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*Data on file, based on durability testing in simulated gastric acid using ASTM International methodology.
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Disrupting Our Practice Models

I have been reading The Innovator’s Prescription, an interesting book recommended by SIR member Michael Webb, MD, of Murray, Utah. In it, Clayton Christiansen, a professor at Harvard Business School and a renowned management thinker on innovation, and his co-authors consider the challenge of creating greater value in health care in the United States.

I was pleasantly surprised that the authors recognize the innovative nature of IR and identify our minimally invasive procedures as a classic example of disruptive innovation—replacing more morbid surgical options. This fits well with our self-image of being on the cutting edge of change in health care.

However, it has also struck me that we focus primarily on new innovative therapies and spend less thought on new innovative practice models. Christiansen clearly sees disruption of current practice models as the key to controlling cost while simultaneously improving quality.

While a detailed discussion of the authors’ theories is beyond the scope of this column, one key part of their prescription is the transitioning of routine procedures from the general hospital to outpatient procedure centers. The evidence suggests that these are lower-cost settings, with the added benefit of greater patient convenience. These centers also have the potential to provide better outcomes by focusing on a limited number of procedures, with their teams developing great expertise in them.

This has been happening for a number of years for a variety of treatments. One obvious example is the development of dialysis access centers, where excellent outcomes and patient services can be achieved in a low-cost setting. While hospital-based groups may operate these centers, many are run by companies that specialize in the field—and hospital-based interventional radiologists have lost this business. In many parts of the country, few dialysis interventions are now provided in hospitals, and access centers have taken over.

Freestanding interventional centers are a growing part of the IR world, in many cases owned and operated by IRs. While they recognize an opportunity in developing these centers, they face a number of regulatory barriers. One particularly difficult problem is the recent requirement in many states that the physicians working in these centers have admitting privileges at a nearby hospital. While this is not a particular barrier for a vascular surgeon, cardiologist or interventional nephrologist, it can be a problem for an IR. Most hospitals have exclusive contracts with their radiology groups—contracts that prevent an outside interventional radiologist from being granted privileges without the agreement of the group.

Exclusive contracts are an understandable concession to a radiology group in exchange for the responsibility of treating all the hospitals’ patients without regard to insurance status and of providing that care 24 hours a day as needed. However, these contracts have the paradoxical effect of preventing independent interventional radiologists from developing practices in these centers while not hampering competitors from other specialties.

It is obvious why hospital-based groups might view the request by a competing IR for privileges at their institution as being against their interests. Why facilitate a competitor in practice? Why open the door to that IR to compete from both within and outside the hospital?

What this viewpoint misses is that competition is going to come from some quarter regardless and that these services are best provided by skilled IRs and not those who are less qualified. Rather than resist this change, it may be time for us to consider how we should disrupt our own practice models. Rather than resist this change, it may be time for us to consider how we should disrupt our own practice models.

We may need to consider how we partner with would-be IR competitors to collaboratively provide services in both settings. It is difficult to disrupt our own practices, but without innovation in how we provide our care, we may not meet our mandate to provide greater value for patients.
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The Society of Interventional Radiology is proud to provide members with exclusive discounts on publications ordered from the IR Store. All proceeds from the sale of publications and products through SIR help to support the Society’s work in education, advocacy and public outreach on behalf of interventional radiology. The Society thanks you for your continued support.
My Social Network

I’ll admit it—I’m a techie. I was using email in the late ‘80s, back when you waited for the modem to hang up so you could telephone the recipient to make sure it arrived; I was also one of the first 1.5M people using Twitter (there are now over a billion registered users).

Still, I’m sheepish when talking with others about how to best use social technologies in our personal and professional lives. No matter your profession or title, you can find conflicting examples on what and what not to do. My advice to you: find the networks that work for you and maintain authentic, perhaps different, voices on each one. Personally, though, the stories I value the most have helped me form my own POV on how I use social media—my focus for this issue’s column.

Let’s start with Twitter. I like to say that I tweet about what motivates me, personally and professionally—subjects at the crossroads of my professional life as a nonprofit association executive working in the medical community and my personal point of work-life balance.

I follow a number of influential voices (individual and organizational) whose insights and knowledge I respect and value. I “favorite” specific items that are interesting to me or retweet those I think could be of interest to others. What’s in it for me? My Twitter timeline has become a great library and note keeping tool for interesting articles or reports I may want to retrieve in the future.

While I do some of the same on LinkedIn, this medium is my modern Rolodex. I used to photograph all business cards I received using LinkedIn’s CardMunch app (which has recently been discontinued). However, there are numerous other business card scanning apps to help you pull data into the systems and processes you use—a great way to organize all the details you need about the people you work with most!

Hootsuite is a social media management tool that lets me manage multiple Twitter, Facebook (profiles and pages), LinkedIn and Google + networks all from one place. When posting updates, Hootsuite lets me do the usual things (write messages, add photos, embed hashtags, shorten URLs, etc.) across more than just a single network. This is particularly useful when I find something worth sharing with often uniquely different groups of followers.

But I mainly use the streams available in Hootsuite to organize my listening. I have one tab devoted to my Home Feed in Twitter—tweets from everyone I follow, sent tweets, tweets I’m mentioned in, direct messages and my tweets, retweeted—and another for my Home Feed in LinkedIn, where I can monitor updates from more active groups, including DigitalNow and the Society of Physician Entrepreneurs. Perhaps most useful to me is a tab I call “Official and Unofficial SIR Tweets” from which I can monitor what people are saying about SIR or interventional radiology, time-dependent hashtags like #SIR2014, and some overarching search terms, like “innovation” or “leadership.”

In NetVibes, I keep three main dashboards—one for interventional radiology, another for breaking news and a third for all of my personal networks—that are equally accessible to me from my work computer, my laptop, my iPad or the rare guest computer. From here, I access most of the RSS feeds that used to clutter my inbox on a daily or weekly basis: full contents of trade publications and eNews headlines, such as The Gray Sheet, MedPage Today, and even Aunt Minnie; tables of contents from JVIR and other journals and periodicals; and breaking news alerts from across the globe to down the street.

Lastly, just in case you think otherwise, I’m equally on social media for personal connections and fun. I enjoy sharing posts and photos with friends and family on Facebook, Snapchat and Instagram. (How else can I keep connected to my teens and my mom at the same time?) Pinterest is my public creative outlet, collectively my recipe box, travel guide, style manual and visual way of keeping shopping and to-do lists. I can’t say I have as much appreciation for Tumblr or Buzzfeed as my daughters do; however, sharing an Instagram and Twitter account with them, on behalf of our dog, has confirmed to me that your pet will likely get you more followers than just being yourself.

Patient privacy aside, workplaces today that ban social technologies on company time are viewed as distrusting and overly controlling. If you can trust your staff to dress and speak professionally, you can trust them to use social technologies, deliberately, in achieving their goals at work.

More and more, being connected socially makes people feel that they are not just a number; if you have ideas, then you have a voice and the opportunity to be connected.

My advice: find the networks that work for you and maintain authentic, perhaps different, voices on each one.
SIR and SIR Foundation Leadership Approve New Organization-wide Brand

At last month’s June Leadership Retreat, the SIR Executive Council and SIR Foundation Board of Directors approved new branding and a visual identity for the organization. With the changing health care landscape, the new branding will reinforce how the organization and the field of interventional radiology are critical players in this collaboration-based approach of delivering high-quality, patient-centered care. It will also help the Society and Foundation position the specialty as a leader in developing innovative, minimally invasive therapies for patients. Be on the lookout for more details on the new branding in the coming months.

SIR Launches Grassroots Leadership Program

On May 29–30, 12 SIR trainees attended a four-hour grassroots advocacy boot camp that helped participants understand the advocacy process and become familiar with SIR policy issues. The boot camp was followed by visits to congressional offices for individuals sitting on the Energy and Commerce and Ways and Means committees. The event was capped with a dinner hosted by SIR for Ways and Means Committee Rep. Tom Reed (R-N.Y.). Over the two-day period, SIR members had more than 20 individual meetings with members of Congress and their staff. The participants discussed issues such as Medicare reimbursement reform and increased funding for graduate medical education residency slots.

For more details and a video of the event, visit www.SIRweb.org/sirpac/grassroots_leadership.shtml. For more information on SIR’s Grassroots Leadership Program, contact Doug Huynh, SIR’s director of government and policy affairs, at dhuynh@SIRweb.org.
SIR Releases Valuable ICD-10 Resource

On Oct. 1, 2015, ICD-10 will fully replace ICD-9. Is your practice ready? SIR has developed a new ICD-10 resources web page (http://members.SIRweb.org/members/coding/icd-10.cfm) with up-to-date information about learning opportunities and practice impact. An article describing the change will appear in the next issue of IRQ.

IR Division Chiefs Association Formed

At the SIR 2014 Annual Scientific Meeting, a group of IR division chiefs met to discuss a range of topics, including the breadth of IR chief responsibilities. At the meeting, the group unanimously voted to form the Association of Chiefs of Interventional Radiology (ACIR). ACIR’s bylaws and structure were developed to help IR chiefs do their job as divisions become bigger and the position requires more duties. J. Bayne Selby Jr., MD, FSIR, was selected to be ACIR president, Michael D. Darcy, MD, FSIR, was selected to be ACIR vice-president, and John A. Kaufman, MD, MS, FSIR, was selected to be secretary-treasurer. For more information on this group and its activities, please contact Dr. Selby at selbyjr@musc.edu.

SIR Remembers Harvey L. Neiman, MD, FSIR

SIR was saddened to learn of the passing on June 5 of Harvey L. Neiman, MD, FSIR, FACR, a Society Fellow and former chief executive officer of the American College of Radiology (ACR). A letter from SIR and SIR Foundation has been sent to Dr. Neiman’s wife, Ellen (Ellie), and her family expressing our condolences.

FDA Issues Recall of HydroFinity Hydrophilic Guidewire

The U.S. Food and Drug Administration (FDA) has issued a recall for all lots of the HydroFinity Hydrophilic Guidewire because it may be damaged during use, which could lead to injury. For more information, please see www.fda.gov/MedicalDevices/Safety/ListofRecalls/ucm402724.htm.

SIR Members to Advise Joint Commission Panel on Radiation Safety

SIR members James Silberzweig, MD, FSIR, and Robert Dixon, MD, FSIR, are providing technical expertise to a newly formed Joint Commission Working Panel that is examining radiation risks, safety procedures and protocols for designing a safety program. The panel is examining all ionizing radiation, including fluoroscopy. Among several tasks, the panel is charged with defining the major risks in the provision of diagnostic ionizing radiation and magnetic resonance imaging services, as well as advising on steps that an organization providing imaging services should be doing to mitigate these risks. In mid October, the panel will host a day-long meeting at the Joint Commission offices to finalize its recommendations.

SIR greatly appreciates Dr. Silberzweig and Dr. Dixon volunteering their time to represent the Society on this important panel.
New QI Tool Available

Jeremy C. Durack, MD, Chair, SIR Foundation Quality and Outcomes Division

At the SIR 2014 Annual Scientific Meeting, we saw greater emphasis and messaging on IR quality improvement and performance measure development. As a specialty we know we must invest in ways to evaluate the practice of IR and intensify efforts to build a strong evidence base to prove the value of our procedures. To that end, a new mechanism has been developed to collect feedback and suggestions from any member of the IR community. On the SIR website (www.SIRweb.org/clinical/quality2.shtml#feedback), members can submit specific data elements pertinent to quality improvement, performance measure recommendations or thoughts on broader lines of investigation for clinical trials or registries. Contributors will be asked to explain the rationale for their suggestion and potential impact for our specialty. Our intent is to open a channel for communication to members of the SIR Foundation Quality and Outcomes and Clinical Research Trial divisions. Contact information will be collected from each contributor in order to encourage responsiveness and future interchange. Please visit www.SIRweb.org/clinical/quality2.shtml#feedback and offer your suggestions today!

For questions, contact Tresha Russell, SIR Foundation director of quality and outcomes, at (703) 460-5576 or trussell@SIRweb.org.

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Want to Get More Involved?

2015 Committee Application Opens Aug. 4

SIR and SIR Foundation have committees that fit every area of expertise, so take this opportunity to get more involved! By volunteering to serve on an SIR or SIR Foundation committee, you will help improve interventional radiology and patient care and make the most of your SIR membership.

Committee Application Timeline:
- Aug. 4, 2014: Application cycle opens
- Sept. 29, 2014: Application cycle closes
- Mid-November 2014: Notification of committee appointments
- SIR 2015 Annual Scientific Meeting: Committee terms begin

Learn more at [http://members.SIRweb.org/members/volunteer](http://members.SIRweb.org/members/volunteer).

2014 PQRS Group Practice Reporting Registration Due by Sept. 30

If you are an eligible professional who wishes to participate as a group practice in the 2014 Physician Quality Reporting System (PQRS) program, you can now [register for group practice reporting](https://portal.cms.gov) with the PV-PQRS Registration System. You will need to use a valid IACS User ID and password to choose your group’s reporting mechanism. The registration system will be open until Sept. 30, 2014.

Check Your PQRS Claims Data

The Centers for Medicare and Medicaid Services (CMS) have made available a new tool to check your progress toward meeting 2013 PQRS reporting requirements. Using this tool, which is available through the Physician and Other Health Care Professionals Quality Reporting Portal ([www.qualitynet.org/portal/server.pt/community/pqri_home/212](http://www.qualitynet.org/portal/server.pt/community/pqri_home/212)), individual eligible professionals who reported at least one PQRS quality measure in 2013 can view summary or individual data and monitor the status of claims-based measures and measures group reporting.

FDA Issues Update on IVC Communication

The U.S. Food and Drug Administration (FDA) has issued an update to the 2010 Safety Communication on inferior vena cava (IVC) filters ([www.fda.gov/MedicalDevices/Safety/AlertsandNotices/ucm396377.htm?source=govdelivery&utm_medium=email&utm_source=govdelivery](http://www.fda.gov/MedicalDevices/Safety/AlertsandNotices/ucm396377.htm?source=govdelivery&utm_medium=email&utm_source=govdelivery)). The update provides information on recently published research and postmarket studies for the devices and states that there are no new safety concerns related to this update.

Sunshine Act Update

It’s Time to Register With the Physician Open Payments Program

**Phase I**

**Phase II**
*Mid July*—Register in the Open Payments System to track reportable transfers by downloading a free app through the iTunes App Store or the Google Play Store (search for “Physician Open Payment”). Physicians will have 45 days to review and dispute their data, plus an additional 15 days to resolve disputes. Any data that is disputed, if not corrected by industry, will still be made public but will be marked as disputed.

SIR Foundation’s Summer Medical Student Research Internship Program: Fostering Tomorrow’s Pioneers

On the first day of Priscilla Quynh-Phuong Vu’s summer medical student research internship at UCLA Medical Center, her mentor Edward W. Lee, MD, PhD, MSc, helped her make the connection between ascites and portal hypertension by showing her the most common complications of portal hypertension. This was only the beginning of Ms. Vu’s introduction to IR, made possible by SIR Foundation donors. The program is designed to help introduce medical students to IR or corporate research by pairing them with experienced mentors, with the aim of creating the next generation of interventional radiologists.

“Dr. Lee was an amazing mentor,” says the University of California, Irvine School of Medicine student. “He always challenged me with questions about procedures, gave great advice about succeeding through medical school and pursuing radiology, and was always open to teaching.” By working with Dr. Lee at UCLA Medical Center, Ms. Vu was finally able to connect her basic first year medical education to a real patient and see an actual treatment option that was so minimally invasive. “I imagined all the patients to whom I could one day apply my knowledge. Most importantly, I saw how innovative and creative medicine could be.”

SIR Foundation donors should feel good knowing they are a partner in making possible internships that expose medical students like Ms. Vu to IR research. With their generosity, medical students have the opportunity to explore IR-related research projects at leading academic institutions or to be embedded in the device world with a corporate host. Due to her research project comparing balloon-occluded retrograde transvenous obliteration (BRTO) and transjugular intrahepatic portosystemic shunts (TIPS), she has a clearer idea of what IR is and what interventional radiologists do: “IR requires extreme creativity to solve complex cases, and the innovation never ends—interventional radiologists are constantly trying to find new and better ways to treat patients. It has inspired me to study hard so that I can apply my knowledge innovatively to help patients in the future.”

Visit www.SIRFoundation.org/donate to make a charitable donation to SIR Foundation’s annual fund, which helps to support programs designed to advance IR through research like the Summer Medical Student Research Internship Program.

Are You a Pioneer?

“Sustaining innovation relies on our support now more than ever. I make a living by being an IR, and SIR and SIR Foundation are where I am inspired to dream big and see it come true. The thrill of giving to SIR Foundation lasts a lifetime—see your legacy live on!”
—Mehran Midia, MD, Life Member of the Pioneer Circle

SIR Foundation, a 501(c)(3) charitable organization, does not receive operational funding from SIR member dues. We rely on charitable donations to the Annual Fund to foster IR research, increase the number of skilled investigators, and encourage the development of innovative therapies leading to improved patient care and quality of life.

Please visit www.SIRFoundation.org/pioneer to find out more about the Pioneer Circle, a new way to support SIR Foundation’s work. Your donation will lead to increased funding for grants and awards, evidence-building initiatives, research education and mentoring, medical student outreach, and so much more. Donate online at www.SIRFoundation.org/donate.

Pioneer Circle Founding Donors

Consider joining a growing list of generous Pioneer Circle donors. Several levels of recognition are achievable, each with unique recognition and donor acknowledgements (see www.SIRFoundation.org/pioneer).

SIR Foundation is grateful to the following donors for their generosity:

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- Suresh Vedantham, MD, FSIR

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Thank you to the more than 50 donors at this level. Please visit www.SIRFoundation.org/pioneer/grateful.shtml to see a complete list of Pioneer Circle members.
ARIN Update

Joint Commission Unveils New Radiology Standards
Greg Laukhuf, ARIN President

Progression and change are a constant in radiology. The effectiveness of diagnostic imaging has led to increased reliance on imaging modalities through the years. With the increased use, concerns have surfaced regarding growing risk and safety issues. To assist organizations in evaluating these issues, effective July 1, the Joint Commission is releasing new diagnostic imaging standards. These updates to the current standards will be rolled out in two phases over 2014 and 2015.

The first phase of updates will focus on CT, nuclear medicine PET and MRI. In 2015, the second phase will address cone beam CT, fluoroscopy and clinician qualifications for performing imaging exams. These standards will apply to the environment of care, human resources, medical staff, provision of care and performance improvement. The standards will focus on four key areas related to diagnostic imaging: 1) establishing a minimum competency for radiology technologists, 2) addressing CT dose documentation, 3) ensuring that the imaging protocols of individual organizations are addressing the needs of the pediatric population, and 4) ensuring the proper evaluation of imaging equipment by medical physicists.

Through consistent educational initiatives, the Association for Radiologic and Imaging Nursing (ARIN) equips imaging nurses with the knowledge necessary to assist with the new standard transition. Many imaging nurses are familiar with the Joint Commission processes and standards, positioning them uniquely to support this update. These updates impact patient safety and care. Imaging nurses act as a liaison between inpatient nursing and radiology while maintaining quality patient care. Additionally, imaging nurses advocate and are instrumental in issues concerning patient safety, setting practice guidelines and interdepartmental quality assurance.

The changes to standards are set to roll out. For your department to be successful, it is imperative that all members of the team be engaged. I encourage you to reach out to your imaging nursing staff and take advantage of their unique skill sets. Imaging nurses can play an integral role in reaching these new standards in this climate of cost containment.

Apply Now!

SIR Foundation Research Award and Grant Application Deadlines Approaching

2015 SIR Foundation Research Award Deadlines
Oct. 8, 2014
Leaders in Innovation Award

Nov. 15, 2014
• Dr. Gary J. Becker Young Investigator Award
• Resident/Fellow SIR Annual Scientific Meeting Research Award*
• Dr. Constantin Cope Medical Student Annual Scientific Meeting Research Award*

*To be eligible to apply for this award, SIR 2015 Annual Scientific Meeting abstracts must be submitted by Oct. 3, 2014, 5 p.m. EDT.

2015 SIR Foundation Grant Application Deadlines
Dec. 14, 2014
• Allied Scientist Grant
• Academic Transition Grant
• Dr. Ernest J. Ring Academic Development Grant
• Funding Source Development Grant
• Pilot Research Grant
• SIR Foundation-Harvey L. Neiman Health Policy Institute Cost-effectiveness and Quality Outcomes Research Grant

Feb. 1, 2015
• Resident/Fellow Research Grant
• Student Research Grant

For more information regarding these awards and the application process, please visit www.SIRFoundation.org/grants-awards/awards.shtml.
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Mark your calendar today! www.SIRweb.org/LEARN
August 4
SIR volunteer application process opens

September
National PAD Awareness Month

September 1
SIR office closed for Labor Day

September 30
- PQR Group Registration Deadline
- SIR volunteer application process deadline

October 1
- SIR 2015 Annual Scientific Meeting registration opens
- Resident-in-training Travel Scholarship and Medical Student Travel Scholarship applications due

October 3
SIR 2015 Annual Scientific Meeting abstracts due, 5 p.m. (EDT)

October 8
Leaders in Innovation Award nominations due

October 9–11
Lower Extremity Arterial Revascularization (LEARN) Course, Scottsdale, Ariz.

October 20
World Osteoporosis Day

November 8
International Day of Radiology

November 15
- Dr. Gary J. Becker Young Investigator Award applications due
- Resident/Fellow SIR Annual Scientific Meeting Research Award applications due
- Dr. Constantin Cope Medical Student SIR Annual Scientific Meeting Research Award applications due

November 17
SIR Veins Meeting at AIM Symposium, www.aimsymposium.org

December 14
- Allied Scientist Grant applications due
- Academic Transition Grant applications due
- Dr. Ernest J. Ring Academic Development Grant applications due
- Funding Source Development Grant applications due
- Pilot Research Grant applications due
- SIR Foundation-Harvey L. Neiman Health Policy Institute Cost-effectiveness and Quality Outcomes Research Grant application deadline
You have an idea for a new invention. How do you keep other people from using it without your approval or without compensating you for your creativity? Many times, the answer is to get a patent on your new invention.

**What Is a Patent and What Does It Do?**

A patent is a grant from the U.S. government, issued by the Patent and Trademark Office (PTO), that gives the patent owner the right to exclude others from making, using, selling and importing the patented invention for a limited period of time. With some exceptions, this limited period of time is 20 years from the date the patent application is filed. In exchange for this right to exclude, the inventors provide a detailed disclosure of the invention.

The scope of a patent is determined by the patent’s claims, which define the invention’s outermost property line. Patents that are narrow and weak (i.e., relatively easy to design around) frequently offer no substantial patent protection, and the expense of seeking them must be justified on secondary values other than patent protection.

The value of a patent is influenced only in part by factors of breadth and strength. The commercial value of the invention that the patent protects, of course, underlies all other patent evaluation factors. While many broad and strong patents do not earn the cost of obtaining them, sometimes a narrow and weak patent may be worth much more than it costs because the narrow feature that it protects has great commercial value or because of its secondary values.

The decision to file or not to file an application for patent should be based not only on the patentability of the invention, but also on the commercial potential of the invention itself, the various different values of the particular type of patent that can be obtained and the uses to which the patent may properly be put in the industry to which the particular invention relates.

**What Is Patentable?**

Almost anything can be patented, including medicines, devices, materials and processes. Subjects that are not patentable include mathematical formulas, mental processes and laws of nature (e.g., gravity). Patents do not protect ideas in the abstract but rather protect tangible or identifiable structures and methods.

In addition, patentable inventions also must be new, useful and nonobvious and cannot have been publicly known before filing for a patent application. This means inventors should take care to seek patent protection before publishing or otherwise disclosing the invention publicly. Useful inventions serve some purpose and actually work for their intended purpose.

This requirement is relatively easy to satisfy. A harder requirement to satisfy, however, is that inventions must be nonobvious. That is, for an invention to be patented, it must be innovative to the point that it wouldn’t be obvious to others. Nonobvious is one of the more difficult concepts in patent law because it is viewed from the vantage of a hypothetical person of skill in the relevant field of the invention who has access to information like scientific and medical publications.

**How Do I Pursue a Patent?**

*Preliminary Patentability Search.* Often, the first step to patenting an invention is to disclose the invention to a patent attorney. Patent attorneys are specifically qualified to practice before the U.S. PTO. If the invention appears to fall within one of the general classes of patentable subject matter, the attorney may recommend a limited search of publication databases to understand the scope of patent protection that may be available. This sort of patentability search involves using a variety of resources to find the “prior art” that is closest to your invention. The prior art search can include prior U.S. and foreign patents, books, or articles from magazines or technical journals. The goal is to find the closest prior art to your invention so that you and your attorney can better evaluate just how different your invention is from what has already been done. At this point, the attorney may advise you whether to stop or proceed with the patent application.

*Application for U.S. Patent.* If you decide to go forward with a patent application, the next step is to prepare a utility patent application. A U.S. patent application (which may include figures) completely describes your invention to a degree of detail that allows someone who has read the application to build or use your invention. Patent applications may be anywhere from a few pages to more than a hundred pages long and are published by the PTO 18 months after.
after their filing date, unless a request for nonpublication is made.

A special type of application called a “provisional” patent application is a sort of placeholder that allows inventors to establish a filing date from which other patent applications may be based. A provisional application does not begin the clock for calculating the 20-year patent term and is not examined. Consequently, a provisional application never matures into a patent. It exists for a maximum of 12 months, after which time (unless an application has been filed claiming priority from it), the provisional application goes abandoned by law.

The international application or Patent Cooperation Treaty (PCT) application also serves as a placeholder, on a global scale. Like a provisional application, a PCT application can act as a placeholder to establish a filing date in countries that are parties to the PCT. All of the major industrialized countries (with a few exceptions, including Argentina and Taiwan) are members of the PCT.

**Prosecution of the Patent Application.** When the patent application has been filed, the PTO examiner performs a patentability search. Hopefully, the examiner will not find anything better than the prior art identified in a preliminary search. In the event other prior art is identified, the examiner will read all the relevant art and compare it to your invention. The examiner then issues an “Office Action”—a letter citing the prior art references that the examiner found that they think limits the scope of your invention. This first Office Action is usually rendered approximately 18 to 24 months after the application is filed. The attorney obtains copies of the references cited in the Office Action and studies them. Sometimes, the examiner’s search, which is more exhaustive than can be afforded in a limited patentability search prior to filing an application, turns up more relevant references than were found in the preliminary search of the type recommended previously.

Based on the prior art references found by the examiner, the attorney may recommend that the application be abandoned at this point—which is rare. More typically, based on the attorney’s judgment that the examiner’s references do not destroy the novelty of the invention, and on an assumption of the client’s continued commercial interest in the invention, the attorney may recommend that the application be further prosecuted. However, it often happens that during the year or more between first filing of the application and the first Office Action, the client develops a new idea that is better than the one disclosed in the patent application, or determines that the market potential of the invention is markedly less than earlier believed. For these or other reasons the client may conclude that the application should be abandoned even though at least some scope of patent protection may still appear to be available.

**Further Prosecuting the Application.** If the inventor decides to further prosecute the application, the attorney prepares for the examiner what is usually referred to as an “Office Action Response.” This document may amend the claims and sometimes other parts of the specification to accentuate the differences between the invention and the prior art references cited by the examiner. It may also amend the application to comply with the examiner’s editorial taste. The Office Action Response always includes a discussion of the differences between the references cited by the examiner and the applicant’s invention and, in appropriate cases, it will include a legal argument setting forth the reasons that a patent should be granted for the particular application.

The attorney and the examiner continue to exchange actions and amendments of this nature until the application is either allowed or rejected in a final office action. This further prosecution after the filing of the original application requires, on average, about three years, although the time may range anywhere from a year upward. Most of that time lapse is spent awaiting office actions by the PTO.

**Conclusion**

Developing a patent strategy often involves a portfolio of patent applications covering different aspects of related inventions and consideration of the marketplace in the United States and abroad. Many potential pitfalls can affect your patent rights; various strategies can be tailored to suit business and commercialization goals. For more details and guidance, inventors are encouraged to seek legal counsel to discuss patent protection strategies early in the inventive process.

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Interviews With Akshaar Brahmbhatt and Erik Velez, HHMI-SIR Foundation Medical Research Fellows

SIR Foundation has partnered with the Howard Hughes Medical Institute (HHMI) to fund an HHMI-SIR Foundation Medical Research Fellow since 2013. The program supports a year of full-time biomedical research training for medical students. For information, visit www.SIRFoundation.org/grants-awards/hhmi.shtml.

Akshaar Brahmbhatt is the 2013–2014 HHMI-SIR Foundation Medical Research Fellow. He has nearly completed his research fellowship working in the research lab of mentor Sanjay Misra, MD, FSIR, at the Mayo Clinic in Rochester, Minn. Mr. Brahmbhatt’s research focuses on developing translational therapies aimed at inhibiting stenosis formation in hemodialysis grafts.

COLLINS: Please describe for our readers the overarching goals of your research.
BRAHMBHATT: The goals my research project are to better understand the mechanisms of venous neointimal hyperplasia, which causes arteriovenous fistula failure, and to develop new therapies to prevent its occurrence.

COLLINS: What have you learned about stenosis formation in hemodialysis grafts that could be translated into clinical practice?
BRAHMBHATT: Many factors are implicated in venous neointimal hyperplasia, including shear stress, inflammation and hypoxia. Over the past year, I studied the role of the IEX-1, the intermediate early-response gene, in venous neointimal hyperplasia. This gene is implicated in cell survival and may contribute to venous neointimal hyperplasia in response to several stimuli. So far we have discovered that the IEX-1 gene is upregulated in arteriovenous fistulas. Using a knockout mouse model, we have found that by eliminating IEX-1 there is a reduction in inflammatory and angiogenic cytokines. This leads to a reduction in venous neointimal hyperplasia. We have also found that high doses of calcitriol reduce IEX-1 expression. We are currently developing a translatable therapy based on reducing IEX-1 in the venous outflow through the local delivery of calcitriol via a nanoparticle hydrogel solution.

COLLINS: Based on your research results to date, what new questions (hypotheses) have been generated and how will these be answered?
BRAHMBHATT: Although we understand the effects of IEX-1, the exact mechanism of the gene is not well understood. It is important to find a good research mentor early on who can help you learn how to go about translating a clinical problem to a bench-top research question either in vivo, in vitro or both.

—Akshaar Brahmbhatt
understood. Future work will look at the mechanisms of IEX-1 and the effect it has on a variety of cell types implicated in venous stenosis. We will carry out cell culture experiments as well as screening studies to answer these questions. Future work will also aim to develop a more effective translatable therapy.

COLLINS: What did the HHMI-SIR Foundation medical research fellowship enable you to accomplish that would otherwise have been challenging during your medical training?

BRAHMBHATT: The fellowship enabled me to have dedicated time for basic research, which can be hard to come by outside of an MD/PhD program. The fellowship has allowed me to build a strong skill set in basic and translational research that I would not have otherwise learned through traditional medical training.

COLLINS: What advice would you give to medical students who are interested in translational research in general and in interventional radiology in particular?

BRAHMBHATT: It is important to find a good research mentor early on who can help you learn how to go about translating a clinical problem to a bench-top research question either in vivo, in vitro or both. Finding a mentor who is truly invested in your future and whom you can emulate is a great place for medical students to begin building a career in research.

COLLINS: How do you like to spend time outside the lab?

BRAHMBHATT: Outside the lab, I have really enjoyed exploring new roads and places, photography and trying new recipes.

Erik Velez is the 2014-2015 HHMI-SIR Foundation medical research fellow. His project will investigate the local and distant pro-oncogenic effects of microwave ablation of liver and renal tumors and will be performed under the guidance of his mentor Muneeb Ahmed, MD, at Beth Israel Deaconess Medical Center/Harvard Medical School.

COLLINS: Congratulations on being awarded the HHMI-SIR Foundation medical research fellowship for 2014-2015. Can you summarize the goals of your research for our readers?

VELEZ: My research will investigate microwave (MW) ablation-induced upregulation of mediators and periablational inflammation that can lead to local and systemic tumorigenesis. In addition, I will be investigating whether MW ablation can stimulate distant tumor growth and will combine MW ablation with adjuvant inhibitors to block key pathways responsible for potentially deleterious effects of ablation. I anticipate these results will further our understanding of local and systemic effects of MW ablation and will form the basis for relevant combination therapy regimens. My hope is that my findings eventually can be applied to clinical practice and improve the current state of MW ablation therapy.
My introduction to research was in a chemistry laboratory, which was very far removed from the patient care setting. Since then, I have had many encounters where patients benefited from the initial discoveries made in a basic science setting.

**Collins:** It can be difficult for medical students to learn about cutting-edge clinical research questions. How did you become interested in tumor ablation research?

**Velez:** Working with an interventional radiologist during my first year of medical school, I scrubbed in on a transcatheter arterial chemoembolization procedure for a patient with hepatocellular carcinoma. Since then I’ve had a strong interest in interventional oncology and sought out labs with a focus on IO. After looking at many labs, I found Dr. Ahmed’s lab focusing on tumor ablation research, and the project was an amazing opportunity that fit my interests.

**Collins:** What do you hope to accomplish during your research fellowship, both from a research perspective and professional growth standpoint?

**Velez:** While my research experience thus far has led to my interest to pursue a research career, I do not have strong footing in the skills needed to conduct translational research. This project will expose me to cutting-edge oncology research in IR, animal research techniques that are central to translational research, data analysis and interpretation of results that will prompt further clinical questions. By taking this year as an HHMI-SIR Foundation fellow, I will be able to fully devote myself to research and develop the foundation necessary to continue my research career during residency and beyond.

**Collins:** Did a particular clinical experience as a medical student prompt you to seek out opportunities in translational research?

**Velez:** My introduction to research was in a chemistry laboratory, which was very far removed from the patient care setting. Since then, I have had many encounters where patients benefited from the initial discoveries made in a basic science setting. The most memorable cases for me were new treatments for oncology patients.

I believe that the future of great innovations in the medical field will rely on the connection between basic science and clinical applications. Being up to date on the latest research and current clinical needs, one can pull ideas from both ends of the spectrum to formulate research ideas with the greatest potential to improve patient care.

**Collins:** Can you comment on the value of the HHMI-SIR Foundation Medical Research Fellow application process in terms of formulating hypotheses and cogently describing your research plan?

**Velez:** Applying for the HHMI-SIR Foundation medical research fellowship was a great learning experience in itself. I learned about the grant writing process, became up to date on the current research in the area, and scrutinized my project for potential pitfalls and solutions.

**Collins:** What advice would you give to medical students who are interested in translational research in general and in interventional radiology in particular?

**Velez:** For students interested in translational research, I strongly recommend taking a year off to pursue research. Medical school is demanding and it is difficult to fully benefit from focusing on research part-time. During the year one can truly experience the life of a researcher, preparing one for a career as a physician-scientist. For IR in particular, I recommend finding opportunities to shadow interventional radiologists as early as possible, as the field covers a wide scope of disease states. Research in the field is quickly expanding and has the potential to alter the traditional management of many diseases, so it is important to get exposure and figure out your interests.

**Collins:** How do you like to spend time outside the lab?

**Velez:** In my time off I enjoy exploring the city, eating good food, watching Game of Thrones and hiking.

SIR Foundation thanks the hundreds of donors who made these grants possible through support of the Discovery Campaign and Annual Fund. SIR Foundation’s grants program has experienced growth in high-quality application submissions. Please consider a donation that will support the future of the field through increased research funding and training, and visit [http://www.SIRFoundation.org/donate/](http://www.SIRFoundation.org/donate/).
On Sept. 24, 2013, the U.S. Food and Drug Administration (FDA) issued a rule to create the Unique Device Identification system, a program designed to improve device documentation for patient care and to identify medical devices associated with adverse events reports. The ultimate goal of the program is to help the FDA identify product problems more quickly, better target recalls and improve patient safety. The FDA has worked closely with industry, the clinical community, and patient and consumer groups in developing the system.

A unique device identifier (UDI) is composed of a device identifier (DI) and a production identifier (PI). The DI is a mandatory, fixed portion of the UDI that identifies the specific version or model of a device and the labeler of that device. The PI is a conditional, variable portion of the UDI that identifies one or more of the following when included on the label of the device: lot or batch number, serial number, expiration date, manufacturing date and distinct identification code (donation identification number). The UDI will allow for adequate identification of medical devices throughout the distribution and use of the device.

In addition to requiring the label of medical devices to bear a UDI, the rule requires medical device labelers to submit and update data to the FDA’s Global Unique Device Identification Database (GUDID) for each model or version of a device that requires a UDI. This publically searchable database will house key device identification information but will not contain any information that will identify a patient. Medical device labelers must enter basic device identification information such as the brand name, model or version, device count, size and DI.

The GUDID will contain information particularly useful to health care professionals, such as whether the device is packaged as sterile and whether a particular sterilization method is required prior to use. Additionally, the DI record will indicate the MRI safety status of the device. The DI record will also indicate whether a device is labeled as containing natural rubber latex or dry natural rubber.

The FDA anticipates that health systems will provide access to the data in the GUDID by linking the UDI with hospital systems such as inventory management, clinical and claims systems. Earlier this year, the Office of the National Coordinator included in its proposed 2015 electronic health record (EHR) certification criteria the requirement that EHR technology be able to record and display UDIs and other information about implantable devices.

All implantable medical devices are required to comply with the UDI requirements by Sept. 24, 2015. Including the UDI in patient records will help improve the response to postmarket surveillance activities, including adverse event reporting and recalls. Postmarket studies of medical devices can also benefit from the UDI requirements. The precise identification of devices will help link devices to clinical data and allow for a better assessment of the risks and benefits associated with a device within specific subpopulations. Safety and effectiveness studies of medical devices will be more complete and accurate with the ability to identify the particular model or version of the device used in a clinical setting.

While the UDI requirements are being phased in over the next seven years, now is the time to begin implementing strategies to allow for the optimal use of UDIs in your health care programs. For more information, please contact the UDI team at UDI@fda.hhs.gov.

References

Erin Fields is a program analyst with the U.S. Food and Drug Administration/Center for Devices and Radiological Health.
What is the difference between a zero-day, 10-day and 90-day global surgery period? What services can and can’t be separately reported during the global period for a surgery?

**Answer:** Global periods are assigned to almost all procedural and surgical codes signifying the period of time for which postoperative care is included in the initial reimbursement for the service. The Centers for Medicare and Medicaid Services (CMS) classify procedural or surgical services as being major surgery, minor surgery, “-scopy” and/or services to which the global surgery concept does not apply. These procedures have global periods of 90-days, 10-days, zero-days or “XXX” (unassigned), respectively. CMS communicates the assignment of global periods through the Medicare Physician Fee Schedule (MPFS).


The global period for most interventional radiology procedures is zero-day. However, there are services that have 10-day and even 90-day global periods assigned. Providers must know the global period associated with the procedures they perform to ensure that postprocedural follow-up care is appropriately billed and reimbursed. SIR supports the application of appropriate global periods for interventional radiology services finding greater efficiency in billing and promotion of interventional radiologists as clinicians.

**The global period for most interventional radiology procedures is zero-day. However, there are services that have 10-day and even 90-day global periods assigned.**

Minor surgical services and -scopies may have surgical global periods of zero or 10 days or may not have an assigned global surgical period since they are deemed to be minor. If repeat services are necessary outside the global postoperative period (if there is one), modifiers are not required. Appropriate modifiers should be used for services during a global surgical period, or on a separate date of service, to allow payment for these services. Evaluation and management services performed on the same date of service as a minor surgery or -scopy are not separately paid. This is based on the assumption that most patients are already established patients when they appear for their minor surgical or -scopy procedure. Therefore, the preoperative evaluation would most likely have been performed and separately paid on a preceding date of service.

If this is not the case and the patient is presenting for the first time and only receives evaluation and management, which is directed to ensure a safe minor surgery or -scopy, this would not be separately reported and paid. However, if the patient has not been seen before and receives an extensive evaluation and management service, this should be reported with the modifier -25 for a separate and significant evaluation and management service on the date of a procedure. The documentation of this encounter is important to ensure payment.

For more information on global periods and instruction regarding when it is appropriate to use modifiers to report E&M services not covered by a global period, please see Chapter 12 of the Medicare Claims Manual ([www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/downloads/clm104c12.pdf](http://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/downloads/clm104c12.pdf)).

**Coding Services Not Included in the Global Surgical Package**

Carriers do not include the services listed below in the payment amount for a procedure with the appropriate indicator in Field 16 of the Medicare Fee Schedule Database (MFSDB). These services may be paid for separately.

- The initial consultation or evaluation of the problem by the surgeon to determine the need for surgery. Please note that this policy only applies to major surgical procedures. The initial evaluation is always included in the allowance for a minor surgical procedure.
- Services of other physicians except where the surgeon and the other physician(s) agree on the transfer of care. This agreement may be in the form of a letter or an annotation in the discharge summary, hospital record or ambulatory surgical center (ASC) record.
- Visits unrelated to the diagnosis for which the surgical procedure is performed, unless the visits occur due to complications of the surgery.
- Treatment for the underlying condition or an added course of treatment that is not part of normal recovery from surgery.
- Diagnostic tests and procedures, including diagnostic radiological procedures.
Clearly distinct surgical procedures during the postoperative period that are not reoperations or treatment for complications. (A new postoperative period begins with the subsequent procedure.) This includes procedures done in two or more parts for which the decision to stage the procedure is made prospectively or at the time of the first procedure. Examples of this are procedures to diagnose and treat epilepsy (codes 61533, 61534-61536, 61539, 61541 and 61543) which may be performed in succession within 90 days of each other.

- Treatment for postoperative complications that requires a return trip to the operating room (OR). An OR for this purpose is defined as a place of service specifically equipped and staffed for the sole purpose of performing procedures. The term includes a cardiac catheterization suite, a laser suite and an endoscopy suite. It does not include a patient’s room, a minor treatment room, a recovery room or an intensive care unit (unless the patient’s condition was so critical there would be insufficient time for transportation to an OR).

- If a less extensive procedure fails, and a more extensive procedure is required, the second procedure is payable separately.

- For certain services performed in a physician’s office, separate payment can no longer be made for a surgical tray (code A4550). This code is now a Status B and not a separately payable service. However, splints and casting supplies are payable separately under the reasonable charge payment methodology.

- Immunosuppressive therapy for organ transplants and critical care services (codes 99291 and 99292) unrelated to the surgery where a seriously injured or burned patient is critically ill and requires constant attendance of the physician.

### Components of a Global Surgical Package

Carriers apply the national definition of a global surgical package to all procedures with the appropriate entry in field 16 of the MFSDB. The Medicare-approved amount for these procedures includes payment for the following services related to the surgery when furnished by the physician who performs the surgery. The services included in the global surgical package may be furnished in any setting, e.g., in hospitals, ASCs or physicians’ offices. Visits to a patient in an intensive care or critical care unit are also included if made by the surgeon. However, critical care services (99291 and 99292) are payable separately in some situations.

- **Preoperative Visits**: Preoperative visits after the decision is made to operate beginning with the day before the day of surgery for major procedures and the day of surgery for minor procedures

- **Intraoperative Services**: Intraoperative services that are normally a usual and necessary part of a surgical procedure.

- **Complications Following Surgery**: All additional medical or surgical services required of the surgeon during the postoperative period of the surgery because of complications that do not require additional trips to the operating room.

- **Postoperative Visits**: Follow-up visits during the postoperative period of the surgery that are related to recovery from the surgery.

- **Postsurgical Pain Management**: By the surgeon.

- **Supplies**: Except for those identified as exclusions.

- **Miscellaneous Services**: Items such as dressing changes; local incisional care; removal of operative pack; removal of cutaneous sutures and staples, lines, wires, tubes, drains, casts, and splints; insertion, irrigation and removal of urinary catheters, routine peripheral intravenous lines, nasogastric and rectal tubes; and changes and removal of tracheostomy tubes.

**Disclaimer**: SIR is providing this billing and coding guide for educational and information purposes only. It is not intended to provide legal, medical or any other kind of advice. The guide is meant to be an adjunct to the American Medical Association’s (AMA’s) Current Procedural Terminology (2013/CPT®). It is not comprehensive and does not replace CPT. Our intent is to assist physicians, business managers and coders. Therefore, a precise knowledge of the definitions of the CPT descriptors and the appropriate services associated with each code is mandatory for proper coding of physician service.

Every reasonable effort has been made to ensure the accuracy of this guide; but SIR and its employees, agents, officers and directors make no representation, warranty or guarantee that the information provided is error-free or that the use of this guide will prevent differences of opinion or disputes with payers. The publication is provided “as is,” without warranty of any kind, either expressed or implied, including, but not limited to, implied warranties or merchantability and fitness for a particular purpose. The company will bear no responsibility or liability for the results or consequences of the use of this manual. The ultimate responsibility for correct use of the Medicare and AMA CPT® billing coding system lies with the user. SIR assumes no liability, legal, financial or otherwise for physicians or other entities who utilize the information in this guide in a manner inconsistent with the coverage and payment policies of any payers, including but not limited to Medicare or any Medicare contractors, to which the physician or other entity has submitted claims for the reimbursement of services performed by the physician.
In its ongoing effort to expand and enhance its offerings, SIR has been exploring new ways to reach out to and engage its 5,000+ members, as well as the broader interventional radiology community. Over the past few years, SIR has embraced growing technologies to make its various resources and services—from educational programming and research materials to publications, communications and outreach—more accessible to all.

That effort is increasingly timely as SIR steps up its efforts to maintain a leadership position on the rapidly evolving health care landscape. “During this time of historic change for medicine and physicians, SIR must play a leading role in shaping the way we and our members use technology to communicate, deliver timely, quality education, and share new ideas and innovations on a range of topics in interventional radiology,” says M. Victoria Marx, MD, FSIR, chair of SIR’s Publications Committee and SIR treasurer.

To achieve this goal, SIR invested $372,000 during FY2013 toward the creation and dissemination of multiple new technology systems, including upgrades to its online educational offerings, the development of a subscription-based online resource for sharing IR educational content, and doubling its offering of online publications and e-books. This article explores some of the many ways SIR is incorporating new technologies and what these advancements mean for interventional radiologists everywhere.

**Crowd-sourced Knowledge**

In 2013, SIR celebrated 40 years of operation. At the time, as then-president Scott C. Goodwin, MD, FSIR, pointed out, the Society took a moment to celebrate the past but focused most of its attention on “looking for new ways to ensure a healthy future for the field of interventional radiology.”

Perhaps the largest effort SIR has put forth in the last year or so, at least in terms of upgrading its technology, is the development and implementation of SIRcloud™ ([http://sircloud.sirweb.org/](http://sircloud.sirweb.org/)).

Unveiled in December 2013, the SIRcloud platform is an online collaborative space providing access to a growing collection of editorially vetted case studies, teaching files, reference documents, clinical images and meeting presentations (dating back to 2011). By offering on-demand uploads and downloads to SIR members, corporate partners, medical students and interventional-radiologists-in-training, SIRcloud is intended to greatly expand knowledge-sharing within the greater IR community.

“SIRcloud is our biggest new education rollout,” says Dr. Funaki. “We recognize our members’ need to share their cases with other IRs, whether to teach and learn, gain feedback or other uses. But until now there hasn’t been a centralized location to do this. So we created a customized web portal to offer greater access to cases, slide decks and other materials.”
He adds that, by creating an open platform with multiple access points, SIRcloud will build “strong and powerful connections” for teaching and learning within the Society’s membership and throughout the IR community and beyond. So far, the reaction to SIRcloud, which was initially launched to medical students and IRs-in-training, has been positive.

“Everyone is really thrilled,” Dr. Funaki says, noting that the SIRcloud demo at SIR 2014 was well-attended. “A number of the members said they can’t wait to try it out.”

Another technological breakthrough gaining in popularity is the SIR Annual Scientific Meeting mobile app (which can be found by searching “SIR 2014” in your app store). Unveiled several years ago to facilitate participation in SIR 2012, the app has been upgraded several times since. New features for 2014 included the ability for users to map their route in SIR Expo, schedule networking meetings with fellow attendees and submit session evaluations from their mobile device. Greater functionality has led to wider adoption—to date, the app has been downloaded 10,601 times over the course of SIR 2012, 2013 and 2014—leading the Society to consider creating additional mobile apps in the future.

“We are always looking for new ways to improve the experience for members,” says Dr. Funaki, “and a robust mobile strategy is certainly one of them.”

**Online Learning**

One area that has received much recent attention is online education. In 2012, the Society upgraded its online Learning Center (https://learn.sirweb.org) to allow greater integration with the CME Gateway, a portal run by the Radiological Society of North America (RSNA). Now SIR members receive automatic tracking of their educational activities for maintenance of certification and their learning credits are seamlessly applied to their American Board of Radiology (ABR) account for MOC progress tracking, eliminating the need to self-report earned credits.

In 2013, the Maintenance of Certification (MOC) process received some much-needed improvements—including elimination of the cap on the number of self-assessment CME (SA-CME) credits that can be earned annually and qualification of all accredited Accreditation Council for Continuing Medical Education (ACCME) enduring CME activities (electronic and print) as applicable for SA-CME credits.

As a result, SIR’s extensive collection of MOC resources available through the online Learning Center should quickly become a hot commodity to members.

“This is a big benefit for members,” says Brian Funaki, MD, FSIR, Postgraduate Medical Education Division councilor. “Because our online Learning Center includes hundreds of hours of ACCME-accredited enduring materials, as well as on-demand webinars and meeting proceedings, we can now provide more opportunities for members to earn credits toward MOC than ever before.”

Last year also saw the launch of the “Best of SIR” series. Showcasing some of the most popular and best-rated sessions and presentations from SIR’s Annual Scientific Meeting, and chosen by SIR’s subject matter experts, the “Best of SIR” webcasts offer these sessions with the original presenters and extend the society’s educational offerings to a wider audience.

And “VRirtual SIR,” a new virtual meeting platform that broadcasts live sessions from the Annual Scientific Meeting in real time to participants in more than 30 countries around the world, was rolled out in 2013.

**Member-driven Change**

Meeting members’ needs is also the driving force behind SIR’s decision to move its publications and product offerings into the fast lane.

“Obviously, as a society that represents a highly technologically driven industry, we want to keep up with the latest technological innovations,” says Dr. Marx. “Our decision to upgrade the books and publications system with new technology was really driven by our members. I know that sounds like a marketing campaign, but it’s true. We wanted to provide more value for our resources and deliver something people want to read.”

SIR solicited feedback from its members about their needs for online access to materials, their purchasing preferences and their reading habits, among other topics, then researched system upgrades that would meet members’ needs.

“We asked our members what books they thought would be good to read on a handheld device, and we got a lot of feedback, especially from younger members,” Dr. Marx says. “We listened to their comments, and what they wanted was ‘content to go,’ or ‘content on the go,’ so it just made sense for us” to make more titles available in a digital format.

As a result, SIR has doubled its digital offerings to include 11 SIR publications now available on the IR Store on www.sirweb.org as e-books for reading on mobile devices. Among the most popular is the 2014 Interventional Radiology Coding Update, the essential IR billing and coding guide, which features new and revised IR codes and sample 2014 charge sheets (available online as a free download for SIR members—a $299 value).

SIR’s 2014 Publications & Product Catalog is now available online, as well, with optimized hyperlinks for easy ordering. New for 2014 is the inclusion of SIR’s e-learning products, such as a new section dedicated to IRs-in-training—the future of IR—and a greatly expanded selection of e-books with more than 27 new titles from which to choose.

The benefits of digitizing the SIR publication system and products go beyond greater flexibility and options, according to Dr. Marx. “I think the biggest benefit is that we are cutting down on the amount of inventory and inventory costs and saving ourselves and our members money,” she says. “Also, we are allowing our members to find within our organization what they’re already experiencing in their personal life. Namely, if they have an
e-reader that they are happy with and use to read books in their spare time, they may want the same experience at work. So we’re providing that to them.”

**Getting Social**

SIR is also finding new and more effective ways to communicate with its members. For instance, the Society maintains a robust social media strategy with a presence on most of the main channels, including Facebook, Twitter and LinkedIn, as well as maintaining a YouTube channel and a Google+ account.

The goal of taking such an approach, says Maryann Verrillo, director of communications and public relations, is to increase the ways SIR can help its members interact with each other.

“Social media is a great way for our members to gain even more insights, interact with fellow IR professionals and generally be in the know,” says Verrillo. “And it’s a great opportunity for us to engage with them in new ways.”

The plan seems to be working: SIR’s Facebook fan base increased by more than 3 percent last year, with 9,000 + “likes,” and its Twitter followers increased by nearly double that amount, with many participants posting and viewing messages from outside the United States.

In 2013, SIR replaced its bimonthly newsletter with *IR Quarterly*, which is available to members in a convenient electronic version as well as in print.

The SIR Residents and Fellows Section (RFS) also recently introduced a new e-newsletter, called “IRs-in-training Update,” along with a new series of on-demand online webinars provided by leading IR faculty from around the world, all created specifically to promote the clinical model of interventional radiology practice at the trainee level. All back issues of the SIR e-newsletters and magazines are archived online.

**Success Story**

Perhaps as validation of SIR’s forward-thinking attitude, two of its staff members were selected to present at the 2014 digitalNow conference, an annual event for C-suite and volunteer leaders from professional, nonprofit and trade associations across America.

But, as Dr. Marx points out, the most important result of any association’s decision to improve the way it interacts with members is larger than peer approval or product sales.

“If increasing our online presence allows us to engage with our customers or members in new ways, then it’s a success story,” she says. “It’s really a conversation starter. Our goal in making these changes and additions to our service offerings is to support the Society’s work in education, advocacy and public outreach on behalf of interventional radiology and our patients.”

Henry Mortimer is president of MortimerCommunications.com, which works with health care companies to find their voice and tell their story in order to achieve their strategic goals.

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**Online Resources**

**Annual Scientific Meeting app:**
search “SIR 2014” on your app store

**IR Store:**

**SIRcloud:**
http://sircloud.sirweb.org/

**VIRtual SIR 2014:**
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Innovation to Entrepreneurship:

HOW IR SUSTAINS ITS CULTURE OF CREATIVITY

BY JENNIFER J. SALOPEK

In his bestselling book, The Innovator’s Dilemma, Harvard Business School professor Clayton Christensen introduced the concept of “disruptive innovation.” Although that may have been the first time those two words were linked, the concept of disruptive innovation is familiar to all IRs. A key facet of disruptive innovation is developing new, simple applications early in the lifecycle of a product or service, such as off-label use or modification of devices. The mindset that informs disruptive innovation pervades the culture and practice of interventional radiology. But in today’s risk-averse, litigious climate, can it be sustained?

In a later volume, The Innovator’s DNA: Mastering the Five Skills of Disruptive Innovators, Christensen joined with two collaborators to outline the five discovery skills that distinguish innovative entrepreneurs: Associating, Questioning, Observing, Networking and Experimenting. It’s difficult to say whether the practice of IR develops these skills in interventional radiologists or the field simply attracts people who already have them, but one thing is clear: entrepreneurs may not be innovative, and innovators may not be entrepreneurial; but many interventional radiologists are at least one—and often both.

Associating

By its very nature, IR facilitates the skill of associating—with other practitioners and with patients. “The field attracts people who seek direct contact with patients and feel responsibility for their well-being,” says Keiran J. Murphy, MD, FSIR, vice chair and chief of medical imaging at the University of Toronto. “I think it’s genetic. We are all very similar in that way.”

As chair of the SIR 2011 Annual Scientific Meeting (“IR Innovation”), Dr. Murphy facilitated association among innovators and entrepreneurs by doing a survey of SIR members who hold patents. Holder of 62 patents himself, Dr. Murphy found that at least 457 interventional radiologists hold 2,492 patents, and he hopes to build a community of patent holders for SIR Foundation. “Interventional radiology attracts inventive people,” he says.

Association with patients also attracts people to the field. “What got me into the field was the ability of interventional radiology to make a dramatic change in a patient’s status in a short period of time,” says Julio C. Palmaz, MD, FSIR, chief scientist at Palmaz Scientific. “I found it intoxicating, engaging, fascinating.” Palmaz is the inventor of the Palmaz Stent and holds a total of 20 patents. He is a member of the National Inventors Hall of Fame.

Questioning

“Because ours is a relatively new field, I think the workforce is younger and less accepting of the status quo,” says Nicholas F. Frano, MD, founder and CEO of Novita Therapeutics, LLC. “This inspires them to think of things that don’t exist.”

“Interventional radiologists are engineers by nature. They are deft with their hands and like to solve problems. They have mechanical minds that understand gadgets and how they work,” says Dr. Palmaz.

“People who are creative are attracted to IR. People who are uncomfortable with an unclear path, or feel uncertain with a lack of structure or consistency, wouldn’t find it attractive,” Dr. Frano says.
Observing
One could argue that imaging and the interpretation of images is a form of observation, the fourth competency key to innovation. “Our biggest advantage is our very broad knowledge of imaging,” says Palmaz. “That made us uniquely enabled for intervention in many modalities.”

Networking
Networking helps to reinforce and spread an innovative culture. “We are all innovators,” says Scott Trerotola, MD, FSIR, chief of interventional radiology at the University of Pennsylvania Medical Center and holder of eight patents. “Every day I do something I’ve never done before. I pass that on to trainees by telling stories on a daily basis, asking questions and attending SIR meetings.”

Some environments or practice areas facilitate the networking that can drive innovation. For example, Dr. Franano cites matching fund programs and public-private partnerships in Canada and some U.S. states that provide important resources.

The value of associating and networking has been scientifically validated by Dr. Murphy. In his paper, “A Study of Inventiveness Among Society of Interventional Radiology Members and the Impact of Their Social Networks,” published last year in the Journal of Vascular Interventional Radiology, he concluded that 1) “Creativity and inventiveness stem from institutions that are hubs of innovation” (Associating) and 2) inventors “are facilitated by… strong industry contacts” (Networking).

“Rather than major institutions directly supporting inventors or promoting innovation, their more important quality may be to act as gathering points for cutting-edge thinkers,” he wrote. Despite those findings, Dr. Murphy also finds enormous potential in being alone with one’s thoughts. “When you’re in a quiet place, the ideas start coming. Throughout history, inventions have come from periods of prolonged isolation.”

Experimenting
The dictionary defines experiment as “a test, trial or tentative procedure.” The off-label use of a device or drug certainly meets that dictionary definition. As regards innovation, Christensen et. al. say that “experimenters construct interactive experiences and try to provoke unorthodox responses to see what insights emerge” and engage in “active experimentation,” which includes physical tinkering.

“Every inventor has a need to look for solutions when they encounter a problem. They keep thinking after they fail. It was that motivation to improve that led me to the development of the stent,” says Dr. Palmaz. “Before the 1980s, you were not supposed to leave things in the patient,” he continues. “But as we saw the field developing in the intervention era, we laid claim to
“Entrepreneurs must have strength, a thick skin and resilience, even through a string of failures. It’s just plain hard.”
—Julio C. Palmaz, MD, FSIR

A host of materials we could use in patients, and provided solutions at the time they were needed.”

In *The Little Black Book of Innovation*, author Scott D. Anthony calls this “associational thinking”—thinking about problems by association. Associational thinkers ask themselves, “Is there a similar problem that has already been solved in another category?” The evolution Palmaz describes is an example of associational thinking.

Dr. Franano agrees. “Interventional radiology was born from repurposing tools from other fields for use in novel ways. It has always been acceptable to express ourselves through experimentation,” he says. And it probably contributes to professional satisfaction and pride: “We have the freedom to innovate. IR feels fun to creative people, where other surgical specialties might feel stifling,” he says.

This kind of experimentation requires risk-taking, Trerotola emphasizes, but it’s not “cowboyism.”

“Being honest with patients is key. It’s a shared risk; everyone is on the same page,” he says.

**From Innovator to Entrepreneur**

Interventional radiologists and entrepreneurs share many key traits, Dr. Franano says. “IRs understand the concept of urgency. You can only sedate patients for two or two and a half hours; there’s not a minute to spare. Good entrepreneurs feel the same way. The clock is ticking, time is passing you by.” He likens the experience to rowing a boat across a big lake while the boat is on fire.

Drs. Murphy and Franano emphasize that innovation, or inventiveness, and entrepreneurship are not the same thing.

An inventor becomes an entrepreneur when he begins to make money from his innovation, but the drive for the vast majority of interventional radiologists is not money, Dr. Murphy says.

Entrepreneurs are willing to take personal risk and are determined to see their innovation through a long, hard process, emphasizes Dr. Franano. “The idea is very important, but 99 percent of the work is the value creation that comes afterward,” he says. “Then one day you wake up and 50,000 people a year are benefiting from your idea.” It took 13 years for Dr. Franano to move his first idea to phase 3 testing.

“You need a long-term vision and the commitment to grind it out. The idea is just the very first, modest step,” he says.

A tolerance for failure is as important as patience, notes Palmaz: “Entrepreneurs must have strength, a thick skin and resilience, even through a string of failures. It’s just plain hard.”

Observing the tenets of good business and strong planning can set a would-be innovator up for success, says Dr. Franano. “Establish a good long-term plan before you take someone else’s money or convince them to quit their job to work with you. You must be ready.”

Can innovation and entrepreneurship be taught? How can they continue to be promulgated in the field of interventional radiology? Dr. Palmaz, Ashbel Smith Professor at the University of Texas Health Science Center at San Antonio, believes that innovation courses should be part of the medical school curriculum. In the meantime, however, he has some advice for young people entering the profession:

- Adapt your goals to your capabilities: time, resources, intelligence.
- Be willing to be number 1. Pursue excellence, but remember it can be a small area; don’t bite off more than you can chew.
- Be an intellectual rebel. Question everything, asking, Can it be changed for the better?
- Don’t pursue an idea just for financial gain.

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This column alerts SIR members to abstracts that may have an impact on their practice and how they converse with referring clinicians. If you would like to suggest abstracts you feel should be included, email us at gandhi@baptisthealth.net or sganguli@partners.org.

**A Controlled Trial of Renal Denervation for Resistant Hypertension.**

**BACKGROUND:** Prior unblinded studies have suggested that catheter-based renal-artery denervation reduces blood pressure in patients with resistant hypertension.

**METHODS:** We designed a prospective, single-blind, randomized, sham-controlled trial. Patients with severe resistant hypertension were randomly assigned in a 2:1 ratio to undergo renal denervation or a sham procedure. Before randomization, patients were receiving a stable antihypertensive regimen involving maximally tolerated doses of at least three drugs, including a diuretic. The primary efficacy end point was the change in office systolic blood pressure at 6 months; a secondary efficacy end point was the change in mean 24-hour ambulatory systolic blood pressure. The primary safety end point was a composite of death, end-stage renal disease, embolic events resulting in end-organ damage, renovascular complications, or hypertensive crisis at 1 month or new renal-artery stenosis of more than 70% at 6 months.

**RESULTS:** A total of 535 patients underwent randomization. The mean (± SD) change in systolic blood pressure at 6 months was -14.13 ± 23.93 mm Hg in the denervation group as compared with -11.74 ± 25.94 mm Hg in the sham-procedure group (P < 0.001 for both comparisons of the change from baseline), for a difference of -2.39 mm Hg (95% confidence interval [CI], -6.89 to 2.12; P = 0.26 for superiority with a margin of 5 mm Hg). The change in 24-hour ambulatory systolic blood pressure was -6.75 ± 15.11 mm Hg in the denervation group and -4.79 ± 17.25 mm Hg in the sham-procedure group, for a difference of -1.96 mm Hg (95% CI, -4.97 to 1.06; P = 0.98 for superiority with a margin of 2 mm Hg). There were no significant differences in safety between the two groups.

**CONCLUSIONS:** This blinded trial did not show a significant reduction of systolic blood pressure in patients with resistant hypertension 6 months after renal-artery denervation as compared with a sham control. (Funded by Medtronic; SYMPLICITY HTN-3 ClinicalTrials.gov number, NCT01418261).

**Treatment of Acute Venous Thromboembolism With Dabigatran or Warfarin and Pooled Analysis.**

**BACKGROUND:** Dabigatran and warfarin have been compared for the treatment of acute venous thromboembolism (VTE) in a previous trial. We undertook this study to extend those findings.

**METHODS AND RESULTS:** In a randomized, double-blind, double-dummy trial of 2589 patients with acute VTE treated with low-molecular-weight or unfractionated heparin for 5 to 11 days, we compared dabigatran 150 mg twice daily with warfarin. The primary outcome, recurrent symptomatic, objectively confirmed VTE and related deaths during 6 months of treatment occurred in 30 of the 1279 dabigatran patients (2.3%) compared with 28 of the 1289 warfarin patients (2.2%; hazard ratio, 1.08; 95% confidence interval [CI], 0.64-1.80; absolute risk difference, 0.2%; 95% CI, -1.0 to 1.3; P<0.001 for the prespecified noninferiority margin for both criteria). The safety end point, major bleeding, occurred in 15 patients receiving dabigatran (1.2%) and in 22 receiving warfarin (1.7%; hazard ratio, 0.69; 95% CI, 0.36-1.32). Any bleeding occurred in 200 dabigatran (15.6%) and 285 warfarin (22.1%; hazard ratio, 0.67; 95% CI, 0.56-0.81) patients. Deaths, adverse events, and acute coronary syndromes were similar in both groups. Pooled analysis of this study RE-COVER II and the RE-COVER trial gave hazard ratios for recurrent VTE of 1.09 (95% CI, 0.76-1.57), for major bleeding of 0.73 (95% CI, 0.48-1.11), and for any bleeding of 0.70 (95% CI, 0.61-0.79).

**CONCLUSION:** Dabigatran has similar effects on VTE recurrence and a lower risk of bleeding compared with warfarin for the treatment of acute VTE.
Randomized, Controlled Trial of Ultrasound-assisted Catheter-directed Thrombolysis for Acute Intermediate-risk Pulmonary Embolism.


BACKGROUND: In patients with acute pulmonary embolism, systemic thrombolysis improves right ventricular (RV) dilatation, is associated with major bleeding, and is withheld in many patients at risk. This multicenter randomized, controlled trial investigated whether ultrasound-assisted catheter-directed thrombolysis (USAT) is superior to anticoagulation alone in the reversal of RV dilatation in intermediate-risk patients.

METHODS AND RESULTS: Fifty-nine patients (63 ± 14 years) with acute main or lower lobe pulmonary embolism and echocardiographic RV to left ventricular dimension (RV/LV) ratio ≥ 1.0 were randomized to receive unfractionated heparin and an USAT regimen of 10 to 20 mg recombinant tissue plasminogen activator over 15 hours (n = 30; USAT group) or unfractionated heparin alone (n = 29; heparin group). Primary outcome was the difference in the RV/LV ratio from baseline to 24 hours. Safety outcomes included death, major and minor bleeding, and recurrent venous thromboembolism at 90 days. In the USAT group, the mean RV/LV ratio was reduced from 1.28 ± 0.19 at baseline to 0.99 ± 0.17 at 24 hours (P < 0.001); in the heparin group, mean RV/LV ratios were 1.20 ± 0.14 and 1.17 ± 0.20, respectively (P = 0.31). The mean decrease in RV/LV ratio from baseline to 24 hours was 0.30 ± 0.20 versus 0.03 ± 0.16 (P < 0.001), respectively. At 90 days, there was 1 death (in the heparin group), no major bleeding, 4 minor bleeding episodes (3 in the USAT group and 1 in the heparin group; P = 0.61), and no recurrent venous thromboembolism.

CONCLUSIONS: In patients with pulmonary embolism at intermediate risk, a standardized USAT regimen was superior to anticoagulation with heparin alone in reversing RV dilatation at 24 hours, without an increase in bleeding complications.

Compression Stockings to Prevent Post-thrombotic Syndrome: A Randomized Placebo-controlled Trial.


BACKGROUND: Post-thrombotic syndrome (PTS) is a common and burdensome complication of deep venous thrombosis (DVT). Previous trials suggesting benefit of elastic compression stockings (ECS) to prevent PTS were small, single-centre studies without placebo control. We aimed to assess the efficacy of ECS, compared with placebo stockings, for the prevention of PTS.

METHODS: We did a multicentre randomized placebo-controlled trial of active versus placebo ECS used for 2 years to prevent PTS after a first proximal DVT in centers in Canada and the USA. Patients were randomly assigned to study groups with a web-based randomization system. Patients presenting with a first symptomatic, proximal DVT were potentially eligible to participate. They were excluded if the use of compression stockings was contraindicated, they had an expected lifespan of less than 6 months, geographical inaccessibility precluded follow-up visits, they were unable to apply stockings, or they received thrombolytic therapy for the initial treatment of acute DVT. The primary outcome was PTS diagnosed at 6 months or later using Ginsberg’s criteria (leg pain and swelling of ≥1 month duration). We used a modified intention to treat Cox regression analysis, supplemented by a prespecified per-protocol analysis of patients who reported frequent use of their allocated treatment. This study is registered with ClinicalTrials.gov, number NCT00143598, and Current Controlled Trials, number ISRCTN71334751.

FINDINGS: From 2004 to 2010, 410 patients were randomly assigned to receive active ECS and 396 placebo ECS. The cumulative incidence of PTS was 14.2% in active ECS versus 12.7% in placebo ECS (hazard ratio adjusted for centre 1.13, 95% CI 0.73-1.76; P = 0.58). Results were similar in a prespecified per-protocol analysis of patients who reported frequent use of stockings.

INTERPRETATION: ECS did not prevent PTS after a first proximal DVT, hence our findings do not support routine wearing of ECS after DVT.
The 9th Annual SIR Fellows Spring Practicum took place May 8–10 in Chicago, Ill. The meeting had its largest attendance, with 79 attendees. Primarily designed for fellows, this meeting also served as a primer for residents and a refresher for new attendings. The meeting offered various learning formats including didactic lectures, panel discussions, case presentations and three hands-on workshop sessions. The 10th Annual SIR Fellows Spring Practicum will take place in May 2015 in Chicago.

The SIR Fellows Spring Practicum is a high-yield finishing course for fellows that I had the pleasure of attending in Chicago in early May. The program is a targeted review and enrichment program, well-designed to help graduating trainees transition from fellow to junior attending. Even coming from a strong fellowship, there remain countless practical points to be reviewed at the end of a busy year on service. This course fills those gaps in knowledge.

As a resident and fellow, I performed innumerable hospital consultations; however, the majority of these services were never billed for. Sarah B. White, MD, shared her ingenious strategies in navigating the system of reimbursement for E&M services, in order to get paid for the work her team was already doing. From holding regular meetings with her billers and coders, to making efforts to educate herself on their language, she was able to increase production of her unit by tens of thousands of dollars per year. She shared how she employed standard templates in the electronic health record to ensure that the proper modifiers and phrases were automatically present in their documentation. She also demonstrated how keeping track of these accomplishments in the form of data could serve as a powerful tool to demonstrate the value of your services—to your group as well as your hospital administrators. This may ultimately be leveraged to obtain additional resources needed to grow one’s practice.

Brian Funaki, MD, FSIR, presented a highly educational variety of “best complications.” It was fun to watch him present a patient case I’d submitted, with his added editorial comments and experience. In addition, Dr. Funaki’s medicolegal session was packed with experience, from the practical to the absurd. Each of these experiences, candidly relayed, was used to provide practical advice on dealing with a lawsuit, should one arise.

I found myself hanging on every word in each of the peripheral vascular sessions, led by Drs. Parag J. Patel, MD,
Keep It Simple!

Does this situation sound familiar? It’s a busy day with two rooms running, a consult waiting, and you are answering questions about coagulation status of a pending patient. You walk in to do a “bread and butter” case. Forty-five minutes later you walk out of the room frustrated, needing a change of scrubs, and more behind schedule than ever.

These are few things I do to keep things as simple as possible:

1. Try lung biopsies on expiration. Sedated patients can routinely exhale to the same level reproducibly. They have a harder time reliably holding their breath, making lesions hard to target.

2. I do almost all abscess drainages with an 18 Ga Chiba needle for puncture and a 3 J movable-core guidewire. It’s a nice compromise between using an AccuStick system and trocar technique.

3. Use cone-beam CT for IVC filter removal. Half-strength contrast with rotational CT shows the orientation of the filter and tip embedding in the wall you may not otherwise appreciate.

4. If what you are doing just doesn’t feel right, trust your gut. As often as not, a slight adjustment in technique or equipment selection will smooth out a bumpy ride.

We’d all like to learn from your experiences. Please share your Tips and Tricks with me for publication at j1barker @nch.org.
The 1st Spring International Radiological Forum was held April 11–12, 2014, in conjunction with the Liver Study Group Meeting of the Mongolian and Korean Radiologists in Ulaanbaatar, Mongolia, at the Conference Hall of the Ministry of Health.

There were 200 attendees, including IRs, radiologists, hepatobiliary surgeons, internal medicine doctors and residents. Most of the participants were radiologists and IRs from all over Mongolia, a nation with 23 provinces. The two-day program included 22 lectures and five seminars with 16 guest speakers from four different countries—the United States, South Korea, China and Egypt.

A highlight of our meeting was introducing and implementing new diagnostic methods of liver-specific imaging and intervention. We had a great lecture from Brian F. Stainken, MD, FSIR, past SIR president. He encouraged our IRs to become professionals and also shared his experience about how to take care of IR patients. We also had a wonderful presentation from SIR member Sanjay Saini, MD, professor of radiology, division of abdominal imaging, Massachusetts General Hospital. There were also 13 guest professors from five different university hospitals from Korea, including Seoul National University Hospital, Korea University Hospital and Yonsei University Hospital.

The most important element of this meeting was the opportunity to network with experienced professionals from highly developed countries.

Highlights from the 1st Spring International Radiological Forum in Mongolia; the lower-right photo depicts the full group of attendees. All three past SIR International Scholarship recipients were in attendance at the meeting.
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If you haven’t seen the 2013 Matt Damon dystopian sci-fi thriller *Elysium*, you’re not missing much. One of the main elements I remember from the movie is a futuristic healing machine. Imagine a sleek-modern-furniture-looking combination of a hyperbaric chamber with CT scanning abilities but, instead of resulting in cross-sectional imaging, it cures any disease. Pneumonia? Quick scan. Sickle cell anemia? Quick scan. Face blown off by a grenade with temporary cardiac arrest? Slightly longer (~31-second) scan. While, to my knowledge, no machine like this exists, it reminds me of some futuristic IR-related technologies (in no particular order) I’ve come across over the years:

1. **In 2010, Microsoft released its *Kinect***, a motion-sensing device initially used for interactive video games. Soon after, a PC version came out allowing computer scientists to utilize this breakthrough hardware for nongaming applications, such as interacting with medical imaging intraoperatively, with simple hand gestures. For now, this is as close as we can get to the *Minority Report*.

2. Electromagnetic and optical tracking applications in medicine have been around for awhile, especially in neurosurgical suites; IR applications exist, but aren’t in the mainstream. Bradford Johns Wood, MD, director of the National Institutes of Health Center for Interventional Oncology, has worked extensively on refining this technology to optimize ablations, biopsies or other difficult needle-guided procedures, using ultrasound as the “real-time” imaging synchronized to a CT or MRI dataset. That para-aortic lymph node looks suspicious. Need a biopsy? No problem.

3. **At SIR 2014, Barry T. Katzen, MD, FSIR, spoke on his experience with the *Magellan* intravascular catheter guidance system. Essentially, it reminded me of the *da Vinci* robotic surgery system, except for IR. The demo was interesting. Could this be the answer to home IR call? Or the start of IR nighthawks? Not anytime soon.

4. High-intensity focused ultrasound (HIFU) is as close to future medical science fiction as you can imagine. Focusing ultrasonic pulses onto a focal spot of pathologic tissue via MR imaging, it is radiation oncology’s non-DNA-damaging counterpart. With current main applications in uterine fibroids and prostate lesions, it will be interesting to see where this modality will primarily be used down the road.

5. **Google glass?** The futuristic computer-embedded eyeglasses are more novelty than anything right now, but how can they be used practically in IR? Phillips, in a proof-of-concept project, has shown some basic intraprocedural applications (e.g., real-time vital sign monitoring), but making this technology truly an asset to patient care is a long way from reality. Plus, I want to know if they will be lead shielded.

I’m sure there are many more technologies that deserve mention, but until I randomly come across them or they’re featured in a Matt Damon sequel, this is the best I can do.

**References:**

David Tabriz, MD, is the SIR Residents and Fellows Section (RFS) representative on the IR Quarterly editorial board.
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