

REHAB

Part of the 2017 UPMC Rehabilitation Institute Highlights Report







The practice of physical medicine and rehabilitation at UPMC, and the application of its guiding principles, extends far beyond the confines of the hospital or outpatient clinic. The role that this discipline plays within the greater UPMC system is expanding to meet both the evolving trends in health care delivery and the evolving needs of patients.

The knowledge derived in our laboratories and research corridors continues to drive not only our technological innovations but our fundamental understanding of the importance of rehabilitation medicine across the entire spectrum of health care.

Fueled by our multidisciplinary approaches to treatment and research, our comprehensive programs provide a continuum of care from the hospital and clinic to the skilled nursing facility and into the home. We are achieving this in innovative ways that challenge the existing paradigms of patient care to continuously improve.

We build on our collective past endeavors to inspire the changes and updates necessary to be better doctors, better therapists, and better innovators — sometimes incrementally, and sometimes with bold leaps forward.

This report enables us to share our work with our colleagues across the country in the hope that collectively we can inspire each other toward the breakthroughs of the future that will change the lives of those entrusted to our care.

Respectfully,

A handwritten signature in black ink, appearing to read 'G Sowa', written in a cursive style.

Gwendolyn Sowa, MD, PhD

Director, UPMC Rehabilitation Institute

Chair, Department of Physical Medicine and Rehabilitation

Burn Rehabilitation: Caring for Medically Complex Patients

Part of the largest rehabilitation network in western Pennsylvania, the UPMC Rehabilitation Institute offers specialized inpatient and transitional care for a variety of conditions. This specialized care centers on medically complex patients, including individuals sustaining burn injuries who require a unique combination of medical intervention and rehabilitation.



Members of the burn rehabilitation care team meet with a patient.

“Contact with burn patients begins as soon as they’re admitted to the ICU,” says Maria Twichell, MD, assistant director of the UPMC Rehabilitation Network. “Physicians from the Department of Physical Medicine and Rehabilitation (PM&R) are consulted immediately upon admission, and they follow the patients through their series of surgeries, hydrotherapy sessions, and the acute course of treatment, which can be prolonged depending on the severity of their injuries.”

UPMC is nationally recognized as a leader in providing quality care to individuals of all ages with severe burn injuries. The rehabilitation team works closely with the burn team throughout the patient’s rehabilitation, including the coordination of discharge plans and follow-up appointments for each patient. Together, these highly specialized services focus on delivering expert medical care and developing therapeutic plans that help the patient transfer from hospital to home.

Once admitted to the UPMC Rehabilitation Institute, burn patients have wound management in the morning, followed by three to four hours of comprehensive therapy each day, as directed by a physiatrist. Rehabilitation protocols also include physical therapy for improved endurance and stamina, transfer techniques, independent mobility, strengthening, and occupational therapy for improving fine motor skills and activities of daily living. Burn patients also work with their therapists on stretching, contracture prevention, learning self-management techniques, massage, and prevention of further complications. Some patients may require splinting.



Maria Twichell, MD



“SINCE REHABILITATION IS AN ONGOING PROCESS AS OPPOSED TO SOLELY A HOSPITAL-BASED PHENOMENON, INVOLVING FAMILY MEMBERS IN THE CARE AND RECOVERY PROCESS HELPS MOTIVATE OUR PATIENTS TO CONTINUE THEIR THERAPY ONCE THEY RETURN HOME.”

Physiatrists manage the return of function while ensuring that patients continue to recover clinically. There are many patient-specific medical issues to be addressed by the physiatrist while each individual is participating in rehabilitation. Physiatrists evaluate lab data for electrolyte imbalance from fluid shifts, monitor anemia that can be brought on by blood loss from wounds, and frequently check markers of impending infection.

Nutritional status, including adequate supplementation as patients go through therapy, is integral to wound healing and recovery. Many patients require respiratory support or tracheostomy management due to lung injury from inhalation of smoke. Orthostasis, from blood/fluid loss and prolonged immobility, is also addressed by the physiatrist. Finally, adjustment and management of pain medications to provide adequate analgesia as patients undergo therapy are integral to a successful treatment plan.

Another important component of burn rehabilitation at UPMC is neuropsychology. Therapy sessions are provided daily for all patients as many will have psychological concerns due to the physical limitations caused by their injuries. Patients often have significant worries about being able to provide for their family and how their role in the

family may change. Many must also deal with their altered physical appearance, which may cause psychological distress. They may also experience chronic pain, post-traumatic stress disorder (PTSD), anxiety, or difficulty sleeping. To aid in the patient's physical and mental recovery, the trauma and burn physicians, physiatrists, neuropsychologists, and rehabilitation therapists collaborate and involve family members from the outset of the patient's care.

“We start family training early in our patients' treatment and involve them in the entire process,” continues Dr. Twichell. “We teach family members to help with wound care, administer burn medications, and provide motivation for stretching and ongoing therapy.”

“Since rehabilitation is an ongoing process as opposed to solely a hospital-based phenomenon, involving family members in the care and recovery process helps motivate patients to continue their therapy once they return home.”

Reducing Avoidable Readmissions: The Home Transitions Program

With more than 90 inpatient, outpatient, transitional, and long-term care locations, UPMC has developed a network of services to meet patients' needs at each stage of recovery. As the healing process moves from hospital to home, UPMC Community Provider Services (CPS) steps in. An important part of the continuum of care, CPS helps patients reintegrate into the community and raises awareness of beneficial community resources to ensure that each patient continues to receive quality care, thereby reducing readmissions.



Michael Boninger, MD

"Ninety percent of our CPS patients are elderly, so we provide many services that help this patient population safely transition home postdischarge," says Michael Boninger, MD, senior medical director for post-acute care for the UPMC Health Services Division. "Our physical medicine and rehabilitation physicians often are consulted to help determine the discharge location for these patients to ensure their safety and enable them to maximize function after leaving the hospital. We are dedicated to helping our patients so they can continue living full lives, despite their health setbacks."



*Cindy Wilson, senior director of UPMC
Community Supportive Services*





“OUR PHYSICAL MEDICINE AND REHABILITATION PHYSICIANS ARE OFTEN CONSULTED TO HELP DETERMINE THE DISCHARGE LOCATION FOR THESE PATIENTS TO ENSURE THEIR SAFETY AND ENABLE THEM TO MAXIMIZE FUNCTION AFTER LEAVING THE HOSPITAL. WE ARE DEDICATED TO HELPING OUR PATIENTS SO THEY CAN CONTINUE LIVING A FULL LIFE, DESPITE THEIR HEALTH SETBACKS.”

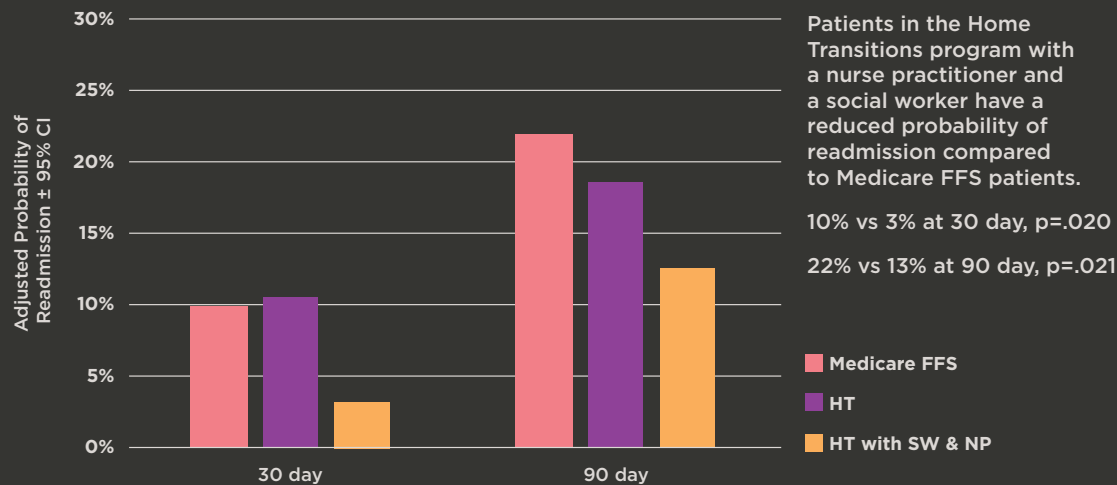
To help reduce potentially avoidable 30-day readmissions for patients identified as high-risk for readmission at the time of hospital or skilled nursing facility (SNF) discharge, CPS has created Home Transitions, a home-based transitional care program. The goal of the program is to prevent complications, identify early changes in the condition or deterioration of the patient, and intercede with the skilled home health plan of care, while involving the patient's primary care physician (PCP).

As an integrated delivery and finance system (IDFS), UPMC serves as a preeminent health care provider and as the payer due to its own health insurance arm, UPMC Health Plan. The Home Transitions program is part of this payer-provider model. It is a collaborative effort between UPMC Home Healthcare and UPMC Health Plan. UPMC patients identified as medium- to high-risk for readmission are referred to UPMC Health Plan for approval and can then enter the Home Transitions program.

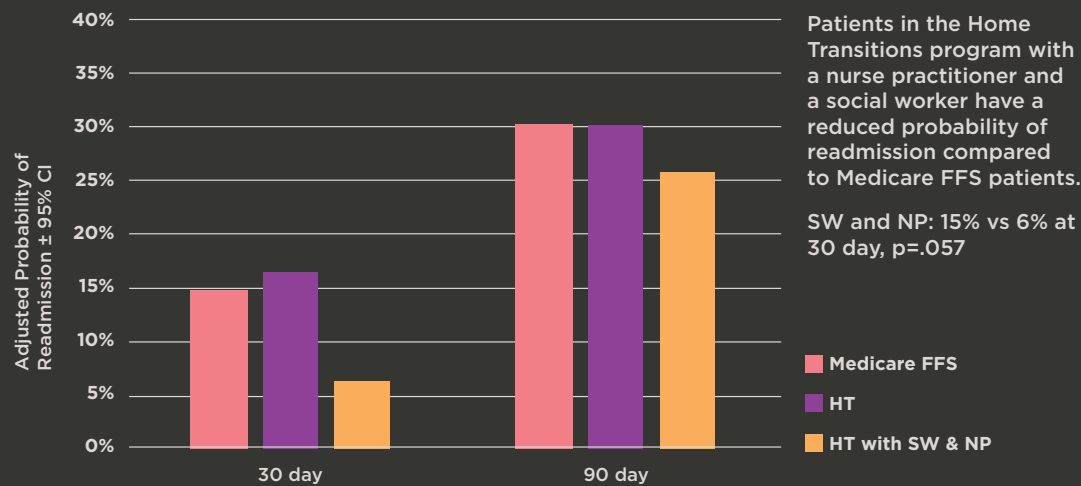
“We refer to the Home Transitions program as ‘home health on steroids,’” says Cindy Wilson, senior director of UPMC Community Supportive Services. “Our patients receive the same services as other home health patients, but there are many additional layers of care, including an expedited start of care, visits by certified registered nurse practitioners, and social workers.”

A care transitions coordinator (CTC) works as the “air traffic controller” of these complex patients' needs. The patients' certified registered nurse practitioner, social worker, pharmacist, PCP, and the medical director from UPMC Health Plan hold weekly interdisciplinary conferences to discuss these cases. In-depth review of patients' care can reveal prescribed medications that aren't being filled or a need for language translation.

Adjusted Readmission Results (Medium Readmission Risk)



Adjusted Readmission Results (High Readmission Risk)



“The CTC provides extra hands-on care coordination, and they can introduce patients to various resources in the community to help them return to the life they had before their injury or illness,” says Wilson.

In a soon-to-be published study done by The Wolff Center at UPMC, readmission rates were compared between UPMC Health Plan patients who accepted enrollment in the Home Transitions program and those in a matched Medicare fee-for-service (FFS) population. As the chart indicates, patients within the UPMC Home Transitions program have a reduced probability of readmission compared to those in the Medicare FFS program.

“With all the changes in reimbursement, and a focus on decreasing readmissions, our numbers speak volumes about the success of this program,” says Dr. Boninger, who is working on publication of the study. “The Home Transitions program clearly has a significant effect on readmissions, while enabling our patients to remain in the comfort of their own homes.”

Figure 1: 30-Day Readmission Rates¹


	Medium-Risk Patients	High-Risk Patients
Home Transitions Program	3%	6%
Medicare Fee-For-Service Program	10%	15%

¹Percentages are based on 5,000 patients from July 31, 2015 to April 30, 2017.

CI - Confidence Interval
FFS - Fee-For-Service

HT - Home Transitions
NP - Nurse Practitioner

SW - Social Worker

A man with a beard and glasses, wearing a grey long-sleeved shirt and blue jeans, is sitting in a wheelchair. He is holding a smartphone in his hands and looking at the screen. The background shows a kitchen with wooden cabinets and a stainless steel refrigerator. The lighting is warm and indoor.

“THE IMHERE SYSTEM WAS CREATED SO THAT PEOPLE WITH DISABILITIES ARE ABLE TO MANAGE THEIR HEALTH AT HOME AND LIVE MORE INDEPENDENTLY. THIS SYSTEM IS MEANT FOR LONG-TERM USE, SO PATIENTS CAN POTENTIALLY UTILIZE IT FOR A LIFETIME.”

imHere: Helping to Prevent Occurrence of Secondary Conditions Through Mobile Health

Studies show that 87 percent of people with disabilities have at least one chronic secondary condition.² This is due in part to a lack of accessible and responsive health care for this patient population. Chronic secondary conditions can be life threatening, but some are preventable. Finding a way to develop technologies to support and educate these individuals on self-care became a priority for researchers at UPMC this past year.

“IF SOMEONE SUBMITS INFORMATION THAT INDICATES THERE IS A SERIOUS PROBLEM, THEN THE WELLNESS COORDINATOR CAN CALL THEM TO MAKE SURE THEY COME IN FOR A VISIT. WE ARE CURRENTLY BUILDING FEATURES TO HELP PEOPLE SCHEDULE THEIR MEDICAL TRANSPORTATION.”

In collaboration with UPMC Health Plan, Brad Dicianno, MD, associate professor in the Department of Physical Medicine and Rehabilitation, and Bambang Parmanto, PhD, professor of health information management at the University of Pittsburgh School of Health and Rehabilitation Sciences, set out to find a way to overcome geographic barriers for people with disabilities and reduce hospital admissions by developing a mobile health platform called Interactive Mobile Health and Rehabilitation (iMHere).

The iMHere system includes a smartphone app with modules that enable individuals with disabilities to manage their own self-care routines, an app for caregivers, a web-based portal for the clinician or case manager, and two-way communication. The smartphone app functionality includes reminders, secure messaging, symptoms surveys and reporting, and photo uploads for assessing various conditions. The case manager can triage individuals and intervene quickly when issues arise by using a dashboard on the web-based portal.

“Some of my early research showed that a lot of complications in this patient population can be prevented if we do better with self-management at home,” says Dr. Dicianno. “The iMHere system was created for patients with disabilities, to manage their health and help them to live independently. This system is meant for long-term use, so patients can potentially utilize it for a lifetime.”

The iMHere system is one of the few mHealth systems that is accessible to people with disabilities and is adaptable to their changing needs and impairments over time.

After undergoing usability studies with focus groups and in-laboratory testing, the app was tested on individuals with spina bifida. Over a one-year period, 13 participants received usual care and used the iMHere system, while 10 control participants received only usual care without having access to iMHere. Positive changes in self-management abilities and less reliance on caregivers were seen with those utilizing the system often. A reduced incidence of preventable conditions and utilization of services was also witnessed. The estimated average cost savings on health care utilization was approximately \$27,000 per user per year.

According to Dr. Dicianno, one wellness coordinator could only handle approximately 25 patients at a time prior to development of the app, and self-management is costly. Mobile health is a way to scale up and make interventions economical while reaching many people simultaneously. This in turn improves health outcomes, improves the patient’s satisfaction, and delivers care at a reduced cost.



Brad Dicianno, MD, and Bambang Parmanto, PhD, developed the Interactive Mobile Health and Rehabilitation (iMHere) mobile health platform.

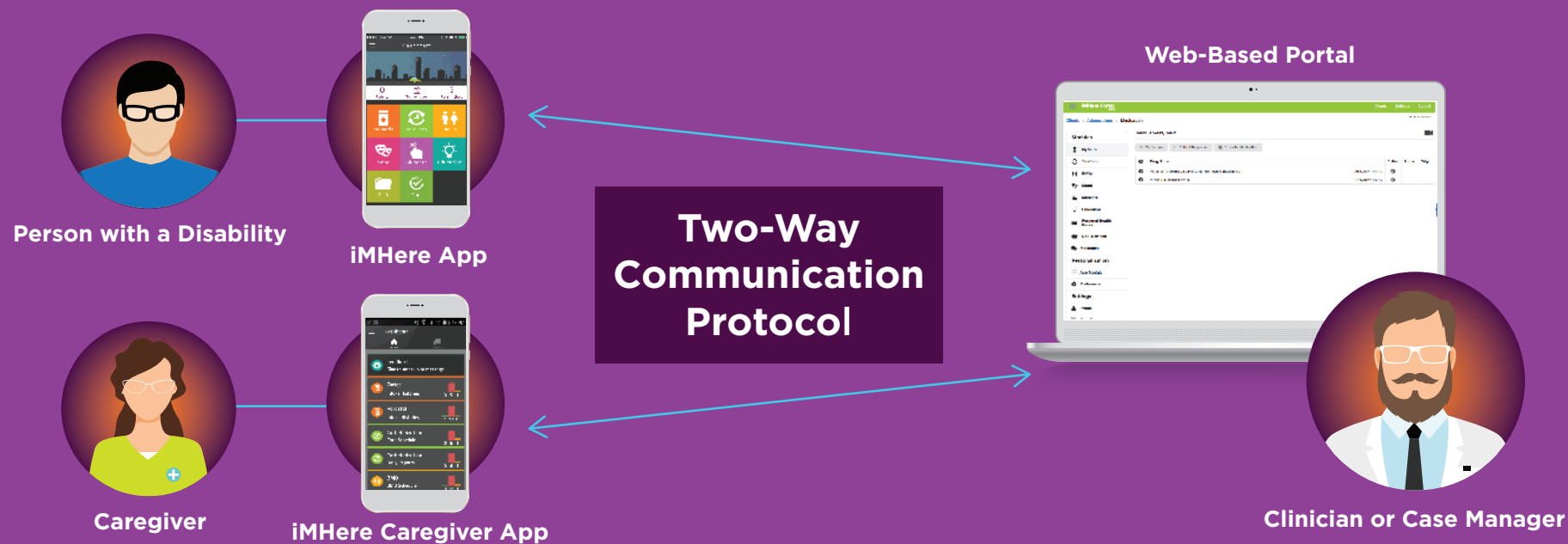


Figure 2. iMHere system that includes a smartphone app for individuals with disabilities and caregivers, and a web-based portal for case managers and clinicians.

“For health systems, the app was developed to be used in a variety of ways, depending on how an institution’s care model is set up,” says Dr. Parmanto. “It’s not meant for emergency care. It operates more like how we provide services in an outpatient setting.”

There are several functions of the app, including:

- Helping patients with self-care, such as knowing which medications to take, self-catheterization needs, skin care, ordering supplies, and making appointments
- Facilitating communication with a wellness coordinator who can provide clinical advice and provide guidance on what patients can do
- Providing new and updated information to patients through the education module

“The app supports people in a number of different ways, not just to manage medical conditions but also to actively participate in and coordinate their care,” says Dr. Parmanto.

One of the main reasons this patient population is rehospitalized is because of secondary conditions, such as urinary tract infection, pressure ulcers, sepsis, pneumonia, and bowel issues. Education is key, which is why the app is so valuable. Some of the educational modules on the app are targeted to these conditions so patients can learn more about them.

“There are a lot of things we can deliver and empower patients to do without actually having to physically visit them,” says Dr. Dicianno.

Usability, feasibility, and clinical trials are ongoing to study the impact of the iMHere system on larger, more diverse cohorts of patients and their caregivers to continuously improve the technology. The preliminary work on this app demonstrates that a scientifically sound mobile health platform can support delivery of many types of health and wellness interventions for those living with chronic conditions.

²Kinne S, Patrick DL, Doyle DL. Prevalence of Secondary Conditions Among People with Disabilities. *Am. J. Public Health.* 2004; 94(3): 443-445.

Accuracy of Activity Monitors and Step Count Recording in Older Adults

Maintaining activity levels in older adults promotes a more independent lifestyle and provides a number of other health benefits. However, many older individuals become less active with age and fall victim to the sedentary cycle, a pattern of limited participation in daily activities that one needs to do, wants to do, or is expected to do.



Inactivity and the sedentary cycle can lead to:

- Physical deconditioning
- Decline in cognition or mood
- Increased hospitalization
- Disease onset
- Decreased life expectancy
- An overall decreased quality of life

Opportunities to stimulate the mind and body, as well as motivation to sit less and move more, must be provided to positively impact this cycle. Two researchers with the University of Pittsburgh Department of Physical Therapy set out to do just that when they conducted the “Step Count Recording in the Elderly” study. The study determined the efficacy of 10 different activity monitors, and the results were applied to an activity intervention program as motivation for older adults.

Andrea Hergenroeder, PhD, assistant professor of physical therapy at the University of Pittsburgh, and Jennifer Brach, PhD, associate professor of physical therapy at the University of Pittsburgh, looked at the accuracy of these devices in counting steps for older people, especially those who walk slowly and use assistive devices for walking.

“The main challenge for this study was to determine which activity monitor could track steps in older adults who walk slowly, shuffle their feet when they walk, or use a cane or walker,” says Dr. Brach. “We wanted all steps to be counted, even ones taken at a slower pace, to motivate this older population to walk more.”

At an average age of 82, there were 43 people residing in independent living facilities who participated in this study, which included an initial gait speed assessment. The accuracy of each of the 10 monitors was determined by having each participant complete two walking trials consisting of 100 steps each while wearing all the devices simultaneously. The devices were designed to be worn on the wrist, waist, ankle, leg, or clipped on to clothing.

After the walking trials, the participants completed questionnaires about the usability features of the monitors. Difficulty assessing the step display and inability to put the devices on were common barriers to monitor use. The most important feature was found to be monitor accuracy, and the least important feature was the ability to interface with a smart device. A commercially available, waist-worn device proved to be the clear winner among the study participants. Results of this study have not yet been published, but plans are already in place to continue building on this research.

“Now that we know what type of activity monitor works best for older adults, we want to focus on how we can apply our findings to those who are going home after discharge from the hospital,” says Dr. Hergenroeder. “How can physicians and other health care providers assist patients who would benefit from increasing their physical activity level or those who are just starting to become more physically active? This question can be addressed as we move forward with this research.”

Hergenroeder and Brach found that most commercial activity monitors lack accuracy when used by older adults who use walkers or canes and walk slowly. However, a few of the monitors performed better than others, were easier to put on, and were cost effective. The self-monitoring capability keeps the users accountable, so they are more likely to want to increase their daily steps and continue on a path of activity and wellness, thereby breaking the sedentary cycle.



Andrea Hergenroeder, PhD, and Jennifer Brach, PhD, tested the accuracy of 10 activity monitors to motivate older adults to be less sedentary.

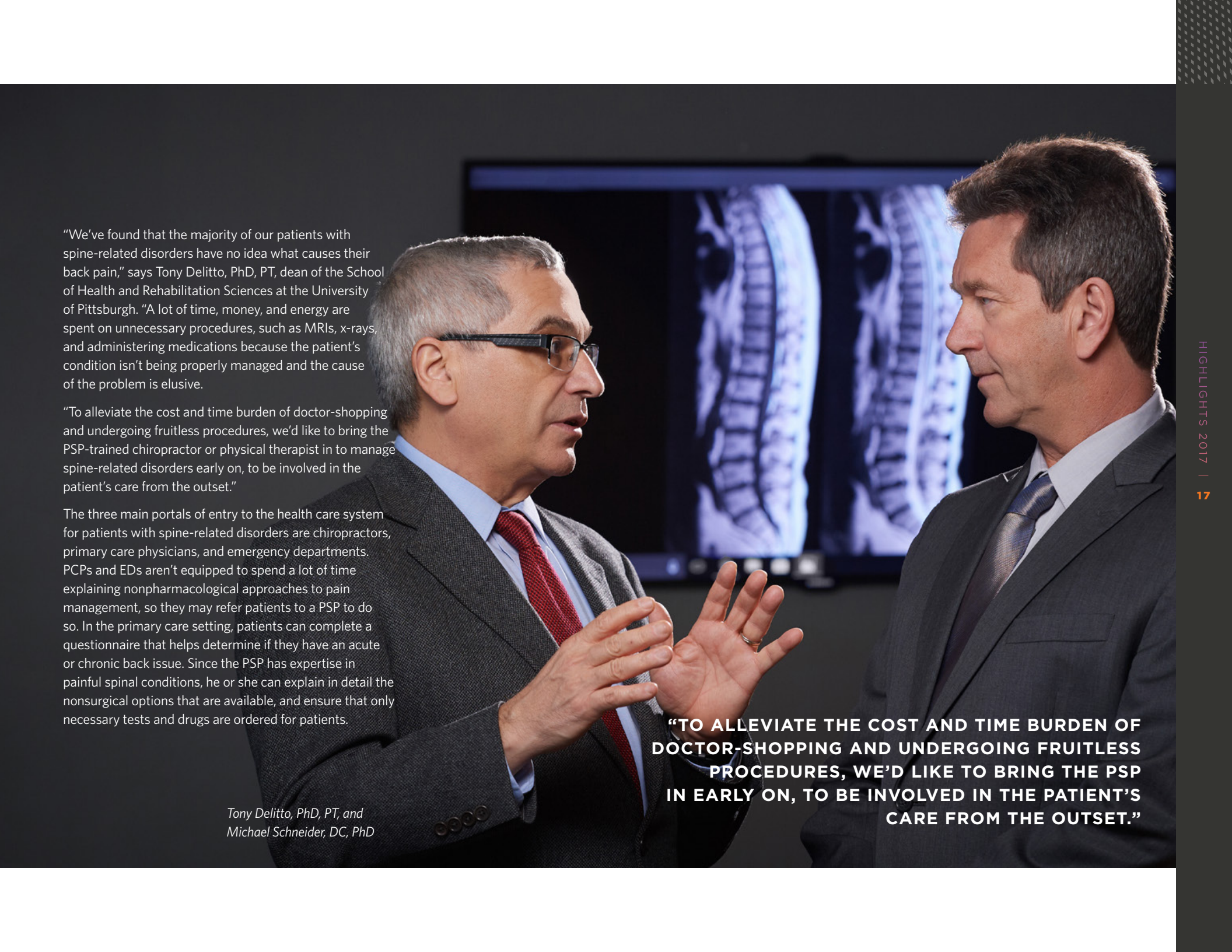
“THE MAIN CHALLENGE FOR THIS STUDY WAS TO DETERMINE WHICH ACTIVITY MONITOR COULD TRACK STEPS IN OLDER ADULTS WHO WALK SLOWLY, SHUFFLE THEIR FEET WHEN THEY WALK, OR USE A CANE OR WALKER. WE WANTED ALL STEPS TO BE COUNTED, EVEN ONES TAKEN AT A SLOWER PACE, TO MOTIVATE THIS OLDER POPULATION TO WALK MORE.”

Primary Spine Practitioner Certification Program: Helping Patients, Reducing Costs

Despite steps being taken to improve health care delivery in the United States, the dramatic increase in health care costs has not led to better clinical outcomes or an improved health care experience for patients. In no area of medicine are these issues more obvious than in the area of spine-related disorders. With more than 80 percent of the U.S. population being affected by some type of spine-related disorder in their lifetime, many of whom go on disability, a solution had to be found.³

The financial burden of spine-related disorders on individuals and society equates to \$102 billion annually, and hovers around \$14 billion in lost wages.³ Between 1996 and 2013, low back and neck pain were identified as the third most expensive disease category in the United States after cancer and heart disease, with direct costs of treatment estimated at \$87.6 billion in 2013. By changing the way spine care is delivered, the triple-aim goals of improved care, improved outcomes, and reduced costs can be achieved.

Central to this process is the establishment of the Primary Spine Practitioner (PSP) Certification Program™, a national certification program offered to chiropractors and physical therapists that will soon be instituted at UPMC. With this program, spine care is coordinated and managed, evidence-based clinical guidelines are followed, and a process is implemented that ensures that patients are involved in treatment decisions.⁴

A photograph of two men in business suits engaged in a conversation. The man on the left, Tony Delitto, is wearing glasses and gesturing with his hands as he speaks. The man on the right, Michael Schneider, is listening attentively. In the background, a large screen displays two side-by-side MRI scans of a human spine. The lighting is professional, highlighting the men's faces and the screen behind them.

“We’ve found that the majority of our patients with spine-related disorders have no idea what causes their back pain,” says Tony Delitto, PhD, PT, dean of the School of Health and Rehabilitation Sciences at the University of Pittsburgh. “A lot of time, money, and energy are spent on unnecessary procedures, such as MRIs, x-rays, and administering medications because the patient’s condition isn’t being properly managed and the cause of the problem is elusive.

“To alleviate the cost and time burden of doctor-shopping and undergoing fruitless procedures, we’d like to bring the PSP-trained chiropractor or physical therapist in to manage spine-related disorders early on, to be involved in the patient’s care from the outset.”

The three main portals of entry to the health care system for patients with spine-related disorders are chiropractors, primary care physicians, and emergency departments. PCPs and EDs aren’t equipped to spend a lot of time explaining nonpharmacological approaches to pain management, so they may refer patients to a PSP to do so. In the primary care setting, patients can complete a questionnaire that helps determine if they have an acute or chronic back issue. Since the PSP has expertise in painful spinal conditions, he or she can explain in detail the nonsurgical options that are available, and ensure that only necessary tests and drugs are ordered for patients.

*Tony Delitto, PhD, PT, and
Michael Schneider, DC, PhD*

“TO ALLEVIATE THE COST AND TIME BURDEN OF DOCTOR-SHOPPING AND UNDERGOING FRUITLESS PROCEDURES, WE’D LIKE TO BRING THE PSP IN EARLY ON, TO BE INVOLVED IN THE PATIENT’S CARE FROM THE OUTSET.”



Tony Delitto, PhD, PT

“There is a primary care physician shortage in the United States, and back pain sufferers are overwhelming the primary care system,” says Michael Schneider, DC, PhD, associate professor in the Department of Physical Therapy at the University of Pittsburgh, who is another key figure in bringing the PSP program to UPMC.

The PSP can do a more extensive review of the back pain issue and modify a physical therapy or a chiropractic approach so it is better tailored to the patient. If the patient has a more complicated problem with biobehavioral overlay, the PSP can help them explore all treatment options by quickly referring them for multidisciplinary management at a musculoskeletal clinic, such as UPMC Total Care — Musculoskeletal Health.

After nearly three years of planning and research, the University of Pittsburgh School of Health and Rehabilitation Sciences launched the certification program to train PSPs. The Primary Spine Practitioner Certification Program has been underway for less than a year through the Department of Physical Therapy at the University of Pittsburgh. It is currently only being offered in Pittsburgh,

with plans to expand to other locations nationally. The current participants in the training program consist of local chiropractors and physical therapists, although many have come from other states and even abroad to participate.

“We’ve built the program, we’ve started to educate people, and now the third phase is implementing it into the UPMC system so that we have the algorithms in place to pick out these spine-related disorder patients and have them sent to a PSP,” says Dr. Delitto. “We haven’t put the plumbing in place where we are finding the patients, routinely screening for them, getting them referred to a PSP, and making sure they go. We’re still working on establishing that cross-talk between the original referrer and the PSP, and creating those strong links with the musculoskeletal health clinics.”

While there are other successful PSP models across the country, UPMC is the first health system to offer a PSP certification program. Once the framework is established, allowing spine-related disorder patients to be identified at the outset of their first appointment, the program will be fully operational at UPMC in spring 2018.

References

³Murphy D, Justice B, Paskowski I, Perle S, Schneider M. The Establishment of a Primary Spine Care Practitioner and Its Benefits to Health Care Reform in the United States. *Chiropr Man Therap*. 2011; 19: 17.

⁴Goertz C, Weeks W, Justice B, Haldeman S. A Proposal to Improve Health-care Value in Spine Care Delivery: The Primary Spine Practitioner. *Spine J*. 2017; 17(10): 1570-1574.

UPMC Rehabilitation Institute Patient Outcomes

January 1, 2017 to December 31, 2017 Facility Type: Rehab Unit

	Key Outcome Indicators	UPMC Rehabilitation Institute	Nation (Acuity-Adjusted)	
All Patients	Number of patients	4,709		
	FIM™ change per day	2.54	2.39	Higher is better
	Average admission FIM	54.9	57.5	Lower = more complex
	Average discharge FIM	85.4	86.0	Higher is better
	Average FIM change	30.5	28.4	Higher is better
	ALOS (days)	14.7	14.3	
Stroke Patients Only	Number of patients	1,406		
	FIM change per day	2.22	2.04	Higher is better
	Average admission FIM	48.9	52.7	Lower = more complex
	Average discharge FIM	78.5	80.3	Higher is better
	Average FIM change	29.6	27.5	Higher is better
	ALOS (days)	16.1	16.1	
Brain Injury Patients Only (traumatic and nontraumatic)	Number of patients	285		
	Case mix index	1.66	1.27	Higher = more complex
	FIM change per day	2.0	2.22	Higher is better
	Average admission FIM	38.0	46.9	Lower = more complex
	Average discharge FIM	69.4	76.9	Higher is better
	Average FIM change	21.4	30.0	Higher is better
	ALOS (days)	19.6	15.7	
Spinal Cord Injury Patients Only (traumatic and nontraumatic)	Number of patients	248		
	Case mix index	2.0	1.47	Higher = more complex
	FIM change per day	1.85	1.84	Higher is better
	Average admission FIM	49.5	53.8	Lower = more complex
	Average discharge FIM	80.2	81.5	Higher is better
	Average FIM change	30.7	27.8	Higher is better
	ALOS (days)	22.3	20.1	

Source: UDSMR*

Key

The FIM™ (Functional Independence Measure) instrument is a measure of disability. The scale measures an individual's ability to carry out an activity independently against the need for assistance from another person or device. Lower FIM scores mean greater dependence.

The need for assistance, or burden of care, translates to the time and energy that another person must expend to serve the needs of the individual with a disability so that they can achieve and maintain a certain quality of life.

The FIM instrument measures the following domains:

- Bladder/bowel management
- Cognition
- Mobility/locomotion
- Self-care
- Transfers

Case mix index — the acuity level of patients

FIM change per day — average FIM change per day

Average admission FIM — total score for all FIM categories at time of admission

Average discharge FIM — total score for all FIM categories at time of discharge

Average FIM change — difference between admission and discharge FIM scores

Discharge to community — percentage of patients discharged to their homes

ALOS — average length of stay for patients in this impairment category

UPMC Centers for Rehab Services Systemwide Visits

January 1, 2017 to December 31, 2017

Outpatient	Visits	Inpatient - Hospitals	Visits
Women's Rehabilitation	36,149	PT	488,135
Physical Therapy (PT)	481,430	OT	278,449
Occupational Therapy (OT)	13,066	ST	45,906
Hand Therapy	43,317	Total Inpatient - Hospitals	812,490
Industrial Rehabilitation (IR)	1,367	Long Term Care (LTC)	Visits
Neurorehabilitation	50,643	PT	38,696
Speech Therapy (ST)	14,970	OT	34,894
Facial Nerve	1,652	ST	9,811
Total Outpatient	642,594	Total LTC	83,401
Grand Total UPMC Centers for Rehab Services			1,538,485

With more than 70 convenient locations throughout western Pennsylvania, UPMC Centers for Rehab Services (CRS) has been providing outpatient physical, occupational, and speech therapy, as well as other specialized rehabilitation services, for more than 30 years. At CRS, the treatment approach is individualized, patient-centered, and evidence-based.

The CRS clinical and management teams are comprised of national leaders, authors, educators, and researchers in the fields of physical, occupational, and speech therapy. Leveraging those experiences contributes significantly to the level of care CRS provides. Through robust continuing education, ongoing training, and collaboration with the physical medicine and rehabilitation physician teams, CRS therapists are positioned to apply state-of-the-art clinical practices and the latest research to their treatment approach.

Due to its relationship with the UPMC Rehabilitation Institute, CRS' authentic patient-focused collaboration and continuity of care are real and tangible possibilities every day.