



Telehealth: Research Update & Novel Applications to Meet the Triple Aim

This article is based on a presentation by Mike Billings, PT, MS, CEEAA, President, Infinity Rehab, and Trevor Russell, BPhy, PhD, The University of Queensland, Australia, at the 2015 FSBPT Annual Meeting.

This presentation reviewed the most recent research in the field of telerehabilitation, implications of research findings, and areas of research still needed. In addition, current federal legislation containing telehealth language and novel applications of telehealth in post-acute care rehabilitation settings was presented, including teleconsultation and workflow design, and how these applications meet healthcare reform goals.

The University of Queensland is well-known for its telehealth research in all medical fields, including rehab. It has a nationally funded Centre for Research Excellence in Telehealth that brings together numerous people doing research in this field. The university has more publications than any other facility when it comes to telehealth research.

Established in 2004, the Centre brings together researchers across four disciplines: physical therapy, speech pathology, occupational therapy, and audiology. It develops the evidence base for practicing those disciplines so patients can be assessed accurately when telehealth is used. The goal is to provide the same outcomes when patients are treated remotely that we would expect if a patient is treated face-to-face. But it's more than just the research. The Centre also looks at the educational aspects to train the next generation and services the public. A clinic run from the university is staffed by university students who would normally be going into emergence programs in hospitals and private practices. Instead, they rotate into the telehealth clinic and provide services to the public under the supervision of clinical educators.

One example is a Parkinson's disease group-based therapy offered by the university. They can bring in experts from around the country, across state borders and jurisdictions, into a session the students run.

The university has published 19,893 telerehabilitation papers. Of those, only 315 have been on PT. But that's a reflection of the fact that telerehabilitation is a relatively new field, only 15 years or so old. There are difficulties doing rehab remotely. The requirements needed from technology are somewhat different, for example. PT is a hands-on profession. Physical therapists use their hands routinely for both assessment and intervention. Solving the hands-on assessment and intervention capabilities remotely is a challenge to the research world.

To assess where telerehabilitation was, the team looked at all the research done in the field and broke it down into types of research and changes in research over time.

Pre-2004, most of the telerehabilitation papers focused on opinion / discussion of the merits of telerehabilitation and the technical aspects of it. There were a few case studies and validity studies to measure if telerehabilitation is providing the same level of care as face-to-face rehabilitation. From 2004-2006, opinion / discussion studies and technical studies remained high, though slightly lower, and there was an uptick in economic and validity studies.

The number of opinion / discussion papers and technical studies continued to fall in 2007-2009, as did the number of economic studies. Case series papers increased and for the first time satisfaction studies and systematic review papers began to appear. Papers on randomized control trials (RCT) also jumped slightly.

Validity studies kept pace in 2010-2012 and case series studies caught up to opinion / discussion papers, which continued to fall along with technical papers. Systematic review papers climbed a bit and qualitative papers made their debut. Alarming, the number of economic studies, which had peaked at a low number in 2004-2006, continued to decline.

In the 2013-2015 period, qualitative, systematic review, and RCT publications all grew. Validity and satisfaction studies fell by large margins and economic studies continued its anemic pace.

Since 2000, then, 27% of telerehabilitation research papers have been published in the realm of opinion / discussion, 19% in the technical arena, 22% case series, 9% validity trials, 8% RCT, 6% systematic review, 3% qualitative, and 2% each for economic, satisfaction, and cohort studies. The goal now is to increase studies on the actual impact of telerehabilitation with fewer opinion / discussion and technical reviews.

One of the systematic review papers was written on the systematic reviews papers. "A quality assessment of systematic reviews on telerehabilitation: what does the evidence tell us?" looked at 10 systematic review studies and rated them on a scale with a maximum score of 11. The scores ranged from 3 to 11, with a few eights and a nine. However, the take-home message from the paper is that generally, telerehabilitation is as effective as face-to-face care and more evidence is needed for stroke cases and, certainly, economics. The studies into what the cost-benefit ratio is for telerehabilitation is woefully inadequate.

Researchers are starting to get enough data in to start a meta-analysis of the systematic reviews, to take the individual studies and combine the results to do stronger and more powerful statistical analyses. All the papers set out to make sure telerehabilitation wasn't too inferior to traditional rehabilitation. The results are starting to tell us that almost the opposite is true. Not only is it as good as face to face, but some evidence is emerging that telepractice actually supplies some slightly better outcomes in some areas. And that's because patients are seen more often, they're provided perhaps with a little more education, and they're being taught how to do some of the hands-on skills themselves so they have the opportunity to do more rehab in their own home.

With telerehabilitation, practitioners can actually see the patient's home environment and can tailor exercise regimes to their living area, to customize a regime that's tailored to their environment.

A question remains if research is translating to practice. According to a study by The Ontario Telemedicine Network, more than two-thirds of telemedicine is concentrated in psychiatry and mental health. Only 2% is reflected in rehabilitation therapies. Obviously, there is tremendous room for growth. There is evidence, however, that research is translating to practice in rehab.

Where should research efforts be focused? Obviously, more research is needed on the economic impacts. Insurers and legislators need to see the cost benefits of telemedicine. Also needed are more studies in the high-quality evidence areas of systematic review, RCT, validity, cohort, and case series studies.

Outcomes research is currently focused on the replication of traditional medicine rather than innovation. But it's the innovation—such as being able to remotely assess a patient's living area—that makes telerehabilitation unique and valuable. Methodology and statistics need to be solid to make a compelling case. Although there have been quite a few technology papers, the field is fragmented with very few standards. Policy guidelines also need deeper study. And studies on sustainable telerehabilitation services should be in the mix.

Infinity Rehab is based in Portland, Oregon. Five takeaways were offered in this section of the presentation.

- Telehealth is a disruptive technology
- Telehealth is increasingly included in healthcare-related legislation
- Telehealth is a real opportunity for physical therapists to help meet the Triple Aim goals
- Putting the FSBPT "Telehealth in Physical Therapy" policy recommendations into practice is more complex than just initiating a Skype session with your client
- Seven strategies for successful implementation

On the subject of disruptive technology, last year 75 million telemedicine e-visits occurred in North America. That's expected to increase to 300 million, according to a Deloitte report. How many are happening in PT? The number is unknown but it's probably not a lot. But the opportunity is there. According to a Remington report, "Almost 1 in 6 primary care consultations will be digital this year, driven in part by consumer demand for convenience and in part by improving more affordable Internet-based video teleconferencing technology."

An IHS study predicted that by 2018, the use of telehealth technology will be more than 10 times that of the 2012 rate. Indeed, we can see the potential growth by the number of companies investing large amounts of money into telehealth technology.

A number of bills have been introduced in the 114th Congress that include telehealth provisions. Most of them will not pass, but it shows that telehealth has caught the eye of legislators. One bill that did pass is H.R. 2, the Medicare Access and CHIP Reauthorization Act, which directs the Government Accountability Office (GAO) to study specified telehealth and remote patient

monitoring services.

Another bill, H.R. 6, the 21st Century Cures Act, had very good telehealth language in its draft form that unfortunately was gutted from the bill as it moved through the process. It is also expected to pass.

Perhaps most importantly to FSBPT, H.R. 2948, the Medicare Telehealth Parity Act of 2015, specifically authorizes physical therapists as telehealth providers. That's important because if Medicare recognizes physical therapy as a payable telehealth service, private insurers are likely to follow suit. Although there has not been a lot of movement on the bill yet, staffers in the office of the bill's sponsor, Rep. Mike Thompson (D-CA), say there is a lot of interest in the bill. *(Note that this presentation was given in October 2015; be sure to check for updates to this legislation.)*

A Centers for Medicare and Medicaid Services (CMS) rule that goes into effect Jan. 1, 2016, on Comprehensive Care for Joint Replacement Model waives certain restrictions on the use of telehealth in the Medicare program, including geographic restrictions that require the patient to be rural and allowing patients to be in their home or place of residence when services are received.

The next generation of the Affordable Care Organization Model also has telehealth language in terms of expanding the originating sites.

The Triple Aim of Healthcare Reform looks at improved patient experiences and lowered costs, with better quality and outcomes.

Telehealth can help maximize standardization and efficiency, use the least expensive alternative with no loss in care, and meet other population health imperatives.

By 2016, Health and Human Services Secretary Sylvia Burwell wants 30% of Medicare reimbursements to fall under the alternative payment models and 85% linked to quality. By 2018, she wants 50% alternative payments and 90% linked to quality. Those goals are expected to be reached before her deadline, however. Six hundred Accountable Care Organizations operate in the United States already with an estimated 20.5 million lives covered by them.

There are now more than 2,000 participants in bundled payments. This includes physical therapists in all settings. We have to change our practice to play in this new world.

The FSBPT "Telehealth in Physical Therapy" policy found in the [Regulatory Resources](#) section of its website is very instructive and useful to anyone in the field. Infinity did not have it available when it started out in telerehabilitation, but has refined some areas due to it.

When Infinity Rehab moved into telerehabilitation, it found it had to look at the human factor aspect. For example, PTs had to be retrained in bedside manner. There's a different dynamic when you're treating a patient on a screen. Infinity also had to provide provider education just to prove the efficacy of telehealth. Informed consent had to be spelled out for patients, pointing out the specific differences between in-house care and telehealth and giving the patient the option. They also had to factor in physical and sensory deficits as well as cognitive deficits

inherent in telerehabilitation.

Ethical factors included verifying the identity of the provider, privacy, and data security. They faced the issue of whether there is a breach in the standard of care if a patient requests telehealth and the technology is available but not used. Case law already reflects use of telehealth as standard of care in rural communities. Some of PT practice acts require onsite visits, raising the question if state boards are doing a disservice to clients in rural communities and limiting the growth of telerehabilitation.

Administrative and technical guidelines also had to be updated and revised.

Finally, Infinity developed The Seven Strategies for Successful Telehealth Implementation:

- Recognize changing patient and provider expectations
- Untether telehealth from traditional reimbursement expectations
- Deconstruct the traditional physical therapy encounter
- Be open to discovery
- Be mindful of the importance of human and ethical factors
- Redesign care with a focus on value
- Be bold and visionary



Mike Billings, PT, MS, CEEAA, President, Infinity Rehab, has been in the rehab industry since 1991 and currently oversees all operations for Infinity Rehab. Mike received a Master of Science degree in Physical Therapy from Duke University. His clinical experiences include outpatient, acute care, home health, long-term care, and wellness. Mike has been a member of the American Physical Therapy Association (APTA) since 1992 and a member of the American Telemedicine Association (ATA) since 2013. He has lectured nationally on wheelchair seating and positioning, Medicare regulations, fitness for the older adult, and telerehabilitation. He has served as an adjunct professor at Pacific University in Forest Grove, Oregon, and earned his Certification as Exercise Expert for Aging Adults (CEEAA) from the APTA.



Dr. Trevor Russell, BPhy, PhD, is an Associate Professor in the Division of Physiotherapy at the University of Queensland, where he is the program coordinator of the Masters of Physiotherapy Studies program. He completed his doctorate in Telerehabilitation at the University of Queensland in 2004, after which he founded and is a co-director of the Telerehabilitation Research Unit. His primary research interests include the validation of rehabilitation assessments and treatment interventions performed at a distance via mobile technologies and telecommunication tools. His research encompasses both clinical service provision and teaching and learning domains and his work includes some of the earliest in the emerging field of telerehabilitation.