During his first years as dean, Charles Christiansen, OT, EdD, oversaw the development and robust growth of the physical therapy and occupational therapy programs at UTMB's School of Health Professions. But he envisioned more. In 1997, Dr. Christiansen enlisted then-vice dean, Ken Ottenbacher, PhD, OTR, to spearhead the effort to add a clinical research component to the school’s academic programs, as well as a doctoral degree in rehabilitation sciences.

Under Dr. Ottenbacher’s leadership, the resulting Division of Rehabilitation Sciences and its Center for Recovery, Physical Activity and Nutrition (CeRPAN) have flourished since their inception in 2001. "We really started from ground zero," Dr. Ottenbacher says, "because we understood that if we wanted to achieve our research goals, we had to build a pipeline to produce researchers focused on interdisciplinary rehabilitation science."

He began by securing grants to train postdoctoral scientists interested in clinical research. His next step was to extend the training to graduate students in the new PhD program. Additional grants for junior faculty members spurred continued progress, and the division soon became the UTMB hub for rehabilitation-focused research that Dr. Christiansen envisioned two decades ago.
"By its very nature, rehabilitation science involves a broad spectrum of disciplines," Dr. Ottenbacher says. "Rehabilitation and recovery is holistic, not organ-based — it involves the whole person." He adds: "This fact demands collaboration from any number of people: physical therapists, doctors, engineers, scientists. So, our training for students and postdocs is necessarily focused on developing interdisciplinary research skills."

Division faculty members work across a wide range of specialties from early childhood preventive medicine to dementia and disability in older adults. Research on cancer, Parkinson's disease and stroke is conducted alongside investigations into health care disparities, brain injury outcomes, muscle metabolism and more, all working together under the CeRPAN umbrella.

These interdisciplinary efforts are distinguished by outcomes of exceptional scientific quality, evidenced by $73.9 million in external funding and the publication of more than 600 peer-reviewed journal articles by division faculty members, students and postdocs over the last 15 years.

The current dean of the School of Health Professions, Elizabeth Protas, PT, PhD, FACSM, FAPTA, has been an active investigator and mentor of doctoral students and postdocs, as well as providing the leadership and resources to expand and improve the research environment within the division, center and school. According to Dr. Ottenbacher, "The division and center's ability to accomplish its interdisciplinary mission is the direct result of the leadership and vision provided by Dr. Protas."

Dr. Ottenbacher and his colleagues are currently focused on "big data," an area of steadily increasing interest. Researchers in many fields believe that the wealth of research data and biomedical information already accumulated, or big data, can be used to greatly advance current research in human health and disease. Effectively consolidating and efficiently accessing the varied sources of data, however, poses a challenge.

To answer this challenge, UTMB garnered funding in 2010 to begin working with a consortium of investigators from Cornell University and the University of Michigan to increase the quantity and quality of research in rehabilitation outcomes that requires large datasets. This unique collaboration recently received a second grant from the National Institutes of Health (NIH) supporting the Center for Large Data Research and Data Sharing in Rehabilitation, which allows the team to continue to build scientific capacity in large data research.

"Clinical research in rehabilitation science was traditionally focused on individual, no-system-related, outcomes," Dr. Ottenbacher says. "But that has changed. Today investigators often need to look at the bigger picture to try and correlate specific factors to specific outcomes. For example, what drives hospital readmission rates? To arrive at a definite conclusion, researchers would have to look at and analyze a tremendous amount of data."

Research focused on the bigger picture also requires new tools. James Graham, PhD, DC, associate professor and division faculty member, says, "the University of Michigan has been archiving research in other arenas for decades, so we are eager to collaborate with them and Cornell to build a repository for completed rehabilitation studies."

The group's initial goal to amplify rehabilitation research using big data has now turned to the work of creating an infrastructure to support the activities of data sharing and archiving information from completed studies. Dr. Graham currently works with Susanne Bruyere, PhD, CRC, from Cornell University, on three pivotal aspects of the endeavor: identifying and accessing large data sources for inclusion in the archive; determining the best methods to analyze and manage those large data sets; and overseeing the process of getting investigators involved and trained to archive their own and access other's research.

The task of developing a web portal for the new data sharing archive is directed by Amol M. Karmarkar, PhD, MPH, from UTMB and Amy Pienta, PhD, from the University of Michigan. Their goals include creation of data directory and cross-data variable catalog that will help researchers locate and access specific information.

The archive will be tested when two categories of pilot studies get underway, overseen by James S. Goodwin, MD, from UTMB and Denise Tate, PhD, of the University of Michigan. One group of studies will track the experience of investigators using data sets from the new archive to examine questions relevant to rehabilitation. The other group will focus on training investigators to archive data from a completed rehabilitation study.

The collaborative aspect of the pilot studies, along with a visiting scholar program and other cooperative activities associated with the overall project, are handled by Rebecca Wong, PhD, from UTMB, along with Dr. Ottenbacher.

"The central component of our mission is to build scientific capacity to advance the practice of rehab science," he says, "and this will only be achieved with extensive collaboration between institutions and across research disciplines."

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