

SPECIAL REPORT

EUROPEAN UNION OF MEDICAL SPECIALISTS (UEMS) SECTION OF PHYSICAL & REHABILITATION MEDICINE: A POSITION PAPER ON PHYSICAL AND REHABILITATION MEDICINE IN ACUTE SETTINGS

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Physical and rehabilitation medicine (PRM) specialists have an important role in the clinical care of patients during the acute phase of a disabling health condition. This phase is defined as once definitive care or resuscitation has taken place and a patient's need to stay in hospital as an inpatient is primarily for PRM services for rehabilitation. This paper describes 4 options for the delivery of services for people, who continue to require to be inpatients and who will benefit from PRM interventions. These are described, along with their clear benefits during the acute phase of a health condition. The first 2 models are the most effective in making best use of the acute facilities and PRM services. The benefits of dedicated PRM beds appear to outweigh those of the other options and may be cheaper, although no cost-effectiveness studies comparing the first 2 options have yet been undertaken. Prospective trials are required to show this benefit, and a number of examples need to be set up to pilot this in order to provide realistic cost-effectiveness data.

Key words: Europe; acute disease; PRM programme development; hospital administration; organisational objectives.

J Rehabil Med 2010; 42: 417–424

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Submitted December 10, 2009; accepted March 29, 2010

INTRODUCTION

Every medical specialty has to define its field of competence (1). The specialty's character, as well as the role, competence and skills of physical and rehabilitation medicine (PRM) specialists is described in the *White Book on Physical and Rehabilitation Medicine in Europe* (2) (*White book*). Recently, the Professional Practice Committee of the Union Européenne des Médecins Spécialistes (European Union of Medical Specialists; UEMS)-PRM-Section has published a conceptual description of the field, based on the model of the International Classification of Functioning, Disability and Health (ICF) (3) and the International Classification of Diseases (4) and other

papers (5). In addition, further data has been given in European Union papers (6, 7).

The definition of acute rehabilitation for the purposes of this paper is the process of rehabilitative treatment that occurs within the first month of injury or illness. This paper refers to the involvement of rehabilitation teams led by a PRM specialist. It is hospital-based and primarily differs from post-acute rehabilitation by virtue of time and by the interaction of the professionals' involvement. Patients enter a programme of goal-oriented multidisciplinary rehabilitation under the responsibility of a PRM specialist. This differs from post-acute PRM programmes, when they may still be in hospital, but are, by this time, usually treated in stand-alone rehabilitation facilities or in PRM departments as ambulatory patients.

Defining the concepts is important, and these definitions reflect those given in the *White Book* (2) (Fig. 1). PRM in acute settings (hereafter called acute or early PRM) is an activity under the clinical responsibility of a specialist in PRM. It delivers a programme of specialist medical rehabilitation for patients during an acute hospital admission following injury, illness or in response to complex medical treatment or its complications. PRM programmes also include the contribution to patient care from the whole of the PRM multi-professional team, with whom PRM specialists work closely, as well, of course, in acute settings, of the other relevant medical and surgical specialties. The members of the team and their roles are described in Section 4.1 and Fig. 5 of the *White Book* (2) and will not be repeated here.

Fig. 1. Definitions of rehabilitation by WHO and by UEMS EBPRM

The World Health Organization's (WHO) definition of rehabilitation is: "The use of all means aimed at reducing the impact of disabling and handicapping conditions and at enabling people with disabilities to achieve optimal social integration".

The definition of PRM by the Union Européenne des Médecins Spécialistes (European Union of Medical Specialists) (UEMS) Section of PRM is "an independent medical specialty concerned with the promotion of physical and cognitive functioning, activities (including behaviour), participation (including quality of life) and modifying personal and environmental factors. It is thus responsible for the prevention, diagnosis, treatments and rehabilitation management of people with disabling medical conditions and co-morbidity across all ages."

There is a need for hospitals to consider a transfer to early rehabilitation in order to achieve shorter inpatient stays. In reality, once definitive care or resuscitation has taken place and a patient's inpatient stay in hospital is primarily for rehabilitation, dedicating facilities, including beds, for this purpose will bear fruit to meet healthcare priorities. However, the situation is sometimes unpredictable and definitive surgical and other specialized medical care and medical rehabilitation overlap. Functional treatment and acute interventions may be required together at the same time because a patient's medical condition may not yet be stable. This, therefore, identifies the need for providing facilities for PRM programmes in acute settings.

Why should this be under a PRM doctor as opposed to continuing under the acute physician or surgeon or even through a therapist- or nurse-led activity? The reasons are explained in the *White Book* (2). Specialists in PRM have the knowledge and expertise, based on their broad and comprehensive training, as well as the time and resource through their team links to deliver high-quality services, which benefit the patient and his or her family, the provider unit by ensuring an efficient process of care, and health service economics and society at large by promoting the individual's participation in society.

The point of entry to an acute PRM programme is defined as when the priority (or the over-riding emphasis) of care has moved from the definitive acute treatment to one of rehabilitation. Multidisciplinary treatment, interdisciplinary cooperation and good liaison are very important, but it is at this point that the specialist in PRM takes the lead for clinical care.

To clarify the situation for a pan-European readership, it should be noted that, in many countries, the physiotherapy professions providing rehabilitative treatments to many patients under the clinical care of acute medical and surgical specialties are anyway centrally directed by PRM specialists and departments. The activity described below is over and above that.

MODELS

Rehabilitation is provided to patients at a number of levels, as described in the *White Book* (2), but there is a hierarchy of interventions depending on the complexity of patients' problems and functioning and the need for intervention. To many, this will be a single therapeutic intervention by a therapist, whereas other patients will require more specialized attention, such as gait retraining, continence management, etc. PRM in acute settings is characterized by the need for a multi-professional approach to the management and promotion of physical and cognitive functioning, activities (including behaviour), participation (including quality of life) and modifying personal and environmental factors (1, 2). It applies and integrates the biomedical and engineering approach to capitalize on a person's capacity through an approach that builds on and strengthens the resources of the person, provides for a facilitating environment and develops the person's performance in interacting with the environment. This includes the diagnosis and treatment of health conditions (3, 4). It is different from the work of other physicians in acute settings, and can thus be delivered in several ways, for example:

- Transfer of patients to PRM beds in the acute hospital (acute rehabilitation unit (ARU)).
- Establishment of a mobile visiting PRM team under the responsibility of a specialist in PRM, while the patient remains in the referring specialist's bed (acute rehabilitation team (ART)).
- Daily visits to the acute wards by specialists from a stand-alone PRM facility.
- Establishment of facilities in PRM centres to take patients very early to start their PRM programme.

A combination of these is required for most situations with the use of a mobile PRM team intervention for patients in the intensive care unit and a subsequent transfer to an acute PRM bed.

Acute PRM beds (Table I)

The advantages of acute PRM beds are that the PRM team (and, in particular, the nursing and therapist staff) can develop the required PRM philosophy under the direction of the PRM specialist, which changes the emphasis of care from acute medical treatment to one concerned with individual functioning within the framework of both the ICD and ICF. This may promote a change from providing direct care to encouraging and facilitating patients to take charge of their own activities. An adequately staffed PRM facility is vital for this to be successful (see below) and good interaction should exist between it and other rehabilitation settings, where further rehabilitation can occur. Discharge would be fast-tracked to other PRM or rehabilitation services for further rehabilitation, to the patient's home whenever possible, to nursing homes (skilled care facilities) and to acute care facilities (in the event of a post-acute complication or illness, as more dependent and sick patients are discharged earlier from acute wards).

Mobile visiting PRM team (Table I)

A mobile team, which reports to a PRM specialist, is able to advise on setting up PRM programmes and preventing complications in the acute facility until such time as the patient can move to the PRM department for further inpatient or outpatient (ambulatory) rehabilitation, as required. This is particularly important where PRM beds do not exist in an acute hospital. The PRM specialist needs to be an integral part of the team and good collaboration is required with referring specialists and with their own clinical teams, who will implement the PRM plan. The problems to be addressed are mostly at the impairment level, with the aim of improving personal functioning. This is particularly relevant, when patients may not yet have the stamina to attend sufficient outpatient therapy from home. Patients may often be unsafe to be discharged home and may anyway need to be in hospital for further acute treatment of the underlying condition, e.g. dialysis.

Daily visits to acute wards by PRM specialists (Table I)

This is possible where the acute hospital cannot include facilities for the PRM service. The advantages are a closer link between PRM specialists and the medical teams in the acute

facility, who also learn exactly what their PRM specialists can and cannot undertake. This is the type of arrangement that could exist where community hospitals admit patients acutely and general practitioners (GPs) and general physicians need to seek the advice of PRM specialists. They will not have the facility to dedicate beds for specialist rehabilitation, and the visit from a PRM specialist will also be valuable in working with community therapists to further the patient's care. The disadvantages of this model of care are that the PRM specialist spends a considerable amount of the working day travelling between the two and cannot really control the quality and exact content of the rehabilitation programme in the acute ward. Although the PRM can produce the required rehabilitation plan for the patient, there needs to be sufficient training and competence amongst those delivering it to ensure that optimal standards exist. A disadvantage of this model is that other members of the PRM team are not involved in developing and delivering the PRM plan.

Establishing acute PRM centres (Table I)

Some centres, particularly in large university hospitals, already fulfil this activity, but they usually extend their role until the

patient is able to go home and most do not have strict limitations to the duration of inpatient stays. Setting up new facilities may not be so valuable, as they would duplicate what can be done in acute general hospitals with PRM beds. Taking all the patients referred would never be possible in an acute PRM facility unless the latter was limited to certain strict entry criteria. The dilemma would then be what one would do with those excluded patients.

The acute rehabilitation unit, where acute PRM beds are established in an acute hospital, provides the most comprehensive and preferred option. There will be pressure on these beds and a number of permutations may have to be considered. They may take the form of dedicated facilities in a local hospital for one particular or frequently occurring pathology, e.g. post-hip arthroplasty, stroke, or be grouped at a regional centre for less common or more complex conditions. These units will need to be in close proximity to acute care specialty's facilities and clear care pathways and service networks need to be established for both the transfer of patients into the acute PRM beds and the return of patients to the acute specialty's beds, if a complication occurs. An example of this would be the transfer of a traumatic brain injury patient with increased intracranial pressure back to the care of the neurosurgeons for the fitting of a ventriculo-peritoneal shunt.

Table I. *Models of acute physical and rehabilitation medicine (PRM) activities*

Establishment	Activity	Advantages	Limitations
PRM beds in acute hospital (acute inpatient specialized team)	Transfer of patients to PRM beds within acute hospital	Rapid change to PRM clinical activity Early rehabilitation principles under the charge of a trained specialist in PRM Capitalize on the expertise, time and resource of PRM team Requires adequate number of dedicated staff	Limited numbers of beds and, therefore, of patients taken Potential for bed-blocking – need to wait to transfer patients out to either home or rehabilitation facility Need to protect against transfer of inappropriate patients Difficulties if staff numbers inadequate
Mobile PRM team (acute PRM liaison team)	A PRM team working solely within acute hospital visits patients under care of other specialists	Possible to consult on larger numbers of patients with wider range of conditions Good liaison between team and staff on acute wards	No clinical control – patients under care of other specialists Treating nurses and therapists not within PRM team Least specialized format for acute PRM Does not often address participation issues
PRM consultation to acute wards	A PRM specialist from stand-alone PRM centre visits patients under care of other specialists	Possible to consult on larger numbers of patients with wider range of conditions Closer links between PRM and acute specialists	to clinical control – patients under care of other specialists Treating nurses and therapists not within PRM team Time and expense to be effective; need to be on site
Acute PRM centre	Rapid transfer of patients to fast-track facility in stand-alone PRM centre	Patient exposed to the total PRM team and facilities at an early stage PRM specialist competence in treating acute conditions	Patients must be medically stable Patients may be transferred back in case of deterioration Little contact between PRM team and acute specialists Little or no service for patients not transferred

Acute PRM beds are likely to be seen in larger and academic centres, but may not be possible in smaller facilities. Service planners may have to consider one of the other options above, which will work nonetheless, but will in some cases not provide patients access to the range of PRM services so early in their care. This paper therefore focuses on the advantages of acute PRM beds; the other 3 models will be described in more detail in subsequent papers.

WHO REQUIRES AN ACUTE INPATIENT PRM PROGRAMME?

Some countries (particularly Italy and the UK) have produced and published standards criteria for inpatient rehabilitation (8–10). Patients requiring these facilities at the start of their rehabilitation programmes are likely to include:

- Patients, who require 24 h nursing and medical supervision for their rehabilitative needs.

Table II. *Typical conditions presenting to acute physical and rehabilitation medicine (PRM) programmes*

System	Condition
Neurological	Traumatic brain injury
	Stroke, including subarachnoid haemorrhage
	Global brain injury (e.g. post-cardiac arrest, near-drowning)
	Post-neurosurgery, e.g. for hydrocephalus
	Acute flare of multiple sclerosis
	Spinal cord injury following trauma, intervertebral disc prolapse, transverse myelitis
	Cerebral and spinal cord infection
Musculoskeletal	Joint replacement surgery, particularly hip arthroplasty
	Spinal surgery
	Limb amputation
	Limb and truncal trauma
	Intervertebral disc prolapse
	Heterotopic ossification
	Post-traumatic compartment syndromes
Cardiovascular	Arterial occlusion
	Acute coronary syndromes, incl. myocardial infarction
	Others
Respiratory	Acute exacerbation of asthma and chronic obstructive pulmonary disease
	Pneumonia
	Pneumothorax and haemopneumothorax
Post-surgery and trauma complications	Infection
	Haemorrhage
	Venous thrombosis and pulmonary embolus
	Pressure sores
	Bowel perforation
Cancer	Burns, tissue loss and skin graft difficulties
	Cancer surgery and chemotherapy
	Bone marrow transplantation
Organ transplantation	Heart and lung
	Liver
	Kidney

- Patients with neurological and musculoskeletal disorders, who have the capacity for, require and who will benefit from rehabilitation, i.e. patients in whom the evidence shows that active intervention improves function, life satisfaction or prevents deterioration.
- Severely disabled patients whose needs can only be met by a multi-professional team practising inter-disciplinary rehabilitation.
- Patients with complex needs, i.e. requiring more than 2 professionals working in a team.
- Some very severely disabled patients with little hope of improvement in personal functioning, but who require assessment and appropriate equipment and whose families require education for caring purposes.

This has also been addressed by the UEMS Section Clinical Affairs Committee in describing the quality of care of PRM services (11–12).

DIAGNOSTIC CATEGORIES

Acute PRM is concerned with any condition producing complex disabling problems or an acute event in a person with an established disability. Table II gives a range of conditions, which PRM specialists may include in acute PRM programmes (2). An acute PRM service would need to define its area of working according to demand and would have specific admission criteria for its particular area of expertise and the demand created by the range of other services with which it works.

ACTIVITIES

The emphasis is on:

- Providing rehabilitation therapy for patients with complex problems requiring an input from at least 3 disciplines of a multi-professional team.
- Preventing preventable complications and providing treatment for them, should they occur.
- Informing and educating patients and their families/carers on their contribution to their rehabilitation, on living with a disability and on adaptations to their personal and environmental situation.
- Providing a triage for further definitive PRM and other rehabilitation programmes, which may prevent the need for further health interventions.
- Educating acute care staff on the practicalities and principles of PRM treatment.

Clinicians in acute PRM will develop a PRM plan together with their patients. They identify the problems and seek to establish a long-term solution. As a result, they also need to determine what can be carried out in acute PRM programmes,

what should be achieved in further inpatient PRM settings, and what can best be achieved in outpatient (ambulatory) or community settings. An important function during the acute phase is the education of family members, who may become care-givers for the first time.

STAFFING

The staff serving an acute PRM unit should reflect those seen in other areas of PRM. This would also be governed by the kinds of patients admitted and by the care pathways and priorities for discharge. An inpatient unit would be composed of doctors, therapists (physiotherapist, occupational therapist, speech and language therapist), nurses, clinical psychologists, a resettlement officer and a social worker.

The workforce establishment in UK units is very low when benchmarked against national and international standards, but is targeted at the following level for each 25 inpatient beds (13):

- 2.0 whole time equivalent (WTE) trained specialists in PRM, plus 1 trainee in PRM
- 5.0 WTE qualified physiotherapists, plus students
- 5.0 WTE qualified occupational therapists, plus students
- 1.5 WTE qualified speech and language therapists
- 2.0 WTE clinical psychologists
- 3.0 WTE nursing staff of variable qualifications
- 1.0 WTE resettlement officer
- 0.5 WTE social worker
- In addition, 1.0 WTE brain injury coordinator or rehabilitation coordinator, depending on the work of the unit.

JUSTIFICATION FOR ACUTE PRM INTERVENTIONS

There is sufficient evidence in the literature to support the concept of inpatient PRM facilities.

The role of the specialist in PRM is to provide medical interventions for the patient's presenting medical and functional problems and to coordinate the activities of the members of the PRM team, with whom he or she works, after making a comprehensive assessment of functioning (a "functional diagnosis") and establishing or confirming a medical diagnosis (14, 15). To do this he or she must use a number of *functional* evaluations and clinical and laboratory/scientific measures and review treatment regularly, so that it can be updated as necessary (16).

The specialist's aim in PRM is concerned with the promotion of physical and cognitive functioning, activities (including behaviour), participation (including quality of life) and in modifying personal and environmental factors. He or she is thus responsible for the prevention, diagnosis, treatments and rehabilitation management of people with disabling medical conditions and co-morbidity across all ages (1).

Inpatient standards were also published in 2002 in a supplement of *Clinical Rehabilitation* on behalf of the Clinical

Standards Committee of the British Society of Rehabilitation Medicine (13). This stated that patients could expect certain standards, such as:

- Specialist services in rehabilitation should be supported by dedicated sessions from a specialist in PRM.
- Patients should have access to appropriate rehabilitation services, or when these are not provided within the locality, defined systems should be in place for referral and funding to ensure equity of access to them.
- PRM programmes should have defined selection criteria for referral and there should be a written procedure for accepting patients according to the selection criteria.

Further quality statements are set out in the guidelines.

Fédération Française de Médecine Physique et de Réadaptation (FEDMER) also produced criteria, which highlighted the areas where PRM specialists could provide early specialized interventions to promote function and prevent or lessen any disablement and potential complications (17, 18).

These all clearly state that inpatient rehabilitation requires a team led by a competent medical specialist and, in a European setting, this means a specialist in PRM. The focus in this standards document is on inpatients, but the same applies to a peripatetic team working in an acute hospital. The evidence from this is in stroke rehabilitation. Not only do acute stroke units save lives (19), but early access to specialist rehabilitation has an impact on secondary prevention (i.e. complications), the impact of other co-morbidities and tertiary prevention (rehabilitation outcomes) (20). Similar benefits have also been described of interventions by specialized teams working closely with the stroke service (21, 22).

FURTHER EVIDENCE

The addition of therapy provided to adults in hospital can accelerate the rate of recovery of personal independence and result in earlier discharge from hospital. It is also associated with enhanced functional recovery and shorter hospital stays, if provided in the context of an integrated service that can provide ongoing community support. In acquired brain injury, there is no evidence of any ceiling effect of therapeutic intensity beyond which no further response is observed (23), but no studies exist to show this in other conditions.

Further conclusions may be drawn, that PRM programmes:

- Reduce complications, e.g. physical effects of neurological injury, immobility, etc.
- Optimize the physical and social functioning of patients.
- Identify cognitive and emotional complications of traumatic brain injury, even in the absence of physical sequelae.
- Improve the chances of living independently at home and returning to work.
- Concentrate therapy. More therapy input is associated with shorter hospital stays and improved outcomes (24).
- Provided the correct environment and skill mix with trained therapists.

Stroke units also improved functional outcome following an intensive period of early rehabilitation (25–28). Another large-scale overview of stroke rehabilitation in a total of 3717 patients also demonstrated that focused rehabilitation can improve functional performance (29). The best results were obtained with younger patients and those receiving rehabilitation early after their stroke.

Similar results, although with smaller patient numbers, have been demonstrated for rehabilitation after head injury and after spinal cord injury (30, 31). Most of these studies confirm the value of 2 different aspects of rehabilitation. First, most of the studies documented improvements in functional outcome and speed of attaining such outcome. Secondly, disabled people going through rehabilitation units have less unnecessary complications. There are less unnecessary physical problems, such as those associated with spasticity, contractures and pressure sores and less unnecessary psychological problems, such as untreated depression. There is clear evidence that an intensive period of rehabilitation after an acute event, such as head injury or spinal cord injury, produces clear, short-term functional gains (32). However, there is also evidence that short-term gains are lost unless longer-term support is available (33). Thus, longer-term contact with the disabled person is important in order to provide rehabilitation until natural recovery is complete and to prevent the later development of unnecessary complications. Assessment of care costs should allow for continuing rehabilitation support.

BENEFITS

- The benefits are well recognized through the evidence for starting rehabilitation as early as possible. The most important are an early and prompt response to treating the ill effects of immobility and complications (as shown above) and in educating staff in acute facilities of the areas where rehabilitation can be of major benefit. There is good evidence that the money spent on rehabilitation is recovered, with estimates of savings of up to 17-fold, and that rehabilitation is both effective and cost-effective (34, 35). The net effect also ensures that patients pass through acute care as quickly as possible and their quality of care is improved. The simple act of transferring patients from acute wards to a rehabilitation setting has a beneficial effect on patient activities and on preventing unnecessary sedation (36). Early intervention in spasticity management can prevent contracture formation and reduce the time spent in further inpatient rehabilitation (37). The benefits are that patients are better able to engage in their rehabilitation programme and therapy can be commended at an earlier stage, thus potentially shortening its duration.
- Acute PRM can only operate effectively in the presence of sufficient facilities and staff. In addition, it requires the active participation of colleagues in both the hospital and in rehabilitation units and the community, to where patients will be sent following their treatment programme. It also

needs to be actively promoted by the hospital management as an integral part of the hospital's acute service provision. It is in both the patient's interests and good clinical practice to transfer patients to specialist rehabilitation, when this is the priority of care (28).

- Many PRM specialists are active in applying basic research and this can be applied to patients in very early settings. The benefits also allow staff in acute facilities to get feedback on the outcome of the patients' care and this increases staff satisfaction. More importantly, patients receive the treatment they need from suitably trained staff.
- A proportion of patients will not require transfer to a stand-alone rehabilitation facility, as they will be able to be managed as outpatients. PRM teams have the necessary networking to direct the patient to the most appropriate competent follow-up treatment and this will ensure that the rehabilitation plan is continued.
- Health-based rehabilitation goes hand-in-hand with social and vocational rehabilitation and an early rehabilitation programme will improve the chance of getting people back to productivity (38, 39).

FUNDING OF ACUTE PRM SERVICES

Financial support for acute PRM will be based on the evidence of its benefit, and the process of attracting funding for its facilities will vary from country to country.

Payment systems for PRM are already very complex, and are characterized by the differences in payments between acute hospital programmes and post-acute/maintenance rehabilitation programmes. In state-supported health systems, the amount of treatment depends on the number of professional experts (PRM doctors, therapists), and PRM has to compete for funding with other clinical services. PRM is subject to the same payment systems as other medical activities, which may be either a prospective payment or a diagnosis-related group.

The principles of a prospective payment system are:

- Per discharge prospective payment system.
- Distinct groups based on clinical characteristics and expected resource needs.
- Separate payments calculated for each group, including the application of case and facility level adjustments.
- System uses a streamlined patient assessment instrument.

The advantages of the prospective payment system have been mixed and studies have reported decreased lengths of hospital stay, but increased rates of readmission, the integration of more complex case mixes, but increasing numbers of patients discharged in unstable condition (40).

Many countries use the diagnosis-related group (DRG) system to classify hospital cases for payment. This is a system to classify hospital cases into one of approximately 500 diagnosis-related groups, which are expected to use a similar level of hospital resources. The system was developed for US Medicare as part of the prospective payment system, but is not

applicable throughout Europe because of the heterogeneity of the national health care systems.

Health-related group systems (HRGs) are also used, but the creation of a separate funding system for acute PRM may be apposite and a functional-related group may be more appropriate for the payment of patients going through PRM programmes. This could be based on the Functional Independence Measure (FIM) (41) and would cover the separate ICF domains (42). In essence, the same system covers acute PRM as for other acute services and most UEMS countries adopt the DRG system. HRGs may be appropriate for many rehabilitation institutions because they can be converted to a contract per case and can apply to inpatients and outpatients, which can cover the time and complexity of the various interventions. More recently, a concept of functional-related groups hold an attraction for PRM because they judge the payment on the basis of a patient's activities. Costs are therefore stratified on the complexity of a patient's impairments and limitation of activities, which will give PRM services the recognition they deserve. However, there is a danger that provider units will not see PRM services as too expensive to set up to retrieve their investment.

The *White Book on Physical & Rehabilitation Medicine* (2) has identified the potential savings to be made from establishing PRM over *ad hoc* rehabilitation services, and this probably also applies to PRM in acute settings. Although there is good evidence for this in inpatient settings, there is no specific published evidence for acute PRM *per se*.

The budget for an acute PRM service will depend on its scope and on the country's payment system, but should cover staff salaries, facilities, etc. This should be cheaper than a similarly situated acute bed, for which hospitals should see acute PRM as an attractive alternative.

CONCLUSION

PRM facilities in acute settings make sense for the reasons set out above. The first 2 options are the most effective in making best use of the acute facilities and PRM services. The benefits of dedicated PRM beds appear to outweigh those of the other options, but no cost-effectiveness studies have yet been undertaken between the first 2 models. The cost-effectiveness of stroke units, is greater than that of mobile PRM teams. The former are analogous here, in terms of clinical activity, to acute rehabilitation facilities. Certainly, acute PRM beds are cheaper and therefore more likely to show a benefit. Prospective trials are required to show this benefit, but a number of units need to be set up to do this, as the true cost-effectiveness can be determined only where set-up costs are not required.

ACKNOWLEDGEMENTS

Members of the Professional Practice Committee: M. Berteau, T. Bender, K. Borg, N. Christodoulou, V. Fialka-Moser, R. Frischnecht, L. Krohn, A. Luckmann, J. McElligott, V. Neumann, K. Stibrant Sunnerhagen, G. Stucki, P. Takac, V. R. Tuulik-Leisi, E. Varela, A. Vetras, D. Wever. M. Zampolini.

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