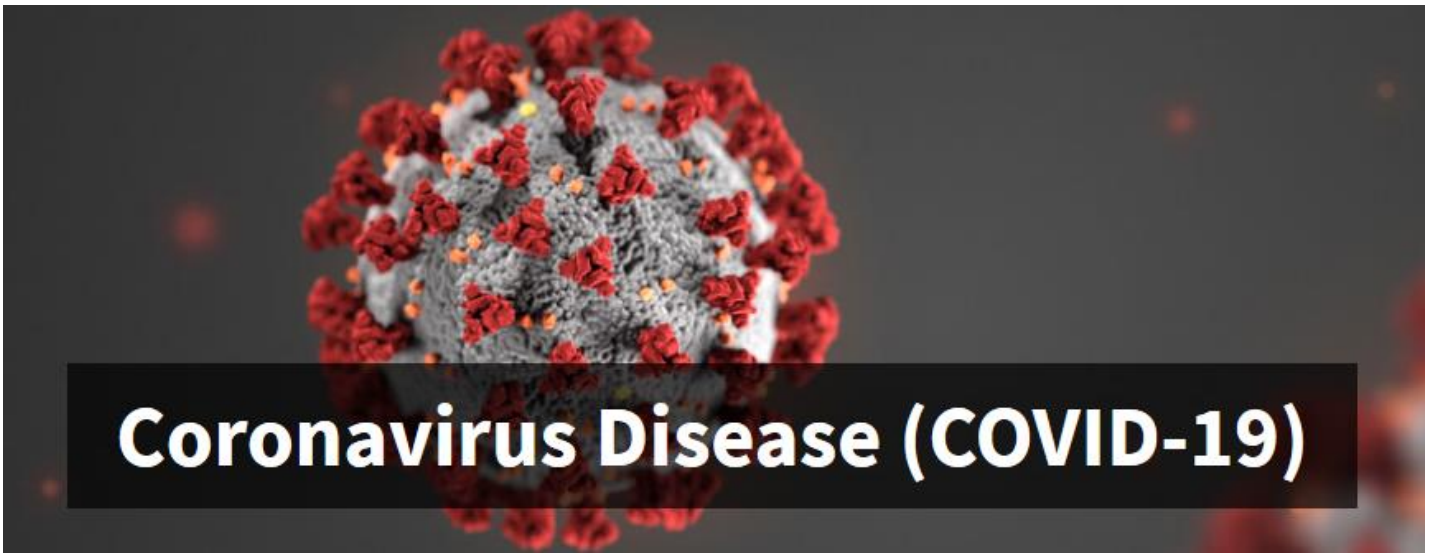
Telemedicine During the Pandemic
Paul F. Schellhammer, M.D.



The COVID-19 pandemic has drastically changed everyone's current lifestyle and will have repercussions on "life as usual" into the foreseeable future. As an 80-year-old part time urologist living in a retirement community, I cannot go to my office for my own safety and the safety of the residents in the community where I reside. In our retirement community, we cannot leave our community, no visitors can enter, groceries and pharmaceuticals are delivered, medical visits are by teleconference, and employees are screened with temperature on entry. Multiple questions arise as to how much long-term behavior and usual and customary procedures will change. Will handshakes and hugs be relegated to history? Will seats at meetings, concerts, theater, or transportation be widely spaced, will smart phone apps tell us the proximity to a virus carrier and trace us for testing alert, will driver's license or other ID cards carry information regarding our immune status?

There is one certainty in the medical field right now - beyond the race to find a cure, a treatment, or a vaccine - and that is the advent of telemedicine. What might have taken years to introduce under usual circumstances, has in a matter of weeks out of necessity, converted the age old doctor's appointment, waiting room, and face to

face consultation to a “Zoom meeting”. The convenience of a connection to your doctor from home and its time saving advantages are undeniable. Whether there will be much lost in the face to face encounter of the patient–physician meeting and discussion will be the subject of many future studies and opinion pieces. Will a lasting consequence of the virus be the absence or withholding of the compassionate touch? Time will tell!

At Urology of Virginia, telemedicine visits have gone from zero to over a thousand visits in the past few weeks. The transition hasn’t been easy for any party involved. Both patient and physician struggle at times to achieve the audio and video connection to make the telemedicine visit work, but everyone has quickly adjusted to the new normal. A great deal of what needs to be accomplished in a routine visit can be done by this form of conversation, however, there is no replacement for a physical exam in some circumstances, or the routine testing that can go along on the day of appointment. Further, an additional challenge is how to get lab work completed while staying safe and minimizing exposure for both patient and staff. But, “necessity is the mother of invention” or in this case “innovation.” Drive through blood draws, and mail in test kits have replaced long waits and exam rooms, and the only waiting rooms encountered are virtual. All in the name of public safety, and “flattening the curve.” Overall, Urology of Virginia has been well ahead of groups across the nation to implement this technology, and continue to provide cutting-edge care safely during the pandemic.

Patient Conference on Prostate Cancer Last November
Lindy Casale-Rinaldi

On Saturday, November 2, 2019, the Paul F. Schellhammer Cancer Center of Urology of Virginia collaborated for a second time with Prostate Cancer International (PCaI) to coordinate a day-long conference for prostate cancer patients and their caregivers in Virginia Beach.

The conference -- "**Prostate Cancer TODAY -- Living Well, Choosing Wisely"** -- was held at the Founders Hotel & Spa, and attendance was FREE for anyone who wanted to attend, although Prostate Cancer International did ask for a small donation from those attendees who could afford to make such a contribution. Breakfast and lunch were also provided at no cost to attendees, and discounted room rates were made available for attendees who wanted to stay in Virginia Beach for one or two nights. The conference was attended by over 300 participants.

The conference included major (plenary) presentations by recognized experts on

- The improvements in the diagnosis of localized prostate cancer that allow us to discriminate better between low-risk forms of the disease (that don't necessarily need immediate treatment) and higher-risk, clinically significant forms that do need such treatment – by Prof. Judd Moul, MD, of Duke University School of Medicine at Durham, NC.

- New approaches to the treatment of advanced forms of prostate cancer -- including forms of treatment based on the genetic profile of the tumor itself – by Prof. Ken Pienta, MD, of Johns Hopkins School of Medicine at Baltimore, MD.

It also included workshops for specific audiences dealing with such issues as:

- How to understand your risk level and what forms of treatment might be available for newly diagnosed patients
- Active surveillance in the management of low-risk prostate cancer
- Different types of radiation therapy in the management of localized and locally advanced prostate cancer
- Radiation therapy in the treatment of oligometastatic prostate cancer
- Nutrition and quality of life in the management of prostate cancer
- Sexuality and intimacy: how prostate cancer can affect your life
- A final session on what a group of the faculty members saw as the most important “future developments” coming down the pike in the management of prostate cancer

The final session was particularly focused on the following areas:

- The expanding role of active surveillance in the management of lower-risk forms of prostate cancer
- The importance of new imaging techniques in the early evaluation and work-up of patients
- The use of hypofractionation in planning radiation therapy for appropriately selected prostate cancer patients
- The ability to develop and use “personalized” forms of treatment in the treatment of men with more aggressive and advanced forms of prostate cancer based on their individual genetic risk levels and the genetic structure of their tumors

PCaI would like to take this opportunity – once again – to thank all of the speakers and sponsors who were willing to work with us to make this conference and the associated exhibit hall a great success!

One of the special components of this series of conferences is that speakers are asked to keep their presentations relatively short so that there is a LOT of time for attendees to be able to ask questions -- usually at least half an hour or longer during each session. Attendees also got the chance to talk with multiple manufacturers of the different types of drugs and other forms of therapy that can be

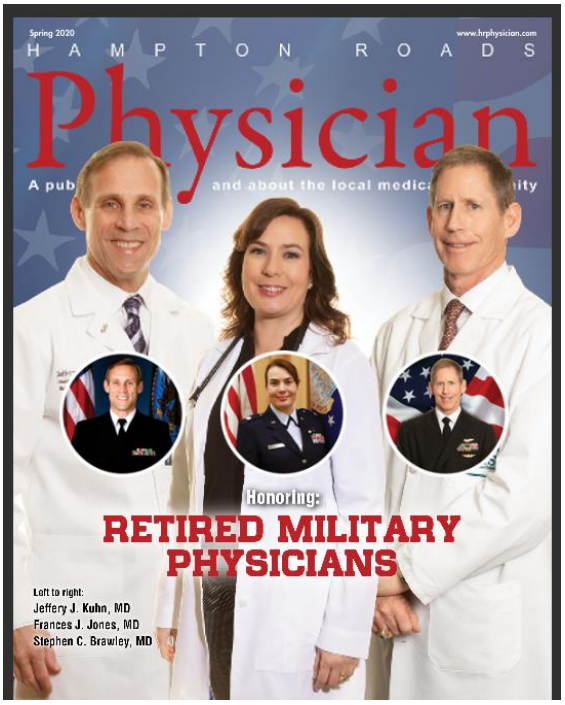
used in the management of prostate cancer today … and with representatives of various prostate cancer support organizations that provide assistance to patients and their family members.

"The audience at last year's patient conference pretty much demanded that we bring the meeting back to Virginia Beach again soon," said Mike Scott, the President and Executive Director of PCaI, "and it is always a great pleasure to be able to collaborate with Dr. Schellhammer and the team from Urology of Virginia in putting together the faculty and the agenda for these meetings."

Further meeting plans have been put on pandemic delay but we look forward to seeing both new and old faces when we are finally able to bring this meeting back to Virginia Beach.

Spotlight On the Providers of Urology of Virginia
Lindy Casale-Rinaldi

Throughout the years, individual providers of Urology of Virginia have been featured in global articles ranging from their areas of expertise in subspecialty groups of urology, research projects, to personal charitible interests, mission trips and more. Hampton Roads Physician Magazine is one such local publication which has covered many of our providers. Dr. Ramón Virasoro, MD, currently serves on the Advisory Board. The Board is responsible for reviewing all cover nominations and voting on who should be the three featured physicians in their quarterly issues. The Board also decides what topics will be covered in the medical editorial calendar and provides ideas for articles during the yearly survey. Urology of Virginia Physicians who have held a chair on the advisory board are: Dr. Jennifer Miles-Thomas, Dr. Jessica DeLong and Dr. Ojo-Carons.



The latest issue Spring 2020, of HR Physician Magazine includes several articles of interest written both by an about the providers of Urology of Virginia. Dr. Jennifer Miles-Thomas, President of Urology of Virginia wrote an article on lesser known treatment options for over active bladder. https://indd.adobe.com/view/0e9f2856-253e-4a6b-88ac-21dddfce75ea

Drs. Langston,Virasoro, DeLong, Fabrizio, Lin and (Physical Therapist) Erin Glace MSPT, PRPC, BCB-PMD are some of those contributing to the HR Physician Magazine. *Welcome to the Community* is a section featuring new physicians, physician assistants and nurse practitioners; this addition features one of our new nurse practitioners, Ingrid Ortiz FNP-BC. *Join us in Honoring* is another feature page dedicated to recognizing physicians who have attained milestones. This issue honors Dr. Miley Walker who retired the first of the year after many years with Urology of Virginia.

Urology of Virginia will be celebrating its 100th year in 2022 and we hope to have a centennial celebration of sorts and that recognition in pubications will be forthcoming. Dr. Paul Schellhammer is spearheading that committee to round up the history and more is to come.

In the meantime the magazine will be virtual as they say due to COVID 19 and hopefully it will go to print soon. To take a virtual peek at the magazine go to this link:
https://indd.adobe.com/view/4a03749a-bc77-4460-927d-7e27f1a7cc4a

Next Generation Imaging: Vital Tool to Combat Prostate Cancer
Matt Gay, MD

About one out of every nine men will be diagnosed with prostate cancer during his lifetime, making it the second most common diagnosed cancer and second-leading cause of cancer death in American men. Next generation imaging (often abbreviated as NGI) technologies are advancing urologists' ability to identify the presence and extent of the cancer and consequently, deliver better care.

Prostate cancer can spread to lymph nodes, bones, liver, lungs and rarely to the brain. Traditionally, to assess for metastatic spread to these areas, patients received a CT and bone scan. But both CT and bone scans have limitations in detecting prostate cancer. As an example, studies have shown that for a CT scan to detect a deposit of cancer cells (a metastasis), the clump of cancer cells has to be 1-2 centimeters, or half an inch in diameter. A clump of cells, or metastasis, of this size will contain over 100 million cancer cells. Recent studies suggest that earlier detection of these "smaller" deposits of cancer spread with next generation imaging, together with novel treatment options, will increase overall survival in these patients with prostate cancer.

Next generation imaging modalities allow a conventional CT to be combined with PET and a radiotracer. PET is a functional imaging technique that can detect metabolic activity. New radiotracers have been created to target proteins which are present in higher quantities in prostate cancer. When CT, PET and radiotracers are combined, this innovative imaging technology can detect previously undetectable metastasis.

In the United States, the current most widely available next generation imaging modality that has the highest sensitivity and specificity for detecting prostate cancer is ^{18}F-fluciclovine PET/CT or more commonly known by its trade name, Axumin.

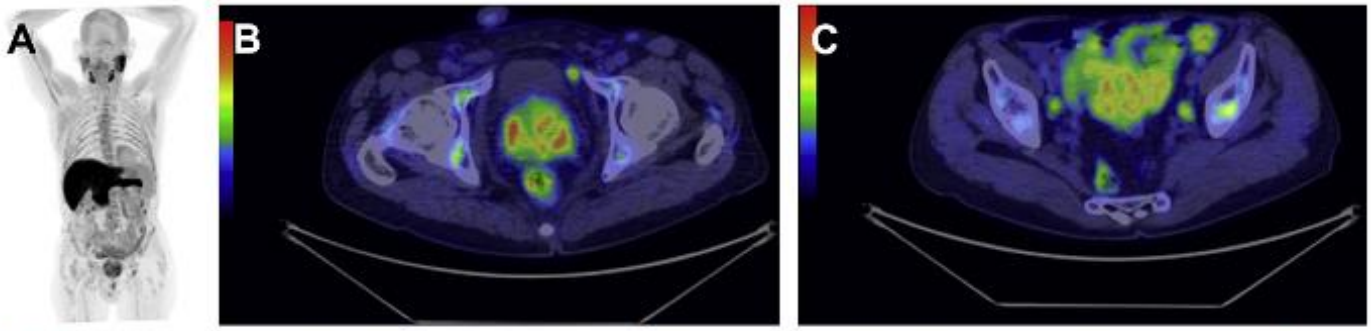


Fig. 5. Pretreatment staging 18F fluciclovine PET/CT in a patient with primary prostate cancer, scheduled for radical surgery, detects multiple nodal and bone metastases leading to a change in treatment management. Patient with high-risk prostate cancer (PSA 18,65, GS 4 + 5, 50% positive core biopsy) was scheduled for radical surgery and lymphadenectomy according to pelvic MR imaging and 11C choline PET/CT standard staging. The experimental tracer 18F fluciclovine detected multiple avid pelvic lymphadenopathies (*B* and *C*, transaxial fused) and inhomogeneous and diffuse uptake throughout the skeleton (*A*, MIP). Considering the disease extent, the patient was finally excluded from surgery. (*Courtesy of* Dr Lucia Zanoni, Programma di ricerca Regione-Università Area 1-Bando Giovani ricercatori "Alessandro Liberati" 2013, Bologna, Italy.)

Axumin is a radiolabeled protein precursor that takes advantage of increased protein uptake in prostate cancer. Axumin is taken up more in prostate cancer cells than surrounding normal tissue, leading to a more precise identification and location of prostate cancer. In 2016, the FDA approved Axumin for use in men with suspected prostate cancer recurrence based on elevated prostate specific antigen (PSA) levels following prior treatment. This approval was based on well done studies that compared Axumin scans in men with suspected recurrence of prostate cancer to the pathology obtained by prostate biopsy and biopsies of suspicious lesions that were detected by imaging. Further

studies have determined that Axumin had a greater ability to detect recurrent prostate cancer compared to other next generation imaging modalities.

The importance of these findings of increased prostate cancer detection is best demonstrated by the results of a large trial, appropriately called the LOCATE trial. This trial used the ^{18}F-fluciclovine PET/CT Axumin scan, to detect these small deposits of cancer in patients with rising PSA after initial prostate cancer treatment with surgery or radiation therapy. This trial investigated the impact of Axumin on patient management of recurrent prostate cancer when conventional CT and bone scan did not demonstrate any abnormalities. The study of 200 patients found that Axumin scan detected lesions that were not identified with CT or bone scan imaging in 57% of patients. This information resulted in a change in the management plan for 60% of these patients.

At Urology of Virginia, we also evaluated our experience with Axumin scans for 48 patients suspected to have recurrence of prostate cancer after initial treatment. In these patients that had no positive findings on CT or bone scans, 71% were found to have lesions detected with Axumin. This detection led to changes in management in 65% of patients.

Since the FDA approval of Axumin in 2016, progress has been made with another next generation imaging agent for use in prostate cancer imaging. It is called the PSMA scan. This is a novel radiolabeled tracer directed at Prostate Specific Membrane Antigen (PSMA), again a protein associated with prostate cancer cells, and is now in international trials. The PSMA scan is likely to be an improvement in detecting even smaller cancer metastasis. The PSMA scan is still investigational in the United States and awaits FDA approval which will likely be granted later in 2020.The accelerating pace of progress in diagnostics and therapies in the field of prostate cancer are grounds for optimism for patients.

Next generation imaging modalities are vital tools in the urologists' armamentarium that can identify previously undetectable prostate cancer metastasis, allowing for earlier treatment, potentially leading to improved outcomes and longer survival.

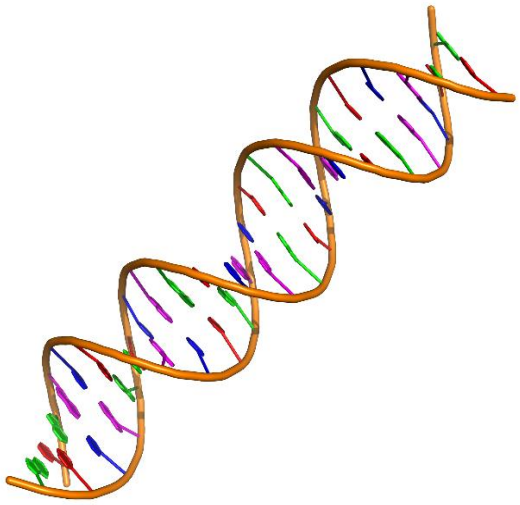
Genetics and prostate cancer: Keeping Pace
Paul F. Schellhammer, M.D.

The world of cancer therapies is experiencing accelerating change that is challenging traditional options and previously accepted guidelines. The rapid pace of data gathering, and analysis, and dissemination threatens to out run the capacity of doctors to both "keep up to date" as well as to "listen and apply" the rapidly evolving treatment recommendations correctly.

I am involved with the Urology of Virginia and Eastern Virginia Medical School residency training program for medical school graduates who have chosen urology as a career. Residents are instructed, mentored, and partnered into the surgical specialties curriculum of knowledge and expertise. This education is accomplished through lectures, meetings, pre-surgical conferences, videos, monitored surgical performance, attendance at national meetings and presentation of Urology of Virginia's research programs and treatment outcomes at those local and national meetings. Keeping current to provide the best possible advances in care is indeed a daunting challenge. A decade ago, a yearly update schedule may have been adequate. Today, monthly, and soon weekly, updates and reviews are mandatory. New surgical techniques and novel pharmaceuticals pace this knowledge explosion. Although advancing rapidly, both of these subjects have always been in the

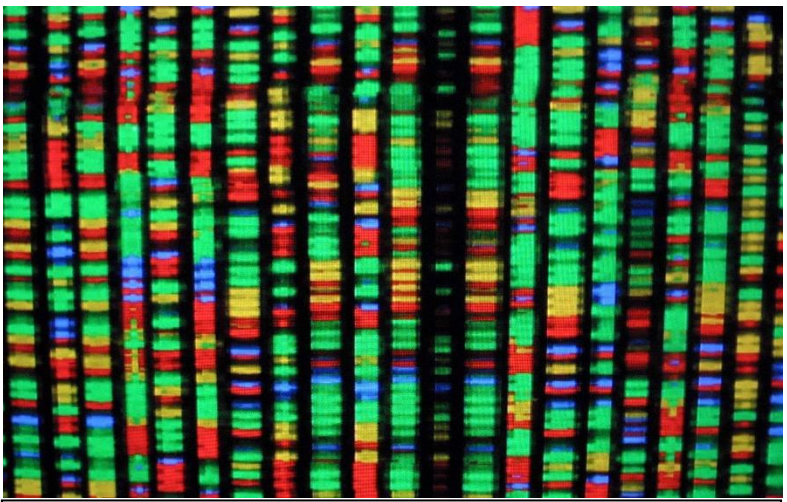
urologic surgeon's field of view. But now there are truly new and previously unexplored horizons making their way into urologic life. One of these horizons is the science of genetics. Previously largely centered on explaining the cause and probability of birth defects and visually apparent deviations from the "normal" human form, genetics now has entered the world of oncology as a potent driver of cancer biology.

The genetic revolution as it pertains to patient counseling and decision-making was brought into stark front-page reality in 2013 through the eyes of Angelina Jolie. A world-famous actress whose face and figure were front and center in the entertainment world was confronted with a strong family history of fatal ovarian cancer in her mother and breast cancer in her grandmother and aunt. Both she and her mother carried the BRCA gene. Faced with an 80% chance of breast cancer and a 50% chance of ovarian cancer she made a drastic life altering, and hopefully lifesaving, decision to proceed with extensive surgery – bilateral breast removal followed later by bilateral removal of ovaries – not as treatment for existing cancer as a preventative measure against a cancer she was at high risk for developing in the future.



DNA was first identified in the late 1860s. Decades later, in 1953, Watson and Crick reached their groundbreaking conclusion: that the DNA molecule exists in the form of a three-dimensional double helix. They were awarded the Nobel Prize in 1962.

The human genome is the term used to describe our internal master plan or roadmap. It is the master template that determines who we are as unique individuals distinct from all other life forms and distinct from one another. Exceptions to this rule are identical twins who share an identical genome. The genome is broken down into smaller units which are called genes.



A method for sorting out and separating protein products templated by the DNA construct.

Very slight variations in the genome and the expression of genes can make a huge difference in the end product of the master template. For instance, the genome of the mouse, and the human are 90+% similar – but what a difference that variation does make! We can liken the gene to a railroad track. In science, it is called the double helix. We inherit one rail from each of our parents which is why we have characteristics of each of them. Depending how our parents' genes are shuffled in the reproductive process, we may closely resemble our brothers and sisters (for instance tall, slender, blue eyes) or appear completely different (for instance tall, slender, blue eye versus short, stocky, brown eyes). Genes, which are segments of these paired railroad tracks, arrange amino acids into proteins. There are only 20 amino acids. They are the basic building blocks from which proteins are constructed. Proteins can be composed of hundreds of these

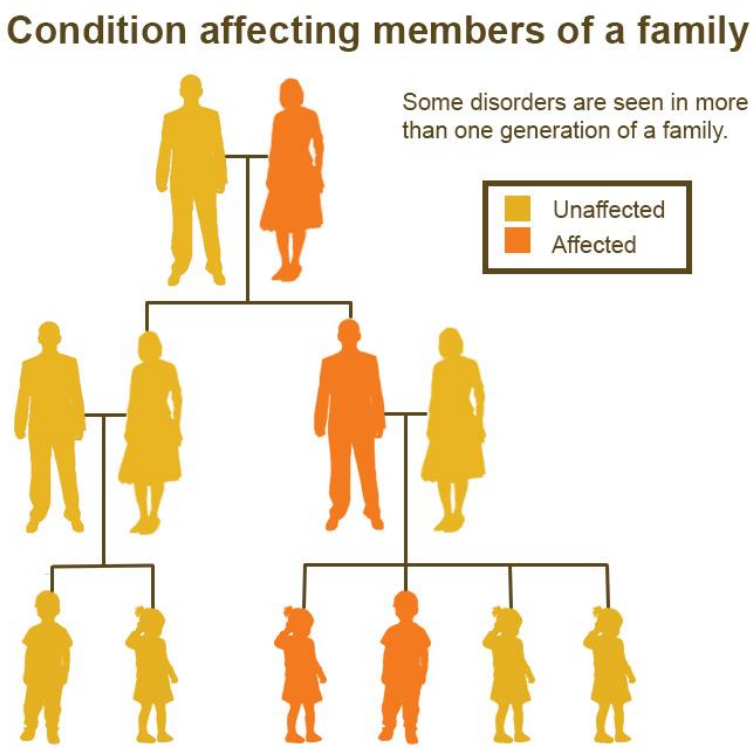
amino units arranged in different configurations. Proteins drive cellular function – as an example, insulin is a protein that regulates/drives sugar metabolism. Mistakes (or mutations as they are termed in science), in the protein can alter its normal function. This mistake can be as apparently minor as the substitution of one amino acid for another or the loss or gain of one amino acid from the protein structure. This mistake may result in a “gain of function” of the gene and the protein it produces, such that if this protein is responsible for driving cell multiplication, there will be in overproduction of cells. Think of this as pushing on the gas pedal to put cells into overdrive. On the other hand, the mistake may result in a “loss of function” where appropriate regulation of cell multiplication is lost resulting in an overproduction of cells. Think of this as loss of the brake function. In either case, there is excessive cell multiplication which describes the hallmark of cancer.

Again, back to our railroad analogy. The rails are held together by ties. A mutation causes a break or disruption in one or more of those ties. This will produce, as we have described, a different and sometimes inadequate protein. In the world of cancer, one of the proteins of interest is responsible for identifying and repairing these very mutation mistakes we have been describing. We could label this protein as a guardian or policeman to ensure normal function by editing and fixing mistakes. If this protein is not normal and functional, and not available to repair mistakes, then we can foresee trouble ahead. An uncorrected mistake in a particular protein that regulates cell division and growth puts that cell on the pathway to unregulated growth -again the definition of cancer. One of these genes which is associated with a high incidence of breast cancer risk called the BReast CAncer (BRCA gene). This is the “Angelina Jolie” gene. It was initially associated specifically with breast cancer, but is now associated with other cancers. The BRCA gene is a guardian against more than one type of cancer. When patients with progressive prostate cancer, or patients with a strong family history of prostate cancer, were evaluated by genetic profiling, 10 – 15% were found to have the BRCA gene mutation. So why is it important to identify this association? First, pharmacologic agents (called PARP inhibitors) have been used successfully in women with breast cancer who carry the BRCA gene. These agents should be tested in men with prostate cancer who are carriers of the BRCA gene. Clinical trials are in the process of defining the role of breast cancer therapy in these men with prostate cancer and the results are promising. In fact, any cancer that is associated with the BRCA gene mutation, whether it originates from the breast, the prostate, the pancreas or other organs, may respond to PARP inhibitors that were originally developed to treat patients with breast cancer carrying the BRCA mutation. Treatment is determined by the genetic abnormality that drives the cancer rather than the organ of origin of the cancer.

What is the source of these mistakes or mutations in a gene? They may have been inherited from one or both parents. If that is the case, the mutation is termed a “germline” mutation. That is to say the mutation occurred somewhere in our ancestry tree in a germ cell (in the testes or ovary) of one of our parents. Thus, the mutation is passed from generation to generation. A well-known mutation that affects the function of red blood cells causes sickle cell disease. When both mutated railroad tracks of this gene are inherited, one from each parent, the red blood cells are severely affected causing sickle cell “disease”. When only one track is mutated, inherited from one parent, red blood cell function is less severely affected as there is partial protection by the normal railroad track inherited from the other parent and is termed sickle-cell ”trait”. If the patient with prostate cancer is determined to have a germline mutation then concern for this mutation passed to his offspring requires genetic counseling. You naturally should ask how this germline testing can be done. How can a patient with prostate cancer learn if he carries a germline mutation? If the mutation is in the germline it will be contained in every cell in the body. Evaluation of white blood cells will reveal a germline mutation; scraping of the inside of the mouth (buccal swab) or a saliva sample will contain cells that can be tested for the mutation. The challenge is to manage this genetic data appropriately and involve genetic counselors.

Genetic counselors provide direction and guidance to the patient and his offspring. The genetic information stream and genetic counseling is a discipline and information stream that is new to most physicians, including urologists.

While we have been discussing the developing science of germline mutations and their relationship to cancer, it is important to recognize that the majority of cancers are not inherited. They are simply accidents of nature and are termed “sporadic cancers” and occur as a result of a number of factors.



- Environmental exposure to chemicals (cancer can be found to “run in the family” if the family resides in toxic chemical exposure zones i.e. the Love Canal).
- Ultraviolet radiation from overexposure to sunlight is the cause of skin cancer and responsible for the recent increase in a specific type of skin cancer called melanoma.
- Radiation delivered for the treatment of other cancers can itself cause a second cancer. The accumulated radiation exposure from multiple imaging tests increases cancer risk. As an example, guidelines for intense CT imaging after the treatment of a cancer have been modified based on the risk of radiation exposure from scans. This is especially pertinent in the arena of childhood cancers where scans may be done over decades. Clearly thoughtful judgment regarding the periodicity and duration of these follow-up protocols is necessary.
- The aging process along with the aging immune system also predisposes to the occurrence of cancer. Because our genome is prone to make more mistakes and is less capable of repair as it ages, cancers are much more common in the geriatric population. How are these acquired genetic changes driving cancer but not related to germline mutations detected? Because these mutations are not present in every cell, a biopsy of the cancer to harvest tissue will provide cells whose genetic profile can be identified. Also, cancers are continuously shedding cells into the bloodstream. These cells can then be harvested by a series of manipulations to isolate them from normal cells so their gene profile, with the railroad track mistakes, can be identified.

The term “precision medicine”, which is finding its way into daily medical conversations, includes identifying the genetic makeup of a patient and his cancer. This information will play an ever more important role in delivering precision medicine to deliver the “right” treatment to the “right” patient/cancer. Precision medicine requires the input of a multidisciplinary team that includes not only medical and surgical oncologists but also basic scientists and geneticists.

Help Support our Mission

The Schellhammer Urological Research Foundation (SURF) is a leading 501-C-3 non-profit organization whose mission is to improve urological care in our community and beyond through excellence in research, education and compassionate innovative health care.

Your donations to the SURF are greatly appreciated!
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