Miracles are events that transform lives, that restore valued functions, that bring reality to what otherwise was impossible. At the Brady Urological Institute, we continuously strive for new miracles that allow patients, young and old, male and female, to overcome medical challenges and to live to the fullest.
RISING TO THE CHALLENGE

AR CALL TO ACTION
Rising to the Challenge: The Campaign for Johns Hopkins will raise unprecedented levels of support to attract, sustain, and further empower the people of Johns Hopkins—our students, faculty, and researchers—who through their work improve the lives of millions around the world. Together with our philanthropic partners we will:

ADVANCE DISCOVERY AND CREATIVITY
through support of our exceptional faculty and researchers. Their innovative work drives the development of new knowledge, new forms of expression, and new ways to save lives and improve health, and furthers progress across our core disciplines in science and technology, the humanities and arts, and public health and medicine.

ENRICH THE STUDENT EXPERIENCE
by investing in scholarships and fellowships, inspirational spaces for collaborative learning and social opportunities, and new programs that will enhance student-faculty interactions, ensure diversity on campus, link learning in the classroom to life after graduation, and strengthen connections between our students and our surrounding communities.

SOLVE GLOBAL PROBLEMS AS ONE UNIVERSITY
by creating new cross-disciplinary solutions in crucial areas such as sustaining global water resources, revitalizing America’s cities, advancing individualized health, understanding how we learn and teach, and attacking the root causes of global health problems.

The James Buchanan Brady Urological Institute is one of research innovation leading to breakthroughs in patient care. Multiple discoveries have yielded new and more effective clinical strategies. Our faculty were first to develop the radical prostatectomy, endoscopic approaches to the transurethral resection of the prostate, systems for classifying and staging bladder and prostate cancers, a surgical technique to remove large kidney cancers that extend into the heart, and gene therapy in urology. Scientific progress is often made through collaboration with other disciplines. For example, the partnership of urology faculty with neuroscientists resulted in the discovery that nitric oxide is the neurotransmitter responsible for erection. Each of these innovations and discoveries has life-changing implications for patients.

Pioneering, Patient-Focused Research

Urological conditions are both prevalent and life-changing. Prostate cancer is the second leading cause of cancer death in American men, behind only lung cancer. During his lifetime, one man in six will be diagnosed with prostate cancer. Kidney cancer is among the ten most common cancers in men and women. According to the National Cancer Institute, there are nearly 65,000 new cases of kidney cancer diagnosed each year in the United States, and nearly 14,000 associated deaths. Bladder cancer is the second most commonly occurring genitourinary cancer in adults: over 55,000 men and close to 18,000 women are expected to be newly diagnosed. Other common urological disorders include infertility, which affects 15–20% of all couples, pelvic organ relax, and certain sorts of sexual dysfunction.

While numbers can convey the magnitude of urological problems, they fail to describe the impact on individuals’ lives—which is frequently profound, if not devastating. Some of the common urological diseases and disorders, such as prostate cancer and kidney stones, affect nearly all of us either directly or through our circles of friends and family. Others, such as Peyronie’s disease and ureteropelvic junction obstruction, are less well known but have equally damaging effects on individuals’ health and quality of life. Some, such as metastatic renal cell carcinoma (a form of kidney cancer), are deadly.

Life-Changing Care
Miracles are events that transform lives, that restore valued functions, that bring to reality what otherwise was impossible. At the Brady Urological Institute, we continuously strive for new miracles that allow patients, young and old, male and female, to overcome medical challenges and to live to the fullest.

As a world leader in urology, the Brady Urological Institute has more than a vision for the future. We are actively creating the future through discovery, intense focus, constant improvement, and attentive service to our patients which, in turn, spark new ideas leading to new discoveries. We are never satisfied with the current state of the science; instead, we maintain a constant cycle of care and innovation in a continued effort to push back the edges of what is known in our field, to develop new methods and approaches that improve outcomes, restore wholeness, and save lives.

THE JAMES BUCHANAN BRADY UROLOGICAL INSTITUTE
As it unfolds, this research may yield

After a 20-year quest, Brady Institute

AccuPSA, which can accurately mea-

These cells may help identify individuals

Ultimately, it may lead to genetic tests

Lupold and his research team have

first hereditary genetic mutation linked

Dr. Bill Isaacs definitively identified the

Dr. Patrick Walsh invented the nerve-

Daniel Chan, and Lori Sokoll are

researchers have identified an inherited

important clues about how prostate

cancer develops and who might benefit

from earlier or more frequent screening.

Ultimately, it may lead to genetic tests

for inherited prostate cancer similar

to those used to screen women for

the BRCA1 and BRCA2 mutations

associated with high risk of breast and/
or ovarian cancer.

Earlier detection: Drs. Alan Partin,
Daniel Chan, and Lori Sokoll are
developing an ultrasensitive test, called
AccuPSA, which can accurately mea-
sure PSA values 1,000 times lower than
standard assays used today. Dr. Shawn
Lupold and his research team have
developed a viral blood test to detect
cancer cells circulating in the blood-
streams of men with prostate cancer.

These cells may help identify individuals
at risk for aggressive disease, and similar
blood tests to detect kidney and bladder
cancers, two cancers that are at present
only detectable when disease is quite
advanced, are expected to follow.

More accurate imaging: Brady
surgeons have teamed with radiologist
Dr. Martin Pomper to develop improved,
real-time, molecular imaging technol-
yogy. Present-day robotic techniques,
while minimally invasive, frequently
leave “positive margins” (cancerous cells
remaining at the edge of the affected
area). In the approach being developed,
the patient is injected with a fluorescent
dye, which binds to the prostate cancer
cells. A surgeon can then use special
fluorescent lighting to detect these
cancerous cells during the operation
and to ensure that the surgery removes
all malignant cells. We anticipate that
this technique will help ensure a nega-
tive surgical margin and prevent the
need for further radiation therapy. It
may ultimately prolong survival for
prostate cancer patients. The team is
also developing imaging agents for
positron emission tomography (PET).

Initial clinical trials have yielded very
promising results for better identi-
fication of metastatic prostate cancer.

Better treatment: Although prostate
cancers typically grow slowly and do
not spread, most men with this disease
receive immediate treatment (surgery
and/or radiation), often leading to
complications such as incontinence and
impotence. In 1995, Dr. H. Ballentine
Carter created an Active Surveillance
Program, with an accompanying
biorepository that contains samples
from thousands of men; this is now the
world’s largest prostate cancer bioreposi-
tory. The program has managed partici-
pants’ disease exceptionally well: none
of the men have died from prostate
cancer; only one third have required
any follow-up treatment. These results
have motivated similar programs
nationally and worldwide, and informed
clinical practice guidelines. By “mining”
birepository data, Dr. Carter and
colleagues now hope to identify

markers that predict which prostate
cancers will be aggressive, warranting
treatment, and which are suited to
active surveillance.

For some patients with prostate
cancer, radiation is an effective
alternative to surgery. However, when
cancer recurs in the prostate following
radiation, “salvage” treatments have
serious side effects. Brady researchers
are investigating the use of high-
intensity focused ultrasound as an
effective but safer option.

Dr. Kenneth Pienta, Director of
Research at the Brady, is working to
improve outcomes for the 40,000 men
diagnosed annually with prostate cancer
(abou 20% of those who receive treat-
ment) who develop metastatic disease,
even after surgery or radiation therapy
that “should” have cured them. Dr. Pienta
has been able to detect cancer

From the Institute’s
inception to the
present, progress
has been continuous,
and is ongoing in
multiple areas of prostate
cancer research.
This ability to detect and treat metastatic cells could lead to the prevention of clinically advanced prostate cancer, effectively curing the cancer before it becomes a life-threatening problem. A clinical trial of this novel and promising approach is planned.

**ROBOTIC SURGERY:** Robotics is revolutionizing urologic surgery. Sophisticated robotic instrumentation can improve the precision of minimally-invasive surgical procedures—with better outcomes, and fewer side effects, for patients. Brady Institute faculty members have completed an initial clinical trial of tandem robot-assisted laparoscopic radical prostatectomy, and have obtained FDA certification for the use of an MRI robot in clinical trials. This is the first FDA approval for a robot constructed in an academic laboratory, a very exciting step forward for this emerging technology and groundbreaking clinical tool.

**BLADDER CANCER**

**EARLIER DETECTION:** To discover new biomarkers for diagnosing bladder cancer, Dr. Trinity Bivalacqua and his research team are searching for evidence of tumor cells in the urine. These biochemical markers could enable scientists to distinguish normal urothelial cells from bladder cancer cells, and patients with non-invasive bladder cancer from those with disease that is likely to spread.

**BETTER TREATMENT:** Institute faculty are developing a novel neo-urinary conduit (tube) for patients with advanced cancer (e.g., incontinence), compared to a traditional colostomy bag. Researchers in the Women’s Center for Pelvic Health, in collaboration with the Brady Institute, have recently conducted a transvaginal mesh study, aligned with the transvaginal mesh study, to determine whether osteotomy reduces the risk of pelvic organ prolapse in women with bladder extrophy. A transvaginal mesh study, aligned with the Food and Drug Administration (FDA)’s recent advisory about mesh-related complications, found that vaginal mesh is successful in 91% of cases for managing pelvic organ prolapse, but that young women are more likely to have complications.

**KIDNEY DISEASE**

Kidney cancer research is rapidly evolving into a signature strength of the Brady Urological Institute. We are now poised to elevate the landscape of kidney cancer care as we have in prostate cancer. To this end, we envision a Center for Kidney Cancer Research that brings together physicians and scientists from diverse specialties, focusing their energies on finding new ways to fight kidney cancer. Synergy is already resulting in research and treatment breakthroughs.

**OTHER UROLOGIC DISEASES AND CONDITIONS**

At the Brady, specialized research programs focus on multiple distinct needs, to better enable health care providers—here at Johns Hopkins and across the country—to provide individualized, compassionate, and effective patient care. The following areas of research illustrate our faculty’s broad efforts to address a full spectrum of urological concerns.

**SEXUAL MEDICINE:** Scientific progress in erection biology has established the central role of nitric oxide for penile erection. Recent work by Dr. Arthur Burnett has further clarified the importance of this gas, demonstrating that it also serves as a homeostatic regulator of the penis. This knowledge has helped advance clinical practice for several erectile disorders including male erectile dysfunction, ischemic priapism, and penile fibrosis.

**MEN’S PELVIC FLOOR DISORDERS:** The penoscrotal approach for artificial urinary sphincter (AUS) placement was introduced in 2003; in the United States, almost 70% of AUS’es are now placed using this approach, due to its technical ease and shorter operative time. Opponents have argued against it, due in part to inferior outcomes (e.g., incontinence), compared to a perineal approach. Researchers at the Brady Institute have recently constructed a urinary sphincter study to compare the penoscrotal and perineal approaches, and found better outcomes with a perineal approach.

**FEMALE UROLOGY:** Researchers in the Women’s Center for Pelvic Health, together with pediatric urology faculty, are undertaking a pelvic organ prolapse study to determine whether osteotomy reduces the risk of pelvic organ prolapse in women with bladder extrophy. A transvaginal mesh study, aligned with the Food and Drug Administration (FDA)’s recent advisory about mesh-related complications, found that vaginal mesh is successful in 91% of cases for managing pelvic organ prolapse, but that young women are more likely to have complications.
In children with exstrophy, weakness of the sphincter muscle largely accounts for lack of urinary control; stem cells may help regenerate and strengthen this muscle. The team is preparing for a clinical trial of this new and hopeful approach.

Dr. John Gearhart and colleagues removing a small sample from a child’s bladder to study this defect. The team is preparing for lack of urinary control; stem cells can suffer persistent urinary leakage and urinary tract infections. Dr. John Gearhart and colleagues plan to use muscle stem cells to treat this problem. Their technique entails removing a small sample from a child’s abdominal muscle, growing stem cells in the lab, then transplanting these cells into the child’s urinary sphincter. In children with exstrophy, weakness of the sphincter muscle largely accounts for lack of urinary control; stem cells may help regenerate and strengthen this muscle. The team is preparing for a clinical trial of this new and hopeful approach.

Our ultimate goal of eliminating prostate cancer will only be reachable through concerted efforts aimed at education, science, and patient care. To spearhead the effort, we propose to create a National Prostate Cancer Research Center at Johns Hopkins. The first of its kind, this center will conquer prostate cancer by simultaneously advancing research into its molecular underpinnings; accelerating the development of innovative treatments; and promoting global collaboration, education, and awareness.

HIGH-RISK PROSTATE CANCER RESEARCH CENTER: Understanding high-risk prostate cancer and developing effective treatments for it are critical to saving lives. To date, there is no consensus on the molecular mechanisms that drive aggressive, high-risk, prostate cancer, nor the optimal treatment for these tumors. Dr. Ted Schaeffer seeks to answer these key questions. He and his research team have carefully explored surgical outcomes of men with high-risk prostate cancer, defined the characteristics (such as PSA and biopsy information) of men who are best suited to undergo surgery, and pursued the molecular basis of these dangerous cancers. In landmark research, the team showed that high-risk tumors have lethal potential from their very inception, and identified several new molecular pathways of aggressive tumors. To capitalize upon this research success—and to meet a great need for effective patient care—the Brady has established a Comprehensive Prostate Center. Here urological physicians and scientists are advancing the frontiers of what is known about stone disease, and what can be done to prevent, treat, and cure it. A research team led by Dr. Brian Matlaga, Director of Stone Disease, has already made multiple scientific contributions, such as documenting the rising incidence of kidney stones among children, and developing a means to significantly improve the outcomes of shock wave lithotripsy, the most commonly performed stone removal procedure in the United States.

INTEGRATIVE MEN’S HEALTH PROGRAM: More than 50% of premature deaths among American men are due to chronic—but preventable—medical conditions. Many of these are associated with erectile dysfunction and low testosterone, which, as in the case of a heart attack or stroke, can precede a critical event by several years. Assessment and treatment of these precursors offers an opportunity for early detection and prevention of serious health threats. Dr. Kevin Billups aims to capitalize upon this opportunity. The Integrative Men’s Health Program makes urology the point of entry into a complex health system; serving as coordinator for additional patient referrals to multidisciplinary specialists in the Johns Hopkins Comprehensive Diabetes Center, Sleep Disorders Center, Ciccareze Center for the Prevention of Heart Disease, Johns Hopkins Community Physicians, and other clinical services. While addressing problems of immediate, pressing concern—erectile and sexual dysfunction—the program takes a unique approach to supporting comprehensive, integrated, medical care for male patients.

The Brady Institute stands at the forefront of prostate cancer research, to elucidate these biological processes. Matching treatments to individuals, are advancing the frontiers of what is known about stone disease, and what can be done to prevent, treat, and cure it. A research team led by Dr. Brian Matlaga, Director of Stone Disease, has already made multiple scientific contributions, such as documenting the rising incidence of kidney stones among children, and developing a means to significantly improve the outcomes of shock wave lithotripsy, the most commonly performed stone removal procedure in the United States. The Brady Institute stands at the forefront of prostate cancer research, to elucidate these biological processes. Matching treatments to individuals, are advancing the frontiers of what is known about stone disease, and what can be done to prevent, treat, and cure it. A research team led by Dr. Brian Matlaga, Director of Stone Disease, has already made multiple scientific contributions, such as documenting the rising incidence of kidney stones among children, and developing a means to significantly improve the outcomes of shock wave lithotripsy, the most commonly performed stone removal procedure in the United States.
WHAT ROLE DOES PHILANTHROPY PLAY?

Urology needs philanthropic support now more than ever before. Research grants, once the mainstay of academic pursuits, have become increasingly competitive. The success rate for grants submitted to the National Institutes of Health (NIH) hit an all-time low of 17% in 2011, down dramatically from 32% in 1999-2003. Simultaneously, changes in healthcare financing and reimbursement have resulted in reduced clinical revenues; whereas once clinical margins were sufficient to cross-subsidize our activities related to education and training, and to support the pilot studies that are so critical but are not generally funded by research grants, now clinical revenues are needed simply to meet clinical expenses. As NIH support continues to decrease and clinical care can no longer help cover the costs of education and discovery, our hope lies in philanthropy.

Philanthropic contributions—large and small—play a critical role at the Brady Urological Institute. In this time of great opportunity, but within a constrained economy, our ability to take the big strides we envision, to create a bright future, for patients with urologic diseases and disorders depends upon the generosity and foresight of our donors.

WHAT WILL IT TAKE?

The Brady Institute is the world’s leading center for research in urology. Our team includes scientists, surgeons, medical oncologists, nurses, allied health professionals, fellows, residents, and technical staff. This confluence of talent has led to major advances in urology over the past century. At the Brady Institute, it is our exceptional people, brought together in an optimal research environment, that make further breakthroughs in urology so tangibly possible.

CRITICAL INGREDIENTS FOR BRADY INSTITUTE SUCCESS

PEOPLE: What makes the Brady Urological Institute a world leader is truly our faculty, who are unsurpassed in their passion for discovery and service to humanity. Development and support of our faculty is therefore a central Institute priority. A primary means of building upon this primary asset is through endowed professorships. Endowed positions are some of the most coveted in academic medicine. They confer not only prestige, but also the academic freedom and flexibility to focus on priorities—in research, education, and patient care. They are a direct investment in outstanding individuals and their work, and are thus an important strategy for advancing the frontiers of research, and for improving patient care. These (named, if the donor desires) positions will allow us to recruit world-class physician-scientists to Johns Hopkins, as well as to better support and retain our most talented faculty, fellows, and staff.

INFRASTRUCTURE: Modern technology, designed for exceptional patient care, enables us to achieve the best possible outcomes for our patients while also supporting the conduct of cutting-edge research. We plan to intentionally promote the success of our research faculty through a combination of: state-of-the-art equipment, telecommunications, and information systems; facilities designed to provide optimal support for research; and an environment conducive to inquiry, creativity, and collaboration.
Rising to the Challenge:
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rev. 03/03/14