients to either 80 mg atorvastatin or 40 mg pravastatin daily. Of the original cohort, 69% had undergone PCI just prior to randomization. The incidence of the primary composite end point of all-cause mortality, myocardial infarction, unstable angina leading to hospitalization, and revascularization after 30 days and stroke was evaluated. We also assessed the incidence of TVR and non-TVR during follow-up.

Treatment with 80 mg atorvastatin reduced the incidence of the composite end point (21.5% vs 26.5%) and lowered the incidence of TVR (11.4% vs 15.4%) and non-TVR (8.0% vs 10.5%) when compared with 40 mg pravastatin. Rates of recurrent ischemia, rehospitalization for unstable angina, revascularization 30 or more days after randomization, and the composite of death and myocardial infarction were also lower with higher-dose therapy. We observed no difference between the groups in the incidence of stroke. After adjusting for 30-day on-treatment serum LDL cholesterol and C-reactive protein concentrations, the odds of TVR with high-dose statin therapy remained significant

"Patients who undergo PCI should be treated with intensive statin therapy, as indicated by the most recent PCI guidelines."

while the odds of non-TVR did not. Our data strongly support the idea that patients who undergo PCI should be treated with intensive statin therapy, as indicated by the most recent PCI guidelines.

Part of the reduction in TVR may be mediated by a pleiotropic mechanism of high-dose treatment that was not accounted for by reductions in LDL-cholesterol or markers of systemic inflammation. These pleiotropic effects may include decreased inflammation, increased plaque stability, and improved endothelial function. Conversely, treatment intensity was not associated with any significant difference in end points among patients managed medically rather than by PCI.

Needs for the Future

The strict enrollment criteria for our study may have excluded some patients normally seen in clinical practice, so our findings probably can't be generalized to all patients. However, our study does heighten awareness on taking the extra steps to ensure that aggressive, intensive lipid-lowering therapy be administered to patients receiving PCI to further enhance outcomes. More education is necessary for interventional cardiologists; simply put, stenting alone isn't enough to treat ACS. In the future, clinicians need to gain a better understanding of the pleiotropic mechanisms of the benefits of statins and explore other agents or processes that might achieve the same goals.

C. Michael Gibson, MS, MD, FACC, has indicated to Physician's Weekly *that he has worked as a consultant for, a paid speaker for, and received grants/research aid from Bristol-Myers Squibb.*

References

Gibson CM, Pride YB, Hochberg CP, Sloan S, Sabatine MS, Cannon CP; TIMI Study Group. Effect of intensive statin therapy on clinical outcomes among patients undergoing percutaneous coronary intervention for acute coronary syndrome PCI-PROVE IT: a PROVE IT-TIMI 22 (pravastatin or atorvastatin evaluation and infection therapy-thrombolysis in myocardial infarction 22) substudy. *J Am Coll Cardiol.* 2009;54:2290-2295. Abstract available at: http://content.onlinejacc.org/cgi/content/abstract/54/24/2290

Jia XW, Fu XH, Zhang J, et al. Intensive cholesterol lowering with statin improves the outcomes of percutaneous coronary intervention in patients with acute coronary syndrome. *Chin Med J (Engl).* 2009;122:659-664.

Johnson C, Waters DD, DeMicco DA, et al. Comparison of effectiveness of atorvastatin 10 mg versus 80 mg in reducing major cardiovascular events and repeat revascularization in patients with previous percutaneous coronary intervention (post hoc analysis of the Treating to New Targets [TNT] Study). *Am J Cardiol.* 2008;102:1312-1317.

Leone AM, Rutella S, Giannico MB, et al. Effect of intensive vs standard statin therapy on endothelial progenitor cells and left ventricular function in patients with acute myocardial infarction: Statins for regeneration after acute myocardial infarction and PCI (STRAP) trial. *Int J Cardiol.* 2008;130:457-462.

Kumar A, Cannon CP. Importance of intensive lipid lowering in acute coronary syndrome and percutaneous coronary intervention. *J Interv Cardiol.* 2007;20:447-457.

Kinoshita M, Matsumura S, Sueyoshi K, Ogawa S, Fukuda K. Randomized trial of statin administration for myocardial injury: is intensive lipid-lowering more beneficial than moderate lipid-lowering before percutaneous coronary intervention? *Circ J.* 2007;71:1225-1228.