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Abstract

**Background:** Accredited Exercise Physiologists provide exercise services for people living with chronic disease, disability or injury and are recognised in Australia as Accredited Exercise Physiologists (AEP) under a national certification system administered by Exercise & Sport Science Australia (ESSA). A major breakthrough occurred for the AEP in 2006 when the Australian Department of Health and Ageing approved the AEP to deliver clinical exercise services for people with chronic medical conditions under the taxpayer-funded national health scheme, Medicare Australia.

**Aims:** In light of these developments, the authors recognised the need for new accreditation criteria, and our report summarises the work that we did on behalf of the profession and ESSA in restructuring the accreditation system.

**Methods and Outcomes:** We first performed a background study that defined the scope of practice of the AEP and benchmarked the AEP against other allied health professions in Australia and Clinical Exercise Physiologists internationally. We then constructed a new set of accreditation criteria comprising sets of pathology-specific knowledge and experiences, together with a set of generic standards including communication, professional behaviour and risk management. All participating Australian universities (18 out of 27 responded) and 29 practitioner experts were then invited to provide comment and input into the draft guidelines. There was strong support for the new system that was implemented nationally on 1 January 2008 and is now administered by ESSA.

**Conclusions:** This work has stimulated an unprecedented level of activity in the Australian university sector in developing new curricula in clinical exercise science and practice, and is intended to lead to improved standards of clinical exercise practice.

**Keywords:** Accredited Exercise Physiologist, exercise therapy, chronic disease, accreditation, assessment.
Introduction

Exercise is now widely accepted by the scientific and medical communities as offering preventive and therapeutic benefits for people living with many of the chronic medical conditions prevalent in the developed world (Booth et al. 2000; Fletcher et al. 1996). In Australia, Accredited Exercise Physiologists (AEP) are university-trained practitioners who provide exercise services for people living with chronic disease, disability or injury, under a national certification system (National University Course Accreditation Program) administered by the Exercise & Sport Science Australia (ESSA).

A major breakthrough occurred for the AEP on 1 January 2006 when the Australian Government Department of Health and Ageing formally approved the AEP to deliver clinical exercise services for people with chronic medical conditions and complex care needs under the taxpayer-funded national health scheme, Medicare Australia. Clinical Exercise Physiology is now a nationally recognised profession for the provision of exercise services for clients with pathology under compensation schemes administered not only by Medicare Australia but other schemes that provide coverage for people injured in motor vehicle accidents or at work, returned armed service personnel and those with private medical insurance. Furthermore, the Royal Australian College of General Practitioners and the Australian Divisions of General Practice have recognised the AEP as a suitably qualified allied health professional to provide these services. To our knowledge, the recognition of the AEP to provide clinical exercise services under the breadth of compensable schemes in Australia for people with chronic medical conditions is unparalleled elsewhere in the world.

The curricula for exercise science within Australia has gradually evolved from Physical Education (1970s), Human Movement (1980s), Sports Science (1990s), Exercise Science (2000s) and more recently to Clinical Exercise Science and its practice. This evolution has created both challenges and opportunities for universities, the profession and the professional (accrediting) association. As a direct consequence of the inclusion of AEP services within the Medicare Health Benefits schedule, universities have recognised the need to align their programs with the new knowledge and skill bases required of clinical exercise professionals to work effectively within allied health service provision. This has stimulated an increased level of activity in the Australian university sector in program design and delivery and will almost certainly lift minimum standards of both education and practice.

In 2006, two primary accreditation classifications within ESSA existed. They were the ‘generalist’ AEP and three ‘specialist’ accreditations in the key pathology areas of clinical exercise practice, namely cardiopulmonary, musculoskeletal and neurological. Both classifications could practise under the compensable schemes outlined above. There was no requirement for the AEP to undertake further training to become a ‘specialist’. Further, only a few practitioners had more than one ‘specialist’ accreditation, meaning that very few practitioners in Australia were competent to provide services for clients
with chronic medical conditions and complex care needs (co-morbidities). Clearly this system was uneven in terms of minimum standards of practice and exposed the profession and its clientele to a range of risks including physical, psychosocial, ethical and/or legal. For this reason the authors, in consultation with universities, ESSA and the profession developed a new national accreditation scheme for AEPs that covered all major areas of clinical exercise practice. One consequence was that the ‘specialist’ areas were absorbed into a new strengthened ‘generalist’ AEP scheme. The implementation of the new system was widely supported by the university sector and the profession and has stimulated unprecedented levels of curriculum development in Australian universities.

The purpose of this paper is to share the methodologies and outcomes that led to the new accreditation scheme that was implemented nationally in January 2008 for Accredited Exercise Physiologists in Australia.

Methods

Scoping

The first step in the development of new AEP accreditation criteria was to determine the breadth of existing AEP practice, followed by comparative analyses of university exercise science and allied health programs and their associated professional accreditation schemes and criteria.

Scope of professional practice

To define the range of roles within professional practice for the AEP in Australia, we sought input from stakeholders using focus groups, interviews, surveys and questionnaires. We consulted with representatives from the university sector, industry, existing accredited and non-accredited exercise professionals, the professional association (ESSA) and authorities that administer funding schemes for the provision of clinical exercise services.

Benchmarking

Three benchmarking processes were undertaken: (1) education and professional training pathways for comparable allied health professions in Australia were investigated in terms of scope of practice, university program content, clinical learning models, clinical practicum requirements, criteria for professional membership and registration, and access to compensable schemes for certified practitioners, (2) education and certification schemes operating overseas, particularly those administered by the American College of Sports Medicine (ACSM) and (3) the course content and practicum requirements of existing programs preparing practitioners of clinical science in Australia in sport and exercise science were evaluated. The purpose of the benchmarking exercise was to assess the current capacity and future needs of the university sector in Australia and to provide the minimum standard of education and professional training needed to address the challenges and opportunities of the AEP’s recent entry into allied health.

All the information we collected during the benchmarking process was publicly available from university and other websites, university handbooks and other publicly available sources.
From the information obtained during the scoping stage of this investigation, a preliminary model of accreditation was proposed. Upon achieving this milestone, the development of specific professional criteria for the AEP could commence.

**Development of new AEP accreditation criteria and system**

The authors undertook the development of a new set of accreditation criteria using the following processes: (1) evaluation of the existing accreditation criteria that were designed in the 1990s for clients without pathology or underlying disease, (2) documentation of gaps in these existing criteria, benchmarked to current and emerging scopes of practice, as determined during the scoping phase, (3) development of new accreditation criteria, (4) development of a new system for accreditation, including assessments of applications, (5) analysis of gaps in university curricula that prevailed in Australia with a view to a national approach to developing new core curricula to meet the new standards, and finally (6) widespread dissemination of the new accreditation criteria that involved an iterative system of consultation and review. Dissemination was conducted via two main methods: first, the draft papers were circulated for comment to Heads of Schools of all Australian universities that provided programs or courses in Exercise and Sports Science and second, ESSA circulated the same material to all accredited practitioners.

**Outcomes and Discussion**

**Scope of professional practice**

At least five main areas of professional practice were identified for Accredited Exercise Physiologists: (1) hospital- and clinic-based exercise, including exercise and physical activity interventions for rehabilitation, prevention and risk management, (2) occupational rehabilitation and functional work conditioning, (3) community and population health: service provision and policy development, (4) sports rehabilitation and (5) case management, using exercise and physical activity interventions for compensable clients with chronic medical conditions or injuries. These areas of professional practice are primarily supported by funding models including national or state-based compensation schemes. With the emergence of these funding models, a rapid expansion of vocational opportunities for Accredited Exercise Physiologists in Australia occurred. Medicare Australia statistics provide evidence showing that the number of Exercise Physiology services (MBS Item 10953) has grown from 17,054 in 2006 to 72,067 in 2010. In addition to this growth, since 2006, new opportunities have opened up for AEPs in the provision of services under schemes administered by WorkCover (most states of Australia) and other compensation schemes (e.g., Department of Veterans Affairs) and private health insurers.

Under the AEP accreditation scheme that existed prior to 2008, exercise professionals were required to submit an evidenced-based application covering criteria that were targeted for the provision of services to clients without
pathology or underlying disease. It was apparent during the scoping phase of this investigation that AEPs were routinely providing clinical services across a wide spectrum of clinical populations. AEPs regularly treat clients with multiple pathologies: for example, a patient with a musculoskeletal disorder may also present with cardiovascular or metabolic co-morbidity. The new AEP model reflected a move away from the existing discrete clinical specialisations and progressed towards a generalist clinical exercise practitioner (in the new accreditation scheme) that requires clinical competency across multiple pathologies (Figure 1). Therefore, when the new AEP accreditation scheme commenced in 2008, all clinical ‘specialisations’ were combined into the primary professional qualification, the AEP.

**Benchmarking**

We examined 16 university allied health programs within Australia, comprising all existing programs in physiotherapy (n=8), occupational therapy (n=5) and osteopathy (n=3). All programs assessed had embedded extensive clinical studies and supervised clinical practice during at least two years of the course, and in many instances, all years of the program included clinical practice experiences. The clinical studies and practice of these courses were designed to equip graduates to conduct discipline-specific assessments and diagnoses, provide treatments or management plans, and be able to reflect on and evaluate their own practice and the practice of their peers and their professions generally.

We also examined the certification schemes administered by the American College of Sports Medicine (2009). The ACSM certifies individual practitioners

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**Figure 1:** The certification system for the Accredited Exercise Physiologist (AEP). Previous accreditation system indicates the structure that was in operation prior to 2008; New accreditation system indicates the structure that was deployed by Exercise & Sport Science Australia (ESSA) on the 1 January 2008.
based on performance of candidates at examinations administered by ACSM. Within the Clinical Track, the ACSM certifies the ACSM Exercise Specialist® and the ACSM Registered Accredited Exercise Physiologist®.

In our deliberations on a new model, we considered proposing a universal examination and certification scheme, external to universities and similar to that employed by ACSM. However, a centralised examination system was rejected due to geographical constraints and the stronger capacity of the university sector to deliver education and training compared to the professional association, ESSA. A centrally administered scheme was considered impractical in a nation of approximately 22 million people sparsely distributed across eight states and territories, each with its own administrative structures for the provision and compensation of allied health services. Furthermore, the university sector in Australia is relatively well resourced and has significant expertise to educate and examine students in clinical exercise science. For this reason, it was proposed that there should be a national university accreditation scheme to guide and recognise universities in the development and delivery of programs in this field. This scheme involved the retention and strengthening of the existing National University Course Accreditation Program (NUCAP) developed in partnership with universities and administered by ESSA.

The risk of adverse signs and symptoms during exercise

The new accreditation scheme differentiates between practitioners who are competent to service clients with significant health problems (AEP) and practitioners who have competencies to work with apparently healthy individuals (Exercise Scientist, ES). This has parallels in the ACSM.

In relation to risk, many allied health professions employ a mixture of physically active and passive therapies (e.g., psychology, speech pathology, osteopathy, physiotherapy, occupational therapy). In contrast, exercise physiologists work exclusively in active therapy, often involving vigorous physical activity or exercise at relatively high intensities. Active therapies may expose people living with chronic medical conditions to a range of physical and/or psychosocial risks that need to be managed by the health professional. Furthermore, for some patient groups, exercise carries acknowledged and specific risks. Within this clinical environment, adverse signs and symptoms during exercise may develop within seconds and often warrant immediate clinical reasoning and sometimes urgent action. Alternatively, timely recognition of signs and symptoms by the AEP can be used to safely continue with exercise. Therefore it is critical that the AEP has rapid clinical decision making skills. We provide the following case study as an example. A 77-year-old male with advanced heart failure and a New York Heart Association (NYHA) functional classification 3 was being treated pharmacologically for atrial fibrillation. The patient was self-motivated to participate in exercise. The goals of pharmacotherapy for atrial fibrillation for this client were to reduce the incidence of tachyarrhythmia at rest and during exercise, and to minimise
the risks of thromboembolism. The goal of the existing pharmacotherapy was to limit and blunt the heart rate responses to exercise. Under the supervision of an AEP and referral from a cardiologist, the client underwent a symptom-limited graded exercise test for the assessment of aerobic power. During most of the graded exercise test, the heart rate responses were within normal limits given the expected pathology-drug-exercise load interactions. However, in the final minute of exercise the client suddenly developed atrial flutter causing heart rate to increase from 110 to 150 b/min within 10 seconds. This necessitated rapid recognition of the rhythm by the AEP, cessation of exercise, monitoring for cardiovascular signs and symptoms during an extended recovery period, provision of reassurance to the client and rapid telephone and written communications to the cardiologist. As a result, the cardiologist increased the pharmacotherapy dose, and the client returned to exercise a month later without further incident.

**The efficacy of exercise as a therapeutic intervention**

Prior to the development of the new accreditation criteria, an understanding of the areas that an AEP should work was formalised. These areas were initially informed by the scope of practice; however, the scope of practice of allied health professionals can sometimes be driven by the prevailing funding models rather than objective measures of efficacy. It was therefore decided that more objective criteria were required in the selection of pathologies for inclusion within the AEP certification system. The pathologies for inclusion into the AEP standards needed to satisfy the following two criteria: (1) the pathologies were listed as national health priorities with a prevalence greater than one percent in Australia, and (2) there was an evidence base for exercise efficacy within each pathology classification.

Coronary artery disease, anxiety and depression, Type 2 diabetes, stroke, dementia and lung cancer are the six leading specific causes of burden of disease and injury in Australia, accounting for approximately 900,000 disability-adjusted life years or one-third of the nation’s total disease burden (Australian Institute of Health and Welfare 2008). The Australian Institute of Health and Welfare have listed eight priority areas for health: arthritis and musculoskeletal conditions, asthma, cancer control, cardiovascular health, diabetes mellitus, injury prevention and control, mental health and obesity. These areas therefore formed the primary disease types to be considered within the accreditation framework. Thus, cardiopulmonary, neurological, metabolic, cancers, mental health and musculoskeletal were put forward for inclusion within the AEP certification system. We then assessed the evidence for the efficacy of exercise within each of these nominated pathology areas.

The efficacy of exercise within a specific disease state can be defined on the basis of evidence on the impact on pathogenesis of the disease, its effect on symptoms specific to the disease or the ability to improve quality of life or physical function (Pederson & Saltin 2006). Exercise has been shown to have efficacy in cardiopulmonary-related diseases, such as hypertension, chronic obstructive pulmonary disorder,
coronary heart disease and chronic heart failure (Blair et al. 1995; Fletcher et al. 1996; Haskell et al. 1994; Ishikawa et al. 1999; O’Connor et al. 2009; Pina et al. 2003; Roberts & Barnard 2005; Smart & Marwick 2004; Wing et al. 2007). Metabolic-related disease states, such as Type 2 diabetes, insulin resistance and metabolic syndrome, obesity and dyslipidaemias have also been shown to respond positively to exercise therapy (Dunstan et al. 2002; Leon & Sanchez 2001; Lloyd-Williams, Mair & Leitner 2002; Pan et al. 1997). Neurological-related disease states, including Multiple Sclerosis and Parkinson’s disease, have solid evidence bases of exercise efficacy (Goodwin et al. 2008; Rietberg et al. 2005). Evidence also shows exercise has a beneficial effect with some cancers (breast, prostate and colon) and appears to have a positive effect on cancer-related fatigue (Cramp & Daniel 2008; Knols et al. 2005; Roberts & Barnard 2005). In relation to mental health disease states, exercise appears to have a positive effect on depression (Cramp & Daniel 2008; Lawlor & Hopker 2001; Mead et al. 2009). Finally, musculoskeletal-related disorders, such as osteoporosis, osteoarthritis, fibromyalgia and back pain all have strong evidence bases of exercise efficacy (Bartels et al. 2007; Haskell et al. 1994; Hayden, Van Tulder & Tomlinson 2005; Shea et al. 2004). Thus, the evidence shows that exercise appears to have efficacy for the range of disease states contained within the new AEP certification system. Once this evidence of efficacy was assembled, the specific accreditation criteria that encompassed each of the identified pathology areas were developed.

New accreditation criteria

In developing the new criteria, we described the AEP as a ‘practitioner of clinical exercise science’ who at graduation is able to work at novice practitioner level across all of the major pathologies that improve clinical status, physical function and/or quality of life. Therefore, the framework of the new AEP accreditation criteria was organised to acknowledge both generic (e.g., risk factor stratification, ethics, impact of medical conditions and medical treatments, communication, behaviour counselling) and pathology-specific areas of practice (Figure 2). Organisation of the criteria in this way acknowledges that there is a fundamental skill set that will be used by the AEP irrespective of the specific pathology. Secondly, the schema also recognises that pathology-specific areas of practice may change with time. Thus, should new evidence emerge with regards to the efficacy of exercise or the manner in which exercise as a therapy is applied, the pathology-specific criteria may be modified independently of the generic areas of practice.

New Accreditation model

The introduction of the accreditation scheme was designed as a two phase model spanning 2008–2014. The first phase was to implement a system commencing in 2008 that permitted both university programs and individuals to become accredited. In other words, graduates from universities that have earned National University Course Accreditation Program (NUCAP) certification are automatically entitled to AEP accreditation. In contrast, individuals from non-accredited programs may apply based on their
knowledge and experience in clinical exercise science and practice, and their capacity to support their applications with evidence covering all criteria for AEP accreditation. The first phase has provided time for non-accredited universities to restructure existing programs or develop new ones with the intention of applying for program accreditation at a later date.

The second phase of the model will commence in 2014, after which accreditation of individuals graduating from non-accredited universities will cease. We believe that this will provide greater certainty with respect to minimum standards of clinical exercise practice than continuing with individual applications. These arrangements have precedence in Australia, with all other allied health professions using external course accreditation schemes as the pathway for Australian graduates to enter professions. Furthermore, these arrangements do not preclude new programs from being developed after 2014, but these programs will need to undergo external accreditation before graduates are eligible to practise. After 2014, the only exceptions to these arrangements will be individual practitioners who are returning to work after career interruptions and are able to make the case for accreditation, and suitably qualified applicants from

Figure 2: The schema of knowledge and skills required for accreditation as an Exercise Physiologist (AEP). Within each of the dashed boxes are the broad headings under which there are detailed accreditation criteria. The dashed boxes are classified according to either generic or pathology-specific knowledge and skills. Full details of the accreditation criteria are available on http://www.essa.org.au/?q=node/127
overseas. Local applicants from other (non-exercise) allied health professions (e.g., osteopathy) will need to complete a course of study in an accredited (usually postgraduate) program in order to achieve AEP accreditation.

Finally, by 2014, all universities that provide accredited programs in clinical exercise science and practice will need to provide all the clinical practicum opportunities deemed necessary for AEP accreditation within their programs. In the new system, the requirements for clinical practicum includes at least 360 hours contact with clients with one or more cardiopulmonary, metabolic, musculoskeletal, mental health, cancers and neurological conditions, underpinned by at least 140 hours of practice with apparently healthy clients. Thus a total of at least 500 hours is required for certification under the new scheme.

**Current and future capacities**

In 2006, there were just three Australian universities holding accreditation for AEP courses. At the end of 2010, there were a further six universities who had submitted accreditation applications, and up to a further eight universities have expressed an intention to submit their applications.

![Figure 3: Historical changes in professional membership numbers with the Exercise & Sport Science Australia (ESSA). AEP (Accredited Exercise Physiologist) and Full Member represent professional membership categories within ESSA. The AEP is a specialist member accreditation for those working in clinical settings who have satisfactorily met the AEP exercise physiology criteria. Full Membership is obtained upon completion of a three or four year exercise or sports science degree that has met the exercise and sport science accreditation criteria. Medicare Australia is an Australian government agency that runs a number of programs that assist in improving health outcomes in Australia. Medicare announcement denotes the declaration that exercise science services would be included within the Medicare Benefits Schedule. Medicare commencement (1 January 2006) denotes the formal instigation of exercise science service provision under the Medicare Benefits Schedule (http://www9.health.gov.au/mbs/search.cfm?q=exercise+physiology&sopt=S).](image-url)
applications before 2014. This makes a total of 17 universities who have or intend to apply for accreditation. In all cases, curriculum renewal was or is being undertaken as part of the accreditation process. This significant growth in interest of institutions to provide certified AEP programs is mirrored by the rapid growth in AEP numbers from 2003 (275) to August 2010 (1,516), representing a 451% increase in accredited membership (Figure 3). A large portion of the growth occurred concurrently with the listing of AEP services on the Medicare Health Benefit Schedule, resulting in a rapid expansion of vocational opportunities for AEPs. Currently, the dominant pathway for entry to AEP accreditation is via individual applications. As the second phase proceeds, new AEPs will come predominantly and then exclusively from the pool of graduates of accredited programs.

The new AEP accreditation criteria introduced in 2008 significantly modified the core knowledge, skills and clinical experience required for certification. The introduction of the new model for AEP accreditation has stimulated a significant increase in curriculum renewal within Australian universities. This current level of activity in program development, we believe, is unprecedented and should lead to higher standards for the exercise professions. However, it appears that the most significant challenge faced by universities is not from a curriculum development perspective but involves the provision of sufficient student clinical placements to satisfy the new AEP certification requirements. This challenge is not unique within the allied health professions. The new AEP criteria significantly increased the minimum number and mix of clinical practicum hours required. The previous AEP accreditation system required 300 hours of non-clinical experience; this was increased to 500 hours, a 66% increase, with 360 of these being in clinical exercise practice. To meet this challenge, some universities will need to negotiate and secure clinical placement agreements with external service providers or alternatively develop in-house on campus clinical facilities with the primary purpose of providing high quality clinical practicum experiences.

Summary and Conclusions

In response to the breakthrough in 2006 allowing entry of the AEP into the national taxpayer-funded universal health system to provide clinical exercise services, a new accreditation system for the AEP was developed, comprising a set of generic criteria and sets of pathology-specific criteria in the areas of cardiopulmonary, metabolic, musculoskeletal, mental health, cancers and neurological practice. In addition, new clinical practicum requirements were introduced. The new system was endorsed by the university sector and the professional association, Exercise & Sports Science Australia (ESSA), and implemented nationally on 1 January 2008. This now forms the benchmark in clinical exercise practice in Australia.

Beyond 2014, the primary pathway for AEP accreditation, and therefore clinical exercise science practice in Australia, will be via AEP-certified university courses and programs. We believe that these new arrangements will produce the satisfactory minimum
standards of practice needed for safe and effective clinical exercise practice and produce useful and sustainable benefits for clients, practitioners and the taxpayers of Australia.

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Medicare Benefits Schedule - Note M3.4.


