

# Implementation of a protocol facilitates evidence-based physiotherapy practice in intensive care units

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## Abstract

**Objectives** To compare the physiotherapy service provided when therapists' decisions are guided by an evidence-based protocol with usual care (i.e. patient management based on therapists' clinical decisions).

**Design** Exploratory, controlled, pragmatic sequential time block clinical trial.

**Setting** Level 3 surgical unit in a tertiary hospital in South Africa.

**Participants** All patients admitted consecutively to the surgical unit over a 3-month period were allocated to usual or protocol care based on date of admission.

**Interventions** Usual care was provided by clinicians from the hospital department, and non-specialised physiotherapists were appointed as locum tenens to provide evidence-based protocol care.

**Main outcome measures** Patient waiting time, frequency of treatment sessions, tasks performed and adverse events.

**Results** During protocol-care periods, treatment sessions were provided more frequently ( $P < 0.001$ ) and with a shorter waiting period ( $P < 0.001$ ). It was more likely for a rehabilitation management option to be included in a treatment session during protocol-care periods (odds ratio 2.34, 95% confidence interval 1.66 to 3.43;  $P < 0.001$ ). No difference in the risk of an adverse event was found between protocol-care and usual-care periods ( $P = 0.34$ ).

**Conclusions** Physiotherapy services provided in intensive care units (ICUs) when the decisions of non-specialised therapists are guided by an evidence-based protocol are safe, differ from usual care, and reflect international consensus on current best evidence for physiotherapy in ICUs. Non-specialised therapists can use this protocol to provide evidence-based physiotherapy services to their patients. Future trials are needed to establish whether or not this will improve patient outcome.

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**Keywords:** Evidence-based practice; Protocol; Physiotherapy; Critical care; Intensive care unit

## Introduction

Patient care in intensive care units (ICUs) is expensive; opponents have argued that a disproportionate amount of the available resources is used in the management of a select few patients [1]. As such, optimising the delivery of therapies known to be effective, rather than developing new therapies, has become a research focus [2]. While there is sufficient evidence for physiotherapy interventions used in ICUs [3], there is an urgent need to determine the optimal service delivery model. This is reflected by the variable physiotherapy

practices noted between countries, regions and individual units [3–6]. Physiotherapy practice varies in the availability of therapists to the ICU and tasks performed. Unit location and size; staffing levels, expertise and educational profile; and intensivists' perceptions and referral attitudes have been identified as factors influencing physiotherapy activity in ICUs [7]. Adherence to recommended physiotherapy staffing levels [8] is rare. One-quarter of European ICUs [5] and 80% of Australian ICUs [6] surveyed reported that they did not have a dedicated physiotherapist.

Variations in practice in other areas of ICU care are linked to less than optimal patient outcomes and increased cost [9]. Development and implementation of protocols based on best-available evidence are advocated to address this variation [10], facilitate clinical decision making [11,12], and

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optimise the use of evidence by practitioners [12,13]. Finding ways to align bedside decisions with best-available evidence is driven, in part, by the lack of specialised therapists involved in physiotherapy service provision in ICUs [5]. This is recognised as a reason for variations in practice [5]. To the authors' knowledge, there are no standards regulating physiotherapists' work in ICUs, although standards have been developed to regulate the qualifications of physicians and nurses working in this environment [14], resulting in improved patient outcome [15,16]. In the absence of regulation of qualifications of therapists working in ICU, the use of a validated evidence-based protocol to guide the clinical decision making of non-specialised therapists could be a novel approach to ensure the application of best practice in ICUs. This could standardise care which, in turn, could facilitate patient outcome and decrease cost. While some regard protocols as essential for improved patient outcome, the use of protocols within ICUs has been regarded with some scepticism in the medical community. The concern is that the use of protocols may reduce the quality of care by replacing clinical judgement, thereby breeding complacency or stifling learning [10]. It is argued that thorough application and adaptation of an intervention to patients' moment-to-moment needs cannot be captured in a simple checklist of algorithmic pathways, and that case-targeted, individualised treatment is more effective and safer [17].

#### *Preliminary work*

This work forms part of a larger trial which compared the impact of protocol care with usual care on selected patient outcomes. The standard of usual care is important when comparing its impact with that of protocol care [18]. The implementation of a sedation protocol resulted in a significant reduction in ventilation time among patients admitted to a North American ICU. However, less positive outcomes were documented when the same protocol was implemented in a before–after study in an Australian ICU [18]. The authors speculated that the standard of care before implementation in the Australian ICU was already based on best practice.

The aim of this study was to describe and compare the physiotherapy service provided in a surgical ICU when therapists' decisions are guided by an evidence-based protocol with the usual care provided. The objectives were: (1) to compare the availability of physiotherapists in the ICU during the two periods; (2) to compare the frequency of physiotherapy interventions; (3) to compare the time from ICU admission to patient assessment; (4) to compare the activities recorded in the two periods; and (5) to describe adverse events. In addition, this report could facilitate external and internal trial validity when patient outcomes are described in future papers.

## **Methods**

An exploratory, controlled, pragmatic sequential time block clinical trial was conducted between November 2008

and February 2009 in the surgical ICU of a tertiary hospital (1352 beds) in South Africa. Two 6-week trial periods were divided into four 3-week condition periods (usual care or protocol care; Table A, see supplementary online material). Each trial period was followed by a washout period.

#### *Research setting*

The study was performed in a 10-bedded Level 3 closed unit. The staff were: unit director, nursing director, nurses (nurse:patient ratio 1:1.7) [20], on-call dietician and permanent medical technician.

Ethical approval was received from the Institutional Research Ethics Committee (Project Number 2003/055/N). Existing physiotherapy procedures were delivered using two different physiotherapy service models. No new experimental procedures were introduced. Standard measures for identification and management of adverse events as a result of physiotherapy interventions were in place. Proxy consent was obtained from the Superintendent of the tertiary hospital for all patients admitted to the ICU during the trial period, with approval of the Institutional Research Ethics Committee [19].

#### *Research team*

The primary investigator ensured protocol standardisation. Four non-specialised physiotherapists were recruited as research therapists, and appointed as locum tenens to the ICU for the duration of the trial [27]; they provided protocol care. Two ICU specialised nursing practitioners were appointed as data assistants to extract baseline data from existing documentation systems.

#### *Convenience sample*

All patients admitted consecutively to the ICU over two trial periods (1 November 2008 to 12 December 2008 and 5 January to 15 February 2009) were included. Patients were excluded if they were less than 16 years of age, or already present in the ICU on 1 November 2008 or 5 January 2009. The type of care provided was based on ICU admission date (Table A, see supplementary online material).

#### *Protocol development*

A conceptual framework was developed from information synthesised from two observational baseline studies [20,21] (Fig. 1). Eight subject areas were identified based on unit prevalence. Through a systematic literature review, a concept protocol consisting of five clinical management algorithms was developed ([http://www0.sun.ac.za/Physiotherapy\\_ICU\\_algorithm/](http://www0.sun.ac.za/Physiotherapy_ICU_algorithm/)). This protocol was then presented to an international, multidisciplinary Delphi panel of experts [22–24]. The validated algorithms were combined into a flowchart (Fig. A, see supplementary online material).

Usual care was provided by the hospital physiotherapy department. The department offered an intermittent non-referral service to the ICU. The one therapist allocated to the

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