Physiotherapy research: A retrospective look at the future

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I am pleased and honoured to have been invited to follow in the distinguished footsteps of Chris Silagy. My biggest challenge will be to come anywhere close to the standard set by my predecessor. While seeking inspiration, I was reading through some back issues of the *Australian Journal of Physiotherapy* and was struck by the fact that the history of physiotherapy research is surprisingly long considering that our emergence as an autonomous professional group is relatively recent. I envisage this being highlighted in some way. I therefore decided that my talk would be a retrospective analysis, with prospective undertones and overtones, of physiotherapy research in Australia.

I recognise from the outset that my sample is skewed and my interpretation biased - indeed, blinkered - and that my internal and external validity will be seriously compromised but then, these traits have marked all of my research for the past 20 years, so why change now?

*Etzioni (1969)* asserted that “one of the characteristics of a profession is its ability to develop and validate a body of knowledge that is unique to itself.” *[The Semi-Professions and their Organisations. New York: Free Press.]*

Hand in hand with the research activity of a profession, is a feeling of autonomy and identity. I think it is probably true that our growth in both research activity and in self-confidence has been associated with our own abilities to define ourselves and what we are about.

Physiotherapy is about treatment. It is interesting that, in an era in which other allied health disciplines change their names as often as their socks, we have remained wed to the title that has been part of our heritage for 94 years. Other “therapists” may have changed their names and adopted the sobriquet “scientists”, reflecting what they see as a process of deep thinking about their particular discipline, but we have remained true to our purpose. We not only assess and consider the problems of our patients as deeply as anyone else, we treat them.

We walk the razor’s edge, however. If we refuse to subject our treatment to evaluation, we will be castigated, but if we test it and find it all wanting, what then? I am proud of this profession, for it has tackled this issue and our courage has paid dividends.

I find it interesting that we no longer seem to need to raise the question “Why should we be doing research?” The Eighties and early Nineties were the era in which we seemed to need to convince ourselves that research was important. For more than 20 years, however, there has been significant research activity in our profession. Indeed, in the very first issue of the *Australian Journal of Physiotherapy* there appeared a paper which included objective measurement within a case study considering the role of physiotherapy in the management of bronchiectasis (Mackay 1954). By 1956, the American Physical Therapy Association (APTA) was routinely publishing papers which included statistical analysis of clinical data and although Australian physiotherapists were lagging...
behind, it did not take too long before articles began to appear with some simple analysis attached to them.

It was not surprising, perhaps, that early research often targeted the cardiothoracic area. Measurement techniques for vital capacity, peak flow and other respiratory performance had been around for quite some time and were accessible to physiotherapists through respiratory function units in most major hospitals. In Volume 4 of the Journal, in 1958, a paper appeared co-authored by Muriel Ross, Brian Gandevia and JH Bolton which reported a randomised controlled trial (RCT) for asthma. An experimental group of children demonstrated statistically significant benefits of including relaxation and diaphragmatic control over the conventional simple breathing exercises (Ross et al 1958). These data are really quite significant, because the first reports of RCTs had only begun to appear in the mainstream medical literature a very short time before this.

The more common contemporary research has a distinctly biomechanical basis. This would not have been an approach with which our forebears were particularly familiar, but remember, the first force platform only appeared in prototype form in 1952 in California, and the early commercial models did not become available until the 1960s. And, although Muybridge and Marey had been trying to analyse human movement using interrupted photography in the late 19th Century, the automated video-based camera systems so familiar to us now did not appear until the 1980s. Equally, the use of EMG, while dating back to Duchenne in the latter part of the 19th Century, did not have widespread application until much more recently. Some would say, given the implicit difficulties of EMG analysis, that it still awaits the fundamental breakthrough which transformed 3D kinematic and kinetic analysis from an enormously tedious, slow, labour-intensive task to the relatively fast, if still enormously tedious, labour-intensive process it is today.

Prior to the current era, many physiotherapists who wished to develop research skills had to register for higher degrees through established university departments with a tradition of research. This meant that many of our senior researchers today hold degrees in anatomy, physiology, psychology, education, bioengineering, etc. The benefits of such an eclectic background is that these people have brought techniques and designs from these diverse disciplines to address problems specific to our profession. The drawback may be, or at least may have been, that they see themselves as physiologists or psychologists, almost more than as physiotherapists. They remain true to the discipline that claimed them as graduate students and ask the questions that are pertinent to that discipline, not making the move across into the questions we need to answer. It has, therefore, become important that Schools of Physiotherapy offer higher degrees by research which are particular to our profession. We must have researchers whose first allegiance is to physiotherapy.

We have been fortunate, however, in our pioneering researchers. The early history of physiotherapy research in Australia throws out a few familiar names - Margaret Bullock, Lance Twomey and Roberta Shepherd appear frequently in the Journal and it is interesting to note that these pioneers are still keeping up with the pace, albeit through their students and former students. We need to honour these people, and others of their ilk. They established a credibility for physiotherapy research and a culture of scholarship and inquiry. Those of us who have followed have benefited from the battles they fought on our behalf and from the leadership they have shown.

I want to pick out a few issues that I think mark historical developments in our professional research.

Most research starts and indeed continues, because of curiosity. This leads to the reporting of some observed phenomenon. Such studies can probably only be valuable if they lead to some testable hypothesis and are prone to the fishing trip syndrome, where the researcher collects some data and subjects it to an unstructured, yet extensive, analysis in the hope that “something will turn up”. We might almost call it the Mr Micawber approach. That said, I firmly believe that there continues to be a place for this process of scientific inquiry. To me, there are so many questions about human performance in sickness and in health, that remain unanswered. If Etzioni's statement about professions is true, we need to both develop unique knowledge and validate it.

What has often been a problem in the past has been the fact that the new “knowledge” hasn’t been worth knowing, or has not been followed through to tease
out the clinical relevances. Also, particularly in response to the boom in technology, equipment has driven the research question rather than the other way around. A common strategy in early physiotherapy research, and one that persists to some extent even now, is to mount an investigation using young able-bodied subjects. Now there is no reason why that shouldn't be the approach if the problem relates to young healthy people but unfortunately, the results of such studies have often been extrapolated to an unhealthy, not-so-young, population.

Jules Rothstein stated in an editorial in *Physical Therapy* in 1992 that “…. This journal has published too many studies that dealt with clinical issues through the testing of healthy or non-disabled subjects. All too often these subjects are physical therapy students.....” (Rothstein 1992). That situation has certainly changed. Few physiotherapy journals will publish such studies, except as investigative of young normals. What is a little troublesome, though, is the fact that many of the fundamental studies which we continue to use as benchmarks employed just such samples of convenience, and are hallowed by their age. We seldom revisit these, yet how valid are they? Physiotherapy is by no means the worst offender, but it is often perceived as dangerous indeed to challenge an icon. I can think of some holy writ in my own area of human gait that starts to look decidedly shaky on closer scrutiny.

As our stature as a research-curious profession grew, we started to look more critically at what we were doing and how effective our practice was. We rapidly realised that the measures we were using to determine outcome were, in themselves, open to question. Before we could establish whether joint mobilisation increased range of motion, we had to establish to what level of accuracy and with what consistency we could measure that joint motion or apply that mobilisation. The exploration of these issues of reliability have been undertaken with considerable enthusiasm, and rightly so. There has been a long list of papers establishing the intra- and inter-rater reliability of every test or piece of measurement equipment you could think of. Except for the really tricky ones, of course!

I suppose there is some obvious attraction in such research. It is tidy, self-limiting and relatively easy to undertake. Further, although there is some controversy regarding how such data should be analysed, the protocol for testing reliability is reasonably well accepted. The problem is, though, that we can be lured into testing reliability forever, and never actually move on to answer a clinically relevant question.

I began by referring to the published work of our profession and should remind myself of that from time to time. The *Australian Journal of Physiotherapy* has been a barometer for the profession with respect to its intellectual and research growth. Around the late 1960s and through the ‘70s, the Journal had begun to publish a regular proportion of research papers compared with the essentially anecdotal or review papers that had almost completely dominated it up to that time. These research papers reported outcome studies, and although they were largely uncontrolled prospective studies, they established a pattern that had grown from around 10 per cent of all papers reporting research to 42 per cent outcome studies by 1991. In the latest complete volume of the Journal (1999), I counted six review/case study papers, 15 critically appraised papers and 17 research studies. The balance has now significantly shifted. Not only that, but the reviews tend to be systematic and the case studies include data and are presented in a careful and guarded manner.

Once you start library research it is rather easy to become caught up in the “fancy that” paradigm. In reviewing a few main physiotherapy journals from around the world, I looked at the proportion of papers published in them by people from the major countries. Not surprisingly, the bulk of papers come from the home nations (Figure 1) but Australian physiotherapists are quite likely to feature in any of these journals. Significantly, papers from Australia formed the largest number of non-USA papers of those published in *Physical Therapy* between 1995 and 1999. In most volumes of this journal there is an Australian paper, and in one spectacular issue in 1998, there were more Australian papers than all the rest combined.

Most certainly, if we collapse all of these journals for the last five years (Figure 2), Australia is disproportionately important in its contribution to the body of knowledge that is unique to physiotherapy. Almost as many papers have originated here as in the United States. This is a really significant achievement. Particularly given that the APTA boasts a membership of 70,000 and the Chartered Society of
Physiotherapy (CSP) one of 35,000, our per-capita activity appears exceptional. I think that published output is reflective of activity and therefore suggests that APA members are particularly active in research. There is a niggling doubt, though, and one that I will return to: is it correct to say that our profession is active, or merely that a small number of physiotherapy researchers in this country are remarkable for their level of performance and output?

Let us leave that point for the moment and do a bit more self-congratulation Not only are we major players in the physiotherapy literature, but physiotherapy researchers in this country also publish widely in other health-related journals. The publications lists of the Schools of Physiotherapy indicate that, over the past five years, the number of journals in which a paper has been published with an Australian physiotherapist as an author totals a massive 138.

Fundamental to our current research activity is the pursuit of evidence to support or refute practice. This has been greatly assisted by the Cochrane Collaboration and has spawned a most useful partnership which involves the APA, in the form of the PEDro database. This initiative represents a brave step for our profession and one that, potentially, could have left us isolated in quicksand with no evidence at all of efficacy and, consequently, no profession.

Happily, the evidence grows steadily in support of much of what we do (eg supervised exercise in chronic low back pain, osteoarthritis, shoulder pain, multiple sclerosis; breathing exercise in post-abdominal surgery, supervised training in stroke, groin injury, rotator cuff disorders; TENS in low back pain, manipulation in acute back pain; serial plasters in soft tissue contracture.... the list goes on and increases almost daily). It is also true that we have growing evidence of ineffective treatment in some modalities that we have been using in good faith for some time. The challenge is that we must not rejoice at the success of some treatments and ignore the evidence of no effect of others. We must dispose of them!

I think the future of physiotherapy research will continue to be dominated in the near future by the use of the clinical trial (in particular RCTs) to evaluate our practice. I suspect that more physiotherapy higher degree theses will include RCTs/CCTs and that the “literature review” will be supplanted to some extent by the “systematic review”. There are some caveats to this. It is not always feasible to conduct a RCT; sham or no treatments are just not possible in every case -
you can’t treat a post-thoracic surgery patient with excessive secretions for the sake of a controlled trial. We need to balance the pragmatism of the RCT model with the recognition that accumulated evidence of effect may be achieved through studies using different paradigms.

There is certainly a dimension to physiotherapy practice which relates to interpersonal responses. We are aware that there is an art to our profession, perhaps manifest more in some areas than others. To some empirical scientists, this is merely a placebo, a Hawthorne effect, but to others it is a legitimate part of the motivational and educational strategies of treatment. One of the major challenges for researchers is to evaluate the place of this interaction in our treatments. The benchmark for acceptability of evidence in support of medical or physiotherapy intervention is set by the traditional medical lobby. It is the RCT. There is no single piece of evidence in support of, or refuting, physiotherapy intervention which has emanated from a non-experimental paradigm.

Is the interpersonal dimension of physiotherapy merely a placebo? To some, suggesting that there is a parallel between that aspect of our work and the work of the psychotherapist is likely to provoke howls of derision. They are quite likely to go on to say that the psychotherapist is a charlatan and a predator on the insecurities and neuroses of people who ought to pull themselves together and get on with their lives. Nevertheless, I believe there is often a major contribution to treatment effects thanks to a sympathetic and motivating physiotherapist. Is that factor extraneous to what we do? Should our treatments only be deemed effective if they can be successful when delivered by a sociopathic robot?

Jan Ritchie has written a thoughtful and thought-provoking leading article in a recent issue of the Australian Journal of Physiotherapy regarding the place of the qualitative research paradigm in contemporary physiotherapy research. She argues that to exclude the patient’s beliefs, perceptions and opinions from our investigation leads to research that is incomplete and “expert-driven” rather than involving a humanistic dimension. A challenge for the near future will be to find ways in which those aspects of our practice which are less amenable to empirical research methods can be validated using generally acceptable research techniques (Ritchie 1999).

Physiotherapy research will never be complete. This is a truism, but one that needs to be stated. There will always be a need for us to continue to research our professional practice, for there will always be questions. The PRF is an important component in the support of research activity in the profession, but I fear that there is a good deal of complacency among APA members regarding the sustainability of this Foundation. Despite the efforts of various conveners and committee members, the ability of the Foundation to raise funds is seriously limited and our ever diminishing reserves can support fewer and fewer projects every year. Paradoxically, the standard of applications improves each year and the number of worthy projects not funded consequently increases. It is a matter for grave concern that the PRF now rejects a greater proportion of otherwise suitable applications than does the National Health and Medical Research Council.

What exactly does the profession want of its research? It seems to me that by and large we recognise the need for solid evidence to support our practice and to provide that body of knowledge unique to our profession, yet do relatively little to support research which is unique to our profession. The number of clinical positions which include research as part of their duty statements is laughably, tragically small. There is a general reliance on the Universities to both conduct the research and to provide the staff positions to ensure that it is conducted. It is long overdue, in my opinion, for research to be recognised as a legitimate part of clinical practice. In the same way as our specialist physiotherapists need to demonstrate their expertise through further education, so too should our researchers, and there should be recognition of their attainments when they do so. Research is not a part-time, amateur hobby. It is as much the future of our profession as is development of new approaches to management and treatment.

We are, in my opinion, a leading nation in the world with respect to clinical practice; I have tried to suggest that we are also world leaders in physiotherapy research activity, yet there seems to be a gulf dividing these two facets of our excellence. In Faculties of Medicine and, increasingly, in Nursing, universities often appoint clinical professors and have no difficulty in finding people with demonstrated scholarship who are also clinical experts. The expectation is that such people will be leaders in clinical research and in the process of clinical education while sustaining a substantial clinical
presence. My own university has literally dozens of such clinicians. Despite the fact that our Schools of Physiotherapy would be keen to follow this model, there are hardly any comparable positions within our discipline. Why so? The fact is, that there are few physiotherapists with the necessary research training and track record of scholarship who have remained within the clinical field. There has been no incentive for them to do so, and they have moved into academic positions because only there could they achieve their goals. This merely polarises our profession and we are not so large that we can afford to have this happen.

Our profession has come a very long way and is, I believe, well placed to continue its development and validation of unique knowledge. But we need to decide whether we wish to be the leaders or the led as far as the research agenda is concerned. We live in an era of robust competition among all researchers, including physiotherapists. This means that, in their search for funding support, our best researchers will do the research that the market place demands. Our researchers will shape their work to suit and that may not be in our best interests. If physiotherapy is to benefit from their efforts, then physiotherapy needs to support its researchers. It needs to do this by creating real opportunities for research within clinical practice, by the encouragement and support of clinician involvement in research, and through the raising of funds to provide the incentives for research within our profession.

We must not lose the edge that we have won, nor fail to capitalise on the goodwill and real desire that exists within the physiotherapy research community to undertake research that is relevant and valuable to our profession.

I am honoured to have been invited to present this Oration. I remain optimistic about our future as a profession and about the future of research in our profession. We have done incredibly well. We have a profession to be proud of, but the job will never be done and we must recognise the part that we all must play in continuing to develop and validate that body of knowledge that is unique to us.

“In research the horizon recedes as we advance, and is no nearer at sixty than it was at twenty. As the power of endurance weakens with age, the urgency of the pursuit grows more intense....and research is always incomplete.” [Pattison 1875].

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References