

## RESEARCH AND KNOWLEDGE TRANSLATION IN THE COVID-19 ERA

Music (00:00):

[Intro music]

Dr. Camp (00:05):

Welcome to LungFIT, pulmonary rehabilitation podcast, which is dedicated to topics related to the practice and research of pulmonary rehab. I'm your host, Dr. Pat camp. I'm a physiotherapist and researcher at the University of British Columbia in Vancouver, Canada.

Dr. Camp (00:30):

Hi there and welcome to this episode. On today's episode I would like to talk a little bit about pulmonary rehab and research in this complex paradigm of COVID-19. As a clinician and researcher with expertise in respiratory physical therapy and pulmonary rehab, I have been proud of, and I've participated in, the creation of knowledge related to this practice area.

Dr. Camp (00:56):

And in thinking about our research and our practice, initially, our practice was based on experiential knowledge, but over time, pulmonary rehab developed into a practice area based on high quality evidence from numerous RCTs and systematic reviews, and strengthened by knowledge from other types of research, including qualitative and observational studies. The development of this knowledge base took a lot time and expertise, and our rehab specialty has grown because of this investment.

Dr. Camp (01:27):

The COVID-19 pandemic, and the worldwide research community's response to it, has led me to think about my own research process, and how new knowledge is created and disseminated (both generally, and in my laboratory). In my situation, the research I pursue is driven by my own curiosity and what I'm reading in the literature. It is also driven by the partnerships and conversations I have with community members, other clinicians, and students. And of course, funding opportunities that might be there to fund the work. The typical cycle of research that I follow is that my team and I decide upon a research question to pursue, and seek funding for that work. Once funding is received, we conduct the study, analyze the data, present and discuss the work at regional, national and international meetings, and publish the results in a peer-reviewed journal. And you know, other knowledge translation activities may happen, such as webinars, podcasts, and regional presentations to clinicians. We then move on to the next phase of the research, depending on the results and opportunities for further funding.

Dr. Camp (02:35):

This is the general process followed by many researchers. As researchers, we are individually and collectively working on projects that will, hopefully, enable us to better understand pathology, patients, populations, and interventions. With effective knowledge translation, and all the feedback loops therein, we have the foundation for evidence-based or evidence-informed medicine/practice.

Dr. Camp (03:01):

Leslie Portney & Mary Watkins discuss this in their textbook *Foundations of Clinical Research*. They articulate a 5 step research process which is basically what I just said: Identify the Question, Design the Study, Conduct the Methods, Analyze the Data, and Communicate the Results. This process is taught to our clinical students and our research graduate students.

Dr. Camp (03:26):

Clinicians working directly with patients rely on these research processes and the knowledge they create to better understand their patients, develop new skills, or learn about new interventions. A foundational research process is the backbone of most health professions, as it ensures a relatively structured and anticipated method of knowledge generation and translation.

Dr. Camp (03:51):

BUT research takes time, and knowledge translation takes time. The length of an individual trial can take years. Often multiple trials are required to confirm the effect of a new therapy before it can be implemented. For an epidemiological project, it can take years to recruit a large enough cohort to better understand a condition. Although collaboration does occur successfully, the structure of research funding means that research is a competitive business, and many researchers work in relative isolation from other researchers with similar interests.

Dr. Camp (04:25):

Then, when new knowledge is confirmed and disseminated to clinicians, there are many barriers to implementing this knowledge in clinical practice. These barriers include difficulties with understanding the new knowledge, lack of resources to implement something new, lack of interest or time from the clinical community, and lack of skills to implement the new intervention.<sup>2</sup> So, the time from identifying a problem to actually implementing changes in practice can be a multi-year process.

Dr. Camp (05:00):

But then along comes COVID-19 and the realities of a worldwide pandemic. And, like everything else, COVID-19 has turned the research community on its head. Can the normally years-long research cycle apply when faced with urgent need of the world's population for information on COVID-19 transmission, prevention, treatment, and long term management? I developed a COVID-19 research question in May 2020, and am looking for funding for the project. By the time I get it, will it be too late? Will the information still be needed? Or, will the questions still be relevant?

Dr. Camp (05:35):

And very importantly, how will policymakers decide about health care for people with COVID-19, in the absence of knowledge generated by research studies generate? Is it ethical to methodically continue on with the same slow, systematic research cycle steps as articulated above, despite the ramifications that this long period of time and this lack of knowledge would have on humanity? Or do we need adaptations to speed up the process?

Dr. Camp (06:05):

While I don't know the answers to these questions, I am seeing adaptations in the research process – for example, in peer review. Although Portney & Watkins did not break down Step 5 – Communication of Results, in their 5 step process, it should be reinforced that peer review is a key element of communicating findings in research. Peer review, if you are not that familiar with that process, is just the process by which research is reviewed and evaluated, generally *before* publication. After researchers submit research articles to journals for publication, the journal editors then send out emails to other researchers with expertise in the topic, requesting they provide an opinion about all aspects of the research paper (the rationale for the study, the methodology, the results, and the overall quality of the paper). The peer reviewer also offers an opinion regarding if the paper should be published or not, and what revisions are required prior to publication. Researchers voluntarily provide unpaid peer review of papers because we know that the publication of their own papers is dependent on someone else

reviewing them. While not perfect, peer review provides an opportunity for the research community to self-monitor, and hopefully reduce the risk of inaccurate research results being published.

Dr. Camp (07:33):

But when the pandemic hit, the peer review process was altered and much research was disseminated with no, or delayed, peer review. For example, there was a detailed characterization of people with Long COVID which was published on a research repository, and that just gets put online without peer review. There were several reasons why we had to start to read research that did not have peer review. First of all, that peer review process can add weeks or months to the publication cycle, and there was an urgency to release information quickly so the health care community and the general population could benefit from others' knowledge about the virus. Second, researchers are human too and the virus took a toll on them as well, people got infected, research shifted, teaching responsibilities moved online, and service commitments increased. There was not (and still is not!) as much time or capacity to volunteer to be a peer reviewer. And maybe there was a competitive nature to the publication process, to be the first to publish groundbreaking work and forego peer review. Nevertheless, many papers related to COVID-19 were disseminated to the wider health community and the public without the process of peer review. And so without rigorous peer review, we as health care professionals became the 'peer reviewers' of published work, for ourselves and for our patients. This extra responsibility to even more carefully read and critique research which had not undergone peer review added a further burden to health care professionals.

Dr. Camp (09:16):

Another area of adaptation was our need to be more flexible as new information arose. Prior to COVID-19, there was an understanding that changes in practice would occur based on the best evidence from clinical trials and other studies. As previously mentioned, sometimes practice changes would occur over many years. But with COVID-19, we make practice changes within months. For example, early in the pandemic, I, like everyone, was glued to my television watching reports and updates from our health officers. At that time, there was less than 5 known cases of COVID-19 in Canada, so information was mainly from China and Italy. What was the prevailing message regarding transmission at that time based on that level of knowledge? That COVID-19 was spread by droplets, and handwashing, coughing into your elbow, and avoiding touching. That would be adequate to prevent transmission.

Dr. Camp (10:06):

Then new evidence suggested that COVID-19 is airborne and those previously-mentioned prevention behaviours may not be adequate.

Dr. Camp (10:14):

Similarly, we were told that only people with active symptoms, such as cough and sneezing, were going to be able to spread the virus. Then research (both in the laboratory, and using real-world data) led to the knowledge that asymptomatic people were also spreading the virus.

Dr. Camp (10:29):

In Canada, we had to see flexibility and adaptation about policy decisions, so there was a decision to delay the second dose of the vaccine, despite the lack of large-scale RCTs to test the effect of the vaccine with a longer lag time. Because the RCT for the Pfizer vaccine reported a 95% efficacy after the second dose of the vaccine, if that does was administered 21 days after the first dose. The investigators for the trial just made decisions as to when the second dose would occur, likely based on animal studies and small studies in human populations. The approval they received from Health Canada was based on

the findings of those trials. But since those approvals, our health officers made the decision that the second dose of these vaccines would not occur at 21 days, but would instead be at 4 months.

Dr. Camp (11:19):

And quadrupling the waiting period between doses, that was not based on further large scale RCTs, but rather on 'real-world' data as well as other policy-related considerations, including the potential population-based benefits of having more people vaccinated one time (with possibly less individual protection, but more of the population protected) versus a smaller population getting both vaccines in a 21 day period (with potentially greater individual protections, but less of the population protected).

Dr. Camp (11:41):

So, information that appears to contradict what is previously known can be very challenging for healthcare professionals and the patients they care for. It can look like the research process is flawed, and knowledge is being disseminated that is not true but really it is just accelerated. Well over 100,000 COVID-19 research articles have already been published since the pandemic began. And, you know, we are receiving information, and seeing policies enacted and abandoned, in a much tighter time frame, and much more publicly, than usual.

Dr. Camp (12:12):

We should, of course, acknowledge that policy and evidence clashes occur all the time; that's at the very core of most health service environments. Policy-makers must always consider the evidence, but they also make decisions about health services based on other factors as well, including competing resources, the numbers of individuals potentially impacted, and the precedent of making a particular decision. However, with COVID-19, what was probably a somewhat private conversation in health-policy environments but now it is on the front pages of our news.

Dr. Camp (12:46):

And when we think about long COVID, a large proportion of people who survived COVID-19 are now grappling with long term physical and mental health problems, and it is likely that many of these people will need rehab. As health care professionals who have a strong likelihood of working with patients with COVID-19, in acute, community, or telehealth rehab settings, we are being faced with a novel patient population, limited research on etiology and appropriate treatments, and yet an enormous sense of urgency. So, our critical thinking has never been more important.

Dr. Camp (13:21):

Trish Greenhalgh, a physician and Oxford Professor who is heavily involved in COVID-19 research, suggests that medicine may need to shift from our previous reliance on evidence-based or evidence-informed practice, and move toward "complex-systems paradigms" with a greater appreciation of the complex interplay between science, policy, and public health. As health care professionals working in pulmonary rehabilitation, we have experience dealing with uncertainty, often our research was not available to support every aspect of our rehab care and in many cases it is still not available. So going forward, we will do what we have always done. We'll continue to learn from our patients, focus on function, draw on our expertise, understand that science is often uncertain, and prepare for the next evolution in knowledge creation for pulmonary rehabilitation.

Dr. Camp (14:19):

To do that, we'll need to rely on our trusted professional bodies, our researchers, and our expert clinicians as they disseminate emerging knowledge about rehab for long COVID. But we, as clinicians,

must also keep in mind the limits of the research, and we need to be flexible when new or conflicting information arises. Potentially, the COVID-19 and long COVID pandemic may galvanize emerging international communities of practice in pulmonary rehab, with close engagement with researchers and policymakers. And it could be an exciting way to better appreciate the complex system paradigm we find ourselves in now.

Dr. Camp (14:55):

I hope you've enjoyed listening to this episode of LungFIT, and until next time, keep moving and keep learning, bye for now.

Music (15:02)

[Outro music]

Dr. Camp (15:18):

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