Plans are now complete for the fall meeting of the SRU, to be held at the Westin Michigan Avenue Hotel in Chicago this coming October. The annual postgraduate course will take place October 21-23. The superb program, put together by the SRU Program Committee under the leadership of Deb Rubens (Chair) and Marcela Bohn-Velez (Vice Chair), will begin with a plenary session that will review the status of past SRU consensus conferences and will continue with educational sessions presenting the latest information about ultrasound practice. I'm looking forward to a large turnout, since we'll have a great program in a great city. Instructions on registering can be found on the SRU website (www.sru.org).

The postgraduate course will be preceded by a consensus conference on imaging of the painful shoulder, to be held October 18 and 19. It will assess the appropriate use of various imaging modalities, including ultrasound, magnetic resonance imaging and computed tomography, in a number of clinical settings. The conference directors are Lev Nazarian of Thomas Jefferson University and Jon Jacobson of the University of Michigan, and, like our prior consensus conferences, will include panelists from different medical specialties and with varying areas of expertise. The output of the conference, a consensus statement by the panelists, is likely to have an important impact on clinical practice.

One of the most enjoyable and uplifting parts of every SRU annual meeting is the presentation of our two major awards. The Distinguished Service Award, presented annually to an SRU member in recognition of outstanding service to the SRU and to radiology, goes this year to Alfred B. Kurtz, MD. Al is a professor of radiology at Jefferson Medical College and Thomas Jefferson University Hospital. He has an impressive record in all aspects of ultrasound, including research, teaching and involvement at the highest levels in major ultrasound societies. A measure of his prominence in the field is his past presidency of both the SRU (1991-1993) and the American Institute of Ultrasound in Medicine (2001-2003).

The second major SRU award is the Lawrence A. Mack Lifetime Achievement Award, presented annually in recognition of a lifetime of achievement in ultrasound and for contributions to ultrasound research. The award was established to honor the memory of Dr. Larry Mack, an early and valued member of the SRU who made numerous original contributions to ultrasound. This year's recipient of the award is Jon M. Rubin, MD, PhD. Jonathan's research addresses such topics as flow imaging, elastography, perfusion and ultrasound contrast agents. He bridges the gap between basic science and clinical aspects of ultrasound research as well as, or better than, anyone else in ultrasound.

One of the features of the SRU annual meeting over the past several years has been the Toshiba Residents program, wherein a number of residents and fellows have their expenses for attending the meeting subsidized via funds.
generously provided by Toshiba America. This year, I am pleased to announce that Toshiba has substantially increased their contribution to the program. You will soon receive (or may have already received, by the time this newsletter comes out) specific information about how to nominate radiology residents and fellows for the program.

The SRU Sonographer Relations Advisory Committee, under the leadership of Beverly Hashimoto, has held a number of conference calls over the past several months. The most recent call focused on advanced practice sonographers. Key elements of the discussion included plans to develop a survey for distribution to SRU membership to assess the extent of use of advanced practice sonographers, and a discussion of educational requirements for this position.

As I have stated in my prior letters from the president, I want to strongly encourage all members to contribute to the SRU Foundation. Contributions, which can be made via the SRU website, are tax-deductible and help the society to achieve its goals by defraying the costs of our consensus conferences and by providing support for ultrasound research. The Foundation falls under the purview of the SRU Investment and Finance Committee, which has been chaired by Ray Bertino. Ray’s active, enthusiastic work on behalf of the Foundation has been a key element in getting it up and running. I’m sorry to say that Ray has decided to step down from this committee chairmanship. I want to express my gratitude to Ray for his important contributions. John Cronan, the SRU Secretary, has taken on interim chairmanship of the committee until a new permanent chair is named.

The SRU Program Committee is delighted to offer an exciting program for this year’s annual meeting in Chicago. After surveying the membership and the attendees of last year’s meeting, we selected the most frequently requested topics and most frequently cited practice gaps to help us in developing the program.

The plenary session on Friday, October 21 will include a review of five SRU consensus conference statements. Consensus conference statements are key educational and clinical practice guidelines that are widely used by both radiologists and other practicing sonologists. Each topic (carotid, uterine bleeding, thyroid nodules, adnexal cysts, and this year’s category, shoulder pain) will be reviewed by one of the expert radiologists who crafted the original statement. To cap off the plenary session, the 2011 Member-in-Training Award paper will be presented and Roy Filly will present a lecture on the contribution of sonography to fetal therapy.

On Friday afternoon, an ultrasound management course entitled “You Made the Call - Now What? Ultrasound Management Issues in 2011” will include discussion of topics culled from all areas of ultrasound to provide a comprehensive and thought-provoking session. A second session on Friday afternoon will focus on musculoskeletal imaging, and will include not only didactic presentations but live scanning demonstrations of the hip, knee and ankle.

On Saturday, October 22, one session will focus on state-of-the-art OB-Gyn topics including 3D, patient safety, US vs. MRI or CT for pelvic pain, and a case management panel discussion. Advanced sonographic techniques are also featured throughout the abdomen, vascular and women’s imaging programs sessions on Saturday. Specific topics include sonography of the bowel, early ovarian cancer detection, ultrasound BI-RADs and carotid waveform analysis.

The program will conclude on Sunday, October 23 with a pearls and pitfalls session that will have something for everyone, covering the abdomen, pelvis, small parts, and vascular imaging.

For a complete schedule of the meeting and to download a registration brochure, please visit www.sru.org. You may register online and obtain a room at The Westin Michigan Avenue Hotel via links on the website beginning July 6. We are looking forward to an exciting and rewarding meeting and hope to see you all there!
I am a member of Central Illinois Radiology Associates (CIRA), a group of 72 radiologists and eight mid-level providers covering 15 hospitals in central Illinois. Two of the mid-level providers are ultrasound assistants (UAs). I work at OSF Saint Francis Medical Center (SFMC) in Peoria, Illinois. SFMC is a 700-bed hospital and a level 1 trauma center and has between 150 and 200 residents, 16 of whom are radiology residents. Both of the UAs work at SFMC.

SFMC has McKesson PACS. SFMC has three outpatient imaging sites, which offer ultrasound and which are connected to the McKesson PACS. Images from those sites can be viewed at SFMC (the central site) as soon as they are obtained. The ultrasound department at SFMC does about 40,000 exams per year. The department does full-service general ultrasound scanning plus full-service vascular scanning. There is 24 hour/day, 7 day/week in-house coverage by sonography technologists.

There are two radiologists assigned to ultrasound every day; one does general ultrasound and the other does vascular ultrasound. The great majority of cases done by the ultrasound technologists have their images reviewed prior to the patient leaving the department. This includes images obtained at the outpatient sites. There are only a few types of exams for which we do not require the technologists to show images. Prior to the hiring of UAs, radiologists performed the function of checking exam images.

The two radiologists at SFMC assigned to ultrasound also cover part or all of the ultrasound at each of the other CIRA hospitals by web-based connections. Because of transmission speed issues, images at the other three hospitals are only checked prior to the patient leaving in perhaps 30% of the cases. Of course, it is our goal to raise that remote review from the smaller hospitals to 100%.

Of the two UAs, one is assigned to general ultrasound and the other to vascular ultrasound. As described above, the UAs have the responsibility for checking images from exams before the patient leaves. The UAs have the authority to release the patient once they have reviewed the images and are satisfied with the exam. If they perceive an issue that is likely to result in a callback, they will discuss the issue with the attending in ultrasound, who may then also review the images. We have a low threshold for calling a patient back if we feel that important information may have been missed by the scans. Our call-back rate has not been tracked but does not seem to have significantly changed with the addition of the UAs.

Both UAs are expert in the areas they cover. Both will do scanning themselves to check findings in several patients each day. They are much more likely to do this when the scanning has been done by an inexperienced technologist. They have been very valuable in teaching less-experienced technologists, and more experienced technologists also have a consistent person with whom they check cases. During the day, they will pre-dictate 100% of the exams done at SFMC, including its outpatient centers, using Powerscribe. They will also pre-dictate about 40-50% of the cases at the three outside hospitals that are covered by the two radiologists in ultrasound at SFMC. Their pre-dictions cannot be seen by anyone other than the attending radiologists. Once their dictation has been seen and modified as needed by the attending radiologist, the dictation becomes visible whether it has been signed or remains unsigned.

All stats wet reads are reviewed by the radiologist prior to a report being printed in the ED or called to the ordering physician. Radiologists do most of the calls to ordering physicians, although the UAs may perform that function once the radiologist has reviewed the case. The radiologist most frequently has the UA make the call when the case is not complex and when the radiologist has other responsibilities that may delay a call.

Residents currently have two rotations in vascular ultrasound and three rotations in general ultrasound. We have at least one resident in the department perhaps ten months of the year. The UAs perform a significant teaching function for the residents, particularly for those in their first rotation. They are always available and foster the learning of scanning skills. Residents learn the nuts and bolts of exams from them. Residents continue to check out the cases they dictate with the attending so they can learn more of the medical issues involved. The residents have not been formally polled, but informally seem to feel that their learning experience has been enhanced by the addition of the UAs.

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The Ultrasound Assistant Position: How It Works for Us (continued)

The UAs do so much work that if one of them is on vacation we increase our daily SFMC coverage from 19 radiologists to 20 in order to cover all of the work that needs to be done. With two UAs, significant time savings for the radiologists assigned to ultrasound have occurred. The time savings have mainly resulted from two of the UA functions. The first function where a radiologist saves time is that he or she is no longer involved in the checkout of cases unless the UA perceives that there may be risk of a callback. Each of the UAs has very quickly become aware of what aspects of the case may make us likely to call a patient back and will consult us for complex cases before the patient leaves. As mentioned above, our callback rate has not significantly changed since hiring them. The second time saver is their pre-dictionation of cases. Voice recognition dictation with Powerscribe is pretty good, but as many of you must know, it has its vagaries. It is much quicker to modify their report as needed than it is for us to produce our own. These time savings have allowed the two ultrasound radiologists to also perform other functions within CIRA to allow CIRA to become more efficient. CIRA has achieved a high return in efficiency by hiring the UAs.

WE DO NOT AND CANNOT BILL FOR UAs. This point is important. There is no mechanism that allows for billing for the work of a UA without breaking one or more compliance rules. Nonetheless, even without performing any function that can be billed, they remain valuable to CIRA. All radiologists who work in ultrasound recognize this. All radiologists who work at SFMC and therefore have the opportunity to observe the work of the UAs also recognize this. Nothing but support has been expressed by those in CIRA. The UAs also allow our ultrasound department to run more smoothly than when radiologists were checking out all cases. This is because they are more likely to be readily available than a radiologist, who more easily gets tied up in meetings and with teaching responsibilities.

UAs work well at our site, very well. Having them on staff has strengthened our ultrasound department. Eighteen months after hiring our second UA, I already see other roles into which the UAs could be expanded, roles that would result in improvement in patient care and in the efficiency of our radiology group.
Advances in Sonography

21st Annual Meeting & Postgraduate Course

October 21 – 23, 2011
The Westin Michigan Avenue
Chicago, IL

Program includes:

- Plenary Session: “The SRU Consensus Statements: Are They Still Useful?”
- Musculoskeletal Imaging with Hands-On Demonstrations
- Ultrasound in Obstetrics and Gynecology
- Ultrasound in Abdominal Imaging
- Ultrasound in Women’s Imaging
- Ultrasound in Vascular Imaging
- Pearls and Pitfalls in Imaging with Ultrasound

Register online at www.sru.org
It's hard to know where to start. In April 2011, I went to Malaysia as part of the RSNA International Visiting Professor program, which supports small teams of visiting professors to lecture at national or regional radiology meetings of societies in or serving developing nations, as well as at selected host institutions with radiology residency training programs. My trip was set up by the RSNA in conjunction with the College of Radiology of Malaysia, as an outreach to Malaysia’s radiology community. While this sounds like a lot of fun, and it was, it also involved a lot of work. I was joined on the trip by Drs. Andrea Doria and David Yousem. We were selected based upon specialty. I was selected for expertise in ultrasound, intervention and abdominal imaging. The experience involved preparation of 12 different presentations designed for different audiences. I gave a set of lectures to those in the Master Program in Radiology (residents) for two days at the University of Malaysia Medical Centre (UMMC) in Kuala Lumpur. After that I lectured for a day at Universiti Kebangsaan Malaysia (UKM). On the weekend, each of us gave six lectures at the annual radiology congress, which was held in Kuala Lumpur.

From what I understand, all people in Malaysia have access to both government subsidized public healthcare and private hospital healthcare. They pay a nominal fee that is the equivalent of 50 cents in U.S. currency for a doctor’s visit, to up 25 USD for a procedure. These services are offered to everyone, at public or university hospitals. Private hospitals are available to about 15% of the population, to people whose employers have private insurance or to self-paying patients. The average consultation fee in a private hospital ranges from 60 USD to 90 USD, depending on whether the procedure is simple or complex. The fee schedule for all types of procedures and examinations is set by the professional body of the individual discipline. In the Ministry of Health Hospital, there are three classes of inpatient/treatment charges, according to the patient’s ability to pay. Some of the private hospitals appear from the outside to be more like hotels than hospitals. Currently in Malaysia there is a shortage of radiologists. At both universities there are about 20 faculty to trainees, who all train for four years.

In the university there were four general ultrasound rooms for abdominal procedures and one room dedicated to breast imaging. Sonographers perform the exams and do from 30-40 exams per room. They then type a brief report which is signed by the faculty radiologist. From what I could understand, in a public hospital the staff radiologist does about 25-60 exams per day between two and three rooms, scanning the patients and typing the reports. Thus far, no sonographers are available in public hospitals. A busy day indeed for the radiologist.

As to the practice of radiology, there are both differences and similarities between the United States and Malaysia. CT equipment in Malaysia is modern, and includes a 64-Detector CT at both university hospitals and in several public hospitals. There are also a total of four dual-source CT scanners available in the public and university hospitals, which function as national referral centers for cardiac cases. What is different from the U.S. is the efficiency of CT utilization. Nurses and radiographers prepare patients, who are scanned in 10 to 15-minute intervals. In general, they seem fairly sophisticated in CT, but less so in abdominal MRI, which from what I saw is not frequently used.

The practice of ultrasound was perhaps the most interesting. I spoke about interventional ultrasound at all of the venues, yet it seemed that many interventional procedures were performed under CT guidance. It was also interesting to observe the work involved by the staff radiologist in ultrasound vs. CT. It appeared that all faculty, whether at the university, public or private hospitals, thought that ultrasound...
International Visiting Professorship to Kuala Lumpur, Malaysia (continued)

was their hardest rotation. In general, when on CT rotation, the radiologist interprets 25 CT scans per day. The reports are typed by the radiologist. In most private hospitals, all reports were done in the radiology information system (R.I.S.). In public hospitals with T.H.I.S ready, the report is done on the R.I.S. system. There are eight paperless public hospitals in Malaysia. In university hospitals the ultrasound reports were on paper.

The ultrasound equipment is top-of-the-line, with 3-D imaging and elastography capabilities on at least one machine. Because of cost and non-availability of contrast on the Health Ministry-approved drug list, ultrasound contrast is not used in any public hospitals. Some universities used it for a short duration during their research trial and activity. However, UKM has just started to use it regularly for imaging of liver lesions and for solid organ injury.

The medical personnel all seemed very interested in education, and at the university they were very interested in research. All trainees are required to do a thesis, and some were quite good. They were very interested to know if their theses were good enough to be published in American journals. Some were very proud that they had attended the RSNA annual meeting, and were very interested in the RSNA but were not so happy about the winter climate.

The Malaysian people are friendly and very colorful. We were treated extremely well by our hosts.

What I hoped would be an educational experience for my Malaysian counterparts turned out to be an educational experience for me.

Members in the News

Deborah Levine, MD has been re-elected to a second three-year term as the chair of the ACR Commission on Ultrasound. She is also a member of the ACR Board of Chancellors.

Edward I. Bluth, MD has been elected to a three-year term as the chair of the ACR Commission on Human Resources. He is also a member of the ACR Board of Chancellors.

Arthur C. Fleischer, MD’s textbook, Ultrasonography in Obstetrics and Gynecology: Principles and Practice, 7th Edition, has recently been published.

Robert D. Harris, MD has recently been appointed to the ACR Appropriateness Committee on Women’s Imaging, which is chaired by SRU member Marcia C. Javitt, MD. Dr. Harris has also been appointed to the ABR Non-Interpretive Skills MOC Committee.

Bill H. Warren, MD has recently been promoted to the position of Clinical Professor of Radiology at the University of Washington Medical Center.

Stamatia Destounis, MD became a Fellow of the RSNA in November 2010, and a Fellow of the ACR in May 2011.

Anthony E. Samir, MD is the recipient of the 2011-2012 ARRS Scholarship.


If you have professional news that you would like to share with the membership, please send the information to sroberts@acr.org.
Background

There has been a rapid evolution of imaging of urinary tract stone disease. Initial replacement of the KUB by IVP and renal sonography was followed by the rapid adoption of CT as the most sensitive examination for detection of urinary tract calculi. However, the increased cost and radiation exposure associated with CT should prompt radiologists and referrers to consider alternative screening tests. Ultrasound is a less expensive, portable, non-ionizing radiation-based imaging study which is poised to see resurgence in the evaluation of urolithiasis in the current healthcare environment.

Urinary tract stones affect approximately 10-15% of the US population, with most patients being young males. However, renal colic can affect patients of all ages and becomes a recurrent problem in about 50% of patients. Urinary tract stones may be composed of various aggregations of dissolved minerals in the urine forming calculi, most commonly pure calcium oxalate or calcium oxalate and phosphate. Most calculi less than 5 mm in diameter will pass spontaneously into the ureter and may cause intermittent obstruction and pain (renal colic) as they pass into the bladder. Stones larger than 5mm may become lodged along the course of the ureter causing obstruction, with stones larger than 8mm rarely passing without intervention.

What Is Ultrasound Missing?

The challenge for ultrasound has been identification of small non-shadowing renal stones and detection of calculi within the ureters. When compared with plain radiography ultrasound performs favorably, with a sensitivity of 96% for intrarenal calculi and a sensitivity of nearly 100% when calculi are larger than 5 mm. However, multiple studies have shown non-contrast CT to be significantly more sensitive for the detection of urinary tract calculi. The size of the calculus is the primary determinate of likelihood of detection on ultrasound. Most renal calculi missed by ultrasound are smaller than 3 mm. These small stones are more likely to pass spontaneously without intervention, and improved detection of small stones on CT may not be associated with improved outcomes.

Detecting ureteral stones remains a challenge for ultrasound unless there is obstruction. The sensitivity of ultrasound increases to 74% when hydronephrosis is included as a positive sign for ureteral calculi. One could argue that stones causing hydronephrosis should be the focus of imaging, as obstructing stones are much more likely to require further intervention. However, early obstruction may not result in detectable hydronephrosis and imaging early may decrease the sensitivity of ultrasound. Renal sinus cysts and nonobstructive pelvicaliectasis can be confused with collecting system dilatation secondary to obstruction. It has been suggested that spectral Doppler ultrasound to determine the resistive index can be used to help discriminate between obstructive and nonobstructive causes of renal collecting system dilatation. A resistive index value > 0.70 may be indicative of obstruction but the presence of intrinsic renal disease can also elevate the resistive index. Partial obstruction may not result in an elevated resistive index, and the use of non-steroidal anti-inflammatory drugs for pain control or antecedent intravenous contrast may also alter the resistive index.

Optimized Technique

Proper ultrasound technique is critical to maximizing stone detection. If the diameter of the stone is smaller than the ultrasound beam width, detection on grayscale will be difficult. Shadowing can be maximized through placement of a single focal zone at or slightly deep to the stone, use of maximum penetrating frequency and harmonic imaging to take advantage of the higher frequencies. The twinkle sign is frequently useful to identify an otherwise occult stone that blends with the adjacent renal sinus fat. The imperfect surface of a calculus is thought to result in a form of intrinsic

In Memoriam

The SRU has recently been notified of the death of Alan Wolson, MD of Allentown, PA. Dr. Wolson was an Emeritus Fellow of the SRU.

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noise known as clock (or phase) jitter within the Doppler circuitry of the ultrasound machine. This artifact appears as alternating bands of color at the stone and may extend deep as a comet tail, often to the edge of the color box. Interestingly, urate and calcium oxalate monohydrate stones do not show this twinkle artifact, likely due to the relatively smooth surface of the stone.

**False Positives**

The specificity of ultrasound in detecting renal calculi is quite good at approximately 90%, suggesting that calculi identified on ultrasound images reliably correspond to calculi on non-contrast CT. When false positives occur, the source of the false positive is often unclear. Renal arterial calcifications or ureteral stents may be misinterpreted as renal pelvis calculi. Vascular walls that are parallel to the transducer face may appear as linear echogenic foci and be confused for calculi, but these should not shadow or demonstrate twinkle artifact. A recent study by Dillman et al. (2011) found the twinkle artifact alone had a false positive rate of 51% when compared with non-contrast CT. However, only 59% of the foci of twinkle artifact with a corresponding renal stone on CT had a discrete correlative echogenic focus on gray-scale ultrasound images. This finding suggests that the sonographic color Doppler twinkling artifact is likely much more sensitive in the detection of nephrolithiasis than is gray scale imaging although clearly false positives may occur if only relying on the twinkle artifact.

**Bladder Evaluation**

Ultrasound evaluation for urinary tract stones should always include imaging of the bladder, with particular attention to the ureterovesical junctions. Identification of ureteral jets is helpful for assessing the presence of obstruction. Ideally, the bladder should be comfortably distended through pre-scanning hydration. Color Doppler should demonstrate ureteral jets intermittently and bilaterally. A ureteral jet will almost always be absent in high-grade obstruction. However, only about one-third of patients with low-grade obstruction will have a ureteral jet abnormality. Endovaginal or transperineal scanning can be successfully used to identify calculi in the distal ureters and should be considered if a stone is questioned on transabdominal scanning or unilateral hydronephrosis is identified. If a bladder calculus is suspected, rolling the patient during scanning of the bladder may help demonstrate a mobile calculus.

**Imaging Follow-Up**

Ultrasound has tremendous value in imaging follow-up. When a patient has been identified as having renal colic or known renal stones, ultrasound should always be considered for re-evaluation. A typical example is a patient seen in the ED with a prior CT examination demonstrating renal calculi and now presenting with renal colic. An ultrasound should be the initial imaging test to detect hydronephrosis and guide management. Similarly, patients who are not improving on treatment for a previously diagnosed urinary tract stone should undergo ultrasound initially.

**References**