

Dr. Sharon Clarke

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- What reasons led you to study Medicine and to become a physician-scientist specifically?

I have always had an interest in the fields of science, medicine and physics. I was an undergraduate research student studying MRI in the Medical Biophysics Department of Western Ontario University. I enjoy learning about MRI and Medical Imaging because of I find both the physics of image acquisition and the clinical applications of medical images fascinating. In the end, I applied directly to MD/PhD program and met both program requirements. After finishing undergraduate medicine, I completed a residency in Radiology.

- You both completed your MD program and PhD in Medical Biophysics and I was wondering, what is it about the medical biophysics field that fascinates you, as opposed to other PhD programs?

Medical Biophysics is a nice mixture of physics and biology. I always have a research mentality and like to investigate the subjects in a detail-oriented fashion. This led me to work in an academic setting. I focus on developing new protocols for MRI, Medical Imaging and, in a way, become the “bridge” between both the clinician and basic researchers in physics and image processing.

- For the readers who are interested in learning about your research, how would you describe your research expertise?

My research area is in the radiology field where I study and look at abdominal imaging with the use of MRI. I'd like to call my field “translational research” because I work with colleagues from Physics department to find new MRI imaging techniques and apply them to solve clinical problems. My research focus is in liver-related MRI imaging to study and diagnose diffuse liver diseases and liver cancer. For example, I study the diagnosis of cirrhosis with MRI. In cirrhosis, the liver replaces normal liver tissue with scar tissue. Cirrhosis is often caused by fatty liver disease but it could also be a consequence of viral hepatitis, alcohol consumption and autoimmune diseases.



- Physician scientists work in both clinical and research settings; I was wondering what is your day-to-day life like? What are the roles and responsibilities that your job entails outside of research?

For my clinical tasks, I work at the hospital as part of the Radiology Department. I am an abdominal imager, and I primarily interpret CT, Ultrasound and MRI examinations. Many of the radiological studies are done for cancer detection, staging and follow up, but we also see many other pathologies such as appendicitis, cholecystitis, kidney stones, bowel obstructions and traumas.

Outside of my clinical work, I also mentor radiology residents who are MD graduates that move into Radiology residency (a 5 year program). I mentor both junior and senior radiology residents. When the senior residents become more independent in their clinical jobs, they can become more autonomous with their daily work. For the residents to become better in their work, I also provide lectures/workshops as knowledge refreshment.

Every physician also has on-call responsibilities. My on-call responsibilities entail of performing abdomen imaging for emergency cases in the ER department such as CT scans and ultrasound. Usually, my on-call duty schedules from 5 pm of my shift to 8 am of the next day.

- I was wondering how can you balance the amount of clinical cases and do research workload at the same time?

My work consists of about 60% of clinical work and 40% research work. The Radiology Department has dedicated research time for me to do my work. One advantage of being a clinician scientist is that I see the problems clinicians encounter on a day-to-day basis and can direct my research to help address these concerns or answer clinically relevant questions. That way, my research and my clinical work are complementary and I believe that this helps me to manage my time.

- A big component in research is learning and keeping information up-to-date with others in the same field, I was wondering how do you keep yourself up-to-date with information that are relevant to the field?

For research updates, I do regular literature reviews and subscribe to journals. I also go to international conferences related to Radiology and Medical Imaging. For clinical updates, I attend physician conferences and learn new skill sets. For example, recently I attended a workshop about new prostate MRI techniques.

- We heard stories/experiences of how difficult it is to study Medicine. I was wondering what was the most challenging thing about this career journey?

There are different challenges between the MD program and PhD program. In the PhD program, I had to be independent and autonomous with my own research project. It was quite a self-directed program and sometimes, it made me unsure whether I would be able to accomplish the set goals for my project.

The most challenging aspect of the Medicine program is the workload. Due to the nature of the clinical work, as trainees we were constantly shifting through different rotations, each of which required a new set of knowledge and skills. Meeting new people, learning



new skills and encountering varied clinical cases can take quite some time to get familiar with.

- This is a question for a lot of other aspired students like myself - what advice would you give to those who have an interest in medical/clinical research field?

I believe that to be able to prepare and succeed in either medical/clinical research field, it's best to have both the medical/clinical applications and your research interest interweave with each other. By having both come hand in hand, you will be able to conduct research and apply that knowledge directly into clinical settings.

On a more personal level, an advice that I have is not to dwell too much into career and work. It's also good to exercise, socialize and develop a hobby for stress relief as well.

- How do you cope up with stress and work overload? What is it about your job that keeps you motivated to do research and study clinical cases?

I'm fortunate to be surrounded by my family with a supportive husband and two kids.

They keep me focused and grounded with the life outside of work. Thanks to them I did not get too caught up with work.

To be honest, the work that I do is always rewarding. I get the satisfaction from hearing about positive outcomes from patient that I have diagnosed using CT or MRI. Since my research focused on improving medical imaging field, my work can inform physicians about the most updated imaging techniques and help patients with early disease detection. The interesting thing about my research is the results, hence the rewards, take a longer timescale to develop, as opposed to clinical cases with results expected on the timescale of days to months .

I am also thankful for our collaborators from the Biomedical Translational Imaging Centre, BIOTIC. BIOTIC allows me to do a lot of research in prostate cancer imaging field. We are currently working towards developing a machine learning algorithm to detect prostate cancer from clinical MRI exams. Thanks to this project, I get to meet with urologists and keep them up to date with these new methods. In my opinion, research helps to advance clinical care. I have been fortunate to be able to collaborate with GE Healthcare, the manufacturer of 3T MRI machine. This research collaboration benefits the scientists at BIOTIC because we have access to the MRI scientists at GE for help and sometimes the company provides BIOTIC with new pulse sequences or software to aid in our research. I want to give my acknowledgements towards the Atlantic Canada Opportunities Agency (ACOA) for providing me the grants in this prostate imaging MRI project and the Queen Elizabeth II Health Sciences Centre Foundation, NSHARF and Radiology Research Foundation for providing funding for my research.