Executive Committee Spotlight: Dr. Catherine Lang

ASNR's sixteenth President is Catherine Lang, PT, PhD, FASNR, FAPTA. Dr. Lang is the Barbara J. Norton Professor of Physical Therapy, Professor of Neurology, and Professor of Occupational Therapy at Washington University in Saint Louis School of Medicine where she also serves as the Associate Director of the Movement Science PhD Program. In this interview, Dr. Lang shares more about herself, her career, and her history with ASNR.

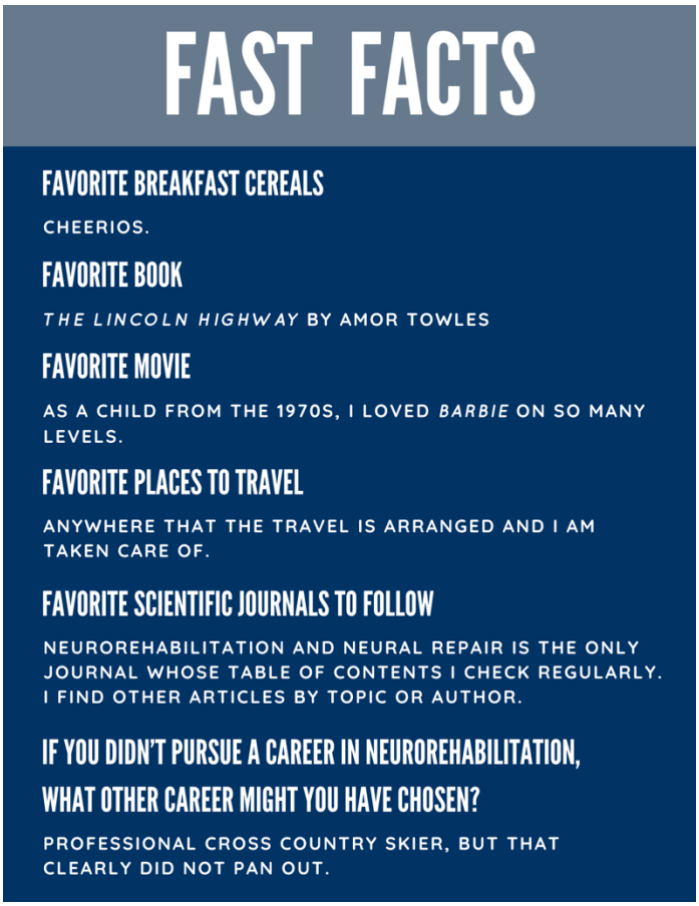
1) How did you get interested in science, and what steps did you take to get to your current role?

I have always been interested in math and science. Interests in STEM run in my family, with my parents and multiple relatives working as middle school and high school teachers. I was attracted to physical therapy because of the science focus. Currently, new practicing physical therapists must obtain a Doctor of Physical Therapy degree from an accredited program in addition to passing a state licensure exam. However, when I was in college, most physical therapists began practicing directly after completing an undergraduate degree in physical therapy and getting their license. This was the route I followed. After graduating from the University of Vermont, I went to work in an inpatient rehabilitation hospital and swore I was never going back to school.

After 6-12 months of providing clinic care, I starting becoming more curious about why some people regained function and others did not. The choice of intervention did not seem to be strongly related to who improved and who did not during their rehabilitation stay. I decided to pursue a Master's degree in Physical Therapy because I wanted to learn more about research. At the time, I did not have any PhD role models and was not ready to commit to the longer degree. Once in the Master's program, academia felt like home, and I knew that I wanted a career in neurorehabilitation research. The next steps were a PhD, a postdoctoral fellowship, a faculty role, and staying focused on the science.

Over the course of my career, I have had the good fortune to be mentored by exceptional scientists and human beings. They taught me to focus on important questions, use rigorous methodologies, and to follow the data. Many of my hypotheses over time have turned out to be wrong, but even when wrong, we have learned important knowledge along the way. I now consider myself in "the last third of my career", where I am enjoying the opportunity to think about bigger science goals and to help grow the next generation of clinical and translational scientists in neurorehabilitation.

2) What is the focus of your current research, and what are some of your key findings?



We have two areas of focus, both revolving around wearable sensor methodology but asking very different science questions.

First, we have been investigating the discrepancies between improvements seen in the clinic (i.e. activity capacity) and improvements in everyday life (i.e. activity performance) as measured with wearable movement sensors. We have found that improvements on tests in the clinic do not necessarily translate to improvements in upper limb and walking performance in daily life. We see this in people with stroke and people with Parkinson disease. We have also found that upper limb activity performance in daily life plateaus very early (3-6 weeks) post stroke, while spontaneous neurobiological recovery and rehabilitation services are ongoing. Our next steps involve the clinical validation of the wearable sensor methodology across multiple patient populations that experience upper limb disability, such as multiple sclerosis, cerebral palsy, traumatic brain injury, or musculoskeletal disorders. Ultimately, we need to get information about activity performance in daily life into the electronic medical record, so the patient-generated data can inform clinical care.

And second, we are investigating motor endophenotypes that contribute to Autism Spectrum Disorder (ASD). Endophenotypes are measurable biomarkers that can link genotypes to a clinical disorder. While motor impairments are not a key diagnostic feature of ASD, up to 80% of people with an ASD diagnosis have co-occurring coordination and/or hyperactivity challenges. With our Child Psychiatry collaborators, we are deploying wearable sensors on infants and toddlers to investigate the heritability and stability of various motor characteristics, their relationships to other non-motor endophenotypes and ASD diagnoses, and brain-behavior relationships. Using a twin study design, we are finding that several motor characteristics quantified by the wearable sensors are highly heritable at 6 months of age, and that these same characteristics are different in school-aged children with versus without an ASD diagnosis. Our next steps in this line of research focus on following the cohorts over time and building models to see how the motor characteristics, along with non-motor characteristics, might predict ASD traits and/or diagnosis. Current ASD interventions are most effective in the youngest children, so the ability to diagnosis within the first year of life could have a major impact on children with ASD and their families.

3) Why did you decide to get involved with the ASNR Board of Directors?

I had attended and presented at several ASNR meetings when I received a call from Dr. Tom Carmichael. At the time, Tom was the Program Committee Chair, and he asked me to join the Committee. I was going to turn him down because of too many commitments, until I found out that the Committee consisted of 10 men – which meant I had to serve. After a few years, I was asked to be the Program Committee Chair. What many of our members may not know is that ASNR has an intentional leadership pipeline from Committee Chairs through to the Executive Office. No one told me when I agreed to be a Committee Chair that I was signing up for 10 more years of service, but it has been a fulfilling experience that has enhanced my professional growth and given me an in-depth understanding of the inner workings of a professional society. Serving in each executive role allows you to learn a great deal about the ASNR organization before you become President. Now, my role is to ensure the organization is healthy, meeting the needs of members, headed in the right directions, and self-sustaining.

4) What do you enjoy most about being an ASNR Board Member?

The best part of ASNR is the people. I love interacting with smart, like-minded people to talk about data and science. It has also been really rewarding to continue to be a force for change. We have come a long way from my early experience as the only woman on the Program Committee to where we are today with women representing nearly half of the members of the Executive Committee and Board of Directors, as well as more than half of our Program, Education, and Member Engagement Committees. Fostering an inclusive environment and seeing increased representation of women and historically marginalized groups within our membership, the organization's leadership, and the field of neurorehabilitation has been really meaningful for me.

5) What do you see as the biggest challenges or areas of opportunities in neurorehabilitation research right now?

A challenge and an opportunity for ASNR is how to grow strategically to further advance our mission to improve the lives of people with neurological disorders through advances in basic and clinical research. We are a unique society that is interdisciplinary and focused on translational and clinical sciences. We want to be selective in what we chose to do and to do it well. Over the past five years, ASNR has accomplished nearly every goal we set in our strategic plan from before the COVID-19 pandemic. Programs such as the webinars, the virtual mentoring, and the revamped 3-year diversity fellowships are products from that strategic plan and are highly valued by our members. We are in the process of a new strategic planning cycle, and I am excited to see where it will take us and the impacts that ASNR will have on the field in the future.