

Aged Care Network

Amputee Services & Rehabilitation Model of Care

1 July 2008



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Table of Contents

FOREWORD.....	5
ACKNOWLEDGEMENTS	6
EXECUTIVE SUMMARY	7
RECOMMENDATIONS.....	8
1 OVERVIEW OF AMPUTEE SERVICE DELIVERY MODEL OF CARE	9
1.1 Scope - Definition of Amputee Patient	9
1.2 Key Features of the Future Model.....	9
2 OBJECTIVES	10
3 DRIVERS FOR CHANGE.....	10
3.1 Gaps in the current service provision environment	10
4 EVIDENCE BASED BEST PRACTICE RESEARCH FINDINGS	12
5 FUTURE SERVICE DELIVERY MODEL OF CARE FOR THE AMPUTEE PATIENT IN WESTERN AUSTRALIA.....	13
5.1 Configuration Of Services	13
5.2 Continuum of Care Approach.....	15
5.2.1 Prevention	15
5.2.2 Acute care	17
5.2.3 Post - Acute Care	24
6. INFRASTRUCTURE SUPPORT FOR MODEL OF CARE	26
6.1 Workforce	26
6.2 Infrastructure.....	26
6.3 Linkages to community	26
6.4 Education and training.....	27
6.5 Information and communication technology.....	27
6.6 WACHS Specific Issues	27
GLOSSARY	28
APPENDICES.....	29
Appendix 1: Discussion Paper - Findings that Support the Future Service Delivery Model of Care for Older Amputee Patients	29
Appendix 2: Service Configuration	41
Appendix 3: Best Practice Standards and Guidelines.....	44
Appendix 4: Amputee Inter-Disciplinary Care Check List	45
Appendix 5: Older Persons Health Service Inpatient Wards	48
Appendix 6: Current Service Delivery Environment: Amputee Services.....	52
REFERENCES	57



Index of Figures

Figure 1. Integrated Clinical Pathway - Entry to Acute Care Sector 18



FOREWORD

It is intended that the proposed *Model of Care for Amputee Services for the Older Person in WA* will be able to provide an equitable and high quality service for the range of services necessary to meet the care needs of the amputee patient and their carer. The model also includes services and programs to meet the needs of the younger amputee patient.

The combined challenges of an ageing population and the levels of chronic disease in the community will impact on the need of adequate and effective levels of services related to the care needs of the amputee population group.

The WA Health system must be equipped to meet the challenges that lie ahead. An approach that concentrates efforts on a continued and sustainable basis in the primary care sector with an emphasis on health promotion and preventative care will help to assist in meeting these challenges. High quality interdisciplinary care services will also help to promote a smooth transition for the amputee patient from the pre-operative stage to care in the community.

Flexible services and supports are required to support the amputee patient and the carer to live as independently as possible in the community. In the case of elderly amputee patients who are not able to return to the community, sufficient and flexible options are required as they move into a residential care setting.

The approach outlined in this model may seem to focus disproportionately on improvements in care across the acute and sub-acute care sectors. However, this focus should not be seen to overshadow or undervalue the role that ambulatory or community care support services play in supporting the desire of the older person and their carer to live in the community as independently as possible.

Without a commitment to the development and strengthening of such services, the desired outcome to remain in the community may not be fully realised.

While the total number of amputations is relatively low across WA Health (an average of 500 per year over the period 2002-2007 including private sector activity¹), the nature of the services required to provide for the care needs across the continuum of care are intense and complex and require a high degree of collaboration and communication between different sectors and within the different care settings.

¹ Table Two - Appendix One. Unpublished data. WA Health. Information and Collection Management Branch. 2007



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A special mention goes to Marion Lineham, New Zealand (Christchurch Department of Health) for her generosity in providing material for the group.

Special thanks also goes to Hilary Johnston, who so willingly and efficiently was able to provide data to support the work of the sub-group.

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Further feedback on the document was sought at the Aged Care Network stake holder Forum held on 9th April, 2008.

Questionnaires relating to the model were distributed across the WA Health system to seek further input.



EXECUTIVE SUMMARY

The current framework for the delivery of services to amputee patients is characterised by large variations in the quality and range of services available.

There is a lack of a coherent and coordinated framework that provides the strategic direction for the planning and configuration of amputee services across WA Health.

There is also a lack of recognition of the importance of interdisciplinary care services for amputee patients and the role they play in assisting in the recovery process. The range of services currently available vary from hospital to hospital as does the capacity to provide the full range of services required.

The model of care for amputee patients and rehabilitation services focuses on:

- strengthening of primary prevention approaches through improved linkages to diabetes clinics, chronic disease management clinics
- the establishment of metabolic syndrome clinics and targeted strategies occurring in the primary care sector to identify people at risk of minor amputations
- strengthening and improvement of inter-disciplinary care services at Fremantle Hospital and Sir Charles Gardiner Hospital prior to the establishment of Fiona Stanley Hospital
- specialist rehabilitation services to be provided on a state-wide basis from the Statewide Rehabilitation Centre at the Fiona Stanley Hospital Campus once established
- specific care pathways for younger and older amputee patients involving prosthetic services and rehabilitation and
- specific care pathways for amputee patients who come from WACHS regions
- strengthening of partnerships between metropolitan and rural hospitals

It is intended that these elements will go some way in addressing the holistic care needs of the amputee patient and their carer. It will also assist to redress inequities of access to the quality and range of care that currently exists across the WA Health system for amputee patients.



RECOMMENDATIONS

Adoption of the recommended:

1. configuration of services that support the model of care pre and post the establishment of the Statewide Rehabilitation Centre at the Fiona Stanley Hospital Campus
2. provision of interdisciplinary care services at all Level 6 metropolitan hospital sites
3. development of an interdisciplinary care checklist that also includes the consideration of the needs of the carer for amputee services that is applicable for the WA Health system
4. development of a formal agreement between metropolitan Level 6 hospitals and partnered WACHS regional resource hospitals regarding the organisation and delivery of services for amputee patients
5. care pathways for the different groups of amputee patients
6. the range of rehabilitation therapy services for amputee patients
7. strengthened linkages to community care service providers that support the amputee patient and their carer to live independently in the community
8. consistent data collection processes and robust electronic collection platforms that promote accessibility to data, consistency in reporting and ability to monitor improvements to the WA health system in relation to amputee patient management across the continuum of care.

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1 OVERVIEW OF AMPUTEE SERVICE DELIVERY MODEL OF CARE

1.1 Scope - Definition of Amputee Patient

While the Aged Care Network Sub-group primarily focused on the older person, the scope of the Model of Care includes both the younger and older amputee patient as the pathways and types of services are mostly common to both groups.

All amputation types are considered in the model. The primary focus is on those amputations that incur mobility problems and functional independence complications (particularly above and below knee amputations, multiple toe amputations) as these form the bulk of amputations across the WA Health system.²

1.2 Key Features of the Future Model

The service delivery model of care appropriate for both elderly and the younger amputee patient in Western Australia is marked by:

- a focus on health promotion and prevention campaigns targetted at the older population in order to mitigate lifestyle behaviours that act as contributing factors for amputations
- targetting at risk populations through clinic based management approaches
- a greater focus on interdisciplinary clinical and allied health care that better services the care needs of older people and amputees in general
- improved equity of access to appropriate rehabilitation services with a shift from rehabilitation provided in the acute care setting to services provided in the sub-acute setting
- improved equity of access to appropriate rehabilitation opportunities including an increased focus on ambulatory care options
- improved integration of prosthetic services along the continuum of care
- an increased focus on the inclusion of the carer as a partner in care.

² See Table One - Appendix One. Amputation Operations 2002-2007. Unpublished data. Information and Management Collection Branch. WA Health. October 2007.



2 OBJECTIVES

Entering Older Age

- development of GP relationships and the management of medical problems for at risk populations
- healthy lifestyle, health promotion and prevention focus

Transitional Stage

- self management behavioural strategies
- aggressive strategies for targeting limb salvage

Frail Aged

- flexible services that support independent living in the community
- adequate services that support the frail aged amputee in the residential care environment.

3 DRIVERS FOR CHANGE

3.1 Gaps in the current service provision environment

An analysis of the data and consultation with key stakeholders indicates that the current service delivery arrangements for amputee patients across the WA Health system can be characterised by inequity of access to:

- surgical services in rural areas
- specialist amputee physician services at all tertiary level hospitals
- consultative geriatric clinical services for elderly amputees
- dedicated generic sub-acute rehabilitation services for elderly patients in rural and metropolitan areas
- transitional care rehabilitation services for both elderly and younger patients
- specialised rehabilitation services for both elderly and younger patients in the rural and metropolitan areas
- interdisciplinary/multi-disciplinary care at tertiary acute hospitals
- outpatient services for metropolitan and rural service
- targeted preventative approaches for populations at high risk of lower limb amputations

The system is also characterised by:

- costly provision of rehabilitation services in a tertiary level hospital acute setting
- inadequate levels of ambulatory care services for rural and metropolitan amputee patients
- the need for improved integration between acute, subacute and ambulatory care services for the amputee patient
- a need for highly specialised services to be provided for the group of active younger amputees who require access to modern high-technology prosthetic devices.



The Discussion Paper: Development of the Model of Care for the Older Amputee (See Appendix One) documents the evidence to support these statements.

The following material is illustrated in the Discussion Paper:

- distribution of amputation caseload activity
- findings from past departmental review in 1999
- distribution of rehabilitation related activity
- gaps in services
- impact of chronic disease and link to amputation caseload
- issues relating to an ageing population in WA.



4 EVIDENCE BASED BEST PRACTICE RESEARCH FINDINGS

In the field of research related to amputee management and care, there is a lack of large well designed randomised controlled trials to demonstrate effectiveness. More high level evidence of effectiveness is required in this area to develop “best-practice models”. However, sufficient evidence at Level 3 is available to draw upon.

Analysis of key literature sources and best practice guidelines relating to amputee care and management indicates the following:

- positive outcomes related to the application of rigid removal dressings at the surgical stage by theatre staff for below the knee amputations
- value of appropriate pain relief during the application of rigid removal dressings if applied post-operatively
- benefits of a holistic approach to the care and management of the amputee patient that considers the amputee patient and family from diagnosis to discharge.
- value of the interdisciplinary team approach to care of the amputee patient both in the acute inpatient setting and the rehabilitation phase.
- positive outcomes of **early and intensive rehabilitation** in a sub-acute care setting to prevent de-conditioning and promote maximum functional independence that otherwise occur in an acute care setting
- potential for community based rehabilitation therapy initiatives
- benefits of specialised and comprehensive units for amputee rehabilitation for the younger amputee patient
- benefits of rehabilitation for older amputee patients in order to maximise functional independence and self-esteem
- potential for the introduction of a comprehensive checklist or “pathway of care” structured to follow the care needs of the amputee patient in logical order through the various stages of care, designed to ensure that rotating staff members do not overlook important aspects of care and travels with the patient in a consolidated format
- links with community support services and other rehabilitation agencies in order to allow continuity of care for amputees
- provision of information for patients, links with support services and accessibility to patient advocacy services and counselling

A future model of care that focuses on service delivery for the amputee patient should incorporate these aspects.

A list of key research literature articles is included in reference list.



5 FUTURE SERVICE DELIVERY MODEL OF CARE FOR THE AMPUTEE PATIENT IN WESTERN AUSTRALIA

The future service delivery model is characterised by a move towards an interdisciplinary model of care with greater access to a wider range of rehabilitation opportunities for the older amputee patient aligned to the future configuration of rehabilitation service delivery across the WA Health system.

It is also characterised by a specialist rehabilitation centre for those amputee patients who are usually younger and assessed as suitable for a prosthesis.

Principles

- geographical equity of access to services
- interdisciplinary care
- integrated services across the continuum of care
- involvement of the carer as a partner in the health care team
- amputee patients are well informed and their physical, psychological and cultural needs are well met.

5.1 Configuration Of Services

The configuration of service delivery is defined by:

- The bulk of public acute surgical and medical services to remain located at the three Level 6 hospital sites of Sir Charles Gardiner Hospital, Royal Perth Hospital and Fremantle Hospital and peripherally at some Level 5 hospitals until 2013³.
- Acute surgical and medical services located at Fiona Stanley Hospital and Sir Charles Gardiner Hospital and peripherally at some Level 5 hospitals post 2013.
- Specialist rehabilitation services delivered through the Statewide Rehabilitation Centre at Fiona Stanley Hospital post 2013 for prosthetic amputee recipients.
- The Statewide Rehabilitation Centre will act as centre for education and training and become the focus for inpatient and outpatient amputee care for patients who receive an interim prosthesis.
- Western Australian Limb Service for Amputees (WALSA) will be located at the Statewide Rehabilitation Centre at Fiona Stanley Hospital.
- A sub-acute transitional care facility such as a "Well-tel" to be established at the State Rehabilitation Centre post 2013.
- Aged care rehabilitation services for the older medically unstable amputee patient will be delivered from dedicated Aged Care Rehabilitation Units (ACRU's) at the hospital sites in the metropolitan area from 2008 as delineated in the WA Health Clinical Services Framework 2005-2015.

³ The data 2013 refers to the completion and commissioning date for the Fiona Stanley Hospital. This date may alter over time.



These sites are:

- Bentley Hospital
 - Mercy Hospital - Restorative Care Unit
 - Armadale - Kelmscott Hospital
 - Swan Districts Hospital
 - Osborne Park Hospital
 - Joondalup Hospital
 - Fremantle Hospital
 - Peel Hospital
 - Rockingham - Kwinana Hospital
- Improved interdisciplinary care services for both younger and older amputee patients at Sir Charles Gardiner Hospital and Fremantle Hospital until the Fiona Stanley Hospital is completed.

This involves the continuation and strengthening of the weekly mobile visiting amputee/rehabilitation physician service that operates from Royal Perth Hospital.

The mobile interim prosthetic team will continue to provide the service for SCGH and FH.

- Priority consideration should be given to promoting the establishment of a pathway that facilitates the movement of the medically unstable older amputee patient (both younger and older) who would not benefit from a prosthesis from SCGH and FH in order for them to benefit from the interdisciplinary care model.
- Priority consideration should be given to promoting the establishment of a pathway that facilitates the movement of the medically stable amputee patient (both younger and older) who would benefit from an interim prosthesis from SCGH and FH to Shenton Park Campus before 2013 in order for them to benefit from the interdisciplinary care model.

This transfer of patients can be accommodated if the proposal to relocate rehabilitation services for those receiving secondary rehabilitation such as the broken neck-of-femur patients from Royal Perth Hospital - Shenton Park Campus are dispersed to Aged Care Rehabilitation Units under the proposed Model of Care for Rehabilitation Services and Ortho-geriatrics.

- Outpatient rehabilitation and review services will be located at the following sites:

North Metropolitan Region

- Swan Districts Hospital
- Osborne Park Hospital

South Metropolitan Region

- Rockingham - Kwinana Hospital
- Fremantle Hospital



- **Armadale-Kelmscott Hospital**

The configuration of the outpatient service is related to the best use of the small pool of expertise for allied health and amputee physicians and the use of this capacity to provide a mobile rehabilitation service.

- Older patients from regional and remote areas will access surgical and medical services through a preferred relationship with a metropolitan Level 6 tertiary site.

Discussion between WACHS and the Level 6 sites should commence to establish these links with a view to the development of a formal agreement between WACHS and regional hospital sites that organises the provision of services for WACHS sites.

- Older patients from regional and remote areas will access rehabilitation services from a linked ACRU in the North and South metropolitan regions and WACHS regional resource hospitals.

It is important to ensure the cultural requirements of indigenous patients are met as best as possible in a rehabilitation context where care can be provided closer to home whenever and wherever possible.

- Younger amputee patients from rural and regional areas will continue to access rehabilitation services from the current metropolitan tertiary Level 6 (and where relevant, some Level 4/5 hospitals).
- A Well-tel facility located at the RPH - SPC facility will provide sub-acute care rehabilitation services for RPH amputee patients from 2007 onwards for rural and remote patients and patients from outer metropolitan areas until the patient is sufficiently functionally independent to be discharged and appropriate support services have been arranged.
- This service will be available to all rehabilitation patients when the SPC facility is transferred to the Statewide Rehabilitation Centre at the Fiona Stanley Campus once established.
- Strengthening of Tele-health services for metropolitan, rural and remote health service delivery, particularly in the follow-up post discharge phase.
- Visiting rights for public hospital amputee physicians and private billing rights to be secured in order to provide consultant rehabilitation services to private amputee patients in the private hospital setting.

Figure One (Appendix Two) outlines the suggested service configuration in matrix form while Figure Two (Appendix Two) outlines the service configuration in geographical form.

5.2 Continuum of Care Approach

5.2.1 Prevention

Population based health promotion and prevention campaigns

Effective mass media campaigns that promote the messages of a healthy eating regime, the benefits of regular exercise and non-smoking are



required to mitigate the impact of vascular disease and diabetic conditions.⁴ These programs are required on a sustainable basis in Western Australia targeting all age groups. It is especially important to strategically target the younger age groups, particularly the 45-64 age group, where healthy lifestyle habits can be encouraged.

Campaigns focusing on injury prevention that mitigate the effects of accident trauma events (especially machinery accidents that precipitate upper limb amputations) are also required on a sustainable basis.

Targeted prevention initiatives

A range of clinic/program based initiatives are required such as:

■ Chronic Disease Management Teams - education and information

Preventive care and education offered through the Chronic Disease Management Teams based in the North and South Metropolitan Health Services are important starting points. Extensions in programs such as these are required to promote equity of access to such services across WA.

This is relevant because of the impact of vascular disease and diabetes, for which preventative interventions such as diabetic foot care programs, healthy eating programs, quit smoking programs and referral to exercise programs can improve the likelihood of a possible amputation and/or further amputations.

- Obesity clinics/Metabolic syndrome clinics - identification of at risk clients, referrals pathways to clinics and targeted approaches for prevention and management
- Diabetes Clinics - targeted approaches for prevention and management of diabetes
- High Risk Clinics - education and prevention of lower extremity amputation

These clinics concentrate on a targeted approach for people who are at high risk of amputation and focus on targeted strategies for limb salvage. Research findings demonstrate positive outcomes from such programs.⁵

The following three-pronged approach is recommended:

- Identification of high risk populations and referral to clinics through hospital admissions (vascular, endocrinology, cardiology, dermatology, foot care clinics) emergency department admissions, general practitioner referrals and residential care referrals.
- Targeted intervention strategies
Diabetes teaching classes focussed on aggressive management of medical problems such as glucose management and blood pressure, diet modification, foot care, wound care, appropriate rehabilitation,

⁴ The data contained in Table Six - Appendix One, demonstrates that Type 2 diabetes and atherosclerosis were the most frequent diagnoses for an amputation between the period 2002/2003 and 2006/7. These conditions are preventable and modifiable.

⁵ Van Gils C. et.al. Amputation prevention by vascular surgery and podiatry collaboration in high-risk diabetic and non-diabetic patients. The Operation Desert Foot experience. *Diabetes Care*. V22:5. 678-683. 1999.



environment modification, adequate prosthetic and orthotic control, management of medical problems and weight management.

- Education for the family and primary carer

Key areas should include information on community care support services, linkages to community based management strategies, lifestyle issues, foot care, education and management strategies for risk factors relating to diabetes and cardio-vascular health.

The Aged Care Health Network will collaborate with the Cardiovascular Health Network to support the current work on developing service models and care pathways for people at high risk of foot amputations.

It will also be necessary to collaborate with the Endocrine Health Network to ensure that care pathways are designed to identify people at high risk of lower limb amputations in the acute care and primary care system, their management in the primary care sector through GP clinics and community health teams and referral to specialist teams for targetted management strategies. This is especially important for people who have chronic foot ulcerations and other diabetes related foot problems.

5.2.2 Acute care

- **Integrated Clinical Pathway for the Amputee Patient**

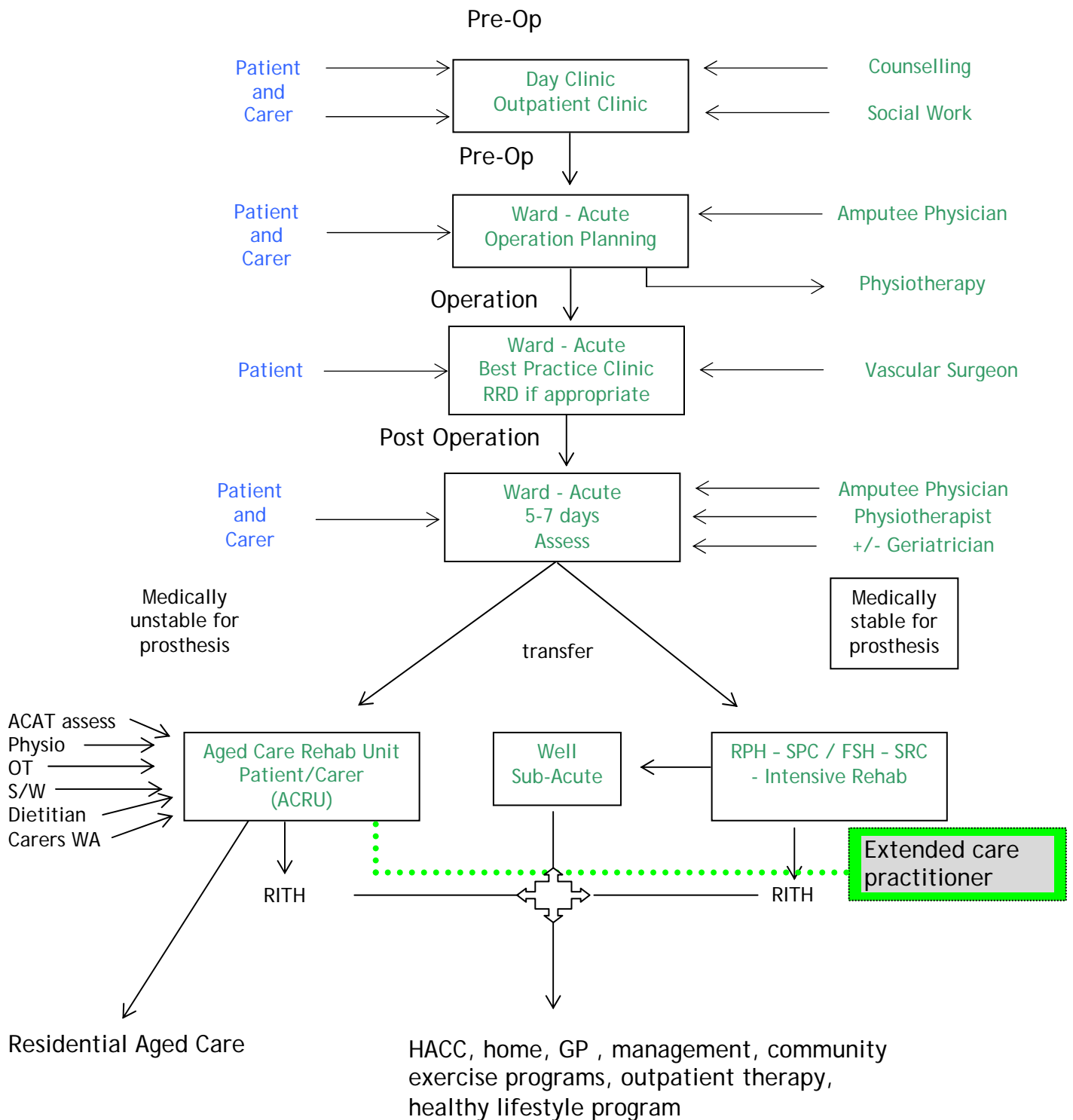
The model of care builds on the vision proposed in 1999 of “the establishment of clear pathways from pre-amputation through to re-integration into the community including a description of services along the continuum of care (that) will assist in standardising care and assist care teams (acute and rehabilitation) in taking a client focused approach to patient care”.⁶

The pathway incorporating the focus on interdisciplinary care and the carer is outlined in Figure One.

⁶ Review of Amputee Services for the Metropolitan Health Service Board. Perth. Western Australia. Dr David Murphy. Dr Bernard Street. November 1999.



Figure 1. Integrated Clinical Pathway - Entry to Acute Care Sector



*See glossary for explanation of acronyms



■ Introduction of Interdisciplinary Care Checklist

A comprehensive interdisciplinary care patient checklist for:

- the older person who is medically stable and able to receive prosthesis (See Appendix Four for an example).
- the older person who is medically unstable, so unable to receive a prosthesis and may receive rehabilitation services at an ACRU (See Appendix Five for an example).

Reference should also be made to the NSW Department of Health "Guidelines for Amputee Care - Policy Directive"⁷ for the development of an interdisciplinary care checklist that is applicable to WA. The physiotherapy department at SPC-RPH has also begun work on the development of a checklist that promotes an interdisciplinary care pathway. This work should be taken into account.

The checklist should accompany the amputee patient and follow the care needs of the patient in logical order through the various stages of care. It is also designed to ensure that rotating staff members do not overlook important aspects of care and moves with the patient in a consolidated format.

It also reduces the amount of documentation and paperwork. The advantage of the checklist is that it is discipline specific and task related to amputee care and management only.

It is also designed to promote the linkages and good communication practices as the interfaces of care as the patient and carer move through the patient journey along the continuum of care.

The needs of carers and the services that carer resource bodies can provide will need to be included in any checklist devised or amputees in Western Australia. It also takes account of cultural aspects that will need to be considered.

■ Extended care practitioner

In recognition of the importance and difficulty of ensuring compliance and good outcomes for the amputee patient over the long term, a clinical practitioner with a specific interest in amputee patient management should provide a care coordination role for medically stable older and younger patients once they are discharged and received their prosthesis.

It is recommended that the practitioner come from an allied health background with experience in care co-ordination practice on an outpatient, non-admitted basis. The integration of a nursing component in the care coordination would also benefit this role.

⁷ Guidelines for Amputee Care - Policy Directive. NSW Health. February 2007.



The person would act as a central resource for patients for information if required regarding their care needs upon discharge, while a surveillance role would also be performed in order to ensure that patients and carers receive appropriate after care in terms of community support and such services as physiotherapy, occupational therapy and psychological care needs. Compliance with attendance at outpatient based therapy programs would also be monitored.

The role could be extended to act as a statewide clinical coordinator for amputee patients who have been discharged to the place of residence and who are able to live independently in the community.

This role could be further developed to provide an educational resource role to promote specific education and training for amputee rehabilitation therapy across the WA Health system.

Pre-operative

1. Information and counselling

Provision of information that assists the carer and the amputee patient should also occur at this stage so that they are well informed about the entire process.

An information booklet should be provided to the patient that contains information on support services including carer support, information on rigid removable dressings (RRD's - for trans-tibial amputees only⁸), leg and arm strengthening exercises and information regarding the rehabilitation process.

Counselling services at the pre-operative stage are also important to assist the amputee patient and the carer with issues related to grief and loss. Peer support information would also assist in the preparation stage.

In consultation with the patient and the primary carer, early discharge planning should also commence at this point⁹, with a clear articulation of goals for post-operative rehabilitation, management and supported discharge to home or a residential care setting. Communication processes to link the patient with services within the hospital system for the provision of aids and equipment to support the amputee patient at home should also commence at this stage.

The inclusion of a social worker at this stage should be considered as routine best practice.

2. Clinical assessment

An amputee physician and a senior physiotherapist should conduct a joint multi-disciplinary assessment in the acute care ward before surgery occurs.

⁸ Information regarding RRD's should only be given to prospective amputees who will have a trans-tibial amputation.

⁹ Preferably from the first day the patient comes in to the hospital, to take account of all possible considerations including social and environmental factors.



This should occur on a consistent basis and undertaken in order to assess for appropriate and timely rehabilitation options to prevent de-conditioning on the acute ward and assist in preventing delays in ordering aids and equipment for the patient post operation.

Intra-Operative stage

Vascular surgeons and theatre nurses to consider the adoption of the application of Rigid Removal Dressings (RRD's) during surgery for below knee amputations on a routine basis.

RRD's have been shown to provide optimal control of swelling and protection to the stump during the healing process while at the same time being a painless procedure for the patient.

This would be according to an agreed protocol developed by vascular surgeons. Education and training of vascular surgeons, medical registrars and theatre nurse staff would be undertaken to assist this process by the Senior Prosthetist at SPC- RPH.

Optimal pain relief should be made available if the RRD is applied post operatively.

Post operative

Following surgery, the amputee physician and senior physiotherapist in consultation with a geriatrician (when considered necessary) will review the patient in the acute ward for transfer to an appropriate rehabilitation option. Plans for fitting a prosthesis are commenced if the patient is assessed as being able to receive an early prosthesis.

Commencement of early rehabilitation begins at this stage to prevent de-conditioning and promote bed to wheelchair transfer.

It is preferable for the physician to be aware of the principles of geriatric care in order to be able to address the complex geriatric care needs of the older patient in assisting with decisions regarding prospective prosthetic options. Alternatively, assistance from a geriatrician should be considered where necessary.

Health professionals on the acute ward will have received up-to-date information and training on appropriate transfer techniques to encourage independence and confidence for the new amputee with transfers.

Clinical decisions regarding transfer to the most appropriate location occur at this stage.

The pathways following assessment are as follows:

1. Both the younger and older amputee patient who are **medically stable** and able to receive a prosthesis will be streamed to the specialist Statewide Rehabilitation Centre (SRC).
2. The older amputee patient who is medically unstable¹⁰ and unlikely to receive a prosthesis will be streamed to an ACRU for rehabilitation. The choice of ACRU is determined by that which is closest to where the

¹⁰ Clinically assessed where current medical care renders them inappropriate for receiving a prosthesis.



person lives and if necessary, the availability of a dialysis unit, if required. Rural amputee patients will need to be transferred to an ACRU.

At some stage it may be possible for the older amputee patient to receive an interim prosthesis and receive services at the SRC as an outpatient.

In order to ensure equity of access to rehabilitation services, a standard clinical protocol should be developed that promotes consistency in referral criteria to the different streams of rehabilitation. A clinical protocol will need to be developed that clearly states the criteria for assessment as medically stable and medically unstable.

3. The older patient with no prospect for rehabilitation and prosthetic fitting will be streamed for assessment by the Aged Care Assessment Team for discharge to an appropriate long term care option.

Discharge from the acute ward should occur 5-7 days after surgery to prevent deconditioning on an acute surgical ward where restricted potential for early and intensive rehabilitation exists.

A transfer check-list that contains all relevant information for the amputee patient should be completed before transfer to minimise delays for therapists at the rehabilitation site and ensure aids and equipment requests have been actioned.

Inpatient Rehabilitation

1. Post - operative discharge pathway to Statewide Rehabilitation Centre - SRC

Whilst in the acute ward, the older amputee¹¹ assessed as medically stable with potential to receive an interim prosthesis, will receive preparatory physiotherapy for an early fitting.

The patient is transferred to the SRC within 5-7 days of surgery. This occurs in order to prevent deconditioning and hasten the rehabilitation process.

The interim prosthesis is ideally fitted within three weeks of transfer to the SRC. In this time the stabilisation of oedema occurs and primary healing of the wound is promoted, reducing the risk of any scarring that may occur through secondary healing processes and facilitates the fitting of the interim prosthesis. A period of intensive rehabilitation therapy will follow.

The Statewide Rehabilitation Service will have onsite prosthetic services to make interim prostheses and to work in close collaboration with physiotherapists during this process.

Interdisciplinary care is provided by a team that attends to the holistic care needs of the amputee patient. Core disciplines involved are:

- rehabilitation physician/amputee physician
- psychologist

¹¹ The younger amputee patient is also included in this pathway.



- physiotherapy services
- social worker
- dietician
- nursing with emphasis on wound care
- occupational therapist
- prosthetist
- orthotist
- podiatrist
- specialist engineering services

It should be noted, that while an interdisciplinary approach is recommended, there are particular skills that are not readily transferable and require a dedicated service component in the complex area of amputee care. In this sense, recognition of a multi-disciplinary approach is required where the team works collectively to achieve successful, goal orientated outcomes.

The fitting of interim prostheses and rehabilitation related to upper limb amputations, where possible, should be performed at the Statewide Rehabilitation Centre as this is a very specialised area of rehabilitation and requires full interdisciplinary team involvement.

The amputee patient is discharged home (with a possible stay via Well-tel) and followed up through the outpatient day service attached to the SRC. The patient is then monitored for the fitting of a definitive prosthesis.

A Well-tel facility located at the State Rehabilitation Centre facility will provide sub-acute rehabilitation services for rural and remote patients, patients from outer metropolitan areas where transport to rehabilitation can pose a problem and those patients where conditions at home are not suitable. The patient will be discharged once they are sufficiently functionally independent, appropriate support services have been arranged and the environmental conditions at home have been rectified.

The availability of community based rehabilitation therapy services can support the amputee patient to promote functional independence at home.

The availability of Tele-health services can support the management of amputee patients in rural and remote areas and patients in outer metropolitan areas who are discharged from the SRC where access to clinical services may be difficult.

2. Post - operative discharge pathway to ACRU

The older amputee patient should be assessed by an amputee physician and physiotherapist with input from a geriatrician, if necessary. If the patient is assessed as medically unstable and with little potential to receive an interim prosthesis, but may benefit from rehabilitation therapy, the patient is transferred to an ACRU closest to where they live.

Stabilisation of the patient to a level where they may be able to be assessed for a prosthesis should be part of the best practice approach to care of the older amputee.



The goal is to restore the maximum functional independence as possible, with a return to home. This is based on the availability of a carer who lives at home with the patient, to provide a support role.

The patient will access outpatient rehabilitation services attached to the ACRU.

The availability of community based rehabilitation therapy services can support the amputee patient to promote functional independence at home.

The possibility of good recovery and rehabilitation outcomes at the ACRU can also precipitate referral to the SRC for a prosthesis at a later time.

5.2.3 Post - Acute Care

■ Assessment services

Links to ACAT assessment services will assist entry to community based residential care programs such as EACH and CACP programs.

■ Discharge planning

Discharge planning options are considered. This is in the context of the availability of a carer who lives at home with the amputee patient. If there is no carer available, a care package is required that provides services to support the amputee to live at home if this is possible.

Rehabilitation therapy care options provided in the home or integrated community based rehabilitation services are also considered as well as access to follow-up counselling and carer support services.

Appropriate aids and equipment are to be provided to assist the amputee patient's adjustment at home.

The role of the occupational therapist and prosthetist in providing advice on the installation and/or modification of equipment is important in preparing the home for independent living at this stage.

As part of the discharge planning process information is provided on linkages to support services such as:

- return to work rehabilitation programs provided by the Australian Government
- disabled sports organisations
- counselling services
- Independent Living Centre - aids and equipment services
- membership of amputee consumer organisations; for example Amputees in Action.

The social worker would refer the amputee patient and the carer to the statewide Extended Care Practitioner in order that the care needs are managed upon discharge.

■ Outpatient Ambulatory Care Programs

- integrated community based rehabilitation where appropriate
- out-patient rehabilitation attached to the Day Therapy Centres (Day Hospitals) at the North and South Metropolitan ACRU's as detailed in Figures One and Two (Appendix Two)



- referral to Outpatient Diabetics Clinic for management of existing diabetic conditions
- referral to Podiatry Clinic for foot care and prevention of foot ulcers
- transport services must be provided at sites they are currently not available to facilitate the rehabilitation process on an outpatient basis
- **Discharge to Community**

Referral to:

- community physiotherapy programs
- Home and Community Care support services (HACC)
- Chronic Disease Management Team (CDMT)
- transport services through the Home and Community Care Program for attendance at ongoing exercise and physiotherapy services based in the community and for transport to outpatient rehabilitation follow-up at the ACRU.

The amputee patient and the carer is linked to the statewide Extended Care Practitioner in order that the care needs are managed upon discharge.



6. INFRASTRUCTURE SUPPORT FOR MODEL OF CARE

The following considerations apply to an effective model of care at the service delivery level:

6.1 Workforce

- service expansion in the number of amputee physicians to 2 x .5 Fte
- adequate FTE allocation for access to rehabilitation service provision
- interdisciplinary rehabilitation teams with full compliment of disciplines
- recruitment and retention strategies including a focus on allied health staff

It should be noted, that while an interdisciplinary approach is recommended, in some cases particular skills are not readily transferable. The area of amputee patient care and management is complex and requires a dedicated multi-disciplinary team approach to ensure comprehensive service delivery.

The importance of investment in workforce development cannot be understated. The role of rehabilitation services in amputee management is central to the overall recovery journey and should be viewed as investment in future long term good health.

6.2 Infrastructure

- construction of Statewide Rehabilitation Centre at Southern Tertiary Campus - Fiona Stanley Hospital
- SRC - Technology Unit should build on current expertise of the SPC- RPH bioengineering department. Facilities for equipment upgrade and a mobile upgrade team should be part of the new Technology Unit.
- construction of Well-tel facility at Southern Tertiary Campus - Fiona Stanley Hospital
- strengthening of Aged Care Rehabilitation Units in the metropolitan area
- service infrastructure to support outreach community based services including rehabilitation services
- adequate and accessible aids and equipment support

6.3 Linkages to community

Discharge planning should include community based rehabilitation options with adequate outreach social worker and occupational therapy support. Strengthened linkages to community support services such as the HACC program and transport services for older amputees, particularly for those without a carer or who have affordability issues.

Community care services are essential to support older people, including amputee patients, to live as independently as possible in the community.



Such services support the older person to gain the maximum advantage from the considerable investment made during the rehabilitation process when they return to their place of residence.

6.4 Education and training

- inter-professional learning at a tertiary level
- workforce appropriately trained and supported within Aged Care and Rehabilitation Care Teams/Units
- future direction of professional training to consider extended care practitioners, clinical specialists support workers and therapy assistants to be multi-disciplinary with common general skills
- State Rehabilitation Centre of Excellence to be the hub of support for on-going access to education and training with a focus on outreach up-skilling of the care teams

6.5 Information and communication technology

- single patient electronic record
- use of Tele-health - video and tele-conferencing particularly for rural and remote areas
- consistent data collection processes and collection platforms that promote accessibility to the data, consistency in reporting and ability to monitor improvements to the WA health system
- commencement of data collection for amputee related rehabilitation activity

6.6 WACHS Specific Issues

- additional FTE funding to support gaps in workforce
- expansion of Tele-health services
- visiting geriatrician consultancy services established through an agreement between the tertiary hospitals and WACHs to support clinicians and allied health professionals in follow-up case management.
- training in the delivery or rehabilitation models of care, particularly ambulatory and community based models.
- adequate provision of rehabilitation equipment supported by CAEP funding



GLOSSARY

In serial order;

GP	General Practitioner
WALSA	WA Limb Service for Amputees
ACRU	Aged Care Rehabilitation Unit
SCGH	Sir Charles Gardiner Hospital
FH	Fremantle Hospital
FSH	Fiona Stanley Hospital
RRD	Rigid Removal Dressing
RITH	Rehabilitation in the Home
SRC	State Rehabilitation Centre
ACAT	Aged Care Assessment Team
EACH	Extended Aged Care at Home
CACP	Community Aged Care Package
SPC - RPH	Shenton Park Campus - Royal Perth Hospital
WACHS	WA Country Health Services
South West OP S (SWOPS)	South West Orthotic and Prosthetic service
ICAM	Information and Collection Management (Branch)
AIHW	Australian Institute of Health and Welfare
AFRM	Australasian Faculty of Rehabilitation Medicine
BACPAR	British Association of Chartered Physiotherapists in Amputee Rehabilitation
PT	Physiotherapist
OT	Occupation therapist
SP	Speech Pathologist
SW	Social Worker
ADL	Activities of Daily Living
IADL	Index of ADL



APPENDICES

Appendix 1: Discussion Paper - Findings that Support the Future Service Delivery Model of Care for Older Amputee Patients

1. Methodology - Development of the Model of Care

A targeted approach to developing the model of care was adopted.

1. A Reference Group was established comprising¹²:
 - Clinical Lead of the Aged Care Network/Geriatrician
 - Vascular surgeon representation
 - Senior allied health staff from the North and South Metropolitan Health Services
 - Amputee Physician - South Metropolitan Health Service
 - Head of Department of Rehabilitation at Acquired Brain Injury Unit - SPC - RPH
 - An independent South Metropolitan Health Service staff member provided advice and comment.
2. A template was used as a guide to gather baseline data.
3. Data research from the Information, Collection and Management Branch of WA Health was incorporated.
4. A literature search, including reference to past departmental reviews, international guidelines and reviews informed the development the model of care.

The literature search has demonstrated the relative lack of Level 1 research studies.

5. Consultation with Carers WA and WACHS was undertaken.
6. Previous consultations undertaken in the context of a system wide approach to rehabilitation services in WA were also drawn upon.¹³
7. Further feedback was sought at the Aged Care Network held on 9th April, 2008.
8. Questionnaires relating to the model were distributed across the WA Health system to seek further input.

Busy work schedules and participation on other network sub-groups limited the number of “face to face” meetings. A large part of the communication and consultation process was conducted through the internet, in recognition of the benefits of operating as a “virtual” network sub-group. Consultation also took place with key clinical advisors in the Eastern States, New Zealand and Sweden.

¹² The list of members are listed on page 4 of this document.

¹³ Extensive discussions were undertaken to support the development of the “Statewide Rehabilitation Service Plan for Western Australia.”



2. Analysis of Current Service Delivery Model

General Overview

A range of providers¹⁴ are involved in providing services to elderly amputee patients across WA Health at various points along the continuum of care. Surgical and medical care in the acute care system is largely concentrated at the three major tertiary level metropolitan hospitals of Fremantle Hospital, Royal Perth Hospital and Sir Charles Gardiner Hospital.

A mixture of medical, allied health and technical prosthetic services are delivered post-operatively, again largely concentrated in the acute sector in the metropolitan area. The service delivery configuration of amputee rehabilitation services is dependent on arrangements at the particular tertiary level hospital. Patients at Fremantle or Sir Charles Gardiner Hospital who are clinically assessed as surgically and medically stable receive rehabilitation services on the acute ward. In the case of patients who are located at Royal Perth Hospital, rehabilitation is provided at the Shenton Park Campus. For patients from RPH who are also assessed as surgically and medically stable, specialist rehabilitation services are also provided at the Shenton Park Campus.

Following discharge, patients are supported by outpatient services either provided by tertiary or secondary level hospital services, community care services, and primary care services involving the general practitioner. In some cases, patients are discharged to the residential care sector if their care needs are assessed as appropriate for this type of care.

Services in the rural sector are extremely limited. For the majority of rural patients, they will most likely be referred to a metropolitan tertiary hospital where the surgical and medical care is provided. Rehabilitation is also undertaken in a metropolitan hospital, due to the very limited nature and scope of such services in rural areas in Western Australia.

¹⁴ See Appendix Six: - Current service Delivery Environment.



Clinical Activity - Type of Amputation operations

Table One outlines the types of amputee operations undertaken over the period 2002-2007.¹⁵

Table One - Type of Amputation Operations

Type of amputation	Number	%
Above knee	372	14.57
At hip	7	.27
Below knee	581	22.75
Toe	1130	44.26
Toe including meta-tarsal bone	359	14.04
Ankle through malleoli-tibia/fibia	2	.07
Disarticulation at knee	13	.5
Through ankle	5	.19
Mid-tarsal	16	.62
Transmeta-tarsal	68	2.66
TOTAL	2553	100

¹⁵ Unpublished data, ICAM. Department of Health October 2007.



Clinical Activity - Distribution of Amputee Operation Caseload

Table Two indicates the distribution of the amputation caseload across the entire health system in WA in the period 2002-2007.¹⁶

Table Two - Distribution of Amputee Operation Caseload

Hospital	Number of amputations 2002-2007	% of total caseload 2002-2007
Private Hospital	876	34%
Royal Perth Hospital	805	31.5%
Fremantle Hospital	392	15.3%
Sir Charles Gardiner Hospital	352	13.7%
Princess Margaret Hospital	60	2.3%
Armadale - Kelmscott Hospital	28	1%
Swan Districts Hospital	9	.35%
Rockingham - Kwinana Hospital	13	.5%
Osborne Park Hospital	8	.3%
Bentley Hospital	6	.23%
Kalamunda Districts Hospital	3	.1%
Kaleeya Hospital	1	.03%
Total	2553	100%

The data indicates that apart from the major caseload undertaken by the private sector, the majority of caseload activity is undertaken in the three metropolitan tertiary level 6 hospitals, with Royal Perth Hospital having the greatest share of the caseload work.

Hospital Catchment Areas

Table Three outlines the catchment areas from which amputee patients were drawn over the period 2002-2007.

The data suggests the following findings:

1. The three metropolitan tertiary hospitals largely draw their activity from within the appropriate geographical health region catchment area.
2. Royal Perth Hospital, although located in the North Metropolitan Health Region until 2005-2006, has taken a significant caseload level from metropolitan catchment areas in the South Metropolitan Health Region, with 34.65% of activity.

¹⁶ Unpublished data, ICAM. Department of Health October 2007.



3. Similarly, SCGH has taken a significant proportion of caseload activity with 27.5% from the South Metropolitan Health Region.
4. The three metropolitan tertiary hospitals take significant levels of caseload activity from the WA County Health Service regions, with Royal Perth Hospital taking the greatest share of work with approximately 21% of total caseload.
5. Private Hospitals also undertake a significant amount of work with 18% originating from the rural regions.



Table Three: Clinical Activity - Catchment Areas

Hospital Site	Catchment Area	No Operations	%
Armadale - Kelmscott Hospital	North Metro Health Service	0	
	South Metro Health Service	26	
	South West Area Health Service	1	
	WA Country Health Service	1	
Total		28	
Bentley Hospital	North Metro Health Service	1	
	South Metro Health Service	4	
	South West Area Health Service	1	
	Total	6	
Fremantle Hospital	North Metro Health Service	11	
	South Metro Health Service	346	
	South West Area Health Service	15	
	WA Country Health Service	20	5%
Total		392	
Kaleeya Hospital	South Metro Area Health Service	1	
Total		1	
Kalamunda Hospital	North Metro Health Service	3	
Total		3	
Osborne Park Hospital	North Metro Health Service	6	
	South Metro Health Service	2	
Total		8	
Princess Margaret Hospital	North Metro Health Service	25	
	South Metro Health Service	20	
	South West Area Health Service	5	
	WA Country Health Service	10	6%
Total		60	



Hospital Site	Catchment Area	No Operations	%
Private Hospitals (country and metropolitan)	North Metro Health Service	411	
	South Metro Health Service	307	
	South West Area Health Service	63	
	WA Country Health Service	95	10.8%
Total		876	
Rockingham-Kwinana Hospital	South West Area Health Service	13	
Total		13	
Royal Perth Hospital	North Metro Health Service	358	
	South Metro Health Service	279	
	South West Area Health Service	41	
	WA Country Health Service	127	15.7%
		805	
Sir Charles Gardiner	North Metro Health Service	212	
	South Metro Health Service	97	
	South West Area Health Service	7	
	WA Country Health Service	36	10.2%
Total		352	
Swan Districts Hospital	North Metro Health Service	8	
	WA Country Health Service	1	
Total		9	
GRAND TOTAL		2553	

1. Amputee Rehabilitation Services - Activity

There is no current data collection system in place that specifically captures amputee rehabilitation activity across WA Health.¹⁷ The hospital site of the surgical operation prescribes the location at which rehabilitation services for the older amputee patient assessed as medically unstable takes places. With the exception of RPH, where they are moved to a specified rehabilitation hospital, the amputee stays, in the majority on the acute ward. Rehabilitation activity that takes place is not coded reliably in this situation and therefore data collection is very uncertain.

¹⁷ This gap in the data collection process is currently being rectified through site-specific collections.



The only reliable indicator currently available that provides indicative statistical evidence is the number of interim prostheses provided by the WALSA service and substantiates the qualitative evidence.¹⁸

Table Four - Interim Prosthesis Provision

Year	Hospital	Interim Prosthesis
2005-2006	Royal Perth Hospital	69
	Fremantle Hospital	51
	Sir Charles Gardiner Hospital	28
	South West O P Services - Bunbury	5
TOTAL		153

Year	Hospital	Interim Prosthesis
2006-2007	Royal Perth Hospital	55
	Fremantle Hospital	29
	Sir Charles Gardiner Hospital	32
	South West O P Services - Bunbury	9
TOTAL		125

The statistical and qualitative evidence indicates that rehabilitation services patients at Fremantle Hospital and Sir Charles Gardiner Hospital are provided in a tertiary level acute care setting. By contrast, patients at Royal Perth Hospital are moved to Shenton Park post surgery where services are provided in a sub-acute care setting.

Professional advice from the Amputee Network Sub-group also indicates that many private patients eventually gravitate towards the public hospital system for outpatient rehabilitation and support services. The implication of this pathway is admission as an in-patient and assessment by the amputee physician before the commencement of outpatient rehabilitation.

A narrative description of the current service delivery environment is outlined in Appendix Seven.

2. Relevance of Department of Health Review - 1999

An extensive review of amputee services in Western Australia was conducted in 1999.¹⁹

The Review articulated a best practice model as a "continuum of care across all stages of the amputee service, commencing with pre-operative

¹⁸ Source: WA Limb Service Association, 2007

¹⁹ Review of Amputee Services for the Metropolitan Health Service Board. Perth. Western Australia. Dr David Murphy. Dr Bernard Street. November 1999.



assessment, and continuing through surgery, rehabilitation and into community after discharge.”²⁰

Stakeholders represented on the Amputee Network Sub-group also articulated this goal and re-stated the need to move towards achieving this goal.

3. Demographics Issues

■ relating to amputee patients

The following table describes the demographics of amputee patients over the past five years in all public hospitals across the WA Health system.²¹ It is clear that 59% of the caseload was in the 65+ age group, however, 30% of the caseload was attributed to the 45-64 year age group.

Table Five - Demographic Issues

Financial Year 2002 - 2003 to 2006 - 2007		
Age Group	Number	% Total
0-15	60	4%
15-44	133	8%
45-64	499	30%
65-84	849	51%
85 +	128	8%
Grand Total	1669	100%

Increased age has clinical implications for success in recovery in the acute phase, the likelihood of receiving a prosthesis and successful rehabilitation outcomes. The availability of support services in the community are important to allow the older amputee to live independently in the community and promote functional independence.

Amputees also being generally older, are less able to travel and access support services. This suggests a need for services to be provided at the community level where care can be provided closer to home or in the home.

■ relating to the ageing population in Western Australia

The projected growth of the population aged 65 and over in the short, medium and long term in WA will serve to increase the total aged population base from which the potential older amputee will be drawn. From a statistical perspective, the numbers of older amputee patients may increase relative to population increase over time, all other things being equal.²²

²⁰ page 4, *ibid*.

²¹ Unpublished data Information Collection and Management Branch, WA Health. October 2007

²² For an analysis of projected aged population growth rates in WA see “Model of Care for the Older Person in Western Australia”.

<http://www.health.wa.gov.au/healthnetworks/index/cfm.publications>



4. Principle Diagnosis for an Amputation - WA Health data analysis

Data has been extracted from the Information, Collection and Management (ICAM) coding data relating to amputee episodes of care.

Over the period 2002-2003 to 2006-2007 the total caseload for amputation procedures was 2,553 amputations including those procedures carried out in private hospitals - approximately an average caseload of 500 amputations per year.²³ The data suggests that the four out of the five most frequent principle diagnoses for the need for an amputation are related to chronic and long-term diseases particularly Type 2 diabetes mellitus and atherosclerosis.

Table Six - Principle Diagnosis for an Amputation

Principle Diagnosis	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007		% of total caseload
Type 2 diabetes mellitus	205	194	194	275	224	1092	42.7%
Atherosclerosis	85	84	86	90	79	424	16.6%
Osteomyelitis	27	36	26	29	22	140	5.48%
Acquired deformities of fingers and toes	25	22	30	29	20	126	4.9%
Type 1 diabetes mellitus	22	19	10	18	18	87	3.4%

4.1 Amputations and link to Type 2 diabetes

The following data suggests that the minor procedure of amputation of the toe related to the principle diagnosis of diabetes Type 2 contributes to almost 61% of the total number of amputations related to diabetes Type 2.²⁴ (Amputations of the toe contributed 18% of the total amputation caseload of 2552 amputations over the period 2002-2007).

Table Seven - Amputations & link to Type 2 diabetes

Procedure	Type 2 diabetes caseload	Type 2 diabetes % of caseload
Above knee	100	9.1%
Below knee	283	25.9%
Toe	479	43.86%
Toe including metatarsal bone	187	17.1%
Other	43	3.9%
Total	1092	100%

This finding points to the need for aggressive and targetted management of people at risk of developing diabetes Type 2, and those that already have the condition in order to prevent escalation and the need for a toe amputation or further amputations.

²³ Unpublished data Information Collection and Management Branch, WA Health. October 2007.

²⁴ As above.



5. Impact of chronic disease

5.1 Cognisant of the findings from the data indicated in the previous section, the prevalence of chronic diseases at a population level will potentially impact on future caseloads for amputee services. The Australian Institute for Health and Welfare²⁵ documents the following scenario in terms of chronic disease levels in Australia at 2004-2005:

- Many adults are at risk of developing chronic diseases: for example, 54% of adult Australians are either overweight or obese.
- Some people are affected much more than others: for example, compared with other Australians, Aboriginal and Torres Strait Islander persons have higher mortality from diabetes (14 times higher), chronic kidney disease (8 times) and heart disease (5 times).
- Older people carry a relatively large share of coronary heart disease, stroke, diabetes, osteoarthritis and osteoporosis.
- According to the 1999-2000 Aus Diab study, 7.2% of Australians aged 25 years and over (about 850,000 people) had Type 2 diabetes (AIHW 2002a).²⁶
- Type 2 diabetes was most prevalent among males aged 65-74 years and females aged 75 years and over. An estimated 37,000 people aged 25 years and over had Type 1 diabetes (AIHW 2002a). (page 6 -2004 study)

5.2 Qualitative evidence provided by the Amputee Network Sub-Group indicates a rise in the presence of “metabolic syndrome” amongst amputee patients and the over 65 population in general.²⁷ Metabolic syndrome is marked by:

- abdominal obesity
- hyperglycaemia
- dyslipidaemia (increased triglycerides and reduced HDL cholesterol)
- hypertension

5.3 Lifestyle factors²⁸ are known to be attributed to the development of diseases such as diabetes and cardio-vascular disease:

- More than 85% of adults are not consuming enough vegetables.
- One in two adults are not getting sufficient physical activity.
- Almost 50% of adults are not consuming enough fruit.
- Around 21% of adults smoke tobacco.

The combined effects of:

- chronic disease,
- poor lifestyle habits and

²⁵ page 9, Australian Institute for Health and Welfare, 2006. Chronic disease and associated risk factors in Australia, 2006. AIHW. cat.no. PHE 81.

²⁶ The Australian Institute of Health and Welfare documents that the “Australian Diabetes, Obesity and Lifestyle Study (Aus Diab)” accurate indication of the prevalence of diabetes in Australia. ²⁶

²⁷ the term Metabolic Syndrome (MetS) is the most widely accepted name for this cluster of metabolic disturbances. The MetS is generally recognised as a syndrome in its own right: a syndrome is defined as a recognisable complex of symptoms and physical or biochemical findings for which a direct cause is not understood. With a syndrome, the components coexist more frequently than would be expected by chance Last, J. M. 1995. A dictionary of epidemiology, 3 ed. Oxford University Press, New York

²⁸ page 10, *ibid.*



- the demographic impacts of an ageing population

serve to demonstrate the need to adequately plan for an amputee service that is responsive to the needs of the amputee patient as well as cost-effective and efficient for the WA Health system.



Appendix 2: Service Configuration

Figure One: Suggested timelines for service configuration

FSH - Fiona Stanley Hospital

RPH - SPC Royal Perth Hospital Shenton Park Campus

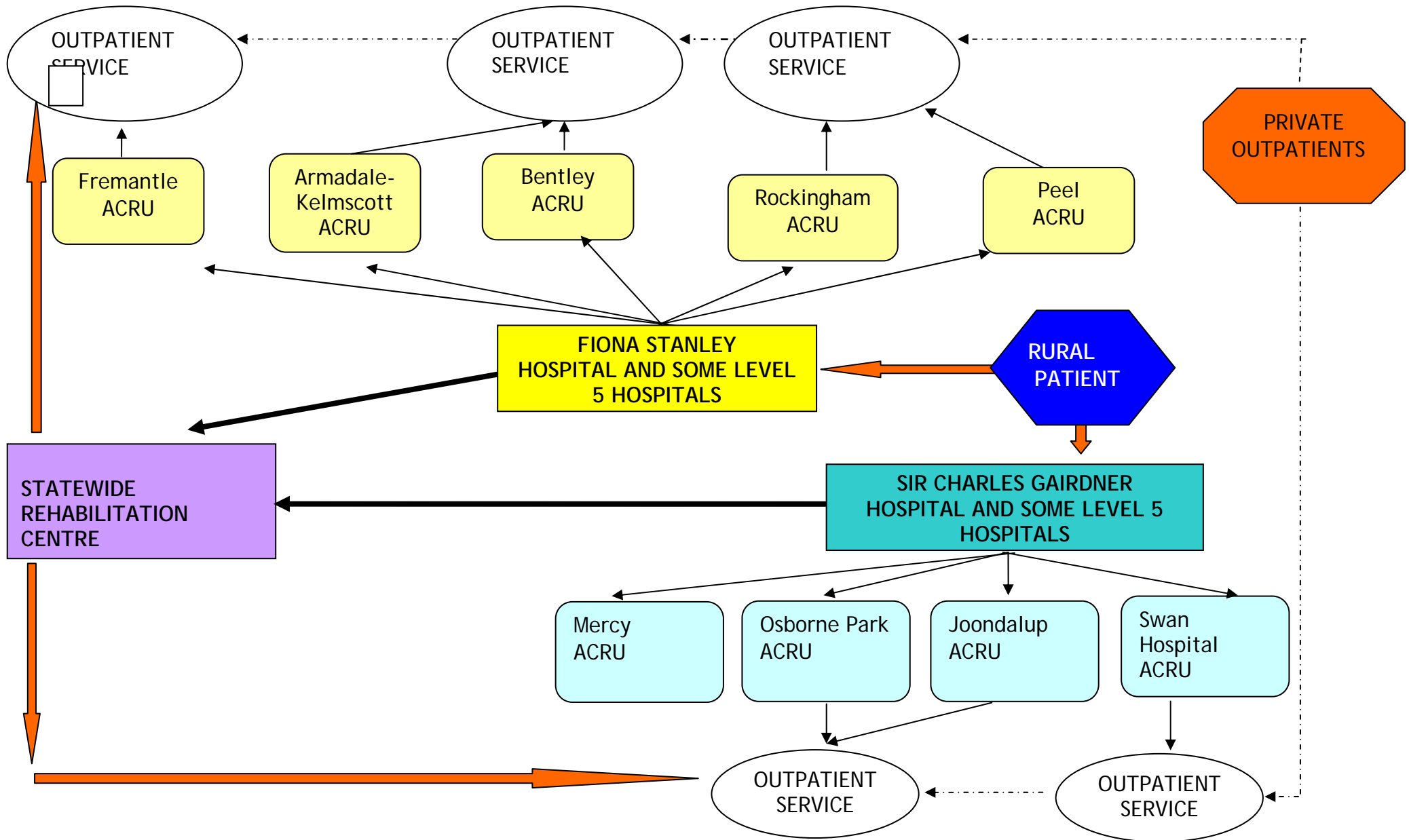
FSH - SRC Fiona Stanley Hospital Statewide Rehabilitation Centre

TYPE OF SERVICES	2008 - when FSH built	RPH - SPC becomes SRC	FSH and SRC Established on same site
ACUTE SURGICAL AND MEDICAL CARE (for all WA patients)			
Sir Charles Gairdner Hospital	X	X	X
Royal Perth Hospital	X	?	
Fremantle Hospital	X	X	
Some major metropolitan Level 5 hospitals	X	X	X
Fiona Stanley Hospital		?	X
Royal Perth Hospital - Shenton Park Campus		X	
WACHS site where appropriate	X	X	X
SPECIALIST REHABILITATION SERVICES (for all WA patients)			
Sir Charles Gairdner Hospital			
Royal Perth Hospital			
Fremantle Hospital			
Some major metropolitan Level 5 hospitals			
Fiona Stanley Hospital State Rehabilitation Centre - WALSA - Well-tel facility			X X X
Royal Perth Hospital - Shenton Park Campus - Well-tel facility	X X	X X	
ON-SITE PROSTHETIC SERVICE (RPH-SPC) (for interim prostheses with input of rehabilitation team)	X	X	X
PROSTHETIC SERVICES - WALSA	Mobile service	Mobile service	Mobile service



TYPE OF SERVICES	2008 - when FSH built	RPH - SPC becomes FSH - SRC	FSH and SRC Established
AGED CARE REHABILITATION SERVICES FOR AMPUTEE PATIENTS (for all WA patients)			
Aged Care Rehabilitation Units	X	X	X
Bentley Hospital	X	X	X
Mercy Hospital - Restorative Care Unit	X	X	X
Armadale - Kelmscott Hospital	X	X	X
Swan Districts Hospital	X	X	X
Osborne Park Hospital	X	X	X
Joondalup Hospital	X	X	X
Fremantle Hospital	X	X	X
Peel Hospital	X	X	X
Rockingham - Kwinana Hospital	X	X	X
WACHS Regional Resource Hospitals	X	X	X
STRENGTHENED INTERDISCIPLINARY CARE			
Fremantle Hospital	X	X	
Sir Charles Gairdner Hospital	X	X	
ESTABLISHMENT OF PATHWAY FOR MEDICALLY STABLE OLDER AMPUTEE (for all WA patients)			
Fremantle → RPH - SPC	X	X	
Sir Charles Gairdner Hospital → RPH -SPC	X	X	
OUTPATIENT REHABILITATION SERVICES			
North Metropolitan Region			
Swan Districts Hospital	X	X	X
Osborne Park Hospital	X	X	X
South Metropolitan Region			
Rockingham - Kwinana Hospital	X	X	X
Fremantle Hospital	X	X	X
Armadale-Kelmscott Hospital	X	X	X
WACHS - major regional centres	X	X	X
STRENGTHENED USE OF TELE-HEALTH SERVICES (for all WA patients)	X	X	X
VISITING RIGHTS FOR PUBLIC HOSPITAL AMPUTEE PHYSICIANS IN PRIVATE HOSPITALS FOR REHABILITATION SERVICE PROVISION (for all WA patients)	X	X	X

Figure Two: Geographical Configuration Post 2013





Appendix 3: Best Practice Standards and Guidelines

Clinical Guidelines

High quality care across WA Health that is comprehensive and interdisciplinary in nature should accord with best practice. The Model of Care for Amputee Patients is guided and informed by the following best practice guidelines and relevant society standards.

1. Australasian Faculty of Rehabilitation Medicine (AFRM)

Royal Australian College of Physicians

- Standards 2005
- Adult Rehabilitation Medicine Services in Public and Private Hospitals 2005

Amputee rehabilitation as defined by the Faculty of Rehabilitation Medicine of the Royal Australasian College of Physicians promotes the outcome of an integrated service delivery system.

2. British Association of Chartered Physiotherapists in Amputee Rehabilitation (BACPAR)

- Evidence Based Clinical Guidelines for the Physiotherapy Management of Adults with Lower Limb Protheses 2003
BACPAR Broomhead, P. et al. 2003
www.csp.org.uk/uploads/documents/csp_guideline_bacpar.pdf
- Clinical guidelines for the pre-and post-operative physiotherapy management of adults with lower limb amputation
BACPAR 2006
www.csp.org.uk

3. Standards of Care

G.Berke. *Standards of Care*. Journal of Prosthetics & Orthotics. Vol 16 (3)Spp 6-12. 2004.

These standards of care identify the essential components that include team involvement; time frame of surgery & recovery; wound healing; amputation-specific goals; "whole person" goals & education & empowerment of the amputee and family matters. The standards act as a useful guide.

4. Therapeutic Goods Amendment (Medical Devices) Act 2002

<http://www.comlaw.gov.au/comlaw/Legislation/ActCompilation1.nsf>

5. Best Practice in Amputee Rehabilitation

Bendigo Project - Amputee Unit. Anne Caudle Campus - Bendigo Health Care Project. Victoria. Commonwealth Best Practice in the Health Sector Program. 1996.



Appendix 4: Amputee Inter-Disciplinary Care Check List

Canterbury
District Health Board
Te Poari Hauora o Waitaha

Patient Label

Ward 15
Christchurch Hospital

Amputee Inter-Disciplinary Care
Check List

Inter-Disciplinary Care Team Members (<i>print name</i>)			
Doctor:	Maori Health Worker:		
Social Worker:	Physiotherapist:		
Key Nurse:			
PRE-OP Key Tasks	√ or N/A	Date Completed	Signature
NURSING			
• Adequate pain relief administered.	<input type="checkbox"/>		
• Early referral to PT - verbally at PT/Nurse Report or beep PT.	<input type="checkbox"/>		
• Information folder given to patient and family.	<input type="checkbox"/>		
• Transfer using ½ standing pivot transfer if unable to walk.	<input type="checkbox"/>		
PHYSIOTHERAPY			
• Check patient has information folder.	<input type="checkbox"/>		
• Order wheelchair with anti tips and stump rest. Order narrowest chair pt can fit, e.g. 16" rather than 18" if possible	<input type="checkbox"/>		
• Assess respiratory status and educate as appropriate.	<input type="checkbox"/>		
• Teach transfers if time allows.	<input type="checkbox"/>		
INTRA-OP Key Tasks	√ or N/A	Date Completed	Signature
MEDICAL / NURSING			
• Rigid removable dressing (RRD) applied in theatre.	<input type="checkbox"/>		

Comment (if required):

.....
.....



POST-OP	Key Tasks	√ or N/A	Date Completed	Signature
NURSING				
	<ul style="list-style-type: none"> Referral to physio immediately if not possible pre-op (beep physio) 	<input type="checkbox"/>		
	<ul style="list-style-type: none"> Ensure adequate regular and PRN pain relief taken on patient. 	<input type="checkbox"/>		
	<ul style="list-style-type: none"> Rigid Removable Dressing (RRD) and wound dressing left in situ for 48 hours or until specified by surgeons, <u>unless</u> concerns about residual limb. **Trans Tibial Amputee patient only. 	<input type="checkbox"/>		
	<ul style="list-style-type: none"> To reduce the risk of swelling, only remove RRD to view wound dressing and to remove drain <u>as</u> the vascular team arrives at bedside. Reapply RRD as soon as possible after viewing wound. 	<input type="checkbox"/>		
	<ul style="list-style-type: none"> Contact physio immediately if you are unable to reapply RRD after wound viewing because of increased swelling. 	<input type="checkbox"/>		
	<ul style="list-style-type: none"> Use occlusive dressings (e.g. post op site) over mefix tape to prevent any leakage of wound exudates onto sock and RRD. 	<input type="checkbox"/>		
	<ul style="list-style-type: none"> Assist physio with delivery analgesic entonox to patient if required. 	<input type="checkbox"/>		
	<ul style="list-style-type: none"> Educate patient and family about rehabilitation process - refer to handout "What Happens After Amputation and How Long Does It Take" in amputee information folder. 	<input type="checkbox"/>		
	<ul style="list-style-type: none"> Shower patient with RRD in situ - cover with plastic bag. 	<input type="checkbox"/>		
	<ul style="list-style-type: none"> For below knee amputees, use ½ standing pivot transfer for bed to chair to bed (refer to photos in ward). Use banana board if necessary. 	<input type="checkbox"/>		
	<ul style="list-style-type: none"> For bilateral amputees, use forwards and backwards transfer (refer to photos). Use banana board to bridge gap between bed and chair. 	<input type="checkbox"/>		
PHYSIOTHERAPY				
	<ul style="list-style-type: none"> Ensure patient has amputee information folder. 	<input type="checkbox"/>		



POST-OP	Key Tasks	√ or N/A	Date Completed	Signature
	<ul style="list-style-type: none"> Commence tasks identified on Physiotherapy Amputee Transfer Summary. 	<input type="checkbox"/>		
	<ul style="list-style-type: none"> Make RRD two or three days post-op, if not made in theatre. Use entonox and adequate pain relief. Ask patient's nurse to administer entonox - this needs to be breathed continuously for at least two minutes <u>prior</u> to making RRD to allow gas to get to where it is needed in the body. 	<input type="checkbox"/>		
	<ul style="list-style-type: none"> Practise bed to chair to bed transfers, using ½ standing pivot transfer for below knee amputee (BKA). Use banana board if necessary. (Refer to photos in ward). 	<input type="checkbox"/>		
	<ul style="list-style-type: none"> Begin anti-contracture exercises. 	<input type="checkbox"/>		
	<ul style="list-style-type: none"> If patient limited by pain, liaise with nurse and doctor about most effective pain relief regime. 	<input type="checkbox"/>		
	<ul style="list-style-type: none"> For bilateral amputee, practice forward and backwards transfers using banana board if necessary to bridge gap between bed and chair. (Refer to photos in ward). 	<input type="checkbox"/>		
	<ul style="list-style-type: none"> If RRD unable to be fitted onto residual limb after wound inspection, use blue line bandaging for a few hours to reduce oedema, then attempt to refit RRD. 	<input type="checkbox"/>		
	<ul style="list-style-type: none"> If patient already has a below knee prosthesis for the other leg, ensure patient wears it for transfers. 	<input type="checkbox"/>		
	<ul style="list-style-type: none"> Complete Amputee Transfer Summary and fax to destination. 	<input type="checkbox"/>		
SOCIAL WORK				
	<ul style="list-style-type: none"> Liaise with ward physiotherapist, Amputee Society, and Artificial Limb Centre if patient requires information to be able to make more informed decision about processing with amputation. 	<input type="checkbox"/>		

NOTE: for applicability to Western Australia, a focus should be placed on the needs of the carer. This will require integration into the checklist.

SOURCE: Final Report to New Zealand Artificial Limb Board
Design and Implementation of Interdisciplinary Care Guidelines for Hospital Management of Amputees in Christchurch.2004. Appendix 2.

Project Author: Debbie Hockley. Project Advisor: Graham Flanagan
Trial Document 1/06/2005



Appendix 5: Older Persons Health Service Inpatient Wards

Canterbury District Health Board Te Poari Hauora o Waitaha The Princess Margaret Hospital	Patient Label
AMPUTEE INTER-DISCIPLINARY CARE CHECK LIST -	
Older Persons Health Service Inpatient Wards	
Inter-Disciplinary Team Members (<i>print name</i>)	
Dietitian:	Maori Health Worker:
Occupational Therapist:	Primary Nurse:
Social Worker:	Service Co-ordinator:
Physiotherapist:	
PRE-OP Key Tasks	<input checked="" type="checkbox"/> or <input type="checkbox"/> N/A*
	Date Completed *
	Signature
DIETETICS	
Poor appetite	<input type="checkbox"/>
Poorly controlled diabetes	<input type="checkbox"/>
Slowly healing wound	<input type="checkbox"/>
NASC	
Identifying funding stream on admission/discharge	<input type="checkbox"/>
Link into other funding streams as required	<input type="checkbox"/>
Ensure appropriate paperwork completed	<input type="checkbox"/>
Identify discharge needs including transport costs/reimbursement to Artificial Limb Centre	<input type="checkbox"/>
NURSING	
Rigid Removable Dressing (RRD) in situ 24 hours, apart from wound inspection	<input type="checkbox"/>
Care of remaining foot/lower limb addressed, including advice to wear a shoe for protection	<input type="checkbox"/>
Adequate pain relief administered	<input type="checkbox"/>
Practice transfers from bed to chair, bed to commode, chair to toilet to promote early independence	<input type="checkbox"/>
Supervision of toileting e.g. transfers, clothing adjustment	<input type="checkbox"/>



Referral to Vascular Team if required for wound or limb review	<input type="checkbox"/>		
Referral to Social Work if patient and/or family/whanau/carers have grief and loss issues identified	<input type="checkbox"/>		
Reinforce rehabilitation process to patient/family/whanau/carers (use information folder patient given to Christchurch Hospital)	<input type="checkbox"/>		
OCCUPATIONAL THERAPY			
Administration of standardised ADL assessment - Activities of Daily Living Index	<input type="checkbox"/>		
Administration of IADL assessment relevant to roles and environment - IADL Scale	<input type="checkbox"/>		
Assessment of functional transfers and mobility in the context of discharge requirements	<input type="checkbox"/>		
Assessment of cognition and/or perception/sensation as appropriate	<input type="checkbox"/>		
Identification of potential barriers to home environment and early home visit if possible (within week 1 or 2)	<input type="checkbox"/>		
Early referral to Community Therapy Services for complex housing and equipment issues (with request for joint home visit) within week 1 or 2	<input type="checkbox"/>		
Education provided to patient/family/whanau/carer regarding Enable funding criteria, timeframes, realistic expectations	<input type="checkbox"/>		

- No check indicates not completed or considered

OCCUPATIONAL THERAPY (continued)			
Incorporation of oedema, skin, contracture and pain management principles into all ADL and IADL activities	<input type="checkbox"/>		
Education/training provided to patient/family/whanau/carers on safe and independent ADL/IADL in the home environment	<input type="checkbox"/>		
Discussion held about driving and alternative transport options	<input type="checkbox"/>		
PHYSIOTHERAPY			
Amputee Transfer Check list from Christchurch Hospital sighted	<input type="checkbox"/>		



Oedema management programme in place immediately - Rigid Removal Dressing (RRD) in situ, elevation of residual limb while on bed and wheelchair	<input type="checkbox"/>		
Transfer ability assessed and documented - bed to chair to bed, chair to toilet to chair	<input type="checkbox"/>		
Anti-contracture management addressed through quads and hip extension exercises/adequate pain relief/use of stump rest on wheelchair	<input type="checkbox"/>		
Early self-management of RRD (Rigid Removable Dressing) and socks	<input type="checkbox"/>		
Exercise programme reviewed	<input type="checkbox"/>		
Commence Pneumatic Post-Amputation Mobility Aid (PPAM) walking if appropriate	<input type="checkbox"/>		
Car transfers practiced	<input type="checkbox"/>		
Long-term wheelchair prescribed if eligible	<input type="checkbox"/>		
Clinic appointment with Artificial Limb Centre (ALC) made (whilst an inpatient) and transport arranged	<input type="checkbox"/>		
ALC Clinical appointment Date:..... Time:.....	<input type="checkbox"/>		
Getting up off floor if possible - independently or with carer	<input type="checkbox"/>		
Stump shrinker ordered for above knee amputee	<input type="checkbox"/>		
SOCIAL WORK			
Assessment of grief and loss issues with patient and family/whanau/carers	<input type="checkbox"/>		
Liaison with Amputee Society for volunteer amputee visitor	<input type="checkbox"/>		
Counselling with individual/family/whanau/carers commenced	<input type="checkbox"/>		
COMBINED DISCHARGE PLANNING			
Equipment organised short-term/long-term	<input type="checkbox"/>		
Trial overnight/weekend leave arranged. Date	<input type="checkbox"/>		
Safe access to home arranged (Specify)	<input type="checkbox"/>		
Liaison Meeting arranged if required. Date	<input type="checkbox"/>		
Self-management of RRD and socks (patient and/or family/whanau/carers)	<input type="checkbox"/>		



Appendix 6: Current Service Delivery Environment: Amputee Services

Operative Services:

Amputation operations are largely confined to the three major level 6 hospitals (SCGH/FH/RPH) with SPC as rehabilitation service centre for Royal Perth Hospital. RPH carries out the bulk of amputations, as well as offering rehabilitation and prosthetic services.

The majority of amputation private hospital operations occur at St John of God's Hospital in Subiaco and Hollywood Hospital.

Occasional amputations occur at Derby, Broome and Port Hedland hospitals and in L5 hospitals.

Table One outlines the distribution of operations across the WA Health system.

Post - operative services:

The subsequent management of the public patient varies considerably between acute hospitals and the type of rehabilitation facilities and services the hospital provides.

Based on qualitative evidence, the likelihood of private patients gravitating to public hospital outpatients services for ongoing management and maintenance depends on the extent of networking contacts by public hospital professionals and relevant stakeholder groups.

Current Clinical Pathways

1. A patient who has an amputation at RPH moves from RPH to Shenton Park Campus (SPC) where the interim prosthesis fitting is made under an amputee team consisting of a physician, physiotherapist. Rehabilitation is undertaken at this sub-acute site through a Multi-disciplinary team.
Elderly people not suitable for a prosthesis commence generic rehabilitation therapy and receive education about stump care.
2. A patient who has had an amputation at SCGH/FH stays at the tertiary acute hospital. Patients stay on acute ward (V5 - at Fremantle) and are seen by an amputee physician from SPC. Rehabilitation is undertaken while on the acute ward. A patient who has had an amputation at FH begins during the peri-operative stage and once the surgical healing is established (usually 5-7 days post operatively), the patient is transferred to either of two rehabilitation wards (V5 or Amity Ward sited Kaleeya Hospital).
3. Amputee patients needing a prostheses and who have undergone acute care in other public hospitals or private hospitals are seen at SPC/SCGH or FH.



Royal Perth Hospital

Over the period 2002-2006, excluding the private sector as a whole RPH had the highest number of amputee operations.

The current amputee service at the Shenton Park Campus of RPH provides rehabilitation to patients who have an upper or lower limb amputation. RPH regularly takes patients who are suitable rehabilitation candidates from country hospitals, SCGH, SJOG, Hollywood Hospital and less frequently, Fremantle Hospital as inpatients and outpatients. Young and complex (multi-level and upper limb) amputee patients access the RPH-SPC service. The metropolitan patients are reviewed in the SPC Outpatient clinic on Thursday mornings and the country patients via tele-health on Thursday mornings where the team assesses the patients for their suitability for fast stream rehabilitation.

Patients from RPH are usually transferred within 7 days to Shenton Park for inpatient rehabilitation and fitting of an interim prosthesis. Rigid Removable Dressings are fitted in the post-operative period, often after the patient visits the amputee clinic. Shenton Park Campus has up to 10 dedicated amputee rehabilitation beds, currently located on Ward 8. at SPC-RPH.

A multi-disciplinary rehabilitation team runs a structured rehabilitation program. An amputee physician and interdisciplinary care team is involved in the acute care, prosthesis fitting, inpatient rehabilitation and outpatient rehabilitation of the patient.

The outpatient rehabilitation service incorporates Well-tel, RITH and Tele-health where appropriate for the patient. Many country patients after some time at home return to use the Well-tel service for intense bursts of rehabilitation and reviews of their prosthetic fit/alignment. The Well-tel service is important for patients outside the volunteer transport zone also (for example, Joondalup, Wanneroo, Rockingham). Tele-health is essential for the country patients review and for support of country rehabilitation staff.

Outpatient physiotherapy rehabilitation is provided at SPC until the patient is suitable to refer to another metropolitan or country physiotherapy service. Access to other physiotherapy services is limited and access to maintenance exercise classes through community physiotherapy services is limited.

The SPC patients are reviewed in the SPC Amputee Outpatient clinic until they are referred to the private prosthetic companies for a definitive prosthesis. On referral for a definitive prosthesis the clinic they are allocated to, is based upon which private prosthetic company their definitive prosthesis is made by. Complex young amputee patients continue review at the SPC clinic after definitive prosthesis as appropriate.



Fremantle Hospital

Over the period 2002-2006, FH had the second highest number of amputee operations.

During the peri-operative amputation period, vascular patients are treated on the vascular surgery ward and patients who have had amputations due to trauma are managed on the orthopaedic ward.

Rigid removable dressings (RRDs) are applied immediately or on day 5 post-operatively, depending on the surgical team's protocol. RRDs are fitted by FH physiotherapists experienced in RRD application.

Older patients assessed as surgically stable are assessed by a geriatrician and usually transferred to either of two Aged Care Rehabilitation wards. Younger amputees (younger than 45 years) usually remain on the acute ward until discharge with ongoing RTIH and outpatient management.

Weekly review of inpatients is provided by a medical officer and amputee clinical specialist physiotherapist from RPH-SPC. Day to day allied health service provision is provided by FH ward staff with consultation and support from the rehabilitation physician and amputee clinical specialist physiotherapist.

On-going out-patient allied health services are provided by FH or the metropolitan hospital closer to the patient's home. Clinical support, as required, is provided by FH staff, usually the amputee clinical specialist physiotherapist.

Prosthetic services are provided a private prosthetic company. Some prosthetic services are provided on-site and at other times, the patient is required to travel to the prosthetic manufacturers premises.

Following discharge, amputee patients are reviewed at an out-patient amputee clinic at FH. In accordance with life-long management, patients who require multi-disciplinary review are seen at the FH clinic which is held on a weekly basis.

Sir Charles Gairdner Hospital

Over the period 2002-2006, SCGH had the third highest number of amputee operations.

Following the operation, amputees are initially treated on the acute ward (usually the cardio-thoracic ward) by a physiotherapist and occupational therapist skilled in amputee management.

Patients commence rehabilitation in the amputee gym in "C" block as soon as they are medically stable. When possible, patients are sent home after transfer training and referred to an amputee clinic that is located on "C" Block at SCGH.

Medically unstable patients who require more extensive rehabilitation are assessed by a geriatrician and may be transferred to the Aged Care and Rehabilitation ward.

Some patients undertake gait training with a prosthesis supplied by WALSA. The Aged Care and Rehabilitation Unit has a Day Hospital at which patients



can be reviewed for outpatient treatment after discharge. The ability to travel to the Day Hospital impacts on the regularity of treatment.

Private Hospitals

As demonstrated in Table Two - Appendix One, the private hospital sector is a major contributor to activity relating to amputations in WA. Qualitative evidence provided by the Amputee Sub-group indicated that much related outpatient activity subsequently occurs in the public system for the patients.

Amputee Clinics

The amputee clinics are serviced by WALSA where a mobile service provides an interim prosthesis. The mobile WALSA service operates at Fremantle Hospital and SCGH under private provider contract arrangements.

A problem currently exists with the data collection process for inpatient and outpatient activity as the length of the rehabilitation episode and the number of patients receiving rehabilitation are not recorded at SCGH/FH.

Fremantle Orthotic Services

The Limb Clinic (TLC Unlimited)

This service provides interim and definitive prostheses.

Ambulatory care services

Rehabilitation services provided in the home are provided through the generic RITH services operating from the metropolitan tertiary hospitals. The extent and availability of these types of rehabilitation services are dependent on the maturity of the programs linked to each of the hospitals.

Amputee Rehabilitation in Rural Regions

A small amputee management and prosthetic service is located at Bunbury and is operated under the auspices of South-West Orthotic and Prosthetic Service (SWOPS). The service is also provided on an outreach basis to a clinic at Albany. It is coordinated by a general practitioner who has taken a special interest in amputee patient management.

Anecdotal evidence indicates isolated and sporadic cases of amputations occur in rural regions, with minimal intensive rehabilitation therapy immediately post-operation as the majority of cases are transferred to a metropolitan tertiary hospital.

Management of medical needs and latter stage rehabilitation may be followed up by the general practitioner in the rural centre.

Community Services and support groups

Social workers concentrate on linking amputee patients to maintenance and support services through the HACC program, driver rehabilitation, return to work and counselling programs. There may be at times, issues relating to adequate coverage and intensity of services through the HACC program for amputee patients.



Of particular importance is the need for transport services to travel to rehabilitation outpatient services, particularly for the older amputee patient who lives some distance from the clinics.

Western Australian Limb Service for Amputees - WALSA

WALSA assists in making artificial limbs to eligible West Australians. WALSA provides prescribing clinics for the prescribing and fitting of artificial limbs. It also facilitates the process of acquittal, repair and maintenance of prostheses and the provision of consumable supplies.

Amputees in Action AiA

The AiA is a voluntary organisation that advocates on behalf of amputee patients to promote better care outcomes.



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