

MAHCP Career Profile

Sonographer

Submitted by Chris Harrington, Sue Murray and Michelle Andersen



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Snapshot

Imagine being able to use a small hand-held probe to slice into the human body to search for evidence of disease...all without harm to the patient. This is the amazing task that diagnostic medical sonographers perform every day!

Using a small transducer connected to a sophisticated computer, a diagnostic medical sonographer uses

painless, inaudible, high frequency sound to peer inside the human body for signs of disease. Tailoring each exam to answer the patient's individual diagnostic question, the sonographer can image almost any region of the body and record two or three dimensional images of the relevant findings. The sonographer then formulates a written technical impression and submits it along with the recorded images to the sonologist who reviews and interprets the images and dictates the final report.

Working closely with the sonologist, the diagnostic medical sonographer is a skilled member of the diagnostic imaging team whose job entails a high degree of responsibility and the ability to adapt to constant challenges and constant change.

Sonographers have extensive, direct patient contact that may include performing some invasive procedures. They must be able to interact compassionately and effectively with people who range from healthy to critically ill.

Some of a sonographer's professional responsibilities include:

- obtaining and recording an accurate patient history
- performing a wide variety of diagnostic procedures and obtaining high quality diagnostic images
- identifying a wide range of pathologies and differentiating the findings from normal
- analyzing the technical information
- using independent judgement in recognizing the need to extend the scope of the procedure according to the diagnostic findings
- providing an oral or written summary of the technical findings to the physician for medical diagnosis
- providing quality patient care
- collaborating with physicians and other members of the health care team
- having knowledge of the interaction of ultrasound in the human body and any potential for biologic effect

Sonographers may also assist with interventional procedures and must also be knowledgeable about and limit the risk from possible exposure to blood and body fluids.

Education and Training

The vast majority of the sonographers in Manitoba were trained at the Ultrasound Training Program at the Health Sciences Centre (HSC). Established in 1973, the HSC program was the first ultrasound training program in Canada. The program is a hospital-based fully accredited one year post-diploma program. The prerequisites for admission to the program



Matthew Epp and Bernardine Chequis Sonographers, HSC

are either a minimum 24 month allied health diploma (Radiography, Nuclear Medicine, Respiratory Therapy, Radiation Therapy, Laboratory Technology, Nursing, etc) or a Bachelor's degree with a minimum of 6 months patient care experience. The program trains 10 sonographers each year.

The strength of the HSC program has always been its dedicated program staff. The program has an exceptional group of clinical instructors at HSC, St. Boniface Hospital, and Seven Oaks Hospital who are passionate about ultrasound and who foster that enthusiasm in their students.

Over the years the program has graduated hundreds of highly successful sonographers, many of whom have gone on to establish programs in other provinces and become leaders in the field. Areas for advancement include obtaining credentials in specialty areas such as Adult and Pediatric Echocardiography (diagnostic ultrasound of the heart), Vascular, Neurosonography (diagnostic ultrasound of the brain and spinal cord), and Breast sonography. Sonographers can also advance into management careers, into education, or into commercial applications with companies such as GE,

Phillips, Siemens, and others.

The HSC program awards a diploma in diagnostic medical sonography. Graduates are prepared to challenge both the Canadian and American certification exams. The Canadian credential is awarded by the Canadian Association of Registered Diagnostic Ultrasound Professionals (CARDUP) upon successful completion of both a Clinical Skills Assessment Process and a written examination. The American credential is awarded by the American Registry for Diagnostic Medical Sonography (ARDMS) upon successful completion of a written exam. Most graduates obtain both credentials.

Training in other provinces is primarily college-based, with many provinces having 24-28 month first discipline programs. Dalhousie University in Halifax has a 4 year degree program with an optional diploma exit after 3 years. Currently, the HSC program is working with Red River College to submit a proposal to restructure the program as a 24 month first discipline program at Red River College.

Employment and Outlook

There are over 100 diagnostic medical sonographers working in Manitoba. In comparison to other provinces this is a relatively small number. This is because unlike many other provinces, diagnostic ultrasound in Manitoba is only practised within hospitals. There are no clinics currently approved to provide diagnostic ultrasound. If this should change in the future, then we would expect the number of sonographers in the province to increase proportionately.

There are three classifications for diagnostic medical sonographers in Canada. These are:

Generalist sonographer: a sonographer who performs scans of the abdomen, obstetrics, male and female pelvis, musculoskeletal system, and superficial structures such as breast, thyroid, scrotum, as well as scans of the carotid arteries and the venous system. These scans can be performed on adults or on

children (pediatric ultrasound)

Cardiac sonographer: specializes in scans of the heart (adult or pediatric)

Vascular sonographer: specializes in scans of the arterial and venous system

Some sonographers hold one classification, while others may hold two or even three.

The HSC training program recently surveyed all Manitoba sonographers. Survey results indicate the following:

Sixty percent of Manitoba sonographers practise within the WRHA, the other 40% practise in rural health authorities or in Brandon. **There is a very balanced distribution of experience from new graduates to experienced sonographers throughout the province.** There is also a normal distribution of ages with the largest cohort in the 40-44 year-old category. **Eighty percent of Manitoba sonographers are female.** Fifty percent of Manitoba sonographers have full-time positions, the other half hold part-time positions. While the majority of Manitoba sonographers expect to be practising for at least 10 more years, **the province can expect to lose approximately 4 sonographers per year over the next 5 years due to retirement, injury, or career change.**

Physical and Mental demands

The physical and mental demands on sonographers are significant. Mentally, the job is extremely challenging as the sonographer plays a primary role in making the diagnosis. Unlike many of the other imaging modalities in which the images are interpreted solely by the radiologist, in diagnostic ultrasound the sonographer is constantly interpreting the findings as they scan in real-time. During the scan, the sonographer must differentiate normal findings from pathology. When abnormalities are identified, the sonographer then tailors or expands the scope of the exam to best document the findings. Once all the images have been recorded, the sonographer writes a technical impression summarizing the findings which accompanies the images to the radiologist's workstation for final interpretation and production of the final report.

Needless to say, this process places significant responsibility on the

sonographer. Good sonographers pride themselves on being able to find and document all the relevant pathologies, and also on not creating confusing or misleading images.

However, this added responsibility is also one of the major factors that lead allied health professionals to seek a career in diagnostic ultrasound. There is simply no such thing as a routine ultrasound and never a dull day. The sonographer can never predict what will be found when the transducer is placed on the patient. The findings are often unexpected and are frequently contrary to what was indicated on the request for consultation. Sonographers thrive on these challenges. As a result, despite the significant responsibility and the mental stress, the levels of job satisfaction for sonographers are usually high.

Work-related musculoskeletal disorders (WRMSD)

Not only is sonography mentally challenging, it is also a very physically demanding occupation. **Sonographers have a very high incidence of WRMSD.** Constantly having to apply transducer pressure, often with suboptimal positioning, puts sonographers at significant risk of developing work-related musculoskeletal disorders such as inflammation of the tendons (tendonitis) or tendon sheaths (teno-synovitis), bursitis, muscle strains, and pathology of the nerves in the upper extremities, neck, and back. A study by the Society of Diagnostic Medical Sonographers reported that more than **80% of sonographers are scanning in pain and 20% of these professionals eventually experience a career-ending injury.** They also found that on average, sonographers experience pain while scanning within 5 years of entering the profession.#

Progress towards reducing the incidence of WRMSD in sonography is being made, but it remains a significant issue. New scanners are more ergonomically designed and sonographers are well aware of the importance of keeping themselves as strong and flexible as possible. They also know the importance of taking scheduled breaks and trying to vary their schedules to reduce the chance of suffering repetitive strain injury. Despite some of these improvements the Manitoba survey indicated that 10% of Manitoba sonographers think that they will end their ultrasound career due to injury and a

recent large Canadian survey has shown a continued increase in WRMSD, perhaps in part due to the increasing obesity of the North American patient population. Manufacturers, management, educators, and sonographers must continue to work together to reduce the incidence of this serious problem. More can be done.

Continuing Medical Education

As with other allied health professionals, sonographers are life-long learners. Diagnostic ultrasound is a dynamic and rapidly advancing technology that allows sonographers to examine almost every region of the body in greater and greater detail. Sonographers learn something new from almost every case. However, their continuing education must also be formalized. Both CARDUP and the ARDMS require credentialed sonographers to obtain a minimum of 30 CME credit hours every three years in order to maintain their credentials. Additionally, the ARDMS has just recently introduced a recertification program that will require all registered sonographers to take a web-based recertification examination in each clinical specialty area in which they hold active status.

One of the challenges for today's sonographers is convincing other stakeholders of the importance of attending national or international educational conferences. While there are many electronic methods for obtaining continuing education, nothing compares to the ability to network with and learn from other sonographers face-to-face at an educational conference.

Summary

Sonographers are proud members of the allied health team. Diagnostic ultrasound is stimulating, dynamic, and rapidly changing field. The technological advances in the past 20 years have been staggering, and will only continue in the future. Systems are becoming smaller and image quality continues to improve. While there is no doubt that the biggest challenge to the continued advancement of the profession is the problem of WRMSD, if all involved work together there is every reason to believe that the future for diagnostic medical sonographers is very bright.



**Sue Murray, Sonographer
Flin Flon, NorMan RHA**

The Northern Experience

Pity me, poor Sue, all alone in Flin Flon in northern Manitoba! ARE YOU KIDDING ME! THIS IS AWESOME! The area is beautiful, the lakes are pristine, there's no traffic, no rush hour, and they just built you a huge state of the art huge department complete with your own corner office with WINDOWS!

How does it feel to be the lone sonographer? There are no sonologists or radiologists on site and no fellow sonographers on site to assist with challenging cases. Well, you just deal with it. You are on your own, and you use



your skills and training. They have trained you well. Trust yourself! You have honed your skills. You have maintained your continuing education. Answer the question given to you on the requisition. Ask the patient about their symptoms. Try to solve their mystery. The radiologists interpreting your cases are only a phone call away at the Health Science Center ultrasound department. The sonologists there have been great! They have kept you on your toes and let you know when you needed to pick up your socks. (of course, that has been on very rare occasions).

Bottom line: working alone is just fine! I can talk to my sonologists whenever I need them. The images go direct to HSC, and can be viewed immediately if need be. The job itself is awesome. Weekdays only, weekends off, no call. Pretty sweet! Of course, the Flin Flon doctors know where to find me if they have an emergency. **But with golfing, the lake, camping, swimming, Seadoing, fishing... well, hopefully they can find me. The equipment is new, the room is beautiful and I am living in paradise.** If you do not believe me, come see for yourself. Ask for Sue in ultrasound. If you forget my name, don't worry, ask for the sonographer. They will direct you to me as I am the only one here!

Happy in Paradise, Sue Murray



Michelle Andersen
Sonographer, St Boniface Hospital

In the Heart of Winnipeg, St. Boniface Hospital

St. Boniface Hospital is a great place to practice diagnostic ultrasound. Working in a tertiary care teaching hospital we are constantly challenged to advance our skills and find ways to improve our service to our patients.

Similar to the ultrasound department at the Health Sciences Centre, we are very fortunate at St. Boniface to work side by side with sonologists (radiologists who specialize in diagnostic ultrasound). Not only are our sonologists excellent scanners, but they can give you immediate feedback on your work and are always available to help with those challenging cases. This provides a great learning environment. The sonologists always have very clear expectations, which pushes us to strive for excellence.

Work Environment

We have a large department with approximately 15 sonographers in full-time or part-time positions. Regular hours are 8:00 am to 4:30 pm. However, we take after hours call on a rotating basis and we also have several sonographers who work evening shifts. Our sonographers' experience range from just over one year to near retirement. **Having a larger group with such a wide range of experience provides great benefit to all, but especially to our younger sonographers. We often collaborate on difficult cases.** My background is radiography and I can tell you that ultrasound, even though part of diagnostic imaging, is very different. As we scan, we not only have to continually optimize our images, we also have to interpret them to ensure that we are accurately recording the anatomy and the pathology. This can be an overwhelming responsibility for some, but I have never met a sonographer who went into the field that was not up for the challenge.

Even though we have a strong sense of teamwork, we work independently within our own scan room. We are typically scheduled 10-12 outpatients patients per day, depending on the type of exams. We are scheduled a fixed amount of time for each patient. However, this can often lead to a time crunch when we are dealing with a patient with complex pathology.

It can take anywhere from 30 minutes to over an hour to perform a scan depending on the type of exam and the degree of difficulty. **Fortunately, we perform a wide variety of exams and the diversity can help reduce some of the problems associated with repetitive strain injury.**

On a rotating basis we are also scheduled with "urgent cases". These days consist of scanning in-patients, emergency patients, or those referred from outside the hospital. Most of our in-patients are transported to our department, but we also do portable ultrasound scans in the ICU. Needless to say, scanning in the ICU patients can be quite challenging due to lack of patient mobility and the need to negotiate all the equipment, IV lines, tubes, and dressings. **Maintaining good ergonomic scan mechanics is often impossible which places significant physical strain on the sonographer.** We also often need to get a little creative in our approach and tailor the exam to the patient's situation.

Types of exams performed

The majority of sonographers at St. Boniface are classified as generalist sonographers.

Our routine scans are of the abdomen, obstetrics, male and female pelvis, carotid arteries, leg and arm veins, and superficial structures such as thyroid and scrotum. We also do some exams that the other smaller facilities may not perform. These include: musculoskeletal cases, hernias, appendix, and a host of others. We also assist our sonologists with interventional procedures and biopsies. Several of our sonographers



Leanne Latourneau
Sonographer, St. Boniface Hospital

are also specialists in areas such as vascular ultrasound, breast, or neonatal head imaging.

Summary

St. Boniface is a great place to practise diagnostic ultrasound. If you are looking for a challenging career in a stimulating high-pace environment within the medical field, diagnostic ultrasound will definitely meet those needs.

Editor's Note:

For further regarding work-related musculoskeletal disorders see:

1. *Ergonomic and Biomechanical Analysis of Postural and Muscular Loading to Diagnostic Medical Sonographers* - Prepared for Health Sciences Association of British Columbia
2. *Ergonomic Report for Grey Bruce County - Addressing the Ergonomics for the Sonographers* - Prepared for Occupational Health Clinic for Ontario Workers Inc.