

outcomes in patients with acute exacerbations of chronic obstructive pulmonary disease. More recently the technique has been proposed for several other applications including facilitation of weaning, management of post-extubation respiratory failure, acute lung injury and as a ceiling intervention for those deemed unsuitable for intubation. Key aspects of using non-invasive ventilation effectively include identifying candidates who are most likely to derive benefit from this technique and minimising delays in implementing alternative approaches to care should the patient fail to respond to therapy. A major reason for non-invasive ventilation failure is an impaired ability to clear secretions effectively. Physiotherapists therefore have an important role to play in the management of these patients, identifying early those individuals not responding appropriately to treatment. Current evidence suggests that clinicians generally have a limited knowledge of the published evidence regarding indications for and outcomes with non-invasive ventilation. Low utilisation of this technique in the acute setting for patients appearing to meet the criteria for non-invasive ventilation has been attributed to this lack of knowledge. Consequently, health professionals involved in the respiratory care of patients using non-invasive ventilation need to appreciate the benefits, risks and consequences associated with this non-invasive approach to managing acute respiratory failure.

### Cardiac rehabilitation: moving forward

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Coronary patients who favourably modify their risk factors, take cardioprotective pharmacotherapy and attend cardiac rehabilitation substantially lower the risk of a recurrent event or death. However, traditional cardiac rehabilitation programs are not utilised by the majority of eligible patients and the potential benefits are not maintained in the long-term. Contemporary secondary prevention programs involving new approaches have emerged as researchers and clinicians aim to narrow the evidence-practice gap. These programs incorporate combinations of clinic/home visitations, community services, and home programs often accompanied by phone support offer flexible and individualised approaches to managing the underlying disease long term. Recent systematic reviews of ongoing prevention measures in coronary patients have found significant reduction in mortality for all models (exercise-only, exercise and education, education-only), and that shorter duration programs (< 10 hours) and those delivered in general practice were as effective as those delivered through cardiac rehabilitation programs. Accordingly, there is resounding evidence to support a change in managing coronary disease risk. Therefore, best practice is evolving toward a model of care which is selected based on appropriateness for each patient considering their clinical history, personal preferences/circumstances, cultural values and the available resources. A generic framework is currently being developed for translation into Australian clinical practice to provide health professionals, managers and policy makers with practical information about how secondary prevention evidence can be integrated into a unified yet flexible framework based on contemporary evidence.

### Implementing scientific evidence into clinical practice

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The workshop will be conducted by two physiotherapists, both of whom are NHMRC-NICS Fellows. This workshop will focus on key principles underpinning evidence-based practice and its application into clinical practice. Participants will gain an understanding and overview of evidence-based practice and consequently the increasing drivers for implementing evidence into clinical practice. The workshop will introduce the 'science' underpinning evidence implementation and achieving change in health care. This workshop will also focus on barriers and enablers commonly encountered in clinical settings when implementing evidence into clinical practice. Participants will be provided with opportunities to reflect on evidence implementation issues in their own practice settings and embrace practical strategies to embed research evidence into clinical practice and achieve successful knowledge transfer. The workshop will also highlight free, widely available tools which can be utilised by health care practitioners in their efforts to implement evidence into clinical practice.

### Does physiotherapy reduce the incidence of postoperative pulmonary complications in patients following pulmonary resection via thoracotomy? A randomised controlled trial

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Postoperative pulmonary complications are an important cause of morbidity following thoracotomy and physiotherapy interventions are commonly provided with the aim of preventing and treating these. This study aimed to determine if prophylactic postoperative respiratory physiotherapy reduced the incidence of postoperative pulmonary complications and decreased length of stay in patients following open pulmonary resection. Seventy-six patients undergoing elective thoracotomy were randomised to a treatment group (n = 42) or a control group (n = 34). Treatment group participants received daily respiratory physiotherapy interventions until discharge. Control group participants received no physiotherapy interventions. Both groups received standard medical/nursing care involving a clinical pathway. Postoperative pulmonary complication data were recorded daily throughout hospitalisation by a physiotherapist blinded to group allocation using a diagnostic tool previously described. There was no significant difference between groups in baseline demographic data or in surgical interventions. Overall incidence of postoperative pulmonary complications was 3.9% (n = 3) and there was no significant difference between the incidence of postoperative pulmonary complications in the Treatment and Control group ( $p = 1.00$ , absolute risk reduction -0.02, 95% CI-0.13 to 0.11). No significant difference was found between groups for LOS ( $p = 0.87$ ), with the median (interquartile range) length of stay for the Treatment group 6.0 (4.0) and the Control group 6.0 (1.0) days. Given the low incidence of postoperative pulmonary complications, these

results suggest that prophylactic postoperative respiratory physiotherapy may not be required in addition to standard care involving a clinical pathway following open pulmonary resection.

### Recent developments in respiratory physiotherapy management of children with neuromuscular disease at Sydney Children's Hospital

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Respiratory complications are a common cause of morbidity and mortality in children with neuromuscular disease. They have weakness of the muscles of respiration causing them to breathe at reduced lung volumes. This places them at risk of developing atelectasis and retaining secretions making them vulnerable to developing pneumonia. In 2008 respiratory physiotherapy management of this patient group at Sydney Children's Hospital was identified as a service lacking in resources and needing development. Following a literature review, including recommendations by the American Thoracic Society and clinical experts in this field, a working party within Sydney Children's Hospital physiotherapy department was established to develop respiratory physiotherapy services. This working party has successfully introduced a number of new resources and therapies. Now, in addition to a neurology physiotherapist, a respiratory physiotherapist also reviews children who attend outpatient neuromuscular clinics on a needs basis. A cough assist machine was purchased and is used to treat inpatients and outpatients who present with an acute respiratory illness. During neuromuscular clinics, children are educated about, and practice using, the cough assist machine so they are familiar with it. The deep breathing bag was introduced into neuromuscular clinics and is given out to children to be used as part of their home management program. Information handouts about the deep breathing bag and manual assisted coughing have been published and are distributed to patients. Future plans are to evaluate the efficacy of introducing these new resources and therapies. Via the process of evaluating service delivery and instituting recommended changes, Sydney Children's Hospital aims to offer an improved quality of patient care, which is closer to current best practice, to children with neuromuscular disease.

### Evaluation of a phase one cardiac rehabilitation exercise program

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Phase two cardiac rehabilitation has been shown to reduce mortality rates in attendees, however program uptake has been consistently low. This pilot study evaluated the effect of a new phase one cardiac rehabilitation exercise program titled 'First Steps on physical function, quality of life and attendance at phase two cardiac rehabilitation'. The *First Steps* program was a single session exercise and education class conducted by a multidisciplinary team within an acute cardiac care unit. Thirty-one participants were randomised to an intervention (n = 19) or a control group (n = 12). All participants received standard ward care, comprising education about cardiovascular disease and cardiac risk factors. The intervention group also attended *First Steps*.

Outcome measures the SF12 and MacNew quality of life questionnaires, the self administered physical activity questionnaire, the DeMorton Mobility Index and the cardiac two minute walk test, a novel test used as an indicator of sub maximal endurance in gait were taken at baseline and three week follow up by a blinded assessor. Attendance at phase two cardiac rehabilitation was recorded at four weeks. A higher proportion of intervention group participants (79%) attended phase two cardiac rehabilitation than control group participants (25%;  $p = 0.006$ ). Physical function and general health domains of the SF12 ( $p = 0.004$  and  $0.05$  respectively) also increased significantly in favour of the intervention group. *First Steps* may have an important role to play in acute cardiac rehabilitation and should be the subject of larger investigation in future.

### Functional outcomes after pulmonary endarterectomy

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Chronic thrombo-embolic pulmonary hypertension (CTEPH) is caused by unresolved or recurrent pulmonary embolism. Pulmonary endarterectomy (PEA) offers potential surgical cure and long-term survival. The aim was to evaluate outcomes of patients following PEA at a tertiary referral hospital. Patients received a standard physiotherapy directed inpatient rehabilitation program following PEA surgery. At discharge patients were given a home-based exercise program which was escalated according to clinical progress during outpatient follow-up. Outcome measurements of New York Heart Association functional class (NYHA-FC), six-minute walk test distance (6MWD), echocardiography parameters and mortality from June 2004 to April 2007 were analysed. Twenty-six patients (17 females) of mean age  $55 \pm 15$  years (range 20–77) underwent PEA. Pre-operatively, 27% were NYHA-FC II, 46% class III and 27% class IV. Three month mortality was 3% and 1-year survival 96%. By 3 months, all patients improved one or more NYHA-FC to 82% class I, 14% class II and 4% class III. At 3 and 6 months respectively, there was significant improvement compared to baseline in 6MWD-mean  $390 \pm 126\text{m}$  vs  $555 \pm 102\text{m}$  ( $p < 0.001$ ) vs  $520 \pm 90\text{m}$  ( $p < 0.001$ ). Furthermore there was a reduction in right ventricular systolic pressure from  $80 \pm 30\text{mmHg}$  to  $37 \pm 21\text{mmHg}$  ( $p < 0.001$ ),  $44 \pm 19\text{mmHg}$  ( $p = 0.001$ ). After PEA, cardiopulmonary function recovery is excellent in most patients. This study demonstrates that 6MWT and echocardiogram are useful tools in the functional evaluation of patients affected by CTEPH and submitted to PEA.

### Development of objective physiotherapy assessment domains for intensive care unit electronic charts

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The Intensive Care Unit at St Vincent's Hospital, Melbourne, adopted a comprehensive electronic medical record in 1994; the first unit in Victoria to do so. Physiotherapy involvement in such systems has been limited to date, due to system limitations and difficulty accurately adapting physiotherapy assessment and treatment documentation to