

Hello everyone, and welcome to the podcast. Over the last several weeks, I've been working on a course related to pulmonary rehabilitation, and one of the sections I cover is on the history of pulmonary rehabilitation. So in this episode, I thought it would be interesting to go over this history with you. Some of our listeners may be just starting out in this area, while others have been working in pulmonary rehabilitation for a long time. But probably a lot of us don't really know the origins of this practice area.

So in this episode, I'll give a brief overview of the history of pulmonary rehabilitation. This is, of course, a history of the western, medical model of pulmonary rehabilitation. I do want to acknowledge that exercise and physical activity to improve health in chronic illness is, of course, a fundamental principle of many health knowledge systems in the world. This presentation focuses on the timeline of the western, medical model construct of pulmonary rehabilitation. To create this episode, I leaned heavily on the chapter on the history of pulmonary rehabilitation by Bart Celli and Roger Goldstein, in the Textbook of Pulmonary Rehabilitation edited by Enrico Clini and colleagues and published in 2018, as well as my own understanding of pulmonary rehabilitation over my own clinical and research work over the last 25 years. I'll link to that textbook in the show notes.

Pulmonary rehabilitation as we know it today evolved from care provided to patients with tuberculosis. In 1863, the first sanitorium opened in what is now Poland for the treatment of tuberculosis. Why sanitoriums? Well, it was understood that tuberculosis was an infectious disease, and the infectious nature plus the large number of cases meant that health care systems at the time needed to find ways to care for patients en masse as they recovered from the illness.

The prevailing treatment at that time was that tuberculosis was best treated with rest and good nutrition, preferably in sanitoriums located at high altitude.

In 1895, Charles Denison, MD, an American pulmonologist, acquired TB and recovered in a sanitorium. He found that during his recovery period, despite the recommendation that he remain sedentary, he found that he felt better after *activity* versus *rest*. He noted that "the rest cure is much in vogue just at present". Interestingly, his past employment as an instructor in gymnastics while in college may have been a driving force in his promotion of exercise in chronic lung disease. A little physiotherapy promotion there ☺.

After his illness, he focused his attention on TB, and subsequently published a book on exercise for people with chronic lung disease, specifically tuberculosis, entitled "Exercise and Food for Pulmonary Invalids", which could be one of the first medical account of the benefits of exercise for people with chronic lung disease.

Moving forward to the mid-1900s, another American pulmonologist, Dr. Alvan Barach, began studies and documented observations related to position and dyspnea in patients with emphysema. It was also around this time that supplemental oxygen was being used to improve the day-to-day function and mortality in people with chronic obstructive pulmonary disease. So health care professionals could now take an approach of working with the patient toward a higher level of functional status compared to previously.

And another pulmonologist, Thomas Petty from Colorado, and other clinicians attended the Aspen Emphysema Conference in 1965, where different treatments for COPD, including exercise, were discussed, and research to investigate further was proposed. From that, in 1969 Thomas Petty MD published outcomes from large study of pulmonary rehabilitation in Annals of Internal Medicine. In

addition, Alvan Barach MD published “*A Treatment Manual for Patients with Pulmonary Emphysema*”. So we see examples where non-pharmacological treatments for COPD were being discussed, including exercise, positioning, and breathing techniques.

Then in 1975, John Hodgkin published a comprehensive summary on pulmonary rehabilitation in JAMA, based on a conference with many leading experts on this topic. Pulmonary rehabilitation was now considered a valid treatment for patients with COPD, with expertise developing worldwide.

By 1982, the focus became more on outcome measures. Dr. RJ Butland demonstrated the validity of walking tests, which became an outcome measure of choice as they were responsive to change, were reflective of the functional status of the patient, and were feasible to conduct in many settings.

Then in 1987, Gordon Guyatt and colleagues created the Chronic Respiratory Disease Questionnaire. Although generic health status measures existed, this disease-specific health status questionnaire allowed patients to state which activities were the most important to them first, then how much dyspnea they had doing that activity, in addition to other questions.

This was soon followed by the Saint George’s Respiratory Questionnaire, developed in 1992 by Dr. Paul Jones and colleagues created, with specific domains related to Symptoms, Activity, and Impacts. This questionnaire included important features such as asking about the impact of lung disease on a person’s life.

Also in 1992, the shuttle walk test developed and validated by Sally Singh. This test allowed clinicians to conduct a symptom-limited maximal exercise test in their pulmonary rehabilitation patients without the equipment and complexity of doing a cardiopulmonary exercise test.

By 1994, we had RCTs of PR, including one conducted by Roger Goldstein in Ontario and Peter Wijkstra in the Netherlands. Followed by RCTs showing the physiologic benefits of exercise in people with COPD, and the impacts of muscle strengthening as part of PR. I’ll provide links to these articles in the shownotes.

This led us to 2006, where the Cochrane SR by Yves Lacasse confirmed via meta-analysis the benefits of PR on dyspnea, quality of life, and the 6MWD. And, a followup review in 2015 that further confirmed the benefits, and made the remarkable statement that the review was closed – there was no need for further RCTs to confirm that pulmonary rehabilitation improves exercise capacity, symptoms, and quality of life.

So with that confirmation, where has the research turned? Over the last 14 years, we have seen other important aspects of PR being explored, including PHYSICAL ACTIVITY, TELEHEALTH, PR IN OTHER DISEASES, PR FOR EARLY, TRANSPLANT, AECOPD, TYPES OF TRAINING, ADJUNCT MODALITIES (SINGING, DANCING, TAI CHI), HOME VS HOSPITAL, MAINTENANCE, PREDICTORS OF RESPONDERS VS NON-RESPONDERS, AND GENDER DIFFERENCES IN PR.

And finally, I also want to highlight another aspect of the evolution of pulmonary rehabilitation. Whereas the clinical and research endeavours were first dominated by white, male, physicians (which of course reflected health care leadership in general back in the day), the research and clinical area of PR is now enriched and expanded by the MULTIDISCIPLINARY CONTRIBUTIONS TO THE FIELD. Research, clinical and policy leaders are individuals with backgrounds in physical therapy, nursing, medicine,

exercise physiology, to name a few. We are also seeing a strong gender balance in our SCIENTISTS AND CLINICIAN LEADERS.

We are also seeing that PR research questions are reflecting the larger, important questions that the world is facing. So it is reflecting the world around us. There is still a lot of work needed to increase black, indigenous or people of colour in positions of leadership related to pulmonary rehabilitation, as required in health care overall. Research questions such as IMPROVING ACCESS TO PR WORLDWIDE, REDUCING HEALTH INEQUITIES, ENSURING THE QUALITY OF PR, and creating CULTURALLY SAFE IN PR are now front and center.

So from humble yet important beginnings, pulmonary rehabilitation has really come a long way. Interestingly, many basic principles of care still exist from the early programs decades ago. Fundamentally, it is about supporting patients with chronic lung disease achieve optimal function, regardless of the severity of their condition.

I hope you enjoyed this brief overview of the history of pulmonary rehabilitation, and we'll be back soon with another episode. Until then, stay well, and keep moving.