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Adult Physical Rehabilitation

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This publication is received by the National Department of Health (NDoH), IUSS Steering Committee Chairman, Dr Massoud Shaker and Acting Cluster Manager: Health Facilities and Infrastructure Management, Mr Ndinannyi Mphaphuli. Feedback is welcome.

Application and development process

These IUSS **voluntary standard/ guidance documents** have been prepared as national Guidelines, Norms and Standards by the National Department of Health for the benefit of all South Africans. They are for use by those involved in the procurement, design, management and commissioning of public healthcare infrastructure. It may also be useful information and reference to private sector healthcare providers.

Use of the guidance in this documentation does not dissolve professional responsibilities of the implementing parties, and it remains incumbent on the relevant authorities and professionals to ensure that these are applied with due diligence, and where appropriate, deviations processes are exercised.

The development process adopted by the IUSS team was to consolidate information from a range of sources including local and international literature, expert opinion, practice and expert group workshop/s into a first level **discussion status** document. This was then released for public comment through the project website, as well as national and provincial channels. Feedback and further development was consolidated into a second level **development status** document which again was released for comment and rigorous technical review. Further feedback was incorporated into **proposal status** documents and formally submitted to the National Department of Health. Once signed off, the documents have been **gazetted,** at which stage documents reach **approved status**.

At all development stages documents may go through various drafts and will be assigned a version number and date. The National Department of Health will establish a **Health Infrastructure Norms Advisory Committee,** which will be responsible for the periodic review and formal update of documents and tools. Documents and tools should therefore always be retrieved from the website repository www.iussonline.co.za or Department webportal (forthcoming) to ensure that the latest version is being used.

The guidelines are for public reference information and for application by Provincial Departments of Health in the planning and implementation of public sector health facilities. The approved guidelines will be applicable to the planning, design and implementation of all new public-sector building projects (including additions and alterations to existing facilities). Any deviations from the voluntary standards are to be motivated during the Infrastructure Delivery Management Systems (IDMS) gateway approval process. **The guidelines should not be seen as necessitating the alteration and upgrading of any existing healthcare facilities**.

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TABLE OF CONTENTS

TABLE OF CONTENTS 1

OVERVIEW 3

INTRODUCTION 5

PART A - POLICY FRAMEWORK 7

1. Policy 7

1.1. Definition of terms 7

1.2. Current government policy and impact 7

1.3. Regulations relating to categories of hospitals 7

1.4. Future government policy development 8

1.5. Infrastructure policy and standards for rehabilitation services 8

PART B - ABOUT THE CONCEPT NOTE 9

PART C - SERVICE SCOPE 12

1. Patient type 12

2. The rehabilitation environment 12

2.1. At the bedside, or in the ward 13

2.2. General rehabilitation by specific discipline/s 13

2.3. Dedicated rehabilitation in a gym 13

2.4. Sub-acute facilities 14

2.5. Community-based rehabilitation, outreach services and support groups 14

PART D - PLANNING AND DESIGN 15

1. Unit operation 15

2. Planning 15

2.1. Location 15

2.2. Rehabilitation 15

3. Functional requirements 16

3.1. Receiving and waiting area 16

3.2. Ward 16

3.3. Therapy areas 16

3.4. Family areas 26

3.5. Team meeting area 26

3.6. Administrative offices 27

3.7. Toilets 27

3.8. Storage areas 27

4. Optional functional requirements 28
4.1. Dining area 28
4.2. Recreational areas 28
4.3. Hydrotherapy 28
4.4. Dedicated clinic area 29
5. Functional flow diagram 30
PART E - ACCOMMODATION 31
PART F - ROOM DATA SHEETS 33
1. Ward accommodation 33
1.1. Ward room layout 33
1.2. Ward passage layout 33
1.3. Ward administration layout 34
1.4. Additional ward requirements 34
2. Therapy areas 34
3. Equipment, both fixed and loose 36
3.1. Physiotherapy 36
3.2. Occupational therapy 38
3.3. Speech therapy 42
3.4. Orthotics and prosthetics 42
3.5. Psychologists 42
3.6. Dieticians 42
PART G - CASE STUDIES AND EXAMPLES 43
1. Western Cape Rehabilitation Centre 43
2. Tshwane Rehabilitation Centre 43
3. Drawings 43
PART H - LIST OF ABBREVIATIONS 45
PART I - REFERENCES AND ACKNOWLEDGEMENTS 46
PART J - BIBLIOGRAPHY 47
PART K - CONCEPT NOTE 48
1. THE STRUCTURE OF THE REHABILITATION TEAM, AND ITS IMPACT ON FACILITY DESIGN AND INFRASTRUCTURE 48
2. Introduction 48
3. The patient requiring rehabilitation 48
4. Different physical rehabilitation team models 49
PART L - BIBLIOGRAPHY 57

OVERVIEW

This document outlines the policy and service context, and attempts to illustrate the desired planning principles and design considerations of inpatient adult physical rehabilitation units.

- *Part A* outlines the national and provincial service and policy context which are the basic determinants of the planning and design principles.

- *Part B* contains the "Concept Note" on evidence supporting the interdisciplinary team-working approach between the rehabilitation healthcare professionals, and forms the foundation for further parts within this document.

- *Part C* contains the service scope, outlining the context within which the rehabilitation service operates, and the elements which create the unique requirements of the facility.

- *Part D* contains planning and design guidance, design considerations, functional relationships between hospital departments with respect to adult inpatient accommodation units (wards), and relationships within the unit itself.

- *Part E* develops these principles into a series of schedules of accommodation.

- *Part F* contains room data sheets and indicative equipment lists.

- *Part G* includes some case studies and examples.

- Parts D, E and F are intended to demonstrate how the principles prescribed in Part B can be applied in worked examples. Parts D or E, if used directly, are deemed to satisfy the principles developed in Part C, but are not the only acceptable solutions.

- Case studies (Part G) provide illustrative worked solutions and should not be adopted without appropriate contextual adaptation.

- While this document outlines design requirements and acceptance criteria which have an impact on clinical services, these requirements are prescribed within the framework of the entire IUSS set of guidance documents and cannot be viewed in isolation. The following documents should be complied together with this document:

- IUSS: Regulations

- IUSS: Project Planning and Briefing

- IUSS: Environment and Sustainability

- IUSS: Hospital Design Principles

- IUSS: Infection Prevention and Control

Table 1 : IUSS:GNS Reference Documents

CLINICAL SERVICES	Essential	Recommended	SUPPORT SERVICES	Essential	Recommended	HEALTHCARE ENVIRONMENT/ CROSSCUTTING ISSUES	Essential	Recommended	PROCUREMENT& OPERATION	Essential	Recommended
Adult Inpatient Services		x	Administration and Related Services			Generic Room Requirements		x	Integrated infrastructure planning		
Clinical and Specialised Diagnostic Laboratory Guidelines		x	General Hospital Support Services			Hospital Design Principles		x	Briefing Manual		
Mental Health		x	Catering Services for Hospitals			Building Engineering Services		x	Space Guidelines		
Adult Critical care		x	Laundry and Linen Department			Environment and Sustainability		x	Cost Guidelines		
Emergency Centres			Hospital Mortuary Services			Materials and Finishes		x	Procurement		
Maternity Care Facilities			Nursing Education Institutions			Future Healthcare Environments			Commissioning Health Facilities		
Adult Oncology Facilities		x	Health Facility Residential			Healthcare Technology		x	Maintenance		
Outpatient Facilities			Central Sterile Service Department			Inclusive Environments		x	Decommissioning		
Paediatrics and Neonatal Facilities		x	Training and Resource Centre			Infection Prevention and Control		x	Capacity Development		
Pharmacy		x	Waste Disposal			Information Technology and Infrastructure		x			
Primary Health Care Facilities		x				Regulations					
Diagnostic Radiology		x									
Adult Physical Rehabilitation											
Adult Post-acute Services											
Facilities for Surgical Procedures											
TB Services											

Colours Legend

Consultants	
Administrators	
Related documents	

INTRODUCTION

The concept of rehabilitation is typically associated with the process which a person undergoes in order to recover from a serious injury or disease, with debilitating and often permanent disability or loss of function. The WHO, in the World Report on Disability, 2011 Chapter 4, asks, "What is Rehabilitation?"

The answer to this question as found in the literature is not a uniform one. While one school of thought categorises rehabilitation as a dedicated and specialised process, along which a patient with a debilitating injury or disease tries to regain as much function and independence as possible, the other school of thought refers to rehabilitation as a general intervention afforded all patients who have a temporary or permanent impairment as a result of a medical intervention or disease.

This can be illustrated as follows:

School 1: Rehabilitation processes and facilities are to be designed and staffed to cater for a patient with a spinal cord injury, who has suffered a stroke, or had a limb amputated. The healthcare professionals are trained and experienced in the specific field of rehabilitation, and do not see themselves as generalists, but rather as specialists in a dedicated field of rehabilitation.

School 2: Rehabilitation is a process which all patients undergo when recovering from a medical intervention or disease. This may be the patient who has had a hip replacement and is learning to walk again; or the patient recovering from invasive abdominal surgery. The staff members treating these patients see themselves more as generalists, using rehabilitation as a treatment approach in the overall treatment of the patient.

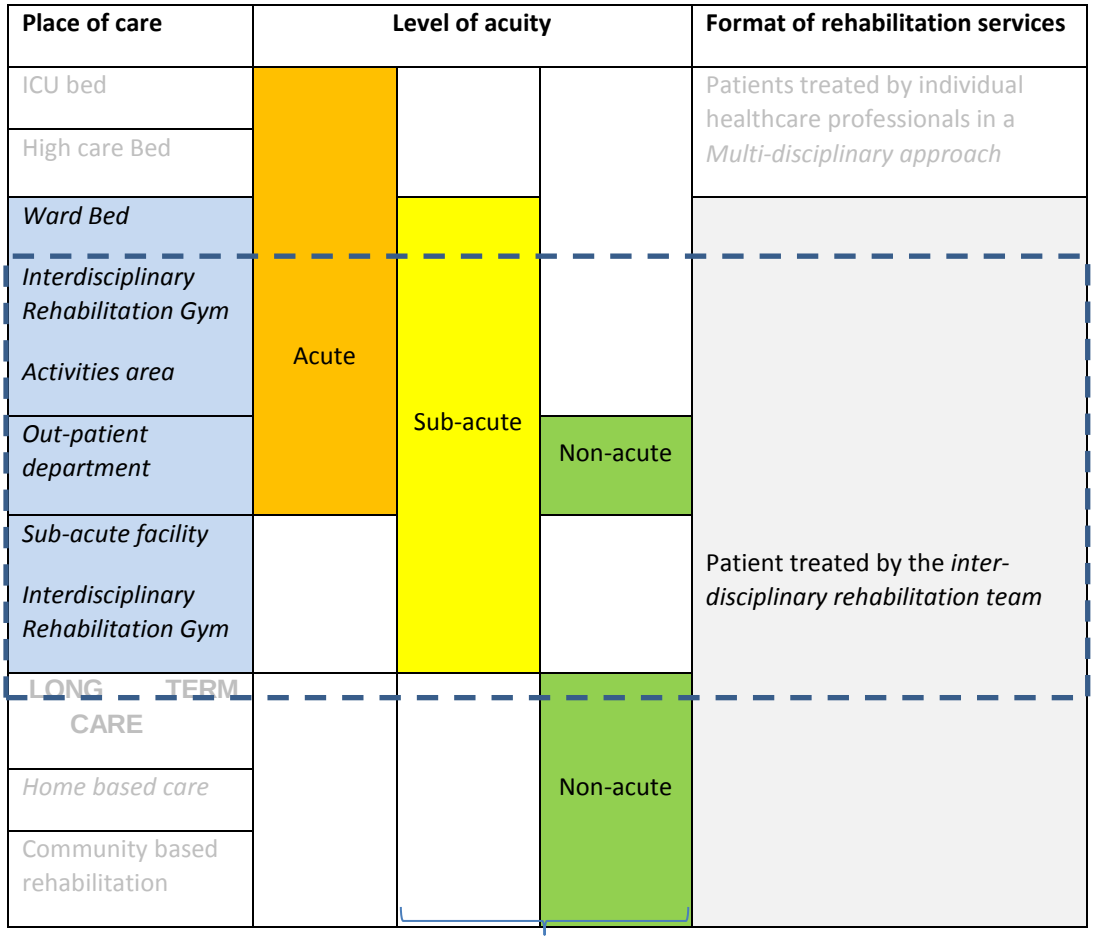
It is important to understand these concepts as they impact directly on the infrastructure and staffing requirements contained in this rehabilitation document. This document will not address rehabilitation as a treatment approach used by an individual therapist as described in the second school of thought, as this should rather form part of the healthcare professionals' service definitions, and is not a facilities issue.

This document will address the rehabilitation facility requirements that facilitate a healthcare provider team approach where the following is applicable:

- The patient has experienced a loss in function and has the potential to either regain full function, or develop maximal functioning.
- The patient does not recover from a medical procedure in the anticipated recovery period.
- A coordinated team of rehabilitation healthcare professionals are required.
- The rehabilitation programme would best be delivered in a dedicated rehabilitation space.
- The rehabilitation programme is not shorter than three days.
- The rehabilitation programme requires a team of two or more rehabilitation healthcare professionals, where a coordinated approach among these treating healthcare professionals is required.

With the call from the WHO for rehabilitation to start from as early as possible (World Health Organization 2011), and for this to be based on a multidisciplinary assessment of individual patient needs and strengths, rehabilitation should take place not only in the specialised rehabilitation units, but should be initiated in the acute hospital setting.

This document will explore the infrastructure requirements to enable the provision of a focused and coordinated rehabilitation service, regardless of the patient's diagnosis, level of functioning or acuity. Depending on the severity of injury or diseases treated, the number of patients requiring rehabilitation and the location of the hospital, these requirements will vary and should be adjusted to meet the needs of the specific facility and epidemiological profile.



Also referred to as post-acute care

The interdisciplinary team should be accommodated for across all general healthcare facilities. However, should the facility have a specialised focus towards the care of a specific patient type (***patient-specific*** focus), this will directly impact on the unique infrastructure and staffing requirements. An example would be a dedicated spinal cord injury unit, which has unique and different infrastructure and staffing requirements when compared with a stroke or burns unit.

For this reason, the dedicated ***patient-specific*** rehabilitation units require a complementary supporting document to highlight their ***unique requirements*** and variations from this core rehabilitation document. These physical rehabilitation facilities would be ***based on this document***, but be adapted to the unique requirements of the dedicated unit. These would include:

- Spinal cord injury units
- Stroke units
- Burns units
- Cardiac units
- Paediatric rehabilitation units
- Mental health units – see *IUSS:GNS Mental Health Facilities* document
- Sub-acute care – see Adult Sub-acute Health Facilities Standards document

PART A - POLICY FRAMEWORK

1. Policy

1.1. Definition of terms

- REHABILITATION:

- Rehabilitation of people with disabilities is a process aimed at enabling them to reach and maintain their optimal physical, sensory, intellectual, psychological and social functional levels. Rehabilitation provides disabled people with the tools they need to attain independence and self-determination (World Health Organization 2011).

- DISABILITIES:

The term 'disabilities is used as an umbrella term, covering impairments, activity limitations, and participation restrictions. Impairment is a problem in body function or structure; an activity limitation is a difficulty encountered by an individual in executing a task or action; while a participation restriction is a problem experienced by an individual in involvement in life situations (World Health Organization 2011).

1.2. Current government policy and impact

A current search of relevant South African government policy regarding physical rehabilitation yields various detailed documents encompassing the many facets of rehabilitation. While the bulk of these documents are not recent, they do provide a baseline from which to develop concepts going forward, where these concepts relate to infrastructure and design:

1.	Regulations relating to categories of hospitals, National Health Act, 2003	March 2012
2.	Provincial guidelines for the implementation of the three streams of PHC	September 2011
3.	National Health Insurance in South Africa - Green Paper	August 2011
4.	Disability Policy Guideline – Department of Public Works	circa 2010
5.	Gauteng Dept. of Health and Social Development Strategic Plan 2009-2014	circa 2009
6.	QASA - Know your Rights - Accessibility and the built environment	2009
7.	Integrated National Disability Strategy White Paper	November 1997
8.	National Health Act	2003
9.	National Rehabilitation Policy	2000

There are further guideline documents that have been drawn up by the various provincial health departments and individual rehabilitation units. These however still need to be compiled into an official document. They outline various standards of care and processes to support the provision of effective rehabilitation services. These include the following, among others:

- Standardisation of provision of assistive devices in South Africa
- Outcomes-based approach to client care

1.3. Regulations relating to categories of hospitals

- Categories of public hospitals as per the government Gazette of March 2012, No. 35101

- Hospital sizes are designated as follows:

a) Small 50 – 150 beds

b) Medium 150 – 300 beds

c) Large 300 – 600 beds

- The following are categories of public hospitals:

a) District hospital

b) Regional hospital – 200 – 800 beds

c) Tertiary hospital – 400 – 800 beds

d) Central hospital – up to a maximum of 1 200 beds (In 2013 these numbered 10 in South Africa)

e) Specialised hospital – maximum of 600 beds

- Provides specialised healthcare services like the following:

- Psychiatric services – see Mental Health Facilities Standards document
- TB services
- Infectious diseases
- Rehabilitation services

1.4. Future government policy development

- Facility definitions – National Department of Health
- National Health Insurance (NHI) in South Africa - White Paper
- Treasury report on financing the NHI

1.5. Infrastructure policy and standards for rehabilitation services

1. Local
   a. R158 regulations
   b. Criteria for Awarding Acute Physical Rehabilitation Unit Status, June 2000
2. International
   a. World report on disability, Chapter 4: Rehabilitation – World Health Organization, 2011

b. Australian Health Facilities Guidelines - Rehabilitation Inpatient Unit May 2012_B_610

c. Australian Health Facilities Guidelines - Allied Health Unit Dec 2010_B_610

d. HBN8 Facilities for Rehab Services - UK National Health Service (NHS)

e. Fitness and exercise spaces – Design guidance note: Sport England, 2008

PART B - ABOUT THE CONCEPT NOTE

For ***form to follow function***, it is important to firstly establish the ideal manner in which the rehabilitation team should interact. This will then provide the patient with the best possible functional outcomes and independence.

In rehabilitation, it is not only the functioning of the team, but also the patient's ultimate independent function (by minimising environmental barriers) that determine the form of the facility. The infrastructure norms and standards therefore need to be moulded around the patient and the healthcare team.

The full rehabilitation team includes the following:

- Patient
- Patient's family and/or caregiver
- Dieticians
- Nursing staff
- Occupational therapists
- Orthotists and prosthetists
- Physiotherapists
- Psychologists
- Rehabilitation doctors or general practitioners (GPs)
- Social workers
- Speech and language therapists
- Technicians – occupational therapy technicians and physiotherapy technicians (assistants)
- Students and volunteers

In a concept note entitled **"The structure of the rehabilitation team, and its impact on facility design and infrastructure",** the approach best used by the multiprofessional team to maximise the patient's outcomes and drive efficiencies has been investigated and proposed based on evidence-based practice.

Following a detailed literature review, it is clear that the ideal rehabilitation team structure is the **interdisciplinary** team approach. This is an approach where the full team of healthcare professionals providing the rehabilitation services coordinates their assessments and treatments, and focuses this around the patient and their family.

A research paper authored by Mirjam Körner, entitled *"Interprofessional teamwork in medical rehabilitation: a comparison of multidisciplinary and interdisciplinary team approach"*, concluded that teamwork and team effectiveness are higher in teams working with the interdisciplinary approach, particularly in physical/somatic rehabilitation units (Körner 2010).
The following table highlights the essential differences between a more traditional multidisciplinary team approach, and that of the interdisciplinary team:

Multidisciplinary team approach	**Interdisciplinary team approach**
Cooperation	Collaboration
Discipline-specific assessments and goals	Team assessments and goals
	Patient and relatives form part of the team

The broadly defined characteristics of an interdisciplinary team include the following:

- An emphasis on the social- or disability-related goals
- Shared responsibility for goals across professional disciplines
- Commitment to shared working practices – collaboration
- Joint decision-making
- An integrative client-centred service (Suddick, 2006)

The interdisciplinary team must have the following:

- A multiprofessional team, including the patient and family
- Team conferences with joint decision-making/problem-solving
- Common goals

It may have the following:

- Various disciplines participating in joint assessment sessions
- Shared record-keeping
- Co-location of staff
- Integrated care plans

The interdisciplinary team approach benefits the patient through the following:

- A patient- and family-focused rehabilitation programme
- Clear rehabilitation goals and plans
- Maximal functional improvement for the patient
- Appropriate length of hospital stay
- Reduced duplication of services
- Efficient use of resources
- Reduction in unnecessary costs
- Collaborative discharge planning

- The following design considerations positively impact on team interaction and the patient experience:

1. Central case notes
    - Avoids duplication of work through access to other team member notes
    - Coordinates the team's activities
    - Promotes continuity of care (if someone is off-sick/on leave)
2. Dedicated team meeting room, with a data projector, boardroom style table and adequate seating
    - Improves team communication
    - Coordinates patient care
    - Develops positive working relations (Molyneux 2001)
3. Family meeting rooms (may be a shared room, with the team room for example)
4. Central shared pause/tea and lunch area away from the therapy areas for staff
    - Improves team communication
    - Helps coordinate patient care
    - Develops positive working relations (Molyneux 2001)
5. IT infrastructure to ensure that all clinical notes and reporting processes are accessible by all staff from various work stations, with due consideration to the relevant patient privacy and confidentiality legislation.
6. Open plan office
7. Joint treatment areas/gym

8. Quiet treatment rooms for the treatment of patients who require cognitive or perceptual therapy, are easily distracted, require isolation due to an infectious disease or require privacy during treatment. This may be for speech therapy, psychology, dietetics, etc.
9. Joint goal-setting/planning sessions and reporting process

This document will describe the design and infrastructure requirements to facilitate the interdisciplinary team approach to rehabilitation, fulfil the needs of the interdisciplinary team and thereby optimise the patient's rehabilitation programme. The nursing area requirements are covered in a separate document detailing the ward and nursing facilities.

For the full interdisciplinary team document, please refer to the Concept Note appended to this document.

PART C - SERVICE SCOPE

The scope of rehabilitation services is a vast one, complicated by variations of interpretation in terminology and the various phases of rehabilitation. Rehabilitation is the process through which a patient goes in order to regain maximal independent function following an injury, disease or medical procedure. In the case of joint replacements this may take just a few days before the patient is functionally independent enough to be discharged home. A tetraplegic patient on the other hand, may take many months before going home.

The various stages of recovery can be classified as acute, sub-acute or chronic. This unfortunately leads to further confusion, as the term 'sub-acute' is also used to refer to a facility, a type of rehabilitation intervention and even a costing model.

In the interest of focus, this document will not address the rehabilitation requirements of the psychiatric or substance-dependent patient, nor will it look at the requirements for frail care or convalescence. It will however offer the rehabilitation services concept to guide the sub-acute care facilities design. This document aims to address the facility requirement for adult physical rehabilitation as provided by an interdisciplinary rehabilitation team, as described and constituted in the Concept Note appended to this document.

1. Patient type

The type of patient treated in the physical rehabilitation facility would include the following:

- Post-surgery recovery
- Multiple trauma, including severe orthopaedic injuries
- Amputees
- Neurological injuries and disease, including head injuries, strokes, spinal cord injury, multiple sclerosis, etc.

The focus and classification will not be based on the patient's diagnosis/disease process, but rather on the patient's need for coordinated rehabilitation. The aim is to improve their current functional level of dependence, to one of further or total independence.

This service needs to be offered on both an inpatient basis, as well as an outpatient service. Outreach and community-based rehabilitation services should use these facilities as a base from which to work, offering administration support, offices, and vehicle and equipment storage.

2. The rehabilitation environment

As the patient moves through the various stages of rehabilitation, the physical location where the rehabilitation is done, changes. The facility and infrastructure should support the rehabilitation efforts of the team in all environments, with this being reflected in the hospital design. A successfully designed hospital with a well-coordinated rehabilitation service will facilitate the best possible outcome for the patient, by empowering the interdisciplinary rehabilitation team. The patient will also not be further disabled due to a restrictive environment with barriers to their independence.

Conversely, the rehabilitation team and the hospital environment need to consider that following the patient's discharge, their home and community environment will not necessarily reflect that of the hospital, with a potential hampering of the patient's independence. Therefore, the rehabilitation environment needs to cater for the 'real-life' environment to which the patient will return. This includes the home, community, work and school environment.

So while rehabilitation needs to take place in an environment conducive to independence, prior to discharge, the patient needs to be exposed to the more challenging environments they will be facing post-discharge. This can be achieved through home trials, work visits and school visits together with members of the rehabilitation team, as well as pre-discharge wards. A Sub-acute facility offers this environment once the patient is medically stable and prior to discharge back into society, and furthermore assists the acute facilities in freeing critical beds.

2.1. At the bedside, or in the ward

Rehabilitation can take place at the patient's bedside, as part of their therapy services. This does not require any additional facility considerations, but may require specific equipment in the delivery of rehabilitation. This equipment would form part of the dedicated therapy areas, but moved to the ward as required.

While the ward is not the ideal environment for intense and focused rehabilitation, it may form a part of the patient's recovery during a short hospital stay, or as part of a broader rehabilitation programme. A patient may for example need to be trained in *hospital bed to wheelchair* transfers, be taught how to use an assistive device for self-feeding in the bed, or be taught how to transfer onto the en suite toilet independently.

The patient would be progressed from treatment in the ward room, to walking to the toilet and into the ward spaces, including corridors and stairs as they are able. It is important therefore that the ward spaces cater for these requirements.

An important consideration for the design of the ward needs to include wheelchair access into and in the room. This caters for access to basins, taps, plugs, curtains and cupboard space from a wheelchair. The wheelchair-bound patient should be able to function from the sitting position, access clothes in the cupboard, wash hands, etc.

2.2. General rehabilitation by specific discipline/s

Patients may be taken off the ward to partake in rehabilitation within the dedicated disciplines department. For example, the patient may go to the physiotherapy department for exercises and training in functional tasks, after which they attend the occupational therapy department for further training.

This approach can be disjointed and uncoordinated; resulting in duplication of services, uncoordinated treatment plans and patient confusion as to what is expected from him and which healthcare professional is responsible for what. This approach is, however, indicated where patients only require treatment by one of the disciplines, or has a short hospital stay.

This approach to rehabilitation will not require a dedicated rehabilitation area, but would rather be incorporated into the general discipline specific treatment area.

Specifications for these areas need to be detailed in a separate dedicated discipline-specific document.

2.3. Dedicated rehabilitation in a gym

In order to provide a coordinated and cost-effective approach to long-term rehabilitation, the sharing of treatment space is ideal. This requires a central gym space with separate dedicated areas for treatments requiring privacy and acoustic privacy. Further dedicated areas catering for administrative requirements, team meetings and reporting will support the integration of the team, moving from a multidisciplinary rehabilitation approach to interdisciplinary teamwork.

The team operating within the gym area may operate as follows:

- Multidisciplinary – this is discussed in detail in the Concept Note. While this form of service offering may still occur, future infrastructure development should facilitate the interdisciplinary team approach in the interest of the patients' outcomes, cost efficiencies and teamwork.
- Interdisciplinary – this document will address the infrastructure requirements that facilitate the interdisciplinary team approach to physical rehabilitation.

2.4. Sub-acute facilities

- Refer to IUSS:GNS Adult inpatient Sub-acute healthcare facilities and IUSS:GNS Outpatient services

For ongoing care of inpatients following discharge, as well as for patients requiring rehabilitation services without having been admitted to the hospital, outpatient care is essential. The challenges for patients are the travel distance to the hospital, as well as costly public transport. This is further amplified for wheelchair users, who are often required to pay double to accommodate the wheelchair, if they are picked up by public transport at all.

There is strong debate about whether discharged patients should attend outpatient rehabilitation in the same gym as the inpatients. The benefits of attending the same gym include mentoring and peer support by the outpatients to newly-injured patients and efficient use of space, equipment and staff. Some patients however choose not to return to the rehabilitation facility post-discharge, as it is a reminder of a very difficult time in their lives, and can be perceived as institutional.

Where resources are limited, combining the two services is recommended. This is the approach adopted in this document.

2.5. Community-based rehabilitation, outreach services and support groups

While this service does not take place with the patient in the facility, the service needs to be supported from the rehabilitation centre. Sharing of equipment, administrative space and staff may improve efficiencies in service delivery.

PART D - PLANNING AND DESIGN

1. Unit operation

An integrated rehabilitation service should aim at coordinating all healthcare professional staff inputs through the interdisciplinary rehabilitation team approach. This approach can be defined as a team of healthcare professionals who meet regularly to coordinate their activities and set treatment goals for the patient through a *collaborative* approach, with less of a hierarchical type of approach. The team includes the patient and the family (Körner 2010).
The operations of this rehabilitation unit therefore need to take cognisance of the elements defined above.

2. Planning

2.1. Location

When selecting the location of the unit, consideration must be given to the fact that many of the patients treated in these units use either wheelchairs (temporary or permanently), or walking aids (mobilise using crutches, a walking frame or walking sticks). It is imperative that the site chosen should be flat, with no steep access roads to the unit. Patients would typically not be confined to the indoor rehabilitation areas, so outside accessibility around the facility as well as to the closest community complex like local shops should not add further restrictions to the patient's independent function.

Within the unit, accessibility by wheelchair or walking aid is a strict requirement, with minimal use of stairs, slopes or lifts where possible. The rehabilitation wards, indoor recreation areas, gym areas and other communal areas need to be on the same level, with minimal use of ramps and no stairs. This not only facilitates patient independence, but makes treatment of patients still bed-bound in the gyms possible through portering of the bed to the gym. It is also an important consideration when it comes to emergency evacuation of patients from the unit, for example in the event of fire.

Where slopes cannot be avoided, the gradient should not exceed 1:20.

2.2. Rehabilitation

Patients who are undergoing intense rehabilitation often have longer stays in the facility. Combined with the fact that these patients are typically medically stable, a more relaxed and less institutionalised arrangement is ideal for their functional recovery and successful re-integration into society.

Common areas encourage peer support, and allow for some time away from the ward. Family members are an integral part of the interdisciplinary team, and are encouraged to be present during treatment times, in the recreational areas and even on the ward. Visiting hours are typically long, with family members being taught how to assist and take care of the patient following discharge. This may include participating in the morning routine of washing, dressing and medical care, to assisting in the rehabilitation of the patient in the gym by helping with walking, transferring the patient, doing stretches and supporting them with their exercises.

3. Functional requirements

The following functional areas are required in the general interdisciplinary rehabilitation unit:

3.1. Receiving and waiting area

There should preferably be separate entrances for the inpatient and outpatient services. This is to reduce the emotional barriers to access for a patient who has transitioned from the inpatient rehabilitation process to a more independent and non-institutionalised state in the outpatient environment.

3.2. Ward

There should be a ward area for inpatients, with easy access to the patient dining area (if the hospital has one), as well as hospital support services like X-rays and the pre-discharge unit.

3.3. Therapy areas

Dependent on the therapy, interaction and treatment of the patient may occur in a general open area of treatment, or in a more controlled and quiet area. The need for privacy should also be considered.

Speech therapy, psychology, dietetics and other consultative sessions typically take place in one-on-one sessions, requiring the patient's full focus and attention. Physiotherapy and occupational therapy may however take place in an open gym environment, where patients encourage one another while doing their exercises, and where the treating therapists assist one another by attending to the patient in the same therapy session. Occupational therapy may however require a quiet area for cognitive, perceptual and visual therapy.

It is therefore a requirement to have both an open gym treatment area to accommodate group activities and individual sessions, as well as separate treatment rooms.

Rehabilitation gym area

The integration of treatment areas utilised by multiple treating disciplines supports the interdisciplinary approach to rehabilitation.

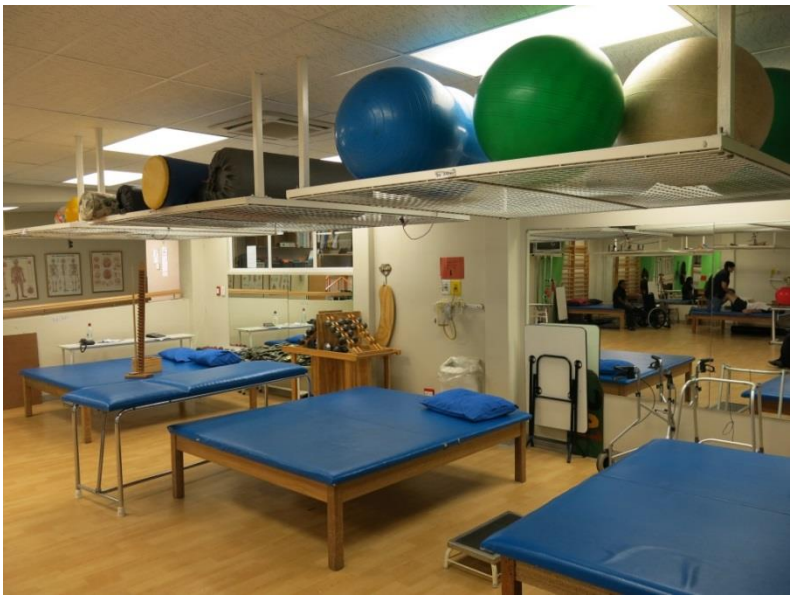
Patients using wheelchairs for their mobility require a low, wide plinth for treatment and training. Rehabilitation would take place both within and out of their wheelchair. It is important therefore to include space either within the gym, or at its entrance for wheelchair storage while the patient is being treated. Space around the plinths also needs to cater for wheelchair access and therapist traffic.

Dimensions: 650 mm wide 600 mm wide

1 000 mm long 1 200 mm long

900 mm high 1 000 mm high

Turning area: 2 000 mm



Plinth

Dimensions: 1 800 mm wide

2 000 mm long

550 mm high

Other considerations: Edges of the upholstery need to be reinforced to protect against repeated wheelchair contact and knocking.

Additional space is required for rehabilitation equipment, which may include the following:

1. Treadmill

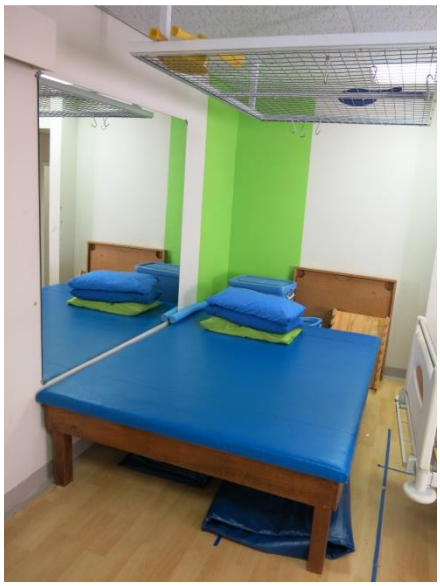

Dimensions: 1 200 mm wide

5 000 mm long

2 800 mm high

Other considerations: This includes a ramp onto the treadmill, and space for an overhead suspension system.

2. Wall ladders and mirrors

Dimensions: 1 800 mm wide 2 500 mm wide

2 500 mm high 2 000 mm high

155 mm off wall

3. Stationary bicycles

Dimensions: 650 mm wide

1 000 mm long

Other considerations: May be bigger if reclining cycle

4. Standing frames

Dimensions: 720 mm wide

1 000 mm long

1 350 mm high

5. Tilt tables

Dimensions: 650 mm wide

2 000 mm long

950 mm high off ground when down

Other considerations: When raised up, this measures 2 000 mm in height. Also needs to fit underneath the suspension frames.

6. Hoists – fixed or mobile

Dimensions: 1 200 mm wide

2 000 mm long

2 000 mm high

Other considerations: Power points at storage areas to charge the batteries.

7. Suspension frame – fixed or mobile

Dimensions: 2 800 mm wide

3 000 mm long

2 500 mm high from floor minimum

Other considerations: Reinforced roof, to carry patients' weight.

8. Parallel bars

Dimensions: 800 mm wide

5 000 mm long

Height adjustable

Other considerations: Need 1 m working space on either side of the parallel bars for the therapist to have access to the patient while walking. A floor-mounted system provides extra safety for the patient. A posture mirror is needed for the open sides of the bars. If the parallel bars lead towards a wall, a fixed wall-mounted mirror is ideal.

9. Mobile posture mirror

Dimensions: 570 mm wide

520 mm long

1 500 mm high

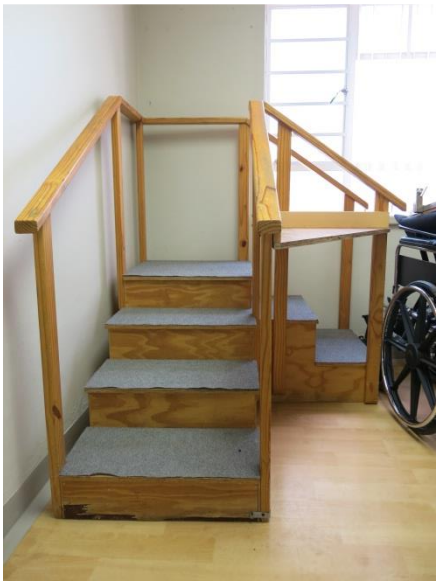
10. Weights trolley or rack

Footprint: 1 500 x 1 500mm wide

1 500 high

Other considerations: Needs to be reinforced and strong, to carry the heavy weights. Heavy duty casters are required, to move the unit into the storage area for safe stowage.

11. Corner stairs unit



Dimensions: 1 600 mm wide

1 600 mm long

1 400 mm high

Other considerations: Ensure that if the patient is standing on the top step, that the ceiling is high enough to clear their head. Top of steps is 650 mm from the ground.

Further considerations include the following:

1. Oxygen and suction units. These are required for the acute patient who may become respiratory-compromised, requiring oxygen and urgent clearing of the airways.

2. Emergency call system linked directly with the ward and on-call system

These need to be within reach of the healthcare professionals as well as the patients. They should therefore be within reach of a person in a wheelchair. These should also be available in areas where the patient might be left alone, for example in the toilet, changing areas, showers, etc.

3. The ceiling height should ideally be higher than the standard 3 m where possible. This not only adds to the feeling of space and activity, but allows for ball throwing activities which are often used in balance retraining. Overhead support treadmills and other such equipment requiring additional height should also be catered for. A ceiling height of between 3.5 m and 4 m is ideal for the gym area, while the office areas need to be at least 2.7 m and storage space at least 2.3 m from floor finish to ceiling height.
4. Should these be required, a section of the roof needs to be reinforced, to allow for the following:
    a. Fixed suspension frame for patient training
    b. Fixed hoist system
5. The floor finishing should be durable, washable and offer a low rolling resistance for wheelchair users. There should not be any grooves or recessed joints where dirt can accumulate.
6. Private treatment areas can be created as required, by installing curtain rails in some sections of the gym, where the curtains can be drawn around a patient should they be required to change or undress for treatment and for general visual privacy. Should full privacy be required, the individual treatment rooms can be used.
7. An area for a patient's family to wait or observe treatment from a distance. Also consider that the patient's family or caregiver may be required to treat the patient under the supervision of the therapist, or be trained in this as part of the rehabilitation process.

8. Lockable storage space is required for movable rehabilitation equipment. Storage racks for weights, hooks for transfer boards and nets for therapy balls need to be catered for.

9. Should patients that require isolation from other patients be treated in the gym, a separate section,, or even a separate gym or session room should be dedicated to their care. It would then be a requirement that these patients use dedicated equipment, which remains in their area to prevent cross-contamination to other patients. Acoustic privacy should also be considered should a patient be very noisy, for example children or head-injured patients.
10. Direct access to wheelchair friendly toilets from the gym for patients. This needs to cater for both wheelchair access alongside the toilet, and grab rails on the sides of the toilet (fold down or fixed), and above the toilet cistern for standing.
11. Access to the gym area should be possible from the ward, the dedicated treatment rooms, and should lead to the outdoor activities area.

Dedicated treatment rooms

The team members that typically require dedicated treatment rooms include speech therapists, social workers, doctors, dieticians, psychologists and at times occupational therapists.

The rooms should lead into the gym area where possible and appropriate, as most of the patients are treated by more than one discipline within the team. This facilitates patient flow and coordination of care. The room size should cater for one patient, one therapist and one caregiver or family member to occupy the room simultaneously, together with the required furniture. Depending on the level of privacy required, there may be clear glass, frosted glass or none at all leading into the gym space. High clear windows are also a consideration. A notice system on the door is required to indicate whether a session is in progress/'do not disturb'.

With regard to patient privacy, a separate entrance to the sessional rooms may be required in some instances, for example with psychology sessions. The patient may not want everyone in the open gym area to see them go into or come out of a psychology session.

While it is ideal that all administration is done centrally by the team as a whole, these rooms may double up as additional administration areas for specific healthcare professionals. It may also serve as filing space and storage areas for specific equipment.

Activities of daily living area

This is a separate and private area leading from the gym area, where patients can practice the activities of daily living. This is often utilised by the occupational therapy and nursing staff, where the patient is taught and practices the following:

- Dressing and undressing
- Getting onto and off a toilet
- Getting into and out of the bath or shower
- Getting onto and off a standard bed, as they might have at home
- Grooming and cleaning at a basin

3.4. Family areas

The patient's recovery and rehabilitation is underpinned by family involvement and support. It is therefore very important to cater for the family when visiting and staying overnight. Unless the patient's support network feels empowered and confident to manage the patient at home, the successful rehabilitation and discharge of the patient will fail.

Needs that have to be addressed include the following:

- A family meeting room, where the entire rehabilitation team can meet with the patient and their family to discuss the injury or disease, potential outcomes and rehabilitation process
- Catering for the family and caregivers in the treatment areas, within reason
- Catering for pause areas where the family and the patient can relax together, both openly and in private
- After-hours recreation or socialising areas
- Onsite accommodation for family that comes from afar
- Accommodating a family member and/or caregiver with the patient in the pre-discharge unit

3.5. Team meeting area

The interdisciplinary team needs to meet weekly as a minimum. The meeting rooms need to be able to accommodate all members of the team who are treating a specific patient or group of patients at once. The presence of the patient may also be required.

A patient would typically be treated by between five and eight rehabilitation staff members. The meeting room would therefore need to cater for a maximum of 12 persons at a time in a boardroom style layout. Network connection and a data projector with screen are essential.

This meeting room may double up as a training room and general staff meeting room should this be required. The family meeting room however should be a separate and dedicated area for that purpose.

3.6. Administrative offices

Staff administration

The staff would typically use a central area for writing up patient notes, capturing information into a central patient management software program, and for writing up reports and motivations. Patient notes also need to be securely stored under lock and key in this area.

Management office

The rehabilitation manager's office needs to be in close proximity to the gym area to aid in general service oversight, as well as to be accessible to both staff and patients. This office would need to include a meeting table for five persons.

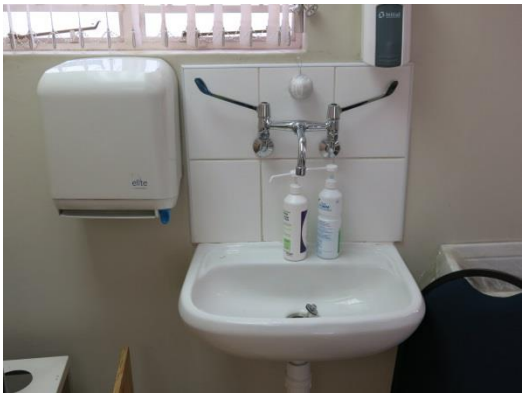
3.7. Toilets

Staff toilets

These should be in close proximity to the staff administration and tea room area, as well as to the gym area, while providing privacy regarding direct access to these facilities. The staff toilets should be wheelchair accessible to cater for physically challenged staff members, and for patient overflow should this be required. Separate men's and ladies toilets are ideal.

Patient toilets

These need to have direct access from the gym area, not only for the patients, but also for staff to dispose of bodily waste and fluids. These need to be fully wheelchair accessible, with grab rails in place, both above the cistern and next to the toilet. Emergency call buttons need to be included, as well as a flusher, taps and a bin that can be operated with minimal hand function.



Visitor toilets

These may be included close to the entrance to the gym area, as well as to the ward.

3.8. Storage areas

Storage areas need to be provided for stowage of daily equipment used in the gym area, as well as for equipment which will be issued to the patient. These might include wheelchairs, pressure relief cushions, transfer boards, etc. The storage areas should have shelved sections, as well as open storage areas for larger equipment. Power supply within the storage areas is important, as charging of batteries for power wheelchairs and hoist systems for example may be required.

4. Optional functional requirements

The following functional areas may be required in the more specialised/dedicated interdisciplinary rehabilitation unit:

4.1. Dining area

In the rehabilitation environment, patients should be encouraged to take their meals away from the ward where possible. Food may be served, buffet style, or on pre-order from the catering department. There should be tables that cater for the wheelchair user, ensuring that a wheelchair can fit underneath, as well as others with chairs for walking patients. This area may have a self-serving kitchenette where patients can make their own tea/coffee, warm up meals, and a vending machine for after-hours food purchases.

4.2. Recreational areas

Patients require time away from therapies and the ward, to socialise with each other, support one another, and interact with family and friends.

Indoor recreation area

This area would include a big screen television for entertainment and for patient education sessions. It may include games like table tennis, foosball and pool, books to read, etc. Access to this area should cater for after-hours utilisation, and may include Wi-Fi for work-related tasks and general e-mail and Internet connectivity.

Outdoor rehabilitation areas

While this area needs to be predominantly wheelchair friendly, there should be areas specifically developed to progress the patient's mobility, albeit it in a wheelchair or using crutches. This may include soft sand, grass, a rocky area, curbs and steep slopes. The idea is that the patient would be able to practice walking or propelling a wheelchair over terrain similar to what they might have at home.

Gardening and planting of small crops may be a source of relaxation or a form of subsistence. Patients are supported by the occupational therapy team to engage in these activities. Allowance needs to be made for raised planter beds, as well as ground-level planting.

Sport facilities should also be provided, and may include a basketball court, an area for wheelchair races, lawn bowls and volley ball.

Further amenities include a peaceful and secluded area for relaxing and contemplation and an area for larger family gatherings.

4.3. Hydrotherapy

Full details regarding the requirements for hydrotherapy are contained in a separate dedicated document. Carefully consider the following points before deciding to provide this service:

- Evidence to support improved functional outcomes for the patient group
- The cost of installing the pool
- The cost of maintaining the pool
- Who takes responsibility for regular pool maintenance, including chemical balance, temperature control, water level, etc.
- Regular microbiological testing of the pool water and action plan should water be contaminated

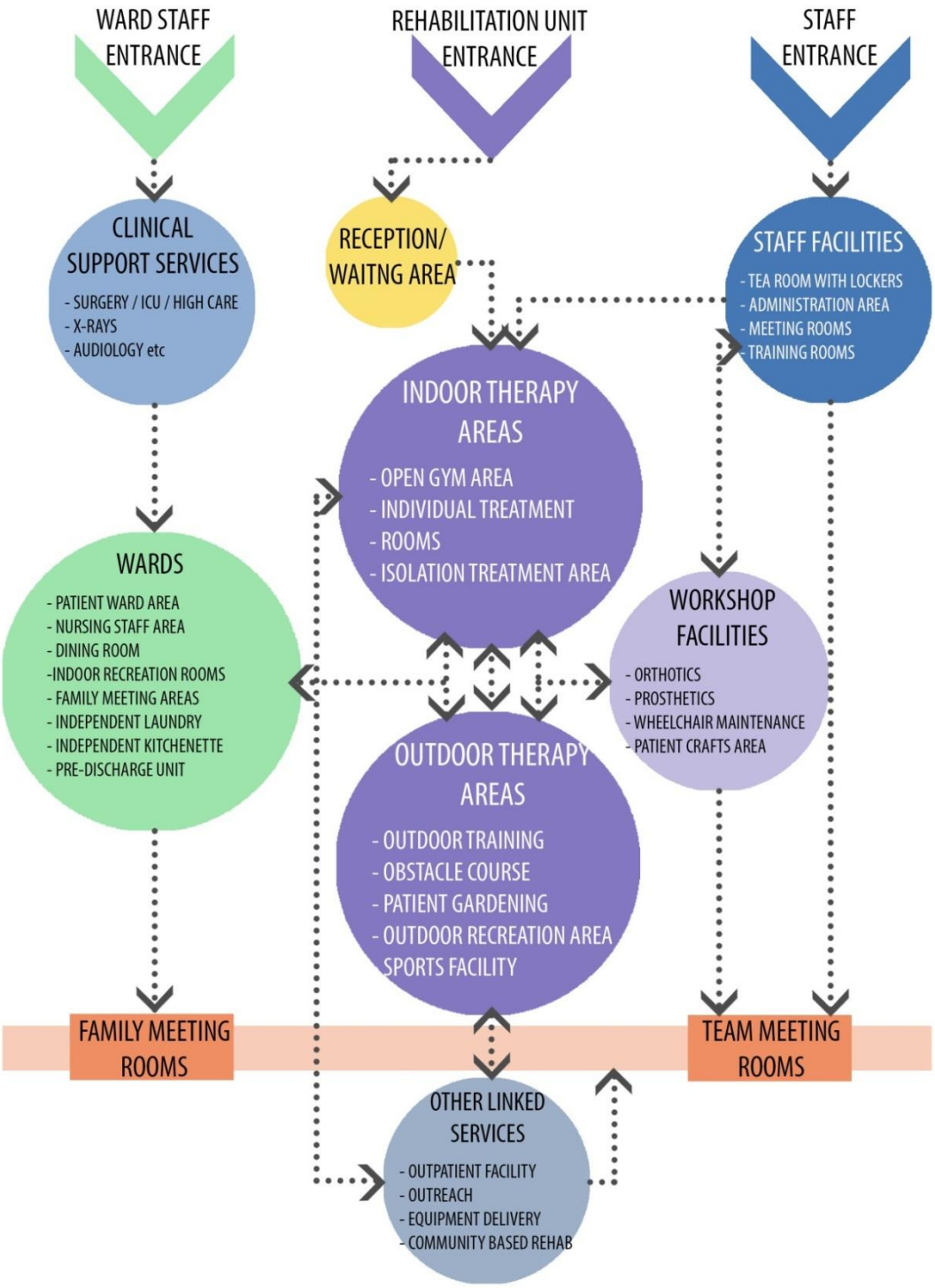
4.4. Dedicated clinic area

Depending on the patient type seen in the facility, the following dedicated areas may be considered:

- Gait clinic
- Seating clinic
- Spasticity clinic
- Vocational rehabilitation/work hardening
- Hand therapy and lymphedema clinic

5. Functional flow diagram

The flow through the rehabilitation facility needs to account for various patient and staff flows, with the following functional relationships:



PART E - ACCOMMODATION

This list of accommodation requirements is based on a dedicated adult physical rehabilitation unit catering for 36 patients who can actively participate in the rehabilitation programme. This patient number was decided upon based on the nursing ratios and staffing approaches typically seen in the rehabilitation environment. Multiples of 18 would also suffice, with consideration then of other numbers to be adjusted in accordance.

This is specific for a patient group that would benefit from more than one allied healthcare professional intervention. While the interdisciplinary team approach is supported in the literature for best patient outcomes, efficiency and coordinated care in the specialised rehabilitation facilities, it demonstrates the basis of all rehabilitation care.

Depending on the number of patients falling under the care of the facility, and the local demand for coordinated rehabilitation services, these numbers and sizes will vary. One does however need to keep in mind the facility efficiencies and patient functional outcomes. A dedicated rehabilitation facility should not be set up for less than 18 patients.

For a 36-bed unit, the staff compliment may look as follows, depending on the patient type being treated:

- Physiotherapists 5 Based on each patient receiving physiotherapy session per day
- Occupational therapists 4 Based on most patients receiving one OT sessions per day
- Speech therapists 2 Based on half of the patients requiring intense ST per day
- Social workers 2 Based on each patient having a SW session every second day
- Psychologist 1 Based on each patient visiting the psychologist once a week
- Dietician 1 Based on each patient visiting the dietician once a week
- Doctor 1 Based on a ward round with all the patients daily
- Orthotics and prosthetics
  These services will fall into those offered in the general hospital. O&P services are centred within their workshop, with access to the gym area.

36- bed rehabilitation unit	Function	Number	Size	Total
Rehabilitation gym	Provide a space in which multiple disciplines can treat and rehabilitate the patient, towards independent function and community reintegration.	1	150 m^2	150 m^2
Isolation treatment gym	Treatment of patients requiring infection control, and those who may disturb other patients due to behavioural changes.	1	25 m^2	25 m^2
Therapy rooms in gym	These rooms are used by the occupational therapists and speech therapists, when dedicated equipment is used, and/or when a quiet environment is needed.	2 OT 2 ST	14 m^2 14 m^2	28 m^2 28 m^2
Private consulting rooms	These rooms require a separate entrance from the gym, but in the same area. These are for 1 x dietician, 2 x social workers, 1 x psychologist and 1 x doctor.	5	12 m^2	60 m^2

36- bed rehabilitation unit	Function	Number	Size	Total
Activities of daily living room	This is used by the occupational therapists to train the patients in using a standard bed, bath/shower and toilet. Dressing and undressing is also practiced. Functional toilet and bath can be incorporated if doubled up with a toilet facility.	1	12 m^2	12 m^2
Patient toilets	These are for quick access during therapy times. Toilets need to be fully wheelchair accessible, and can be unisex.	2	9 m^2	18 m^2
Management office	To support the rehabilitation manager, in close proximity to the gym area.	1	20 m^2	20 m^2
Storage	Enough storage needs to be catered for, to lock away valuable equipment, and also for holding stock of equipment that will be issued to the patient.	3	24 m^2	72 m^2
Staff admin area	For all staff to do patient notes, motivation letters, use computers, store notes, etc.	1	42 m^2	42 m^2
Staff pause/tea area	For staff to move away from the therapy and administration areas, to take their lunch and socialise.	1	50 m^2`	50 m^2
Staff toilets	Male and female	2	9 m^2	18 m^2
Visitor waiting area	For family and friends to wait/observe treatment.	1	12 m^2	12 m^2
Visitors toilets	Male and female	2	9 m^2	18 m^2
Total				**553 m^2**

PART F - ROOM DATA SHEETS

1. Ward accommodation

The rehabilitation patients' ward design and layout requirements vary from the *IUSS:GNS Adult inpatient accommodation* document in the following ways:

1.1. Ward room layout

While the Adult Inpatient Accommodation document provides for wards to be accessible for persons using a wheelchair, further considerations for those who may be dependent on a wheelchair or other device for mobility on a more permanent basis include the following:

- There should be specific rooms equipped with a permanent ceiling hoist system, for the safe management of very heavy patients, or those that require maximal assistance to move from the bed to a chair or wheelchair and back.
- The beds need to be height adjustable together with a thoracic area that can lift up, preferably motorised as opposed to manual. This allows the patient to manage this independently.
- Some rooms need to cater for a ventilator-dependent patient who is medically stable enough to be transferred to the rehabilitation unit.
- The en suite bathrooms need to have both side rails (permanent or fold down) and a rail above the cistern for patients who are able to stand, but require assistance.
- En suite showers should preferably be wet-floor design, allowing wheelchair access into the shower. A mixer-type fitting should be used to allow independent use should the patient have poor hand function.
- All basins should be operable by a patient with poor hand function. The lever type is ideal. Basins should be low enough to be used from a wheelchair, with clearance for the patient's legs to move underneath.
- Transfer boards need to be available on the ward.
- Specific consideration is required to ensure that the patient panic/alarm system is operable by a patient with poor hand function.
- As patients requiring rehabilitation often stay in the hospital for longer periods of time, they are encouraged to dress in their own comfortable clothes, appropriate for training. Their closets need to be big enough to hold personal clothes, and feature a secure section for valuables. The hanging rail needs to be low enough to reach from a seated position in a wheelchair.
- Access to the Internet is important for patients who need to stay involved in work or business obligations, as well as for social network interaction.

1.2. Ward passage layout

While the majority of rehabilitation will take place either in the patient's room initially, or in the gym area, the passage area is often used for rehabilitation, exercise and independent practicing by the patient. It is therefore important to ensure the patients' safety and maximise their independence in all areas.

The following is required:

- Rails along the passages
- Bumper boards at wheelchair height and bed height, especially on corners
- Pause areas along the passage with a chair for the patient to catch their breath
- If there are stairs in the vicinity of the ward, rails are required on both sides
- Smooth flat surfaces with no loose mats or carpets. Avoid small steps, slopes and thresholds where possible

1.3. Ward administration layout

The nursing staff is an integral part of the rehabilitation team. While most of their time is spent on the ward taking care of patients, they are encouraged to participate in the rehabilitation process both on the ward and in the gym areas. By understanding what the patient is capable of, and techniques taught in the gym, the nursing staff are best equipped to continue these methods on the ward after-hours and on weekends. They are also relieved of some of the dependent requirements of the patient, as the patient becomes more independent.

In order for the nursing staff to contribute to the team reports, their attendance of and contributions to the team meetings are critical. Reporting to the centralised system requires that they have Intranet connection from the ward, using ward computers.

The patient notes also need to be centrally located, so that members of the rehabilitation team treating on the ward are able to capture notes in the patients' files.

1.4. Additional ward requirements

Easy access from the ward to the rehabilitation areas is critical for the patient, rehabilitation staff and porters. Patients may attend rehabilitation in the gym area while still bed-bound, so easy portering of the beds is a requirement. The ward should ideally be on the same level as the rehabilitation gym area.

Once the patient has become more independent in their daily activities, a discharge plan should be put together with the patient. This ensures a well-coordinated discharge process, with a higher rate of success. As part of the final preparations before discharge, the patient may be transferred to the pre-discharge ward. This is a room, either adjoined to the ward, or a separate building all together, where the patient experiences living in a standard environment. This would include a standard bed (not a hospital bed), bathroom, kitchen area, etc. This phase of the rehabilitation process may also include co-habiting with a spouse or partner and/or a caregiver.

It is essential that this room is equipped with an emergency call system, telephone and Internet connection.

2. Therapy areas

All areas need to be well ventilated, with the option to cool in the summer, and heat in the winter. This is especially important when treating spinal cord injured patients, and others who have problems in regulating their body temperature.

	Plug points	Network points	Lighting	Finishes	Water	Waste	Acoustic/ sound	Ceiling height	Flooring	Other
Rehabilitation Gym	1 per plinth	2 for patient computers	Natural and florescent	Paint colours should be dynamic and energetic	2 Water coolers. 2 Hand basins for staff to wash hands	Sharps bin. Toilet area needs to cater for dirty linen	Can be a noisy environment, no echoing	3.5m – 4m	Smooth, durable and easily cleaned	Need music Reinforced roof to hold suspension frames over most plinths.
Isolation treatment gym	1 per plinth	-	Natural and florescent	Paint colours should be	1 Water cooler. Hand basin	Medical waste disposal	No echoing, needs to be acoustically	3.5m – 4m	Smooth, durable and	Need to have a door that can close should there be a lot of noise from the isolation room, or to cut out noise from gym area

	Plug points	Network points	Lighting	Finishes	Water	Waste	Acoustic/ sound	Ceiling height	Flooring	Other
				more neutral	for staff to wash hands	bins, gloves, gowns, masks, sharps disposal bin	private		easily cleaned	should patients require a calm and quite space. Windows should have blinds.
ST rooms in gym	2 in each room	1 in each room	Natural and florescent	Paint colours should be more neutral	Hand basin	Medical waste disposal bin	Room should be acoustically private	3m	May be a continuation of the gym flooring, or carpeted	Need to cater for a wheelchair bound patient to get in underneath the desk, opposite the therapist. A mirror on the wall for the patient, at the seated position height. Need a chair for family member or carer too. Lockable storage cupboard.
OT rooms in gym	2 in each room	1 in each room	Natural and florescent	Paint colours should be more neutral	Hand basin	-	Room should be acoustically private	3m	May be a continuation of the gym flooring, or carpeted	Need to cater for a wheelchair bound patient to get in underneath the desk, opposite the therapist. Need a chair for family member or carer too. Lockable storage cupboard. Should the room double up as the splinting room, this should have a heat and water resistant surface, and a big basin with hands-free taps.
ADL Room	2	1	Natural and florescent	Paint colours should reflect the interior design approach for household – not clinical	Need plumbing to cater for a shower, bath, basin, toilet and utility basin	Utility basin for rinsing out buckets etc.	-	3m	Bathroom type flooring	Basins should be disabled friendly regarding taps. The other equipment in this area should be standard, as the patient will use these to practice on before going home. The disabled friendly facilities should be available on the ward for daily use. Bath does not have to have functioning plumbing.
Management office	2	1	Natural and florescent	Paint colours should be more corporate	-	-	Room should be acoustically private	3m	May be a continuation of the gym flooring, or carpeted	Need to cater for a small board room table for small private meetings. Space for lockable filing cabinet. Lockable storage cupboard.
Storage	4	-	Florescent		-	-	-	3m		Need plug points to recharge power wheelchairs, hoists etc.
Staff admin area	1 per staff station	1 per 4 staff members	Natural and florescent	Paint colours should be more neutral	-	-	Room should be acoustically private	3m	Carpeted	Desk space along the wall, 1m per staff member. 1 networked computer per 4 staff members for team notes and evaluations. Lockable filing cabinets. Include a photocopier/printer and shredder. Lockable storage cupboard for stationery etc.
Staff pause/tea area	3	-	Natural and florescent	Paint colours should be more neutral	Relevant water supply for kitchenette	-	Room should be acoustically private	3m	Carpeted	Lockers for staff, kitchenette, casual area for relaxing away from the therapy areas. Lockable storage cupboard for tea, coffee, mugs etc. Fridge, kettle.
Staff toilets	-	-	Florescent		As per toilet regulations		-	3m	Tiles	
Visitor waiting area	1	-	Natural and florescent	Paint colours should be more dynamic	Water cooler	-		3m – 4m	Continuation of the gym flooring	Table with magazines, notice board, chairs for waiting, space to wait in a wheelchair. May include a vending machine.
Visitors toilets	-	-	Florescent		As per toilet regulations		-	3m	Tiles	
SW private room	2	1	Natural and florescent	Paint colours should be more neutral	-	-	Room should be acoustically private	3m	May be a continuation of the gym flooring, or carpeted	Need to cater for a wheelchair bound patient to get in underneath the desk, opposite the therapist. Need a chair for family member or carer too. Lockable storage cupboard.
Dr's private room	2	1	Natural and florescent	Paint colours should be more clinical	Hand basin	Sharps bin	Room should be acoustically private	3m	May be a continuation of the gym flooring, or carpeted	Need to cater for a wheelchair bound patient to get in underneath the desk, opposite the therapist. Need a chair for family member or carer too. Lockable storage cupboard.
Psychologist's private room	2	1	Natural and florescent	Paint colours should be more neutral	-	-	Room should be acoustically private	3m	May be a continuation of the gym flooring, or carpeted	Need to cater for a wheelchair bound patient to get in underneath the desk, opposite the therapist. Need a chair for family member or carer too. Lockable storage cupboard.
Dietician's private room	2	1	Natural and florescent	Paint colours should be more neutral	-	-	Room should be acoustically private	3m	May be a continuation of the gym flooring, or carpeted	Need to cater for a wheelchair bound patient to get in underneath the desk, opposite the therapist. Need a chair for family member or carer too. Lockable storage cupboard. A wheelchair scale with due consideration for its space requirements.

3. Equipment, both fixed and loose

The following is an extensive list of equipment that ***may*** be required. These lists include equipment required for specialist units, and may be exhaustive for a general rehabilitation service.

All equipment is to be regulated according to the requirements of the Provisioning Administrative System (PAS – inventory control).

3.1. Physiotherapy

Clinics

- A portable equipment kit exists for use at clinics and during home visits. The hospital complex must regulate the proper storage and usage of the equipment kit.

The following may be required in order to offer an outreach service at the local clinics or in the patients' homes:

- A pool vehicle
- Exercise mats
- Crutches – aluminium and wooden
- Walking frames
- Nebuliser – electronic with required accessories
- Combination ultrasound/interferential unit*
- Weights/sandbags
- Physiotherapy balls
- Bobath roll
- Stationery
- Pharmaceutical items

Exercise equipment

- Bobath – plinth wooden (platform)
- Treatment plinths – adjustable backrest
- Treatment couch - hydraulic or electric
- Tilt table
- Treadmill – electronic
- Exercise cycle upright or recumbent
- Training stairs
- Steps – single height/double height
- Gym mats
- Elbow crutches
- Axilla crutches – wooden
- Quadrupods
- Walking frame - adult
- Parallel bars-adjustable: fixed and/or portable
- Wall bars
- Dumbbells of various weights (0.5-10 kg)
- Wrist/ankle weights
- Re-education board
- Wobble board for balance retraining
- Bobath balls (small, medium and large)
- Bobath rolls (small, medium and large)

- Stool
- Push-up blocks
- Hand exercisers (power web, theraballs, therapy putty, cones, digifix)
- Theraband
- Theraputty
- Posture mirrors
- Ice packs
- Blood pressure unit
- Patella hammer
- Goniometer
- Measuring tape
- Wheelchairs – porters

Chest physiotherapy equipment

- Stethoscope
- Massager (vibrator)
- Portable ultrasonic nebuliser (unless there is walled oxygen, in which case the jet nebulisers can be used)
- Portable suction unit (unless there are permanent walled suction units)
- Portable oxygen (unless there are permanent walled oxygen supply)
- Incentive spirometer
- Peak flow meter
- Flutter valve (bronchuvibe)

Electronic equipment

All electrotherapy equipment has to be licensed before procurement, to comply with the relevant safety regulations, and has to be inspected for radiation according to the Radiation Act 15.

Electrotherapy equipment has to be serviced once a year. The life span of all electrotherapy equipment is approximately 10 years.

The following is an exhaustive list of possible electrotherapy equipment that may be used by the physiotherapist. The list will be narrowed down in accordance with the specific patient type that is treated in the unit, as well as the current evidence supporting the use of the specific equipment.

- Ultrasound unit
- Interferential therapy unit with accessories
- Ultra-violet unit
- Short-wave diathermy unit – pulsed
- Low frequency electrotherapy unit with accessories
- TENS apparatus
- Laser therapy unit
- EMG retrainer
- Functional electrical stimulation units

Other equipment includes:

- Hot-pack heater with hot packs
- Traction unit complete with accessories
- Paraffin wax heater and accessories
- Trolleys for electronic equipment

Labour-saving devices

This is equipment required to assist the physiotherapist to protect their backs, minimise injuries on duty and safely move the challenging patient:

- Manual or electronic patient hoist
- Transfer boards
- Manual handling belts and slings

This is equipment required to assist the physiotherapist in maximising their productivity:

- Computer (One computer per three physiotherapists, one computer per manager)
- Fax, photocopier and printer (can be an all-in-one)
- Relevant computer software, including PhysioTools for home exercise programmes
- Data projector

Furniture

In the gym area:

- Chairs for patients and their families. Consideration must be given to patients who struggle to stand up from sitting – e.g. sturdy arm rest, higher than usual seat.
- Screens for privacy within the gym area
- Mobile drip stands

In the staff area:

- Desks and chairs for physiotherapy staff to do their administration duties
- Filing cabinet
- Cupboards for stationery, small equipment, etc.
- Telephone
- Lockers
- Notice board

In the kitchen area:

- Fridge with freezer (for cold packs)
- Kettle
- Microwave

Linen

A linen room or demarcated area for linen storage in the general store rooms will be required.

- Sheets
- Pillows
- Pillow cases
- Towels
- Blankets

3.2. Occupational therapy

Clinics

- A portable equipment kit exists for use at clinics and during home visits. The hospital complex must regulate the proper storage and usage of the equipment kit.

The following may be required in order to offer an outreach service at the local clinics or in the patients' homes:

- A pool vehicle
- Portable splint bag (contents to be specified under splinting material)
- Assistive devices for assessment purposes, i.e. swivel bather, bath board, slide board, long-handled reacher, raised toilet seat, adapted cutlery and universal cuff
- Set of portable ramps
- Stationery, including a tape measure

Exercise equipment

- Wooden plinths
- Bobath plinths – adjustable backrest and height
- Tilt table
- Gym mat
- Bobath balls (small, medium and large)
- Bobath rolls (small, medium and large)
- Stool
- Push-up blocks
- Hand exercisers (power web, theraballs, therapy putty, cones, digifix)
- Theraband
- Theraputty
- Posture mirror
- Ice packs
- Blood pressure unit
- Patella hammer
- Goniometer - finger goniometer
- Dynamometer
- Upper limb air splints (medium and large; left and right)
- Measuring tape
- Assorted hand function activities
- Assorted fine and gross motor activities
- Wheelchairs – porters
- ITS machine
- Mobile limb balancer
- FEPS

Hand therapy (including splinting) equipment

- Massager (vibrator) – large and small
- Splint pan x 2 *
- Heat gun x 2 *
- Wax bath
- Splinting scissors x 4 *
- Mirror box
- Metal ruler
- Craft knife x 3 *
- Different-sized handheld punch (dynamic splints)

(* one of these to goes into mobile splinting bag)

Electronic equipment

All electrotherapy equipment has to be licensed before procurement, to comply with the relevant safety regulations, and has to be inspected for radiation according to the Radiation Act 15.

Electrotherapy equipment has to be serviced once a year. The life span of all electrotherapy equipment is approximately 10 years.
The following is a list of possible electrotherapy equipment that may be used by the occupational therapist. The list may be adjusted in accordance with the specific patient type that is treated in the unit, as well as the current evidence supporting the use of the specific equipment.

- Therapeutic electrical stimulation units

Other equipment includes:

- Hot-pack heater with hot packs
- Paraffin wax heater and accessories
- Trolleys for electronic equipment

Labour-saving devices

This is equipment required to assist the occupational therapist to protect their backs, minimise injuries and safely move the challenging patient:

- Manual or electronic patient hoists
- Transfer boards
- Manual handling belts and hoist slings
- Ergonomic mobile stools

This is equipment required to assist the occupational therapist in maximising their productivity:

- Computer (One computer per three occupational therapists, one computer per HOD)
- Fax, photocopier and printer (can be an all-in-one)
- Relevant computer software, including PhysioTools (section with ADL equipment and assistive devices)
- Relevant computer software, including cognitive games and computer-based leisure activities
- Data projector

Furniture

In the gym area:

- Chairs for patients and their families. Consideration must be given to patients who struggle to stand up from sitting – e.g. sturdy arm rest, higher than usual seat.

- Screens for privacy within the gym area
- Mobile drip stands

In the staff area:

- Desks and chairs for occupational therapy staff to do their administration duties
- Filing cabinet
- Cupboards for stationery, small equipment, etc.
- Telephone
- Lockers
- Notice board
- White board and markers

In the cognitive/one-on-one treatment area:

- Desk
- Chairs
- Computer
- Stationery
- Cupboard

In the kitchen area:

- Fridge with freezer (for cold packs)
- Kettle
- Microwave

In the ADL area:

- Bed
- Kitchenette (ADL kitchen) - kettle, toaster, fridge, stove, microwave, mixing bowls, measuring cups and utensils, electric mixer
- Assistive devices
    - Long-handled reacher
    - Long-handled sponge
    - Dressing stick
    - Button hook
    - Tap turner
    - Sock aid
    - Kettle tipper
    - One-hand chopping board
    - Commode with wheels
    - Bath board
    - Bath seat
    - Bath step
    - Raised toilet seats (different sizes)

Linen

A linen room or demarcated area for linen storage in the general store rooms will be required.

- Sheets
- Pillows
- Pillow cases

- Towels
- Blankets

Cognitive/perceptual treatment items

- Various games and activities for perceptual deficits (specific list will need to be submitted)
- Various games and activities for cognitive deficits (specific list will need to be submitted)
- Map book
- Leisure/craft activity supplies
- Stopwatch
- Standardised cognitive-perceptual assessment and treatment - LOTCA, Rivermead Perceptual Assessment battery, COTNAB, Rivermead Behavioural Memory Test, etc.

3.3. Speech therapy

Need a comprehensive list

3.4. Orthotics and prosthetics

See separate document on O&P workshop and equipment requirements.

3.5. Psychologists

Need a comprehensive list

3.6. Dieticians

Need a comprehensive list

PART G - CASE STUDIES AND EXAMPLES

1. Western Cape Rehabilitation Centre

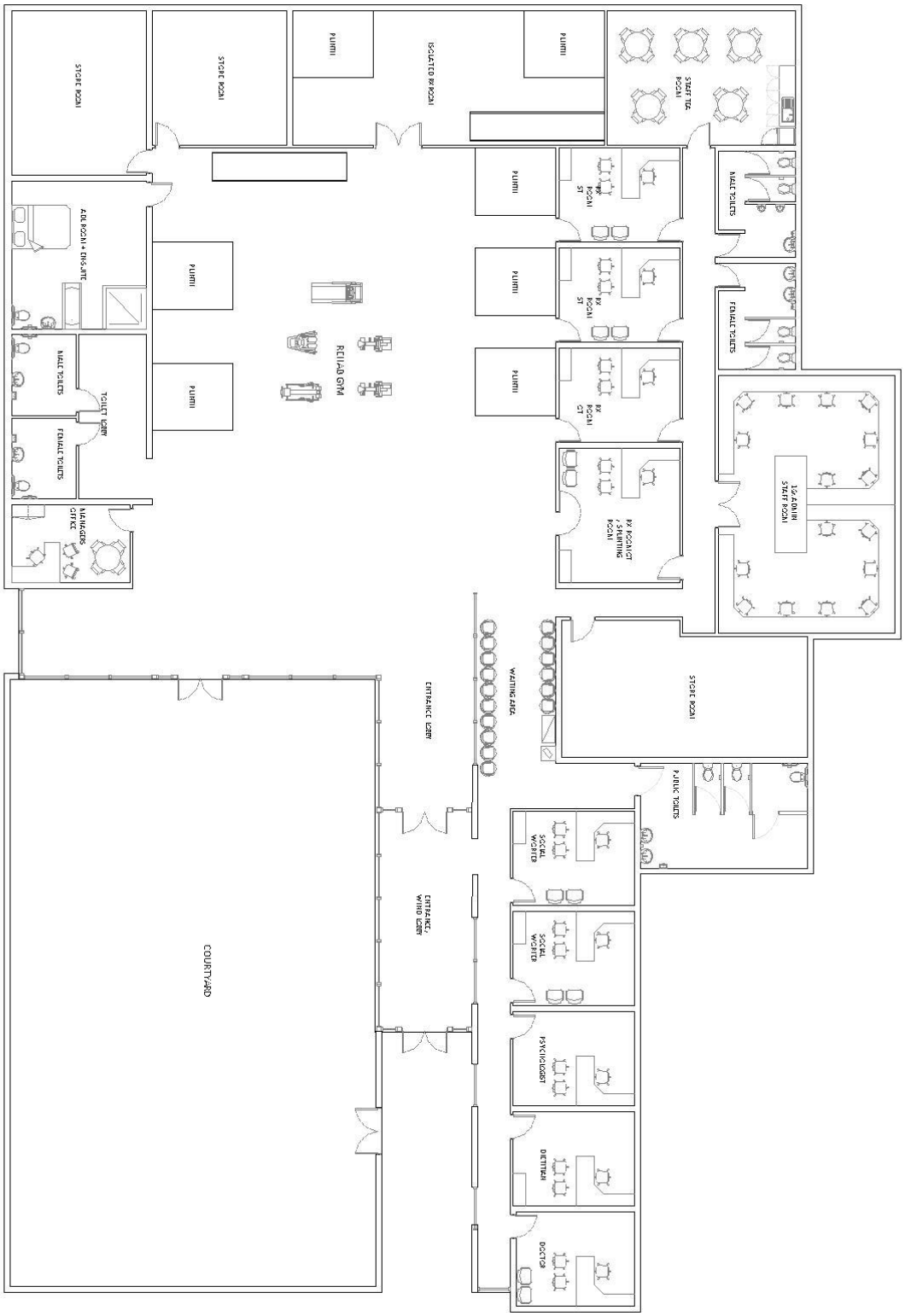
2. Tshwane Rehabilitation Centre

3. Drawings

Below is an example of a rehabilitation unit with the team focused on the patients' activities. All members of the interdisciplinary team are working with the patients in the same area, facilitating patient flow between therapies, and coordinating these activities between the various disciplines. Consideration is given to treatment sessions that need to be done in isolation, due to distracting patient behaviour to other patients, a requirement for acoustic and visual privacy, and infection control.

The outdoor area, natural light and a feeling of activity through high ceilings are incorporated into this design.

This drawing is an example intended to portray the concepts above. It is not drawn to a scale relating to the patient numbers or Accommodation Schedule in PART E, nor the Therapy areas described in paragraph F2.


STORE ROOM
STORE ROOM
PLUMB
ISOLATED BY ROOM
PLUMB
STAFF TOI. ROOM
PLUMB
PLUMB
PLUMB
ADL ROOM + ENSUITE
PLUMB
PLUMB
RECI-AB GYM
MALE TOILETS
TOILET LOBBY
FEMALE TOILETS
MANAGERS OFFICE
RX ROOM
RX ROOM
RX ROOM / SKIMMING ROOM
MALE TOILETS
FEMALE TOILETS
I.C.T ADMIN STAFF ROOM
STORE ROOM
PUBLIC TOILETS
WAITING AREA
ENTRANCE LOBBY
ENTRANCE/ WAITING LOBBY
SOCIAL WORKER
SOCIAL WORKER
PSYCHOLOGIST
DIETITIAN
DOCTOR
COURTYARD

PART H - LIST OF ABBREVIATIONS

ADL	Activities of daily living
CSIR	Council for Scientific and Industrial Research
GP	General Practitioner
HCP	Healthcare professional
ICU	Intensive care unit
IUSS	Infrastructure unit support systems
NHI	National Health Insurance
NHS	National Health Services
OT	Occupational therapy
PRM	Physical and Rehabilitation Medicine
PT	Physiotherapy
O&P	Orthotics and prosthetics
OPD	Outpatient Department
QASA	Quad-Para Association of South Africa
ST	Speech therapy
SW	Social work
TB	Tuberculosis
WHO	World Health Organization

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PART K - CONCEPT NOTE

Deon Bührs, 18 March 2014

1. The structure of the rehabilitation team, and its impact on facility design and infrastructure

2. Introduction

Rehabilitation can be defined as the active process in which the patient is restored to their previous level of independent functioning, following a traumatic event with serious bodily impairment of function. Should the patient not be able to return fully to their previous level of functioning, rehabilitation would focus on enabling the patient to regain as much functional independence and social reintegration as possible, by utilising the expertise of the healthcare professionals dedicated to the rehabilitation process, and the available resources.

These resources are not only limited to human resources, but also to the financial resources, which determine the type of equipment that the patient will be issued with, the alterations that may be done to the patient's work and home environment, and any ongoing support the patient may require after discharge in the form of a caregiver, if needed.

The method through which rehabilitation services is delivered is of critical importance to the patient's progress and outcome. While it is well understood that there are many healthcare professionals involved in the rehabilitation process, the interaction and teamwork of these professionals are of utmost importance.

This concept note will explore the ideal team model which would deliver the optimal rehabilitation outcomes, as well as the impact that the arrangement between the various disciplines will have on the design and infrastructure requirements of the rehabilitation unit. It will most importantly address the optimal design and infrastructure requirements in order to support the team approach, and ultimately the best possible outcome for the patient.

3. The patient requiring rehabilitation

"About 70 years ago, the interdisciplinary rehabilitation team emerged in response to the increasingly complex healthcare needs arising from World War II. Thanks to antibiotics and other medical advances many soldiers wounded in that World War II survived who would not have survived World War I. With this increased survival came a greater number of those patients with severe injuries and disabilities. Physicians confronted new challenges that could not be addressed by single-discipline care. Creative approaches and innovative strategies were needed. Central to their response was the development of the interdisciplinary team to promote comprehensive and collaborative care. This team approach eventually became the mainstay of a new field of medicine, being Physical Medicine and Rehabilitation" (Strasser, 2008).

The field of rehabilitation has grown tremendously since the Second World War, with advances in technology, facilities and communication tools. The rehabilitation process has also diversified across

various medical fields of care, with the result that the word 'rehabilitation' itself needs further clarity.

Rehabilitation can be divided broadly into physical or somatic rehabilitation, and mental health or psychosomatic rehabilitation. For the purposes of this concept note, I will be focusing on the somatic rehabilitation, rather than the drug and alcohol dependency or mental wellness area of rehabilitation.

Physical rehabilitation can be further divided into subclassifications depending on the place in which the rehabilitation takes place, the stage of recovery in which the rehabilitation occurs, as well as the medical condition requiring rehabilitation.

Place where physical rehabilitation occurs:

- In the acute hospital (in the bed, bedside, or ward)
- In the dedicated rehabilitation facility
- In a step-down unit or pre-discharge facility
- Community-based rehabilitation
- Outpatient facility
- In the patient's home

Stage of rehabilitation:

- Acute rehabilitation
- Sub-acute rehabilitation
- Ongoing or chronic rehabilitation

Condition being rehabilitated:

- Spinal cord injury
- Stroke and other brain injury
- Multiple- or poly-trauma and amputations
- Cardiac and pulmonary rehabilitation
- Rehabilitation following severe burns

4. Different physical rehabilitation team models

Successful rehabilitation requires the input and skills specific to various medical disciplines, as well as that of the patient's broader support structures, being the family, caregiver and the employer.

In broad terms, the following disciplines are involved in the rehabilitation programme:

- Mental Health services/GP with a special interest in rehabilitation
- Nursing
- Physiotherapy
- Occupational therapy
- Speech therapy
- Psychology
- Social work

- Dietetics
- Orthotics and prosthetics

The manner in which these disciplines interact and coordinate their activities impacts directly on the type of rehabilitation programme offered, and can be one of the following:

- Individual disciplines - engage with the patient oblivious to other healthcare providers' contributions, with no coordination or communication between providers
- Transdisciplinary approach – Health care practitioners (HCP) take on the roles of other providers, merging the rehabilitation approach into one or several HCPs that provide services which would typically be done by close colleagues.
- Multidisciplinary approach – a discipline-oriented approach, with all professionals working in parallel and with clear role definitions, specified tasks and hierarchical lines of authority. The level of autonomy is high, with each discipline creating its own goals and treatment plans for the patient, with only problem cases being discussed in team meetings (Körner 2010).
- Interdisciplinary approach – a team of HCPs who meet regularly to coordinate their activities and set treatment goals for the patient through a *collaborative* approach, with less of a hierarchical type of approach. The team includes the patient and the family (Körner 2010).

To further clarify the differences between the multi- and interdisciplinary team approaches:

Interdisciplinary	**Multidisciplinary**
Collaboration	Cooperation
Team assessments and goals	Discipline-specific assessments and goals
Patient and relatives form part of the team	

Interdisciplinary collaboration is not cross-training to perform each other's roles – this would be referred to as the transdisciplinary approach. Neither is it necessarily about developing a team consensus or about thinking alike. It is about the individuals taking responsibility for their own area of practice and coordinating it effectively as they make decisions about patient management (Solomon 2010).

Before moving further in the process of determining the infrastructure and design requirements for physical rehabilitation, it is essential to review the body of evidence and literature for the ideal team approach to rehabilitation. Once this is established, the model providing the best service delivery to the patient, in the most cost-effective manner, with the best possible outcomes needs to be adopted. This will then inform the built environment design, which in turn will facilitate the type of service provided to the patient, in a supportive and barrier-free approach.

Literature review

According to Vera Neuman "... the overwhelming view amongst Physical and Rehabilitation Medicine (PRM) specialists who represent their nations at the Union of European Medical Specialists is that **'interdisciplinary working'** is the preferred pattern of team working. This means that PRM teams not only comprise members from many different professional backgrounds, but also work towards agreed aims and using an agreed and shared strategy" (Neumann, 2010).

This interdisciplinary working is also referred to by Patty Solomon in her Enid Graham Memorial Lecture at the Canadian Physiotherapy Association's congress in 2009 (Solomon 2010) as **inter-professional collaboration**. In her address, Dr Solomon asks the question: "Is inter-professional collaboration a passing fad or the way of the future?" With emerging evidence, Canadian government support, momentum and increased patient and family awareness, she is a strong advocate for this approach. Dr Solomon also sees the interdisciplinary approach being a benefit to the professions, in that it improves relationships and awareness between professions.

Case studies highlight that in more complicated cases, such as severe head injuries, it becomes all the more important to work in an interdisciplinary team (Hudson, 2008). According to Duff, if a patient presents with a complex array of problems as found in the neurologically impaired patient, a comprehensive interdisciplinary team should be at the heart of the rehabilitation service provision, in order to provide effective rehabilitation services (Duff 2009).

A review of assessments done on inpatients in rehabilitation cites that up to 75% of disabilities are unrecognised by physicians (Duff 2009). This suggests that an interdisciplinary team assessing the patient would better identify problems experienced by the patient. McGrath and Davis go on to say that the interdisciplinary assessment places the focus on the patient, rather than trying to fit the assessment into the professional categories and boundaries as is found when operating in the multidisciplinary team approach (McGrath, 1992). Duff further confirms that assessment and rehabilitation require the knowledge and skills of an interdisciplinary team in partnership with the patient (Duff 2009).

According to Strasser et al., the characteristics of team functioning predict selected rehabilitation outcomes in stroke patients, including length of in-hospital stay being influenced by team effectiveness; and improvement in motor function being associated with task orientation, order and organisation and utility of quality information by the rehabilitation team (Strasser, 2005).

Strasser goes on to state in a subsequent research paper on the interdisciplinary team and polytrauma rehabilitation that well-functioning teams are critical to service integration, while teams are more effective in supportive hospital environments (Strasser, 2008). In response to the complexities of contemporary healthcare, Strasser goes on to suggest that the integration of the various role-players of the rehabilitation team should also include partnership with hospital administrators, national leaders and patients and their families.

The interdisciplinary team approach requires a greater degree of collaboration than the multidisciplinary team approach, being defined as a model of care delivery and group interaction that will improve the outcomes of the intervention far and beyond that of the summative effort of the team members working in isolation (Melvin 1980).

The broadly defined characteristics of an interdisciplinary team, which is supported by the literature, include the following:

- An emphasis on the social or disability related goals
- Shared responsibility for goals across professional disciplines
- Commitment to shared working practices – collaboration
- Joint decision-making

- An integrative client-centred service (Suddick, 2006)

The interdisciplinary team must have the following:

- A multiprofessional team, including the patient and family
- Team conferences with joint decision-making/problem-solving
- Common goals

It may have the following:

- Various disciplines participating in joint assessment sessions
- Shared record-keeping
- Co-location of staff
- Integrated care plans

In a recent research paper by Mirjam Körner, entitled "Interprofessional teamwork in medical rehabilitation: a comparison of multidisciplinary and interdisciplinary team approach", it was concluded that teamwork and team effectiveness are higher in teams working with the interdisciplinary approach, particularly in physical/somatic rehabilitation units (Körner 2010).

The impact of the interdisciplinary team on service delivery and patient outcomes

It is critical to clearly define the interactions between the members of the large rehabilitation team of health care professionals. Done correctly, the patient will be afforded the following benefits:

5. A patient-centred approach
6. Reduced duplication of services and coordination of care
7. Efficient communication between members of the team
8. Clear rehabilitation goals and plan
9. Appropriate length of stay, rehabilitation intensity and cost efficiencies
10. Maximal functional improvement for the patient

1. A patient-centred approach

   According to Patty Solomon, interdisciplinary collaboration is the interaction between two or more professions, organised into a common effort to address common issues, with the participation of the client (Solomon 2010). An interprofessional approach results in the emergence of a more patient-focused model, which develops as a result of problem-solving, and an open and flexible approach to the roles and tasks of individual team members (Molyneux 2001).

   Rehabilitation can only be most effective if the patients have proactive involvement in the process (Duff 2009). It has been shown that patients who are actively involved in their rehabilitation process have better long-term physical and psychological adjustment, and maintain the skills learnt better in their everyday lives (Norris-Baker, 1981).

Programmes used in the UK that focus on increasing the patients' sense of control through their active participation in their healthcare have been found to promote their adjustment and accommodation to their changed circumstance, reduce primary care contact, morbidity, mortality and secondary complications (Department of Health (UK) 2001)

This UK report goes on to support that self-management approaches reduce the likelihood of more disabling aspects of chronic conditions such as symptoms, pain, reduced social activities, isolation, lack of employment, and problems of psychological adjustment and life satisfaction. There is evidence of improved adherence and healthful behaviours, improved health status and decreased days in hospital.

The patient's family also forms a key element to the interdisciplinary rehabilitation team. In a sense, they are also in treatment, with needs similar to those of the patient – they must also deal with anxiety and stress related to the disability of their family member. They need to prepare themselves for how they are going to cope once the patient is discharged, and need to be a part of the realistic planning of the rehabilitation process.

2. Reduced duplication of services and coordination of care

   There are substantial areas of overlap between the members of the rehabilitation team in both assessment and treatment. This can only be minimised through effective communication between team members, combined goal-setting together with the patient and through treating the patient together, or in the same treatment area to each other.

   The layout of the various therapy treatment areas in relation to each other requires careful consideration. The correct set-up will contribute to the reduction of service duplication and facilitate a coordinated care programme.

   Protected time in the daily or weekly programme for HCPs to interact through formal assessments, patient care planning meetings and patient/family meetings is essential to the coordinated care programme.

   By improving collaboration through the interdisciplinary team, the coordination of patient care and reduction in duplicated services will benefit both the patient and the funders of the facility (Sander & Constantinidou, 2008).

3. Efficient communication between members of the team

   Körner describes the interdisciplinary team as one which meets regularly to discuss and collaborate on treatment goals, and to jointly carry out these treatment plans. The team members are generally on the same hierarchical level, with a high degree of communication and cooperation among team members.

According to Molyneux, it is important to establish agreement on communication between the team members, that the team members work from one base and that regular and frequent team meetings take place (Molyneux 2001).

When comparing the multi- and interdisciplinary teams in the somatic rehabilitation centre responses (including units providing care for oncology, orthopaedics, internal medicine, pain, cardiology, respiratory disease and rheumatology), there were significant differences in the two approaches. The interdisciplinary approach achieved significantly better results for all aspects of team work in comparison with the multidisciplinary approach. Staff satisfaction, together with organisation and communication and workplace atmosphere, was also better (Körner 2010).

This affirms the theoretical assumption in the literature that interdisciplinary teams are superior to multidisciplinary teams. This also encompasses a move away from the dominance of the physician, resulting in a more flat hierarchical structure. The higher satisfaction experienced by members of the interdisciplinary team is also supported in a study by Hibbert et al. (1994).

4. Clear rehabilitation goals and plans
   Both assessment and treatment have the best likelihood of being effective when they involve a coordinated effort of the various disciplines involved in rehabilitation. Collaboration between disciplines can result in increased knowledge, improved clinical practice, and ultimately to improved outcomes for persons. This is most certainly the case with TB patients and their caregivers, according to Sander & Constantinidou. (2008).

5. Appropriate length of stay, rehabilitation intensity and cost efficiencies

   Through a coordinated rehabilitation programme, the patient will benefit maximally from the rehabilitation programme, with the most cost-effective allocation of resources. Protracted hospital length of stays are often as a result of a poorly coordinated programme, where equipment requirements at the time of discharge are not available (e.g. wheelchair), or where the home environment and social issues are not sorted out before the planned date of discharge.

   While no clear distinction is made regarding the composition and interaction of the rehabilitation team in the study by Birkan et al, they conclude that a multidisciplinary team approach to stroke rehabilitation may result in a reduced length of hospital stay, and an improvement in function outcome, as measured using the Functional Independence Measure (FIM) score (Tur, 2003).

6. Maximal functional improvement for the patient

   There is convincing evidence to support the idea that patient outcomes improve when care is delivered by collaborative teams. Many of the studies included measures of patient satisfaction, but also outcome measures related to patient-centred practice, such as patient reporting a greater sense of involvement in their care. (Solomon 2010)

The impact of the team interaction on design and infrastructure

What elements of the interdisciplinary team approach affect the infrastructure and design?

1. The team should engage with the patients and their families to agree on appropriate, realistic and timely treatment goals within an overall coordinated rehabilitation programme, being patient-centred and unique. The treatment plan needs to be endorsed by the team as a whole, and not an individual professional.
2. Goals need to be adjusted repeatedly and regularly, as the patient progresses along the rehabilitation programme.
3. Team meetings with the patient and their family, to improve therapeutic alliance, as described by Evans et al. which results in more favourable functional status at programme discharge in clients with brain injury (Evans, 2008)
4. Group therapy area, for:
    - Patient and family education sessions
    - Group physical activities
    - Group psychology/counselling sessions
    - Indoor sports
    - Team meetings and discussions
    - Continued professional development
    - Courses and workshops
5. The ward environment should be one of enablement, and not continuous dependency on nursing care. This may be in the form of progressive transfer of the patient to low dependency areas (lower burden of care), where the patients apply the functional gains made in everyday activities, like washing, dressing, and transferring themselves to the bed and out, and even preparing their own tea/coffee and possibly meals. This could ultimately progress to an independent living environment, where their spouse can form part of the living environment, separate to the ward. This may be referred to as the pre-discharge phase of rehabilitation, and may be interposed with home trials.

The unique role of the rehabilitation nurse is further emphasised as follows:

- Therapy carry-on provider, informed and guided by rehabilitation principles. This does however imply an element of transdisciplinary work (Long, 2003).
- Creating a supportive environment in which rehabilitation can take place. Cross-training between the therapists and the nurse is also important to move away from the nurse that needs ‘to do’ or ‘care for’ the patient, to a situation where the nurse promotes the patients independence (Long, 2003).

A team-based approach also needs to highly structured and coordinated; this allows members of a team to identify common goals, which is essential in achieving a consistent approach to behaviour change (Duff 2009).

Goal planning, when applied correctly, can be effective in resolving conflict among team members because the focus is on patient-driven goals, which facilitates collaborative interdisciplinary work (McGrath, 1991).

Infrastructure requirements to facilitate and enhance an interdisciplinary team approach to physical rehabilitation are as follows:

- Open-plan office
- Timetabling/scheduling of patient sessions and activities
- Joint treatment areas/gym. Will need quiet rooms for speech therapy interventions, and for patients who are easily distracted or require privacy during treatment.
- Joint goal-setting/planning sessions and reporting process
- Joint training/education sessions
- Joint family meeting rooms
- Social events between team members
- Regular team meetings
- Hospital characteristics:
    - Culture
    - Structure
    - Organisational process

The impact of the design and infrastructure on the team interaction and patient experience

10. Central case notes, to avoid duplication, and coordinate the teams activities – also promotes continuity of care (if someone is off-sick/on leave)
11. Team meetings in a dedicated team meeting room, with a data projector, boardroom style table and seating sufficient for the team. This will improve team communication and coordination of care, plan patient care, and develop positive working relations. (Molyneux 2001)
12. Central shared pause/tea and lunch area for the staff away from the therapy areas
13. IT infrastructure to ensure that all clinical notes and reporting processes are accessible by all staff from various work stations
14. Structured dedicated specialised clinics, e.g. seating clinic, gait clinic, spasticity clinic, etc., which is dedicated time and space for an interdisciplinary evaluation and treatment to take place, within the requirements of the specific patient.

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