

Surgery Update

NEWS FROM THE MEDICAL COLLEGE OF WISCONSIN DEPARTMENT OF SURGERY

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Surgery Update is written for physicians for medical education purposes only. It does not provide a complete overview of the topics covered and should not replace the independent judgment of a physician about the appropriateness or risks of a procedure for a given patient.

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Message from the Chairman

The Department of Surgery newsletter serves as a source of clinical and scientific information provided by the residents and faculty of the Medical College of Wisconsin.

by **Douglas B. Evans, MD**

Donald C. Ausman Family Foundation Professor of Surgery; Chairman, Department of Surgery, Medical College of Wisconsin

In this issue, Amanda L. Kong, MD, John B. Hijjawi, MD, and the multidisciplinary breast cancer team provide Part II of a series on breast reconstruction. Managing breast cancer patients from diagnosis through treatment is one of the most complex algorithms in medicine today. Matthew I. Goldblatt, MD, and James R. Wallace, MD, PhD, discuss the importance of vitamin D physiology when managing bariatric surgery patients. Low vitamin D levels increase serum levels of parathyroid hormone. This may increase bone demineralization, leading to osteoporosis and increased risk of fracture. Vitamin D physiology is at the forefront of many research efforts, especially with the emerging importance of this molecule in oncology. Lauren A. Kosinski, MD, provides current guidelines for colon cancer screening and colonoscopy. The second leading cause of cancer death, colorectal cancer may be preventable in many patients; her article should be a guide for managing our patients and ourselves.

This newsletter also alerts our alumni and referring physicians to innovative programs at Froedtert & The Medical College of Wisconsin. Mario G. Gasparri, MD, and William B. Tisol, MD, describe the evolving role of minimally invasive surgery in thoracic oncology. In

collaboration with their partners, this thoracic surgery group leads a multidisciplinary team of physicians throughout greater Milwaukee. Thoracoscopic lobectomy is just one of many innovations they have brought to this region of Wisconsin. Brian D. Shames, MD, and Christopher P. Johnson, MD, summarize the virtual cross-match and its importance for kidney transplantation. Solid organ transplantation has just been named the fourth major academic service line at Froedtert & The Medical College, indicating the importance of transplantation to our institutional mission. Finally, Tracy S. Wang, MD, MPH, and her colleagues Stephen B. Magill, MD, Gilbert G. Fareau, MD, and William S. Rilling, MD, FSIR, review primary hyperaldosteronism — an under-diagnosed disease in hypertensive patients. Dr. Wang emphasizes the importance of accurate diagnosis and localization, and retroperitoneoscopic adrenalectomy — the innovative approach to minimally invasive adrenalectomy.

We hope you find these articles interesting and of help to you in your practice. If there are topics you would like to see in future editions, please let me know at devans@mcw.edu. Thank you for supporting the Department of Surgery.

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PART II: BREAST CANCER SURGERY AND RECONSTRUCTIVE OPTIONS

The Breast Cancer Program at the Froedtert & The Medical College of Wisconsin Clinical Cancer Center provides an interdisciplinary approach to breast cancer treatment in a state-of-the-art cancer center. (froedtert.com/cancer)

by **John B. Hijjawi, MD**, Assistant Professor of Plastic and Reconstructive Surgery; **John A. LoGiudice, MD**, Assistant Professor of Plastic and Reconstructive Surgery; **Amanda L. Kong, MD**, Assistant Professor of Surgery; and **Tina W.F. Yen, MD, MS**, Assistant Professor of Surgery

In the prior issue of this newsletter, we reviewed which breast cancer patients are eligible for breast-conserving surgery versus mastectomy and discussed who should get immediate versus delayed post-mastectomy reconstruction. In this issue, we review all post-mastectomy reconstructive options offered at Froedtert & The Medical College of Wisconsin.

What options are available for women who desire breast reconstruction?

The Department of Plastic and Reconstructive Surgery at Froedtert & The Medical College of Wisconsin is committed to providing the most advanced forms of breast reconstruction available worldwide in a manner that maximizes each patient's ability to return to a fully active lifestyle in as short a time as possible.

What makes the DIEP Flap different?

A woman's own abdominal tissue has long been considered the gold standard for breast reconstruction following mastectomy. The DIEP Flap uses a woman's own tissue to rebuild the breast. It provides skin and soft tissue to truly "replace like with like," creating a reconstructed breast that is soft, mobile and warm.

Plastic surgeons have used the TRAM Flap, or Transverse Rectus Abdominis Myocutaneous Flap, since 1980. While this procedure provides an excellent source of skin and subcutaneous fat, unfortunately, it also requires the sacrifice of one, or in bilateral cases, both rectus abdominis muscles which are important "core stabilizers" of the torso.

The early 1990's saw the evolution of this technique into the DIEP Flap, or Deep Inferior Epigastric Artery Perforator Flap, a technique now considered state-of-the-art in reconstructive breast surgery worldwide. The DIEP Flap provides precisely the same skin and subcutaneous fat as the TRAM Flap, but preserves the abdominal wall muscles and nerves that innervate those

muscles — a major functional advantage. This critical difference reduces the incidence of complications related to abdominal wall hernias and abdominal weakness as a result of muscle sacrifice. Most important for the patient, post-operative pain, hospital stay and recovery time are reduced.

The DIEP Flap uses the same excess abdominal tissue that is removed in an aesthetic abdominoplasty or "tummy tuck," an attractive benefit for patients. This option is available to women at the time of mastectomy or years later, and previous abdominal surgery is rarely a contraindication. The DIEP Flap requires highly specialized training and is more time consuming than previous techniques. It is available at relatively few specialized centers nationwide. However, this technique can truly maximize the patient's reconstructive result without compromising her abdominal wall function.

Breast Implants and Acellular Dermal Matrix Grafts — Major Advances

Breast implants and tissue expanders have been a mainstay of post-mastectomy breast reconstruction for more than 30 years. This straightforward form of reconstruction requires minimal extra time in the operating room and essentially no extra inpatient admission time relative to mastectomy without reconstruction. This form of reconstruction involves placing an expandable breast implant under the pectoralis major muscle immediately at the time of mastectomy or at some time after mastectomy in a "delayed" fashion. The implant can then be filled during short office visits to restore the original volume of the patient's breast.

A major advance in implant-based breast reconstruction has been the development of techniques that use acellular dermal matrix grafts to augment the pectoralis major muscle. This technique increases the space available for implant placement underneath the pectoralis muscle, reducing pain associated with expansion and the time required to achieve full expansion. Significantly more natural-appearing results are routinely possible with this technique than with previous implant-based techniques. Members of our breast reconstruction team currently serve as teaching faculty for instructional courses introducing these techniques to plastic surgeons nationwide.

Other Forms of Breast Reconstruction

At Froedtert & The Medical College, several other forms of breast reconstruction are also available, expanding the scope of options available to our patients. The Superficial Inferior Epigastric Artery Perforator Flap (SIEA Flap), the Thoracodorsal Artery Perforator Flap (TAP Flap) and Latissimus Dorsi Flap (LD Flap) are all options routinely performed in our practice. Our commitment to providing this wide variety of reconstructive choices stems from the reality that not all forms of reconstruction are ideal for every patient. By providing a wide variety of options, we can optimize the reconstructive plan for each patient, finding a plan that fits not only her clinical needs, but also her lifestyle.

For Information, an Appointment or Consultation

Breast Surgery: 414-805-0505 or 866-680-0505

Plastic Surgery: 414-805-5440

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KIDNEY TRANSPLANTATION AND THE USE OF THE VIRTUAL CROSS-MATCH AT THE FROEDTERT & THE MEDICAL COLLEGE OF WISCONSIN TRANSPLANT CENTER

Advances in immunosuppression, diagnosis and treatment of viral infections, and management of cardiovascular disease have resulted in progressive improvement in patient and graft survival after kidney transplantation.

By **Brian D. Shames, MD**, *Assistant Professor of Surgery*; **Christopher P. Johnson, MD**, *Professor of Surgery*; **Thomas Ellis, PhD, D (ABHI)**, *Director, Histocompatibility Laboratory, BloodCenter of Wisconsin*

Since 1967, more than 3,500 kidney transplants have been performed by physicians of the Froedtert & The Medical College of Wisconsin Transplant Center. Currently, approximately 140 kidney transplants are done each year at Froedtert & The Medical College and Children's Hospital of Wisconsin, which comprise the base of operations for the Transplant Center. Advances in immunosuppression, diagnosis and treatment of viral infections, and management of cardiovascular disease have resulted in progressive improvement in patient and graft survival after kidney transplantation. At Froedtert & The Medical College, the one-year patient and graft survival following kidney transplant is 99.11% and 97.64% respectively. This is the highest of 91 centers in the country performing more than 70 transplants per year (Scientific Registry of Transplant Recipients. Center and OPO-specific Reports, January 2009 release ustransplant.org). Contributing to these excellent outcomes is a strong collaborative relationship with BloodCenter of Wisconsin.

Recent technological developments in human leukocyte antigen (HLA) antibody identification have revolutionized the field of histocompatibility. For the last 35 years, the standard complement-dependent cytotoxicity (CDC) cross-match and the antihuman globulin augmented (AHG) assay have been used to detect anti-donor HLA antibodies prior to renal transplantation and to determine donor-recipient compatibility. More recently, the flow cytometric cross-match (FCXM), which is significantly more sensitive than the CDC and AHG cross-match, has been utilized. These traditional tests utilize white blood cells from the organ donor and serum from the potential recipient to determine histocompatibility. The FCXM is currently considered by most centers to be the best

test for the presence of donor specific HLA antibodies. However, the FCXM has some limitations, including potential for non-specific, non-HLA binding which can lead to a false positive result. Second, the assay is not standardized and the cut point to define a positive FCXM can be difficult to determine. Lastly, performing a FCXM in real time as a prospective test prior to transplantation requires additional time and resources in the HLA laboratory and can prolong cold ischemic time.

Utilization of latex beads coated with specific HLA antigens can now provide precise and complete identification of anti-HLA antibodies present in a potential kidney recipient. This permits what is now referred to as a "virtual cross-match," the ability to predict the outcome of a traditional cross-match based on the recipient's known HLA antibody profile and the donor's tissue type. With virtual cross-match (VXM), donor cells and recipient serum are not required. VXM allows multiple potential recipients to be screened rapidly for any given donor. Patients who have developed HLA antibodies due to previous transplants, blood transfusions or pregnancy are considered sensitized and are significantly less likely to receive a kidney compared with non-sensitized patients. VXM, by its ability to quickly and cost-effectively screen multiple patients, should increase access of these sensitized patients to kidney transplantation. Furthermore, in theory, the proper use of VXM could eliminate the need to perform a prospective cross-match prior to transplant, thus saving time and money.

BloodCenter of Wisconsin, in collaboration with our Kidney Transplant Program, began using this technology in 2005. We recently reviewed our results for 169 consecutive recipients of deceased donor transplants performed between January 2005 and July 2007 (presented to the American Transplant Congress in May 2009, Boston, MA). The purpose of this retrospective study was to compare the virtual and flow cross-match as a predictor of outcomes in an unselected, consecutive series of deceased donor renal transplants. The one-year patient and graft survival for this population (N=169 transplants) was 97.8 percent and 96.6 percent (Scientific

Registry of Transplant Recipients. Center and OPO-specific Reports, January 2009 release, ustransplant.org). Nineteen patients were VXM negative and traditional cross-match (FCXM) positive, while the remaining 150 patients were virtual and traditional cross-match negative. In the past, a positive cross-match was considered a contraindication for kidney transplantation. Based on the negative virtual cross-match, we believed it was safe to proceed with kidney transplantation, despite the positive traditional cross-match. One-year graft survival in the traditional cross-match positive group was 94.7 percent. Rejection episodes occurred in only 2 patients (10 percent). Importantly, 20 percent of patients transplanted since we implemented the virtual cross-match protocol were considered to be highly sensitized. The national average is only 10 percent.

At our center, solid phase assays and virtual cross-matches are replacing flow cytometry as the gold standard for detecting pre-transplant donor specific antibodies. Renal transplantation with a positive flow cytometric cross-match in the setting of a negative virtual cross-match can be accomplished safely with excellent short-term outcomes and minimal rejection. Furthermore, implementation of a virtual cross-match protocol has resulted in increased accessibility of transplant for patients who are highly sensitized.

For questions regarding any aspect of solid organ transplantation, Brian D. Shames can be reached at 414-955-6920 and bshames@mcw.edu.

PLEASE JOIN US!

95th Annual Clinical Congress Chicago, Ill

Please join the Medical College of Wisconsin Department of Surgery at the 95th Annual Clinical Congress in Chicago for a reception. The reception will be held on **Monday, October 12, 2009** from 6:00 pm to 8:30 pm at the University Club of Chicago Hotel in the Millennium Room.

BONE HEALTH AND BARIATRIC SURGERY

Over the last two decades, an increasing proportion of the population has become obese. Currently, more than 32 percent of all American adults have a BMI greater than 30 and 4.8 percent have a BMI greater than 40.

by **Matthew I. Goldblatt, MD**, *Assistant Professor of Surgery*; **James R. Wallace, MD, PhD**, *Associate Professor of Surgery*

Since weight loss surgery is the only proven treatment for obesity, the number of weight loss surgeries has also increased sharply from approximately 14,000 in 1998 to more than 100,000 in 2002 to an estimated 250,000 in 2009. Roux-en-Y gastric bypass (laparoscopic or open) and laparoscopic adjustable gastric banding account for more than 90 percent of these weight loss procedures. As more patients undergo weight loss surgery, with a slight majority having a gastric bypass, attention has focused on understanding the physiology of obesity and the metabolic effects of weight loss surgery, particularly gastric bypass.

Surgeons in the Froedtert & The Medical College of Wisconsin Bariatric Surgery Program have performed more than 1,800 bariatric procedures over the last 10 years with excellent safety profiles and patient outcomes. (For further information on our Bariatric Surgery Program, please visit froedtert.com/bariatric)

Metabolic derangements among the morbidly obese are common. The most common metabolic disorder involves glucose metabolism, usually manifested as Type II diabetes mellitus. Emerging as a physiological association with obesity is the observation that many obese patients have elevated parathyroid hormone levels, or hyperparathyroidism. This condition is secondary to decreased levels of 25-hydroxy vitamin D and low calcium availability, which results in secondary elevation of parathyroid hormone levels. Parathyroid hormone maintains calcium homeostasis at the expense of bone by increasing cortical bone turnover. This, in turn, releases calcium. Patients with gastric bypass have been shown to have decreased serum calcium levels and increased parathyroid hormone levels post-operatively, placing them at higher risk for bone disease.

Sixty to 70 percent of patients seeking bariatric surgery are found to have low levels of 25-hydroxy vitamin D (the inactive form of vitamin D) with most maintaining normal serum calcium levels. The cause of low vitamin D levels in obese patients is likely multifactorial. It has been shown that obese individuals have impaired production of 25-hydroxy vitamin D in response to a vitamin D challenge, likely due to the decreased bioavailability of vitamin D caused by its easy solubility and deposition into body fat. Obese patients also have decreased solar ultraviolet radiation exposure needed

for cutaneous vitamin D production due to residence in temperate climates, modesty or sunscreen use. In addition, the obese have been shown to have increased circulating levels of 1, 25 (OH)₂ vitamin D levels (a normal response to the increased PTH levels), which cause inhibition of hepatic synthesis of 25-hydroxy vitamin D. Elevated PTH levels then act on bone by activation of the receptor activator of nuclear factor $\kappa\beta$ ligand (RANKL) on pre-osteoblasts. This interacts with RANK receptors on osteoclasts, enhancing osteoclast activation, function and lifespan. Increased bone resorption of the endocortical surface results in cortical bone loss and relative trabecular bone sparing as seen in patients with secondary hyperparathyroidism of renal disease and in primary hyperparathyroidism patients.

The impact of low vitamin D and hyperparathyroidism on bone health in morbidly obese patients before and after weight loss surgery is an area of active investigation. In a study we reported to the American Society of Metabolic and Bariatric Surgery, bone mineral density studies were performed on pre-operative patients with low (25-hydroxy) vitamin D (hypo-vitaminosis D) and elevated parathyroid hormone levels. These patients had bone density equivalent to patients with normal vitamin D and parathyroid hormone levels.

The correlation between vitamin D levels and bone health in these patients is unclear. While not statistically significant, a trend showed that patients with elevated parathyroid hormone levels had low normal bone density scores compared to patients with normal parathyroid hormone levels. This trend may indicate a very early stage of bone demineralization.

After weight loss surgery, it is especially important to check patients for vitamin and micronutrient deficiency due to decreased food intake and the particular anatomic changes that occur following bariatric surgery. At the Froedtert & The Medical College Bariatric Surgery Program, we perform the laparoscopic Roux-en-Y gastric bypass and the laparoscopic adjustable gastric band. The majority of patients who have vitamin and mineral deficiencies after surgery have had a gastric bypass. These deficiencies relate to the specific anatomy of the surgery, are predictable and require specific supplementation. Since the distal stomach, duodenum and proximal jejunum are bypassed, decreased absorption can be expected for iron, vitamin B12, folate and calcium. These vitamins and minerals can still be absorbed within the remainder of

the gut, but higher doses are required. As a result, all our patients are required to take supplements high in these vitamins and minerals. It is rare that we see patients who are compliant with their supplements and still have decreased levels. However, some patients, despite being compliant with daily vitamins, will have hypovitaminosis D. To treat this, we initially recommend increasing the daily dose of vitamin D intake to 2000 IU. Most multi-vitamins or calcium supplements have only 400 IU. If vitamin D levels do not increase, or if the levels were especially low initially, a regimen of Ergocalciferol 1.25 mg (50,000 IU) twice weekly for eight weeks will effectively increase the body's stores of vitamin D to allow a return to a daily maintenance dose.

Bone health is important in the post-weight loss surgery patient, particularly the post-gastric bypass patient. The majority of these patients are women; therefore, future osteoporosis is a concern. Lifelong follow-up after surgery to monitor specific diseases that may occur later in life is recommended. We offer our patients this follow-up at least once a year for life.

For questions regarding bariatric surgery or the Bariatric Surgery Program, please contact Matthew I. Goldblatt, MD, and James R. Wallace, MD, PhD, at 414-805-5747.

Selected References:

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Steven K. Kappes, MD

STEVEN K. KAPPES, MD, SELECTED BY MEDICAL STUDENTS FOR GOLDEN CANE AWARD

At this year's annual Eberbach resident graduation banquet, Steven K. Kappes, MD, was awarded the Golden Cane Award.

This award is given to a faculty member who is recognized as an outstanding teacher by the third and fourth year medical students. Results are tabulated over the course of a year from May until the following April. The individual receiving the most recognition receives the Golden Cane Award.

Dr. Kappes continues to demonstrate a unique level of dedication to medical education involving not only surgical residents, but also medical students who rotate through his service. His commitment and devotion to the academic process can be summarized best in a quote from a medical student survey: "Dr. Kappes is the best attending to work with by far. He actively involves students in the procedure by discussing the operation with them and is most willing to instruct students on how to do technical procedures."

The Department of Surgery congratulates Dr. Kappes on winning the 2009 Golden Cane Award.



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Acute Care Surgery: 414-266-7858

COMING THIS FALL: CME CREDITS ONLINE

Earn CME credits and stay in touch at a time of your choosing by attending Grand Rounds online without leaving your home or office. Please consider us for convenient, comprehensive, quality learning at mcw.edu/surgery. We are a link to your "surgery home." Watch for further announcements in this newsletter.

DEPARTMENT OF SURGERY DIVISION CHIEF, SURGICAL ONCOLOGY

The Department of Surgery, Medical College of Wisconsin has an immediate opening for the position of Chief, Division of Surgical Oncology.

The selected candidate will be the Stuart D. Wilson Professor of Surgery. In addition to the endowed professorship, the position is supported by a generous start-up package and a new office suite in the recently completed Froedtert & The Medical College of Wisconsin Clinical Cancer Center. Completion of an SSO approved fellowship and demonstrated achievement in basic or clinical research is required. Candidates will need to qualify for the rank of associate or full professor at the Medical College of Wisconsin. The Division of Surgical Oncology is responsible for academic program development in the areas of breast, endocrine, hepatopancreaticobiliary, upper GI and melanoma/sarcoma oncology.

The Department of Surgery welcomes interested candidates, as well as recommendations from senior clinicians/investigators.

Interested applicants should submit a letter of interest and curriculum vitae to:

Tina W.F. Yen, MD, MS, Chair, Search Committee

Douglas B. Evans, MD, Chairman

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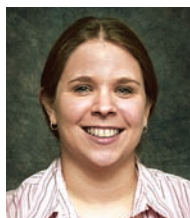
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CHIEF RESIDENTS 2009-2010 ACADEMIC YEAR

Emily L. Albright, MD, James M. Kiely, MD, Jonathan A. Parisi, MD, and Aaron M. Perme, MD, have launched the Acute Care Surgery Service under the leadership of Karen J. Brasel, MD, MPH, and Kathleen K. Christians, MD.



Emily L. Albright, MD



James M. Kiely, MD



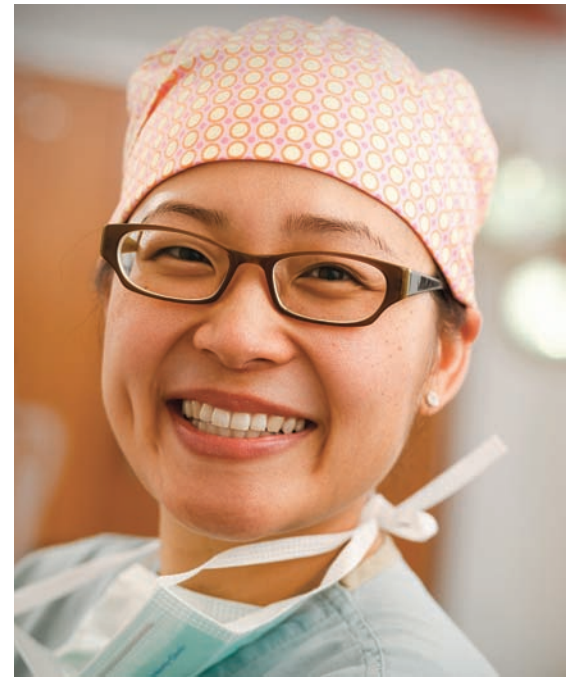
Jonathan A. Parisi, MD



Aaron M. Perme, MD

BREAST CANCER CLINICAL TRIAL: MANAGING POST-OPERATIVE PAIN AFTER MASTECTOMY

Assistant Professor of Surgery Amanda L. Kong, MD, is the primary investigator for a new study that will determine the optimal way of managing post-operative pain in breast cancer patients undergoing a mastectomy with or without reconstruction.



Amanda L. Kong, MD

The study is a collaborative effort among the departments of Surgery, Anesthesiology and Plastic and Reconstructive Surgery.

Eligible patients include those undergoing unilateral total mastectomy with sentinel node biopsy or unilateral modified radical mastectomy, with or without reconstruction with a tissue expander. The study will compare single shot paravertebral blocks, continuous paravertebral catheters and continuous infusion wound catheters.

Patients or physicians who are interested or have any questions regarding the study may reach Dr. Kong at 414-805-5815.

CONTRIBUTORS *Many thanks to the physicians and staff who contributed to this issue of Surgery Update.*



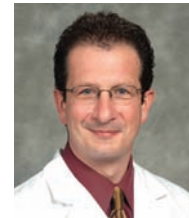
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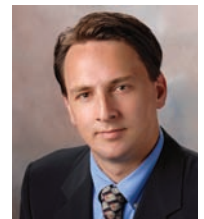
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LENNON ENDOWED CLINICAL TEACHING AWARD

Congratulations to Brian D. Lewis, MD, surgery clerkship director, Division of Vascular Surgery. Dr. Lewis is a 2009 recipient of the Edward J. Lennon Endowed Clinical Teaching Award. The award recognizes junior faculty who clearly make a difference in teaching programs at the Medical College of Wisconsin.



Alumni Corner: Paul Fox, MD

Paul Fox, MD, (Medical College of Wisconsin surgical resident from 1969-1973) began his surgical practice at Waukesha Memorial Hospital in 1976, but his interest in surgical quality started when he was a surgical resident. After founding what is now Waukesha Surgical Specialists, S.C., he frequently compiled statistics for common procedures to ensure that his group was meeting the standard of care.

In 2002, Dr. Fox was elected governor of the American College of Surgeons for the Wisconsin Chapter and learned about the National Surgical Quality Improvement Project (NSQIP) soon after. NSQIP started in the Veteran's Administration Hospital system and completed a successful private sector trial at about the time the board of governors of the American College of Surgeons was contemplating its introduction as a quality initiative in surgery.

NSQIP appealed to Dr. Fox for several reasons. He realized the climate in medicine was changing to one of increasing accountability. Additionally, this program was designed by surgeons, had obvious clinical application, and held great potential for improving the daily practice of surgery. Dr. Fox believed the surgical department at Waukesha Memorial delivered an exceptional product. NSQIP was a reliable way to test that belief.

The financial commitment was substantial and he pursued the administration doggedly. In October 2005, Waukesha Memorial Hospital became the first hospital in Wisconsin to join NSQIP, a testimony to Dr. Fox.

Froedtert & The Medical College of Wisconsin are also proud members of NSQIP.

BREAST CANCER PATIENTS BEING RECRUITED FOR PSYCHOSOCIAL RESEARCH STUDY

Psychosocial care for cancer patients is a vital component of comprehensive treatment.

by **Rebecca C. Anderson, PhD**, *Professor of Surgery*; **Kathleen M. Jensik, MSW**, *Program Coordinator*

National cancer organizations such as the National Cancer Institute, the Institute of Medicine and the National Comprehensive Cancer Network acknowledge all cancer patients will experience some level of distress during the course of illness and treatment.

In its "Meeting the Psychosocial Needs of the Breast Cancer Patient" report, the Institute of Medicine states, "A number of excellent reviews of psychosocial interventions in breast cancer, and cancer in general, have been published recently (Burke and Kissane, 1998; Fawzy et al., 1995; Meyer and Mark, 1995; Newell et al., 2002; Rimer et al., 1985; Wallace, 1997). The majority of these reviews concluded that there are important benefits associated with the use of psychological interventions of various types in various cancer settings, including breast cancer."

As part of Froedtert & The Medical College of Wisconsin's plan for providing more comprehensive multidisciplinary cancer care, the Breast Cancer Program is expanding breast cancer research to include psychosocial aspects of cancer care. Rebecca C. Anderson, PhD, professor and director of Psychology Services of the Transplant Center, Alonzo Walker, MD, medical director of the Breast Cancer Program and Kathleen M. Jensik, MSW, program coordinator, have developed a research project to address a new therapeutic approach to stress management and evaluate the use of psychosocial services. Patients with early stage breast cancer will be screened within nine months of their diagnosis to participate in this study. Recruitment will begin upon Internal Review Board approval in fall 2009. Depending upon recruitment progress, the intervention will begin in late 2009 or early 2010.

The study has two main objectives:

- Research the use of dialectical behavior therapy (DBT), an empirically proven model for dealing with stressors, with breast cancer patients. The DBT therapy model has been significantly researched and validated to be effective with a variety of mental health concerns in the mental health literature. DBT life skills modules will be modified for this unique population. DBT focuses on mindfulness, interpersonal effectiveness, emotional regulation and distress tolerance. DBT workshop will be 10 weeks long with two weeks devoted to each DBT skill. Patients will be evaluated prior to entering the workshop.
- Analyze the utilization, trends and satisfaction of psychosocial services for breast cancer patients. Develop treatment algorithms that impact outcomes and referral to psychosocial programs.

Eligibility Criteria

- Initial assessment within nine months of breast cancer diagnosis.
- Early stage breast cancer (Stages 0, I, II, III)
- Patients who are evaluated to be appropriate for the intervention
- Patients will be excluded from participating in the DBT intervention if during the assessment any findings indicate that life stressors require more intensive treatment. These patients will be referred for appropriate treatment.

For more information, or to refer a patient, please contact Rebecca C. Anderson, PhD, at 414-955-6932 or Kathleen M. Jensik, MSW, at 414-805-9001.



UPCOMING EVENTS

- Pancreatic Cancer Symposium — February 27, 2010
- Second Annual Endocrine Surgery Update — June 5, 2010
- Stuart D. Wilson, MD, Festschrift — June 4, 2010

For more information, please contact **Tracy Milkowski** at tmilkows@mcw.edu.

THORACOSCOPIC LOBECTOMY FOR LUNG CANCER

Lung cancer remains the leading cause of cancer death in the United States with roughly 220,000 new cases each year and 150,000 deaths. For Stage I and II non-small cell lung cancer, surgical resection remains the standard of care.

by **Mario G. Gasparri, MD**, Associate Professor of Surgery; **William B. Tisol, MD**, Assistant Professor of Surgery

Over the years, several surgical approaches have been described in an effort to reduce the morbidity associated with a thoracotomy. In 1992, Roviario, et. al., first described a VATS (video assisted thoroscopic surgery) lobectomy, more properly termed a thoracoscopic lobectomy.¹ Since then, many large patient series from around the world have been reported. However, confusion and skepticism regarding thoracoscopic lobectomy has prevented this procedure from gaining more widespread acceptance. For example, in 2005, 62,256 lobectomies were performed in the U.S. and only 18.3 percent were performed thoracoscopically.² While this percentage may be increasing, it still accounts for only a small percentage of lobectomies performed for cancer.

Confusion persists in defining what constitutes a thoracoscopic lobectomy. Most thoracic surgeons now agree that a thoracoscopic lobectomy should be a completely thoracoscopic procedure performed with a limited number (one to two) of trocars and a single four to six cm. access incision to allow for vessel and bronchial dissection and individual ligation, as well as specimen retrieval. Most important, rib spreading with retractors is not used. Any lobectomy that includes rib spreading to access the pleural space is not a thoracoscopic lobectomy, since the majority of advantages of the minimally invasive approach are lost when this occurs.

Skepticism persists in considering a thoracoscopic lobectomy to be the same oncologic operation as an open lobectomy via thoracotomy. Oncologically, the same surgical principles should be followed when doing a thoracoscopic lobectomy. An anatomic lobectomy is performed by identifying and dividing each pulmonary vessel and lobar bronchus individually. All associated hilar and mediastinal lymph node stations should be harvested for TNM staging. Published reports suggest that anatomically, the same procedure is being performed and additionally, the number of nodes harvested is the same whether the operation is done as an open or as a thoracoscopic procedure.³⁻⁵ Long term results show similar, and in some cases, improved

survival in patients who underwent thoracoscopic lobectomy when compared to those who underwent open thoracotomy.⁴⁻⁶

A final point of debate and modest controversy involves the potential physiologic and quality of life advantages of a thoracoscopic lobectomy. Studies suggest significant benefit to the thoracoscopic approach, including a decrease in the incidence of persistent airleak and postoperative atrial fibrillation.^{3,4} Hospital stay following thoracoscopic lobectomy is two to four days compared to five to six days following an open lobectomy.^{3,4} Pain is significantly reduced in the immediate and early postoperative period allowing for more rapid patient recovery and earlier return to work.^{7,8} Due to decreased pain, there is superior preservation of lung function following thoracoscopic lobectomy.⁹ From a physiologic perspective, the inflammatory response is diminished and cytokine levels are reduced following thoracoscopic lobectomy compared with an open thoracotomy.⁷ While the implications of such biologic events are not fully understood, they may play a role in the increased long-term patient survival mentioned earlier.

While no absolute contraindications exist for performing a thoracoscopic lobectomy, there are some relative contraindications that make thoracoscopic lobectomy more difficult and may necessitate conversion to thoracotomy. These include: large (> 6cm) tumor size, chest wall invasion, endobronchial tumors requiring sleeve resections, enlarged hilar nodes, calcified nodes and lobectomy following induction chemotherapy and radiation therapy. Patients who receive neoadjuvant therapy often have significant fibrosis which can make thoracoscopic dissection difficult. At Froedtert & The Medical College of Wisconsin, all of our thoracic surgeons are proficient in thoracoscopic lobectomy and this minimally invasive technique represents the preferred approach in all eligible patients. For more information on this and other innovative approaches to lung cancer, contact the Medical College of Wisconsin Thoracic Surgery group comprised of **Mario G. Gasparri, MD**, **George B. Haasler, MD**, **William B. Tisol, MD**, and **Daryl P. Pearlstein, MD**, at 414-955-6904. Information is also available at froedtert.com/thoracic.

The Medical College of Wisconsin Thoracic Surgery group currently serves the

greater Milwaukee area at the following hospital locations: Froedtert & The Medical College of Wisconsin, Columbia St. Mary's hospitals, Waukesha Memorial Hospital and the Clement J. Zablocki VA Medical Center.

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A MULTIDISCIPLINARY APPROACH TO THE DIAGNOSIS AND MANAGEMENT OF PRIMARY ALDOSTERONISM

by Tracy S. Wang, MD, MPH, *Assistant Professor of Surgery*, Steven B. Magill, MD, PhD, *Associate Professor of Medicine*, Gilbert G. Fareau, MD, *Assistant Professor of Medicine*, William S. Rilling, MD, FSIR, *Professor of Radiology and Surgery*, Douglas B. Evans, MD, *Professor of Surgery*

Case Presentation: A 47-year-old woman was recently diagnosed with hypertension; her most recent blood pressure was 154/87 and her serum potassium level was 3.1 mmol/L. Her past medical and surgical history was significant for previous Cesarean section and abdominoplasty. An abdominal CT scan was performed and a left adrenal nodule was identified, measuring 1.6 x 1.2 cm; the right adrenal gland appeared normal. She was referred to Gilbert G. Fareau, MD, for further evaluation, with the suspicion of primary aldosteronism.

Definition of Primary Aldosteronism

Primary aldosteronism (PA) is characterized by an inappropriately elevated level of aldosterone production. It is relatively independent of the renin-angiotensin system and is not suppressible by sodium loading. Long-term effects of aldosterone excess consist of cardiovascular damage, including left ventricular hypertrophy and diastolic dysfunction, hypertension, sodium retention and potassium excretion that may lead to hypokalemia.

Hypokalemia in the context of mild-to-moderate hypertension has been obligatory in the diagnosis of PA. However, recent studies have demonstrated a minority of patients may present with hypokalemia. The recognition of the normokalemic variant of PA has increased the detection of PA such that it is now the most common secondary cause of hypertension, affecting approximately 10 percent of all hypertensive patients. PA is commonly caused by an aldosterone-producing adrenal adenoma (APA) or bilateral idiopathic adrenal hyperaldosteronism (IHA).

Evaluation of Primary Aldosteronism

Because PA is relatively common, screening is recommended for the following patients:

1. Patients with resistant hypertension, defined as a blood pressure >140/90 in a patient taking three or more antihypertensive medications
2. Patients with a history of hypertension who develop hypokalemia regardless of whether the patient is taking a diuretic
3. Patients who present with hypertension and an adrenal mass
4. Patients who develop hypertension before age 30 who do not have obesity and/or diabetes
5. First degree relatives of any patient who has developed primary aldosteronism should be screened if they have hypertension.

Screening for PA consists of simple blood testing. Ideally, the samples should be drawn before 10:00 am. A paired plasma renin activity (PRA) and aldosterone are drawn. Before undergoing the test, the potassium level must be checked and normalized, as a low potassium level will adversely affect the aldosterone level. Most patients being screened for PA need to continue their anti-hypertensive medications, so the drugs should not be stopped before the screening. The exception is if the patient is taking spironolactone (Aldactone) or eplerenone (Inspra). These drugs affect PRA and aldosterone levels and should be stopped at least six weeks before screening. If the PRA is < 1.0 ng/ml/hr and the aldosterone is ≥ 15 ng/dl, this represents a positive screen for primary aldosteronism. Some centers use an elevated aldosterone to renin (ARR) ratio of 20 to 30 or more as a positive screen.

If the screening tests are positive, diagnosis must be confirmed. Several methods are available. Most clinics in the U.S. use the saline suppression test or a three-day oral salt load for confirmation. For the saline suppression test, the patient has baseline blood drawn in the clinic and then receives two liters of normal saline intravenously over four hours. Following the saline infusion, if the aldosterone level falls to < 6 ng/dl, the test is negative. PA is confirmed if the aldosterone is ≥ 10 ng/dl after the saline infusion. The three-day salt loading test is conducted at home. The patient consumes extra salty foods or takes salt tablets for three days. On the third day, the patient collects a 24-hour urine for aldosterone, sodium and creatinine. PA is confirmed if the urinary aldosterone is ≥ 14 ug/day and the urine sodium is ≥ 150 -200 mmol/day.

Once diagnosis is confirmed, the subtype of PA (APA or IHA) must be determined to provide the most appropriate treatment. The next step in differentiation is to obtain a CT scan of the abdomen. If the CT

demonstrates a single adrenal nodule, the opposite adrenal gland appears normal, and the patient is <40 years, then unilateral adrenalectomy to remove the enlarged adrenal gland is recommended. If the CT is normal, if there are bilateral adrenal abnormalities, or if there is a single nodule or adrenal hypertrophy present in a patient who is >40 years, then bilateral adrenal vein sampling (AVS) may be necessary. If AVS demonstrates increased aldosterone production from only one adrenal gland, unilateral adrenalectomy should be performed. On the other hand, if AVS demonstrates bilateral aldosterone production, surgery should be avoided. The vast majority of these patients have bilateral adrenal hyperplasia and should be preferentially treated with spironolactone or eplerenone.

Case: The patient's serum aldosterone was 22 ng/mL with a PRA of 0.28 ng/ml/hr (ARR, 58). A saline suppression test was performed. It confirmed the diagnosis with a post-infusion aldosterone level of 40 ng/ml. She was referred for adrenal venous sampling.

Role of Adrenal Venous Sampling in Workup of Primary Aldosteronism

AVS is considered the gold standard for differentiating APA and IHA. Up to 60 percent of patients with PA will have bilateral adrenal hyperplasia. It is important to identify patients with unilateral aldosterone secretion as this patient group can be cured of their condition with adrenalectomy.

When performed correctly, AVS has a very high specificity (>90 percent) and sensitivity. The procedure can be technically challenging due to the very small size of the adrenal veins and the anatomic variations of adrenal venous drainage. Recent advances in the ability to obtain 3-D data sets that can be reconstructed into CT images in the interventional suite have been found to increase accuracy and decrease the failure rate of adrenal vein sampling.

The procedure is performed on an out-patient basis via catheterization of the common femoral vein. The right and left adrenal veins are catheterized using fluoroscopic guidance with confirmatory adrenal venography. Samples are obtained from each adrenal vein and a control sample is obtained from the infrarenal inferior vena cava (IVC). All samples are sent for aldosterone and cortisol levels. Cortisol concentrations are used to confirm successful catheterization; the adrenal

vein/IVC cortisol ratio is typically >10:1. Cortisol-corrected aldosterone ratios are obtained by dividing the right and left adrenal aldosterone levels by their respective cortisol concentrations. A cutoff of the cortisol-corrected aldosterone ratio between the high side and the low side should be >4 if hyperaldosteronism is due to a unilateral aldosterone producing adenoma.

Medical Management of Primary Aldosteronism

Medical management of PA is typically reserved for the patient with bilateral adrenal hyperplasia, or for the patient with unilateral disease who presents a sufficiently high operative risk to be deemed a poor surgical candidate. For these individuals, pharmacotherapy is highly effective at normalizing blood pressure and restoring normokalemia. Spironolactone inhibits the action of aldosterone by blocking the mineral corticoid receptor in the distal convoluted tubule of the kidney. It is a well tolerated medication, but in higher doses can cause gynecomastia in males by cross-over inhibition of androgen receptors. Eplerenone is a more selective mineral corticoid antagonist that does not interact with androgen receptors and does not cause gynecomastia, but is typically reserved as a second line agent due to cost. Other options include the potassium-sparing diuretics triamterene and amiloride. These drugs help normalize serum potassium, but frequently must be administered with other anti-hypertensives to control blood pressure. Care needs to be exercised when prescribing any of these medications with potassium supplements, or with other potassium-preserving agents (e.g. ACE inhibitors) since there is a substantial risk for hyperkalemia.

Surgical Management of Primary Aldosteronism

The primary goal of adrenalectomy in patients with an APA is the resolution of hypokalemia and improvement in blood pressure control. Hypokalemia is normalized in 98 percent of patients after adrenalectomy. Hypertension improves in more than 90 percent of cases, although only one third of patients will have complete resolution (defined as no further need of antihypertensive medications). One recent study examined potential predictors of resolution of hypertension after adrenalectomy and proposed an "aldosteronoma resolution score." This model considered four factors: (1) requirement of ≤ 2 antihypertensive medications (2 points); (2) body mass index ≤ 25 kg/m² (1 point); (3) duration of hypertension ≤ 6 years (1 point);

and (4) female sex (1 point). The predictive accuracy for the complete resolution of hypertension in patients with low (0-1), medium (2-3) and high (4-5) scores was 27 percent, 46 percent and 75 percent, respectively.

Since the early 1990s, the gold standard for surgical resection of benign adrenal neoplasms has been the laparoscopic transabdominal approach. In the early part of this decade, Walz, et. al., published their initial experience with the posterior retroperitoneoscopic adrenalectomy (PRA) performed in the prone jackknife position. PRA is confined entirely to the retroperitoneum; neither the pleural nor abdominal cavities are penetrated. This approach requires a "cognitive reorientation" for the surgeon, as described by Perrier, et. al., to several key landmarks, including the paraspinous muscles, diaphragm, upper pole of the kidney and medial adrenal surface. Important technical aspects to PRA include proper placement of the three trocars, immediate identification and gentle retraction of the kidney, and maintenance of the camera's focus on the region of the adrenal gland, even prior to visualization of the gland. Early identification and ligation of the adrenal vein is a clear benefit of PRA. This affords an improved visualization of the right adrenal vein, which is usually short and often difficult to control from the trans-abdominal approach.

PRA is an attractive option for patients with benign adrenal neoplasms ≤ 6 cm in size. It is not routinely performed in patients with larger tumors or those that may be malignant. Achieving adequate insufflation may also be difficult in patients who are morbidly obese. Further advantages to this approach include avoiding intra-abdominal adhesions and mobilization of intra-abdominal organs such as the liver, spleen, pancreas and colon. Therefore, this approach is ideal for patients with previous abdominal surgery and for patients requiring bilateral adrenalectomy, as patients do not need to be repositioned intraoperatively as is necessary with the trans-abdominal laparoscopic approach.

Case: The patient underwent a left PRA by Tracy S. Wang, MD, MPH, and Douglas B. Evans, MD, (currently the most experienced in the U.S. with PRA). A 1.6 cm adrenal nodule was identified within the adrenal gland. The patient was discharged home on postoperative day one. Her hypokalemia resolved immediately after surgery, and she has remained off of anti-hypertensive medications.

For questions regarding PA or any other endocrine surgery disorder, please contact Dr. Wang at 414-805-5755 or tswang@mcw.edu.

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COLONOSCOPY FOR PREVENTION AND EARLY DETECTION OF COLORECTAL CANCER

Understanding the difference among screening, surveillance and diagnostic exams

by **Lauren A. Kosinski, MD, MS**,
Assistant Professor of Surgery

Public awareness of the risks of colorectal cancer and the role of colonoscopy in prevention and early detection are high, due in large part to celebrity attention and media coverage. Colorectal cancer remains the third most commonly diagnosed cancer in the United States. In 2009, 75,590 men and 71,380 women are expected to be diagnosed, and approximately 53,000 people will die of colorectal cancer. In Wisconsin during 2009, an average of 2,770 people will be diagnosed and 900 people will die from colorectal cancer.¹ An estimated one in 19 Americans born today will develop colorectal cancer in their lifetimes. In 2006, more than 1 million people in the U.S. were survivors of colorectal cancer.

In Wisconsin, 53 percent of adults ages 50 and over reported having no sigmoidoscopy or colonoscopy in the preceding five years.² Lower education level and, not surprisingly, lack of health insurance are associated with lower rates of colorectal cancer screening examinations. African Americans are less

likely to have a colonoscopic examination than Caucasian Americans. African Americans have a higher incidence of colorectal cancer and, once diagnosed, they have a greater chance of dying from the disease.

Paradoxically, familiarity with screening guidelines can give false security to patients and providers who fail to recognize when changing circumstances such as new cancer diagnoses in the family or new symptoms dictate more frequent examinations. It is vital to understand the difference between types of examinations and their recommended frequency: 1) **Screening** for average and increased risk patients; 2) **Surveillance** for patients with significant personal history, and 3) **Diagnostic** for patients with new symptoms such as altered bowel habits, rectal bleeding, or pain — even when a normal colonoscopic exam was performed in the preceding year.

The Polyp-Cancer Sequence

Although the link between adenomatous polyps, or small noncancerous growths, (image 1) and colorectal cancer (image 2) had been established, it wasn't known whether all polyps posed the same risk of progression to cancer



Image 1:
Adenomatous polyp

Image 2:
Colon cancer

or how long the transformation would take. Specific polyp and patient features associated with higher risk of malignant transformation were described in the early 1970s.³ Before the introduction of fiber optic technology and flexible endoscopes, polyps and tumors were detected in the rectum using a rigid proctoscope and in the colon and upper rectum with double contrast barium enema studies. Some rectal polyps and tumors could be removed transanally, but abdominal procedures were required to remove neoplasms above the reach of transanal instruments.

The National Polyp Study conducted in the United States in the late 1980s collected data from seven participating centers (including Froedtert & The Medical College of Wisconsin) on 1,418 patients undergoing colonoscopy for adenomatous polyps. All enrolled patients had follow-up colonoscopic examinations at three years (and the other half had exams at one and three years) after the initial colonoscopy. They were also contacted by telephone at six years after the initial colonoscopy. The incidence of polyp recurrence and development of colorectal cancer were tabulated. These results were compared to historical studies of cancer development in higher risk populations (patients known to have polyps already but who refused surgery) or average risk population (based on reported incidence of colorectal cancer across the United States). It was found that the incidence of cancer was dramatically reduced in patients who had screening colonoscopy and polyp removal than was predicted by trends in the historical control groups. No patient in the National Polyp Study developed an advanced cancer in the three-year follow-up interval to colonoscopy (or six-year telephone follow-up). This study helped clarify the time frame for malignant transformation of benign polyps to cancer and is the basis for current colonoscopy screening guidelines.⁴

Table 1. Colorectal Cancer Screening Strategies

Average Risk	FFC	FFS	DCBE	FOBT	FOBT + FFS
No relatives with CRC or one 2nd degree relative or one 3rd degree relative	Age 50, then every 10 years	Age 50, then every 5 years	Age 50, then every 5 years	Age 50, then every year	Age 50, then every FOBT every year, FFS every 5 years

Increased Risk	Test
1st degree relative with CRC or adenomatous polyps at age < 60 years or two 1st degree relatives at any age	FFC at age 40 or 10 years before youngest age of CRC in a family member, whichever is 1st; then every 5 years
1st degree relative with CRC or adenomatous polyp at age > 60 years or two 2nd degree relatives	FFC at age 40, then every 10 years
Familial adenomatous polyposis (FAP)	FFS at age 10-12 years; then every year; consider genetic testing
Hereditary Nonpolyposis Colorectal Cancer (HNPCC)	FFC at age 20-25 years or 10 years before youngest age of CRC in a family member; then every 1-2 years; consider genetic testing

KEY CRC: Colorectal cancer FFC: Full flexible colonoscopy FFS: Full flexible sigmoidoscopy DCBE: Double contrast barium enema FOBT: Fecal occult blood test

Screening Strategies

Many screening strategies are available, but not one offers the advantages of colonoscopy, which include most accurate evaluation of the entire colon and the possibility of simultaneous polyp removal. If another screening test is chosen, an abnormal result should be investigated by colonoscopy. Genetic testing can also be a component of colorectal cancer screening in select patients. In 2003, the U.S. Multisociety Task Force on Colorectal Cancer published updated recommendations, which have been summarized more recently by the American Society of Colon and Rectal Surgeons and by The American Society for Gastrointestinal Endoscopy. Association of Gastrointestinal Endoscopists.^{5,6} A 2008 systematic review of colorectal cancer screening by the U.S. Preventive Services Task Force made no changes to these recommendations.⁷

The Older Patient

The assessment of colorectal cancer risk must be dynamic, including the age at which screening exams are stopped. It will always be true that an operation to resect a colorectal cancer will be riskier than colonoscopy to remove polyps. However, when a person's life expectancy is less than the three to five-year interval necessary to develop a polyp or cancer, a decision to stop screening may be best. When a patient's multiple medical problems increase the risk of colonoscopy such that it exceeds the risk of harboring a cancer, screening colonoscopy should be avoided.

Screening Colonoscopies

As part of the Clinical Cancer Center initiative to provide total care for cancer patients, colon cancer screening can usually be arranged during the same week the request is made. Medical College of Wisconsin colorectal

Table 2. Colorectal Cancer Surveillance Strategies


Risk Factors	Time of Colonoscopy	
Personal history of adenomatous polyps	Advanced or >3 adenomas	3 years; then depending on findings
	1 or 2 tubular adenomas <1 cm	5 years; then depending on findings
	Numerous adenomas, cancer fully contained in a polyp, large flat polyp, incomplete FFC	Short interval
Personal history of CRC		At time of diagnosis (or within 6 months of surgery if obstruction by tumor prevented preoperative FFC); then follow-up at 3 yrs; then, depending on findings, every 5 years
Personal history of inflammatory bowel disease	Ulcerative colitis or extensive Crohn's disease of 8 years duration or longer	Every 1 to 2 years with random biopsies

surgeons and gastroenterologists provide this service. Appointments can be scheduled by calling the Clinical Cancer Center at 414-805-0505 or 866-680-0505 or by contacting Lauren A. Kosinski, MD, MS, directly at 414-805-5783 or lkosinski@mcw.edu.

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 CUT ALONG LINE TO DETACH

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TRAUMA AND CRITICAL CARE



Jeremy S. Juern, MD, received his medical degree from the University of Wisconsin – Madison. He received general surgery training at Hennepin County Medical Center, as well as a surgical critical care fellowship at the University of Minnesota.



Todd A. Neideen, MD, received his medical degree from the University of Illinois. He completed his residency training and his surgical critical care fellowship at the Medical College of Wisconsin.



TRAUMA AND CRITICAL CARE and COMMUNITY SURGERY

Marshall A. Beckman, MD, comes from the Mayo Health System, where he served as medical director of the Step Down

Unit. He received his medical degree from the University of Wisconsin. Dr. Beckman completed his surgical training and a surgical critical care fellowship at the Medical College of Wisconsin.

GENERAL SURGERY



Matthew I. Goldblatt, MD, comes from Wright State University, where he was assistant professor of surgery. Dr. Goldblatt received his medical degree and surgical training at the Medical College of Wisconsin. His expertise is laparoscopic procedures, including management of gastroesophageal reflux disease, abdominal wall reconstructions, hernia repairs and bariatric surgery.



VASCULAR SURGERY

Peter J. Rossi, MD, is a graduate of the University of the Illinois College of Medicine and the General

Surgery Residency Program at the University of Chicago. He completed his vascular surgery fellowship at the Medical College of Wisconsin. Dr. Rossi brings an expertise in endovascular procedures.

COMMUNITY SURGERY



Dean E. Klinger, MD, a former chief resident at the Medical College of Wisconsin, has joined our new Division of Community Surgery. Dr. Klinger completed his medical degree at the Medical College of Wisconsin. He is certified by the American Board of Surgery. Dr. Klinger is a Wisconsin councilor for the American College of Surgeons and past president of the Milwaukee Academy of Surgeons. He was chairman of the Department of Surgery at St. Luke's Medical Center from 1998 to 2000. Dr. Klinger's expertise is minimally invasive adrenalectomy and vascular access.