Physiotherapy as a profession is constantly evolving as new evidence and research for interventions, treatment modalities and techniques are being produced. It has become apparent that there are different interpretations and some ambiguity in the current coding structure. A further contributing factor to this is the fact that the coding structure and definitions have not been updated for more than 15 years.

In 2010 the SASP gave a mandate to the coding committee to simplify the current SASP coding structure. This simplification of the current coding structure will be done in different phases after extensive consultations and input with and from various special interest groups within the SASP and external stakeholders as well as the membership of the SASP.

Phase one has been completed in 2014 and addressed the rules and modifiers 0006 (Emergency Physiotherapy) and 0015 (Essential continuation of physiotherapy care in an afterhours situation). Phase two will address amongst others, the rehabilitation aspect of the coding structure.

1. Purpose of this Document
The purpose of this document is to provide clarity and guidance to all stakeholders (physiotherapists and non-physiotherapists) in South Africa, on the understanding and usage of the current codes (72501, 72502, 72503, 72507 and 72509) for rehabilitation as part of the physiotherapy treatment intervention. This reference document should be read in conjunction with the SASP’s document The Role of Physiotherapy in Rehabilitation in South Africa (2013). The SASP is the custodian of the physiotherapy coding structure and the interpretation thereof as
mandated by the Professional Board of Physiotherapy, Podiatry and Biokinetics (PBBBP) of the HPCSA.
This interpretation should be utilised in the interim until phase two has been finalised and accepted by the physiotherapy community and introduced to the industry.
This document is the introductory and preamble in addressing the rehabilitation aspect in the simplification process of the coding structure.

2. Scope of Practice

The scope of practice of Physiotherapists is outlined in the core definitions as defined by the Health Profession Council of South Africa (HPCSA) \(^1\)

**PHYSIOTHERAPY**

1. **Care and Rehabilitation of illness, injury and impairment/disability in the following stages**
   - Acute
   - Sub-acute
   - Chronic
   - Final

2. **Restoration to functional ability**

3. **Health promotion and disease prevention through education**

The scope of Physiotherapy is further expanded on below, refer also to the Regulation 2301 –

<table>
<thead>
<tr>
<th><strong>Physiotherapy</strong> is a health care profession, which emphasises the use of physical approaches in the promotion, maintenance and restoration of an individual's physical, psychological and social wellbeing, regardless of variations in either health or economic status.</th>
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<tbody>
<tr>
<td>The skills of physiotherapists are biomechanical, electro-physical in nature and include the application of manual therapy, therapeutic exercise and electro-physical modalities and limited invasive techniques. Through a problem solving and clinical reasoning approach, the physiotherapist is able to apply these skills appropriately in response to the varied needs of individuals.</td>
</tr>
<tr>
<td>Physiotherapists are primarily involved in the management of physical problems in particular those associated with neuro-muscular, musculoskeletal, cardiovascular and respiratory systems.</td>
</tr>
<tr>
<td>Physiotherapists assess and evaluate an individual's needs or potential needs and take into account the current psychological, social and cultural factors and their influence on the</td>
</tr>
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\(^1\) HPCSA. Professional Board for Physiotherapy, Podiatry and Biokinetics. Definitions of core functions of Physiotherapy, Podiatry and Biokinetics. 23/11/2007
individual’s functional ability. This encompasses the needs of associated carers.

Through negotiation and in partnerships, physiotherapists work with persons with special needs in order to optimise their functional ability and potential, within the community and workplace.

In addition, physiotherapists have a general role in promoting health and in the prevention of problems by means of education and promoting self-care of individuals and communities. This can extend to advising and teaching associated carers and other health care professionals in order to provide a coherent approach within the bio-psychosocial model maximising the individual’s independence.

A physiotherapist acts as a first line practitioner and works independently or in association with a health care team to provide optimal services for patient rehabilitation and care.

The Profession of Physiotherapy is primarily focused on the assessment, treatment, rehabilitation and prevention of movement disorders.

Physiotherapy aims to restore normal function and/or minimise dysfunction and pain in patients (adults and children) with physical impairment.

The outcome of physiotherapy intervention will enable the patient to achieve the highest possible level of independant function in their lives. Physiotherapy is further concerned with preventing recurring injuries, minimising the risk of complications, and has an important role in managing lifestyle diseases and their sequelae due to modernisation. The re-integration and independent functioning of the patient in his/her workplace, at home, and in recreational activities is of prime importance to the Physiotherapist, across all communities and age groups.

Rehabilitation is a broad concept as it stretches over many different spheres of physiotherapy from acute to ends stage and even habilitation.

There is not one definitive definition of rehabilitation but a common thread can be seen in various readily available legislative and policy documents of rehabilitation i.e. National Rehabilitation Policy 2000, The National Health Act nr 61 of 2003, The South African Department of Health’s National Rehabilitation Policy as well as the SASP Document; The role of physiotherapy in rehabilitation. Nov 2013 pgs. 6 and 7. This policy describes rehabilitation as a goal-orientated process, which is

“Rehabilitation is a goal orientated and time-limited process aimed at enabling an impaired person to reach an optimum mental, physical and/or social functional level, thus providing her or him with the tools to change her or his own life. It can involve measures intended to
compensate for a loss of function or a functional limitation (for example by technical aids) and other measures intended to facilitate social adjustments or readjustment.”

**Definition of Physical Medicine and Rehabilitation (Webster Dictionary)**
A medical specialty concerned with treating disabling disorders and injuries by physical means (as by the use of electrotherapy, therapeutic exercise, or pharmaceutical pain control).

**Definition of Physical Medicine and Rehabilitation (Concise Encyclopedia)**
Medical specialty treating chronic disabilities through physical means to help patients return to a comfortable, productive life despite a medical problem. Its objectives are pain relief, functional improvement or maintenance, training in essential activities, and functional testing of areas such as strength, mobility, breathing capacity, and coordination. Physical medicine may use diathermy, hydrotherapy, massage, exercise, and functional training.

In conclusion rehabilitation is:
A goal orientated process aimed at enabling an impaired person to reach optimal functional levels i.e. restoration to useful activity of persons with a physical or other disability or impairment.

This goal orientated process requires the active participation of the physiotherapist following the individualised treatment plan geared towards enabling the patient to reach optimal functional levels. It is a physiotherapist’s specific driven process utilising the unique skills of the physiotherapists as the expert in rehabilitation in a multidisciplinary team approach.

Patients should receive the intensity and duration of clinically relevant therapy defined in their individualised rehabilitation plan and appropriate to their needs and tolerance levels.

Rehabilitation may be done simultaneously with other physiotherapy modalities and techniques. The only proviso is that the pathology requires the undivided attention of the physiotherapists during the rehabilitation intervention.

Without rehabilitation, which focuses on returning the patient to their previous level of function or activity, the often symptomatic relief of treatment is temporary. It is the rehabilitation element of treatment that facilitates independence, reduces the risk of re-injury and achieve optimal function. “In short, physiotherapists are involved in the “restoration of the individual to their optimal level of participation” (World Health Organisation (WHO) 2000) regardless of where people enter the rehabilitative process, the severity of their impairment or the psychological, emotional and social issues confronting them.

### 3. Fields of Physiotherapy Rehabilitation
There are many widely divergent fields within which rehabilitative physiotherapy takes place.

Some of these are listed here:
• Burn injuries
• Cardiopulmonary, cardio vascular and respiratory conditions
• Conditions requiring intensive care
• Geriatric conditions
• Treatment of animals
• Psychiatric conditions
• Medical and surgical conditions including amputation
• Musculoskeletal and orthopaedic disorders
• Neurological conditions
• Occupational illnesses, injuries and syndromes
• Paediatric conditions
• Pain syndromes (acute and chronic)
• Rheumatologically conditions
• Spinal cord injuries
• Sports injuries
• Trauma
• Women’s Health: Gynaecological and obstetric conditions
• Urological and gastroenterological conditions

4. Rehabilitation Settings
It is important to note that the rehabilitation process can take place in a variety of locations e.g. acute hospital settings, hospitals, intensive care facilities, frail care and long term care facilities, homecare, workplace settings, schools, outdoor training facilities, gyms, outpatient departments, private outpatient practice etc.

5. Rehabilitation Mediums
Rehabilitation can be done on dry land and water (aqua therapy). Hydrotherapy is a treatment medium were physiotherapists’ uses more than one of the unique properties of water for therapeutic rehabilitation. Some of the unique properties of water are buoyancy, metacenter, hydrostatic pressure, turbulence, drag, bow wave and eddy currents.
Physiotherapy in water facilitates rehabilitation in a wide variety of patients. However certain patients may not be able to tolerate 30 min of immersion initially. Pool treatment (hydrotherapy) may last from 15 to 60 minutes +. 15 minutes is often enough for the first treatment, bearing in mind that the patient may be undergoing an
entirely new experience. The immersion should be gradual, and the physiotherapist should watch for any embarrassment of the circulatory or respiratory systems. A short first treatment to create confidence is a valuable prelude, but once the patient is accustomed to the water, the length of treatment varies according to the pathological condition of the patient and the length of time he has been on treatment. The therapeutic temperature of the water is in the range of 32 – 35 degrees. Many patients, compromised by their particular medical condition for example, Multiple Sclerosis, Chronic fatigue syndrome, Quadriplegia, Paraplegia, Elderly patients post joint replacement, Guillian Barre etc., cannot tolerate immersion for extended periods. The duration of rehabilitation will depend on the patient’s stability, ability and tolerance of the treatment medium.

As the patient’s condition improves with time, rehabilitation time could safely be increased. [Morton et al 2005; Pryor & Prasad 2008].

6. Time duration for rehabilitation

Due to the diversity and the broad spectrum of utilisation of rehabilitation, no specific time duration can be specified for the rehabilitation intervention. The time duration of each individual sessions will be determined by the individual physiotherapists, based on the patient’s condition, stability, ability, presence of co-morbidities, stage of healing and any adverse reaction during the activity. The rehabilitation time could vary for different patients, different pathologies and between different sessions from 15 and 60 + minutes. The physiotherapists must however give his/her full active undivided attention to the patient during the rehabilitation process.

Below are some examples of different vignettes (scenarios) illustrating the broad scope of physiotherapy where the rehabilitation process can be utilised. This list is not exhaustive.

Vignette 1– Bladder Retraining
The treatment of urinary urge incontinence due to an overactive bladder requires rehabilitation of the bladder as part of the active management. Rehabilitation of the bladder (also referred to as bladder discipline, bladder drill, bladder retraining, bladder training and bladder education) is a term used to describe the educational and behavioural process used to restore normal bladder function and reduce urinary incontinence in adults.
This falls under the heading of Behavioural and Conservative Therapy in the NDoH Guidelines on the Management of Incontinence. (3rd Draft 2009)

From this it can be seen that rehabilitation of the bladder is an integral part of the treatment of incontinence. The International Consultation on Incontinence (ICI) reported there was good evidence that rehabilitation of the bladder reduces urgency, frequency and nocturia, and concluded that cognitively intact older persons responded well to rehabilitation of the bladder, which appears to have equal benefit in older and younger persons. (Wilson et al 2005)

Rehabilitation of the bladder includes patient education about:
- The bladder and normal bladder control
- Types of incontinence
- Urge control strategies (distraction, relaxation, recruitment of S2, 3, 4 myotomes and dermatomes)
- Monitoring of voiding behaviour using a bladder diary
- Introducing a scheduled voiding regime
- Monitoring progress
- Determining adjustments to the voiding schedule
- Providing positive reinforcement
  

Rehabilitation of the bladder requires a considerable amount of time to educate and inform the patient about the anatomy and neurophysiology related to the bladder and continence mechanisms as well as explaining the reasons for the symptoms of urgency and ensuing urge incontinence. It is vital that the patient has some knowledge and insight into their condition in order to effectively participate in the retraining programme. For successful treatment of urinary incontinence it is imperative to do rehabilitation of the bladder at all treatment sessions. This is re-enforced continuously over a period of up to six weeks and at follow up visits over several months.

Trials have shown that rehabilitation of the bladder as conservative outpatient management of urinary incontinence is successful and considerably cheaper than inpatient treatment (Ramsay et al 1996). It also results in improved symptoms and quality of life (Keen 2005).

Vignette 2 - Chronic Pain Management

The situation is similar in patients suffering from different types of chronic pain. Patients’ beliefs about the meaning of their pain, their fears of (re)injury and their perceived control over the pain are all factors that strongly influence their health outcomes and physical functioning (Linton, 2002). There is vast and compelling literature that shows that treatment strategies that reduce the perceived threat of the pain, such as pain education, are far more effective than
physical treatments in the management of chronic pain (Moseley, 2004; Watson, Booker, & Main, 1997)
The evidence is overwhelming that certain psychosocial factors are stronger risk factors for persistence of pain than physical factors (Pincus, Burton, Vogel, & Field, 2002).
The rehabilitation intervention of patients with chronic pain may consist of:
- Education of the patient by the physiotherapist to gain insight and knowledge on the stages of healing, the neuroscience and the psychosocial aspect of pain. Education and strategies to change behavioural influence on chronic pain such as strategies to address fear avoidance and other yellow flags.
- Patient specific exercise prescription, progressions and monitoring of same.

The intervention carries no physical risk or stress to the patient. It empowers the patient who gains knowledge about his/her anatomy and understanding of his/her condition and as a result is more likely to engage in the treatment process with insight and commitment, producing more favourable treatment results.

Rehabilitation time for this group of patients may vary, depending on the patient’s ability to cope with physical activity as well as the patient’s ability to understand and grasp the different components and concepts of chronic pain rehabilitation.

References:

Vignette 3- Patients who suffered poly-trauma

Patients who suffer multiple orthopaedic injuries are often confined to bed rest for prolonged periods of time until the fractures are stabilised surgically. These patients may also be admitted to the intensive care unit for observation and management due to the severity of their injuries. Prolonged immobility leads to muscle atrophy and weakness – up to 25% of muscle strength can be lost after 4 – 6 weeks of immobility [Hough & Needham 2007].

SASP Rehabilitation Reference Document: Phase 2 Coding Simplification 11/2014
Rehabilitation for sedated patients in ICU involves maintenance of joint range of motion to prevent joint stiffness and stretching of muscles to prevent muscle shortening and contracture formation [Pryor & Prasad 2008].

The time duration of such rehabilitation will depend on fluctuations of the patient’s vital signs and the patient’s stability.

As the patient becomes awake and responsive, rehabilitation will progress to more patient participation in the rehabilitation process. The patient would be encouraged to move his/her limbs through range of motion actively and the patient would be taught functional activities in bed. When the patient’s condition is stable enough, functional activities out of bed as well as mobilisation would be encouraged. The patient would be mobilised to a chair to counteract the effect of bed rest. This change of position where gravity is employed to activate muscles has been showed to have a positive effect on different body systems such as the heart, respiratory system and muscle system. The next step in the rehabilitation process is to encourage and assist with ambulation, with or without ambulation aids. [Pryor & Prasad 2008; Korupolu, Gifford & Needham 2009].

Rehabilitation time for these activities may vary, depending on the patient’s ability to cope with physical activity. The preparation for each individual treatment session are time intensive for the physiotherapist. Prior, during and post each session the physiotherapist must evaluate the patients status and monitor the patient closely for possible risk factors and any signs of any adverse reaction due to the activity, this alone may take up considerable time of the physiotherapists. After each session the patient and all medical attachments must be monitored to ensure that the patient is comfortable, safe and that all attachments are functioning properly.

Vignette 4 - Conditions requiring intensive care.

Patients are often admitted to ICU due to deterioration of chronic lung disease; respiratory tract infection; complications that arise from diseases of lifestyle (hypertension, obesity, diabetes mellitus); trauma or for postoperative observation and management. Such patients are confined to prolonged bed rest due to the severity of their condition. Prolonged immobility leads to muscle atrophy and weakness – up to 25% of muscle strength can be lost after 4 – 6 weeks of immobility [Hough & Needham 2007]. Rehabilitation for sedated patients in ICU includes maintenance of joint range of motion to prevent joint stiffness and stretching of muscles to prevent muscle shortening and contracture formation [Pryor & Prasad 2008].

The duration of such rehabilitation will depend on fluctuations of the patient’s vital signs and his/her stability.

As the patient becomes awake and responsive, rehabilitation will progress to encourage more active patient participation. The patient would be encouraged to move his/her limbs through range of motion actively and the patient would be taught functional activities in bed. When the patient’s
condition is stable enough, functional activities out of bed as well as mobilisation would be encouraged [Pryor & Prasad 2008; Korupolu, Gifford & Needham 2009].

Rehabilitation time for these activities may vary, depending on the patient’s stability and ability to cope with physical activity. The preparation for each individual treatment session are time intensive for the physiotherapist. Prior, during and post each session the physiotherapist must evaluate the patients status and monitor the patient closely for possible risk factors and any signs of any adverse reaction due to the activity, this alone may take up considerable time of the physiotherapists. After each session the patient and all medical attachments must be monitored to ensure that the patient is comfortable, safe and that all attachments are functioning properly.

**Vignette 5: Cardiovascular conditions.**

Patients who suffered myocardial infarction, angina pectoris or underwent coronary artery bypass grafting are managed in the cardiac wards after admission to hospital. Cardiac rehabilitation phase I commences on day 2 of admission and involves activities such as arm and leg range of motion exercises, limited self-care activities, mobilisation of patient out of bed and short walks down the corridor depending on the patient’s cardiac status [Taylor, Bell & Lough 2008]. The duration of these rehabilitation activities can vary depending on each individual patient’s abilities. Patients with acute cardiovascular will not be able to tolerate 30 minutes of rehabilitation safely. The preparation for each individual treatment session are time intensive for the physiotherapist. Prior, during and post each session the physiotherapist must evaluate the patients status and monitor the patient closely for possible risk factors and any signs of any adverse reaction due to the activity, this alone may take up considerable time of the physiotherapists. After each session the patient and all medical attachments must be monitored to ensure that the patient is comfortable, safe and that all attachments are functioning properly.

Prior to discharge the patient should be able to walk up two flights of stairs without any cardiac symptoms and therefore the duration of rehabilitation may vary by day 6 – 7 of admission. Extensive education and guidance are also needed on activities of daily living, home exercise prescription and working activities to ensure that these patients can be safely discharge without adding additional stress on their cardiovascular system.

After discharge these patients benefit from exercise rehabilitation in the form of cardiac rehabilitation. The recommended duration of such programmes is 4 – 6 weeks [Joliffe et al 2001; Rees et al 2004].
**Vignette 6 - Patients with Amputees**

Causes of amputation range from peripheral vascular disease, diabetes mellitus or trauma. Patients who suffer from diabetes have poor general health and may not be able to cope with 30 minutes of rehabilitation postoperatively.

Rehabilitation activities postoperatively would focus on active range of motion exercises of amputated limb as well as unaffected limbs, strengthening exercises of all limb muscles, mobilisation out of bed, and mobilisation over progressively longer distances and stair climbing. Extensive education and reassurance of the patient and family is also required to ensure that the patient is rehabilitated to his/her maximum ability.

The duration of these rehabilitation activities may vary depending on the individual patient’s ability at the time of physiotherapy intervention [Smith & Ball 1995].

**Vignette 7 – Patients with Burn Injuries**

Patients who suffer burn injuries experience severe pain and discomfort, fluid imbalances and have a high risk of contracting infection while in hospital. Pain, fluid and electrolyte imbalances may predispose these patients to cardiac and renal instability especially during the first few days of admission.

The role of the physiotherapist in the management of patients with burns includes rehabilitation consisting of passive and active range of motion exercises with all limbs, strengthening exercises, mobilisation and chest physiotherapy and functional activities.

The duration of rehabilitation will depend on the patient’s stability, level of pain and the extent of his injuries. The preparation for each individual treatment session are time intensive for the physiotherapist. Prior, during and post each session the physiotherapist must evaluate the patients status and monitor the patient closely for possible risk factors and any signs of any adverse reaction due to the activity, this alone may take up considerable time of the physiotherapists. After each session the patient and all medical attachments must be monitored to ensure that the patient is comfortable, safe and that all attachments are functioning properly. As the patient’s condition improves with time, rehabilitation time could safely be increased. [Morton et al 2005; Pryor & Prasad 2008].

**Vignette 8 – Patients with Neuro-Musculo-Skeletal Spinal Conditions**

The rehabilitation process in this instance would consist of;

- Motivating the patient to comply with the rehabilitation program through a thorough explanation of the importance of a patient specific exercise program.
• Patient education on pathology, physiology and anatomy to empower the patient with knowledge to understand and to manage his/her condition effectively.
• Assessing the current ability of the patient to perform the required exercise program.
• Demonstrate and teach the prescribed exercises.
• Re-assess the ability of the patient to grasp and perform the exercise correctly.

Revise and progress the exercise prescription for hospital and home exercises.

The duration of this process can be affected by the age of the patient or any other circumstance that affects the ability to grasp the exercises, education and advice.

Vignette 9 - Patients needing Neurological Rehabilitation.

Early intervention following a neurological disturbance is crucial for optimal functional recovery. These neurological disturbance could include a stroke (CVA), a traumatic brain injury (TBI), a spinal cord injury (SCI), a genetic, or a birth disorder.

There are also a number of progressive neurological conditions such as Parkinson's disease (PD) & Multiple Sclerosis (MS) which require physiotherapy for the prevention of complications and to help the patient and family cope with the deteriorating functional abilities due to the episodic nature of the disorder.

Patients who suffer neurological insults are often confined to bed rest until they have stabilised. These patients may also be admitted to the intensive care unit for observation and management due to the severity of their condition. Abnormalities in muscle tone can lead to muscle atrophy, weakness and contractures. The duration and intensity of such rehabilitation will depend on vital sign fluctuations and the patient’s stability and ability to handle the intervention.

For example to quote “The Canadian best practices recommendations for stroke care” (update 2008) document:

**Recommendation 5.3 Components of inpatient stroke rehabilitation**

All patients with stroke should begin rehabilitation therapy as early as possible once medical stability is reached [Evidence Level A] (ASA).

i. **Patients should receive the intensity and duration of clinically relevant therapy defined in their individualised rehabilitation plan and appropriate to their needs and tolerance levels [Evidence Level A] (HSFO, RCP).**

ii. Stroke patients should receive, through an individualised treatment plan, a minimum of 1 hour of direct therapy by the inter-professional stroke team for each relevant core therapy, for a minimum of 5 days per week based on individual need and tolerance [Evidence Level A] (EBRSCR), with duration of therapy being dependent on stroke severity [Evidence Level C] (EBRSCR).
iii. The team should promote the practice of skills gained in therapy into the patient's daily routine in a consistent manner [Evidence Level A] (RCP).

iv. Therapy should include repetitive and intense use of novel tasks that challenge the patient to acquire necessary motor skills to use the involved limb during functional tasks and activities [Evidence Level A] (SCORE).

v. Stroke unit teams should conduct at least one formal interdisciplinary meeting per week at which patient problems are identified, rehabilitation goals set, progress monitored and support after discharge planned [Evidence Level B] (SIGN 64). See http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2586332&tool=pmcentrez

Apart from addressing a patient with a neurological condition, initial respiratory and mobilisation needs, the physiotherapist for example, must do a number of counselling and education sessions with the patient and family prior to discharge from the acute setting hospital. The patient might be discharged home to the family, referred to the local day hospital or awaiting a bed in a rehabilitation facility. In this time the patient could develop secondary complications due to his limited mobility such as pressure sores, contractures and painful joints, most often the shoulder due to poor handling or positioning. To successfully bridge this period between therapeutic interventions, the family and patient needs to be well versed (the reasons and importance of the correct approach) and be taught the handling skills during the counselling/guidance session in order to manage the disabled person in the home environment. Failing to educate the family and patient, the patient could require more medical input and perhaps more expensive interventions such as surgery or specialised dressings. Apart from this additional burden to the health system and his medical aid benefits, the patient’s highest functional potential is adversely affected and therefore his prognosis. The family often carries the additional burden of care as the patient is often not able to return to his/suitable gainful employment.

During the rehabilitative phase of a neurological patient’s physiotherapy management, there continues to be a great need for additional education and counselling/guidance sessions as his functional abilities change, i.e. for mobility, safety with transfers including stairs. Patients who are wheelchair bound require specialised counselling/guidance regarding their assistive device settings and cushion care for example. Patients with progressive neurological conditions, also require follow-up and maintenance/revisions of care over an extended period of time. This must be relayed, and often repeated, in a sensitive fashion to patient and family.
Vignette 10 – Patients who suffered spinal cord injuries

Rehabilitation for a sedated patient who has suffered a spinal cord injury with resultant paralysis in ICU involves maintenance of joint range of motion to prevent joint stiffness and stretching of muscles to prevent muscle shortening and contracture formation [Pryor & Prasad 2008]. The duration of such rehabilitation will depend on fluctuation of the patient’s vital signs and his/her stability.

As the patient becomes awake and responsive, active patient participation will be included. The patient would be encouraged to move his/her unparalysed limbs through range of motion actively and the patient would be taught functional activities in bed. When the patient’s condition is stable enough, functional activities out of bed as well as mobilisation would be encouraged [Pryor & Prasad 2008; Korupolu, Gifford & Needham 2009].

Rehabilitation time for these activities may vary, depending on the patient’s ability to cope with physical activity. The preparation for each individual treatment session are time intensive for the physiotherapist. Prior, during and post each session the physiotherapist must evaluate the patients status and monitor the patient closely for possible risk factors and any signs of any adverse reaction due to the activity, this alone may take up considerable time of the physiotherapists. After each session the patient and all medical attachments must be monitored to ensure that the patient is comfortable, safe and that all attachments are functioning properly.

Vignette 11 – Respiratory Rehabilitation

Respiratory re-education and training refers to the intensive specialised re-education training of patients to perform breathing and lung clearing techniques and to enhance lung capacity. These techniques can include autogenic drainage, specific localised breathing techniques, pursed lip breathing, huffing etc. and are usually needed for the respiratory compromised patient. Other techniques can include six minute walk test, use of blow bottles, use of CPAP devices, incentive spirometers and flutter devices.

Many of these patients will be oxygen dependant and will be unable to tolerate extended periods of instruction and performance.

Patients with acute respiratory tract infections such as pneumonia suffer from hypoxia. Therefore these patients may not be able to tolerate extended periods of respiratory re education and training initially.

Patients who suffer from chronic respiratory diseases such as asthma, chronic bronchitis, emphysema, bronchiectasis and cystic fibrosis may develop respiratory infections that lead to their admission to hospital. These patients also suffer from hypoxia (as discussed above) and may only be able to tolerate short duration re-education and training. As their condition stabilises, treatment time can be increased.
Research has shown the beneficial effects of re-education and training of these patients after discharge from the hospital. Rehabilitation programmes that extend over a recommended minimum period of 4 weeks are recommended for these patients to improve their function, exercise tolerance and reduce their symptoms of breathlessness [CSP 2003; Pryor & Prasad 2008; Ries et al 2007].

A patient who is admitted to ICU due to deterioration of chronic lung disease; respiratory tract infection; complications that arise from diseases of lifestyle (hypertension, obesity, diabetes mellitus); trauma or for postoperative observation and management will be confined to prolonged bed rest due to the severity of his/her condition. Prolonged immobility leads to muscle atrophy and weakness – up to 25% of muscle strength can be lost after 4 – 6 weeks of immobility [Hough & Needham 2007].

Prolonged mechanical ventilation (MV) (>48 hours) leads to muscle atrophy and weakness of the respiratory muscles. This group of patients may suffer from ventilatory induced diaphragm deficiency (VIDD) during the weaning and extubation phase of mechanical ventilation. These patients will require extensive respiratory rehabilitation during the weaning stage of MV as well as post extubation to prevent re-intubation and all the associated complications following prolonged and recurrent MV.

Initially treatment may be of a shorter duration especially if the stability of the patient’s condition fluctuates, or as the patient can tolerate. Too high a demand on the respiratory muscle will cause high frequency muscle fatigue that resolve only after 24 hours of rest, during this time the patient may need ventilatory assistance.

As the patient becomes more awake, responsive and stronger the respiratory re-education and training session will take on a more active role, taking longer to complete. [Pryor & Prasad 2008; Korupolu, Gifford & Needham 2009]. Respiratory re-education and training time for these activities may vary between 15 – 30 minutes depending on the patient’s ability to cope with physical activity and the increased demand and work of breathing and the patient’s capacity to understand the complexities of the training and re-education.

**Vignette 12 – Respiratory rehabilitation in patients whom experienced poly-trauma.**

A patient who has been admitted with poly-trauma having suffered multiple orthopedic/musculoskeletal and respiratory injuries is often confined to bed rest for prolonged periods of time for the opportunity for these injuries to stabilise. The extent of these injuries might require intensive care admission for observation. Prolonged immobility leads to muscle atrophy and weakness – up to 25% of muscle strength can be lost after 4 – 6 weeks of immobility [Hough & Needham 2007]. This includes loss of strength of the diaphragm, the main muscle of inspiration. Further complications such as critical illness polyneuropathy will also affect the patient’s ability to breathe
spontaneously, increase the respiratory re-education and training period and result in quicker fatigue while busy with rehabilitation exercises.

The duration of respiratory re-education and training will be determined by the patient’s condition, age, extent of injuries, pre-existing conditions and co-morbidities, and is therefore very patient specific.

Vignette 13 – Patients with Chronic Respiratory Disease.

In patients with chronic respiratory diseases, studies have shown immense benefits to these patients’ quality of life with controlled rehabilitation programmes. [O Brien et al, 2008, Journal of Cardiopulmonary Rehabilitation and Prevention vol. 28:128-141]

Failure to make this a patient specific protocol, can result in the patient hyperventilating, become increasingly short of breath, and result in an uncontrolled breathing rate and might lead to deterioration of the patient’s condition. Studies have shown that if the demand of breathing is too high for the patient to overcome, the respiratory muscles will need up to 24 hours to recover from this, and this rest period might include ventilation.

The duration of respiratory re-education and training will be determined by the patient’s condition, age, extent of injuries, pre-existing conditions and co-morbidities, and is therefore very patient specific.

7. Conclusion

Rehabilitation is an integral part of physiotherapy.

Physiotherapists are experts in physical rehabilitation.

Rehabilitation can be done in any stage; from acute to final rehabilitation.

It is an individualised goal orientated process that can be utilised in varied settings, for a wide variety of patients and conditions without any set minimum or maximum duration.

The type and duration of the rehabilitation activity will depend on the patient’s pathology, overall condition, co-morbidities, ability and stability at the time of the activity. It requires the active undivided attention of the physiotherapists during the entire activity and may be done simultaneously with other treatment modalities.