

MINIMUM STANDARDS

Care of the Person following Amputation

Minimum Standards of Care



The Agency for Clinical Innovation (ACI) works with clinicians, consumers and managers to design and promote better healthcare for NSW. It does this by:

- *service redesign and evaluation* – applying redesign methodology to assist healthcare providers and consumers to review and improve the quality, effectiveness and efficiency of services
- *specialist advice on healthcare innovation* – advising on the development, evaluation and adoption of healthcare innovations from optimal use through to disinvestment
- *initiatives including guidelines and models of care* – developing a range of evidence-based healthcare improvement initiatives to benefit the NSW health system
- *implementation support* – working with ACI Networks, consumers and healthcare providers to assist delivery of healthcare innovations into practice across metropolitan and rural NSW
- *knowledge sharing* – partnering with healthcare providers to support collaboration, learning capability and knowledge sharing on healthcare innovation and improvement
- *continuous capability building* – working with healthcare providers to build capability in redesign, project management and change management through the Centre for Healthcare Redesign.

ACI Clinical Networks, Taskforces and Institutes provide a unique forum for people to collaborate across clinical specialties and regional and service boundaries to develop successful healthcare innovations.

A priority for the ACI is identifying unwarranted variation in clinical practice and working in partnership with healthcare providers to develop mechanisms to improve clinical practice and patient care.

www.aci.health.nsw.gov.au

AGENCY FOR CLINICAL INNOVATION

Level 4, Sage Building
67 Albert Avenue
Chatswood NSW 2067

PO Box 699 Chatswood NSW 2057
T +61 2 9464 4666 | F +61 2 9464 4728
E info@aci.nsw.gov.au | www.aci.health.nsw.gov.au

SHPN (ACI) 170269, ISBN 978-1-76000-651-8 (print); 978-1-76000-652-5 (online).

Produced by: ACI Rehabilitation Network.

Further copies of this publication can be obtained from the Agency for Clinical Innovation website at www.aci.health.nsw.gov.au

Citation guidance: NSW Agency for Clinical Innovation (ACI). ACI Care of the Person following Amputation: Minimum Standards of Care 2017. Australia.

Disclaimer: Content within this publication was accurate at the time of publication. This work is copyright. It may be reproduced in whole or part for study or training purposes subject to the inclusion of an acknowledgment of the source. It may not be reproduced for commercial usage or sale. Reproduction for purposes other than those indicated above, requires written permission from the Agency for Clinical Innovation.

Version: V1.0 **Trim:** ACI/D17/2643

Date Amended: 10/05/2017 **Review date:** 2024 © State of New South Wales (Agency for Clinical Innovation)

Executive report

Annually in NSW, more than 2000 amputation procedures are performed. Over 2/3 of these surgical procedures occur in people aged over 60 years however, amputations also affect people with type 2 diabetes, trauma, tumours, peripheral vascular disease and a small proportion of children who are born with the absence of a limb. Although the number of amputation surgeries are relatively small, the changes to body structures and function are significant and lifelong.

With the significant impact of amputation, it is important that minimum standards of care are developed to ensure that all residents of NSW obtain consistent high standards of care and thereby ensure their needs are met at all stages of the lifelong journey of living with limb loss.

Care of the person following amputation: minimum standards of care has been specifically written for healthcare professionals and health services to outline the minimum standards of care that health services in NSW are expected to provide for people facing the prospect of, or those already living with, limb loss. The document comprises 12 individual care standards (summarised in Figure 1) that focus on both service- and person- based standards. Although the standards have been categorised, a crossover exists between the two categories; service-based standards refer to the process undertaken to provide for the person, whilst person-based services refer to their care.

At the end of this document, the self-assessment tool can be used by health services to evaluate their existing service provision and identify areas for improvement necessary to meet the expected standards of care in NSW. The minimum standards of care are not intended to replace informed clinical judgment nor prescribe how a healthcare service should meet these standards. It is expected that the way different clinicians and services meet these standards will vary depending on the populations they serve and the diversity of the healthcare settings available.

Acknowledgements

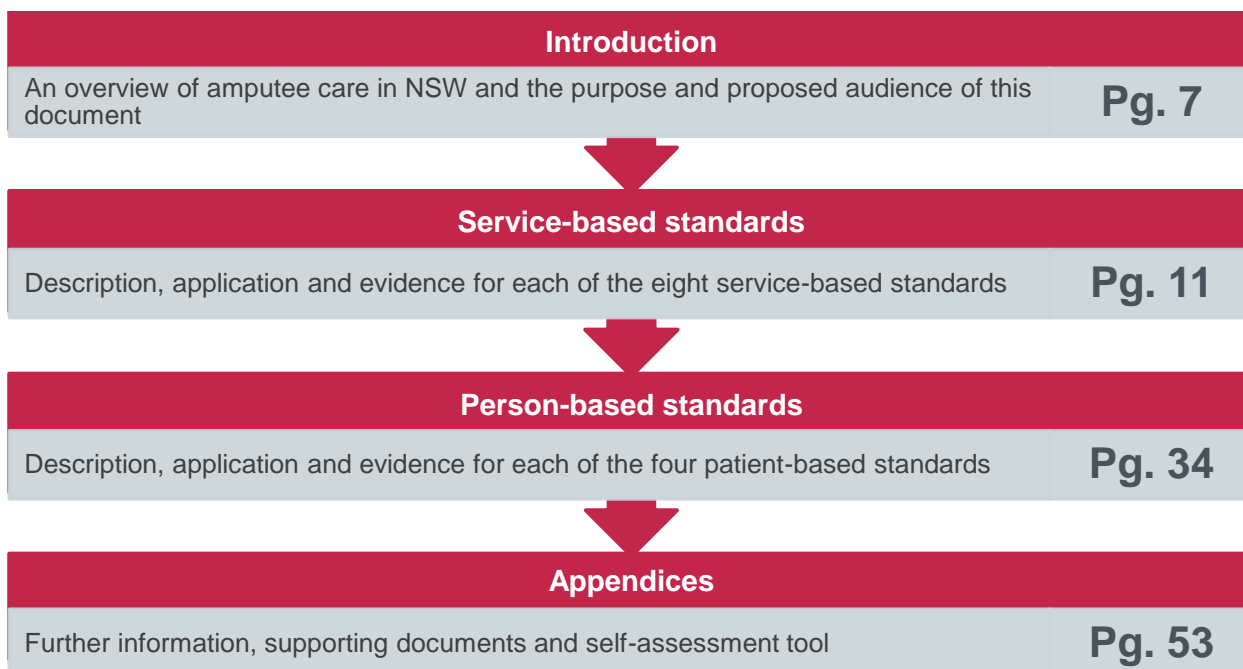
These standards were developed by the Amputee Steering Committee and Working Party, a working party of the ACI Rehabilitation Network. We also acknowledge the valuable contribution of Lynne Brodie, ACI Transition Network Manager; Gavin Meredith, ACI Surgical Services Taskforce; Glen Pang, ACI Aged Health Network Manager; Jenni Johnson, ACI Pain Network Manager; Kiel Hennessy, ACI Chronic Care for Aboriginal People Manager; Lyn Farthing, ACI Endocrine Network Manager; Darrel Sparke, Amputees NSW; and their network members who provided comments on earlier drafts.

Contents

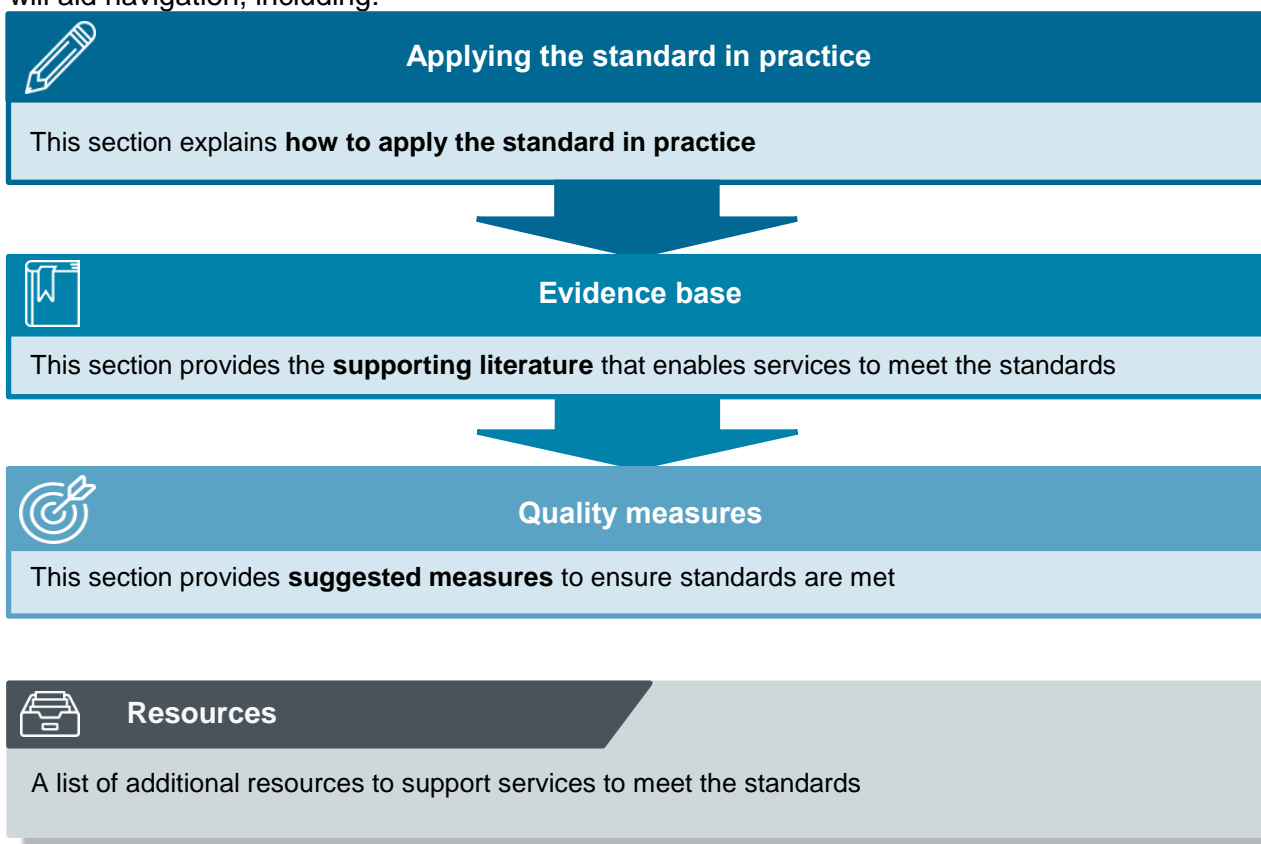
Executive report.....	ii
Acknowledgements.....	iii
Contents	iv
How to navigate the document	5
1. Context	6
2. Background.....	7
Development.....	7
Purpose	8
Intended audience	8
3. Standards	9
Service-based standards	10
Standard S1 – Care coordination	10
Standard S2 – Comprehensive care	13
Standard S3 – Counselling and psychological support.....	15
Standard S4 – Peer support.....	17
Standard S5 – Falls prevention	19
Standard S6 – Discharge planning.....	22
Standard S7 – Specialist paediatric care.....	24
Standard S8 – Persons with upper limb amputation.....	28
Person-based standards.....	33
Standard P1 – Care of the residual limb.....	33
Standard P2 – Education across all stages of care	36
Standard P3 – Pain.....	41
Standard P4 – Special consideration for specific populations	45
4. Glossary	49
5. References	50
6. Appendices	52
6.1 Appendix 1: Standards Steering Committee & Working Group Members.....	52
6.2 Appendix 2: Practical tool and guide	53
Self-assessment tool	53
Guide to the use of post-operative rigid dressings for transtibial amputations	59

How to navigate the document

The below navigation panel provides a quick link and a short description of the main sections of the standards.



Each of the minimum care standards is presented in a common format with design features that will aid navigation, including:



1. Context

Annually in NSW, there are more than 2000 amputation procedures performed. While the vast proportion are amputations affecting the toes (40%) or part of the foot (25%), amputation at the transtibial (13%) or transfemoral (8%) level are also common.⁽¹⁾ More than 2/3 of these surgical procedures occur in people aged over 60 years. While half of all amputations occur in people with type 2 diabetes; trauma, tumours and the long-term complications of systemic disease are also common causes for amputation. A small proportion of children are born with the absence of a limb and some will go on to have amputation surgery or use a prosthesis.⁽²⁾

While the number of amputation surgeries are relatively small, the changes to body structures and function are significant and lifelong. Given the significant impact of amputation, it is important that minimum standards of care are developed to ensure that all residents of NSW obtain consistent high standards of care and thereby ensure their needs are met at all stages of the lifelong journey of living with limb loss, either with or without the incorporation of a prosthetic limb.

2. Background

In 2003, NSW Health commissioned a review into the NSW Artificial Limb Service (ALS) and the services provided to people living with limb loss or limb difference.⁽³⁾ The review arose following concerns expressed by many stakeholders that NSW had fallen behind other states/territories and international best practice in the delivery of care to people living with limb loss. The review was sufficiently broad to cover all aspects of healthcare from pre-amputation counselling to lifelong care for those living with limb loss in the community. Published in 2004, the review presented a number of recommendations to improve the care provided to people living with limb loss in NSW.

In 2005, a Clinical Guidelines Reference Group (CGRG) was established to develop a model that would allow the review's recommendations to be implemented by NSW Health. The resulting *Amputee Care Standards in New South Wales* was released as a policy directive in 2008 with the intent to develop international best practice across the continuum of care.

In 2015, responsibility for reviewing the policy directive was transferred to the NSW Agency for Clinical Innovation (ACI) which led to the development of *Care of the person following amputation: minimum standards of care*.

Development

Care of the person following amputation: minimum standards of care was written in 2015–2016 by a diverse working group including people living with limb loss, allied health professionals, rehabilitation specialists, representatives from NSW Health and academics (Appendix 1). While the group was deliberately diverse, they all shared a common expertise of the experience of limb loss or having worked closely with people who have lived the experience.

The ACI established the working group and led the development of the minimum care standards as outlined below:

- reviewed the *Amputee Care Standards in New South Wales* (2008)
- established the terms of reference for, and oversaw the completion of, a rapid review⁽²⁾ to identify and appraise similar standards of care documents from within Australia and abroad as well as specifically review research describing the effectiveness of removable rigid dressings
- identified gaps or limitations of the *Amputee Care Standards in New South Wales* (2008)
- restructured and rewrote the policy directive to produce the document *Care of the person following amputation: minimum standards of care*
- provided practical tools and guide to support services to meet the minimum standards

Throughout the process, the working group sought to develop the minimum standards of care in keeping with the following principles:

- to ensure that all residents of NSW can expect to receive a consistent standard of care
- that the minimum standards of care reflect the lifelong journey that is the experience of living with limb loss and that the different needs of people through their journey are reflected in the standards
- the minimum standards of care are consistent with the best available research evidence and where such evidence is not available, the expertise of the working group must inform the standards
- the minimum standards of care are equally as applicable to diverse populations and settings given the outcome is described, not how it must be achieved
- the minimum standards of care are designed to guide the ongoing improvement of care provided by individual clinicians as well as health services; not as a punitive tool.

Purpose

Care of the person following amputation: minimum standards of care specifies the minimum standards of care that public and private health services in NSW are expected to provide for people facing the prospect of, or those already living with, limb loss.

By clearly describing the minimum standards of care that are expected of services in NSW, it is hoped that undesirable variations in care can be reduced, clinical practice will increasingly align with the research evidence, and standards of care will continue to improve.

Given this understanding, the minimum standards of care are not intended to replace informed clinical judgment nor prescribe how a healthcare service should meet these standards. It is expected that the way different clinicians and services meet these standards will vary depending on the populations they serve and the diversity of the healthcare settings.

Individual clinicians may use the document to help guide their practice. This may be particularly valuable for clinicians who are new to this specialist area of practice, or for those seeking to improve their practice in keeping with current standards of care.

For health services, the document may be used as a self-assessment tool to evaluate an existing service and identify areas for improvement necessary to meet the expected standards of care in NSW. A self-assessment tool to facilitate this use of the standards is provided in Appendix 2.

Intended audience

While the document is publically available, the language has been specifically written for healthcare professionals and health services in keeping with the purpose of the document.

3. Standards

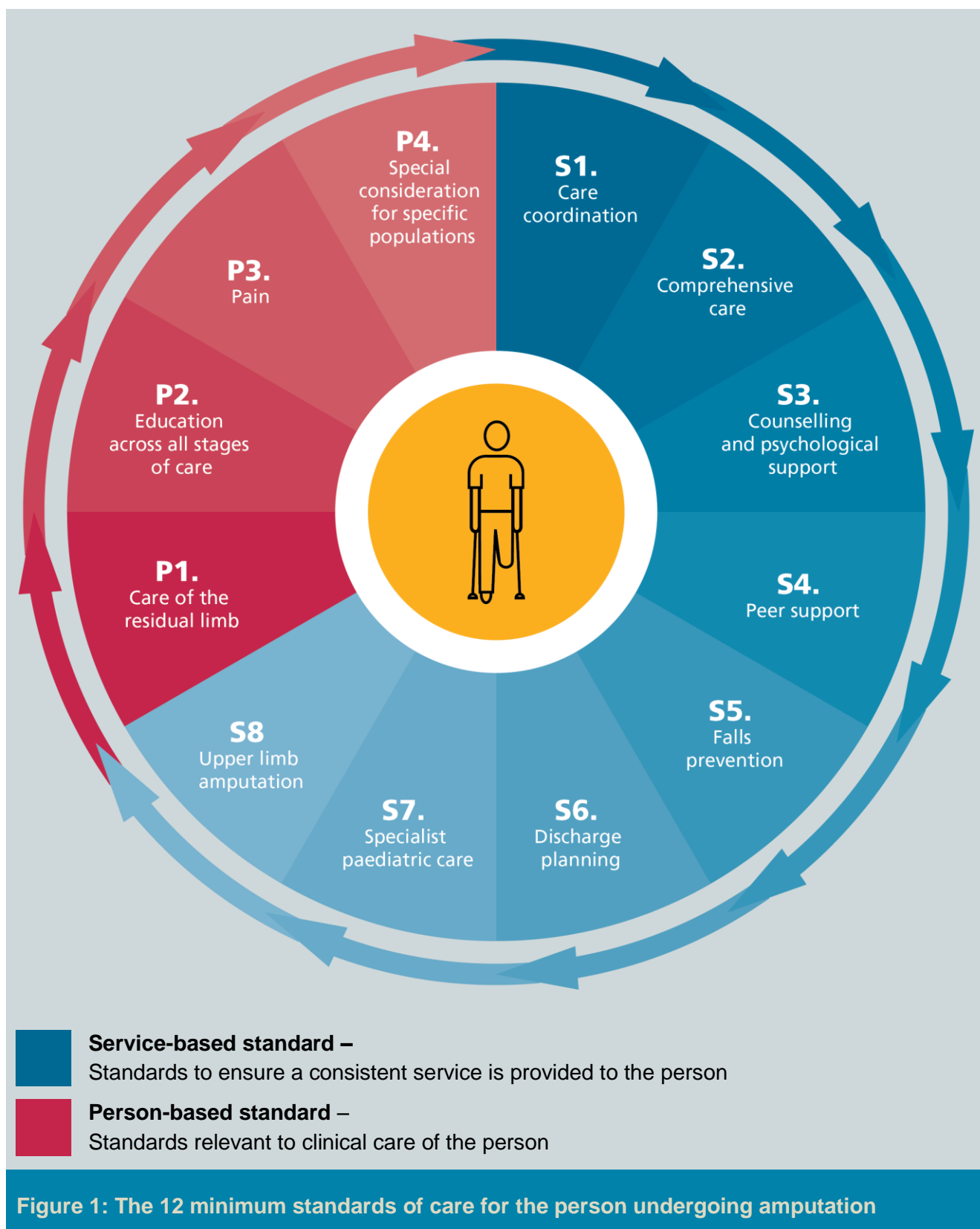


Figure 1: The 12 minimum standards of care for the person undergoing amputation

Service-based standards

Standard S1 – Care coordination

Care is coordinated, multispecialty, and interdisciplinary across all phases

Care for the person with an amputation or limb loss (the person) is coordinated across multiple specialties and supported by interdisciplinary assessment.

A specialist interdisciplinary team provides coordinated care throughout all care phases for the person. The care requirements are complex, and coordination of multiple medical, surgical and rehabilitation specialties is required. Across all phases of care, interdisciplinary team assessment should be utilised to support development of a comprehensive treatment plan. This treatment plan is developed in collaboration with the person and their valued others, and guides care from pre-surgical to post-surgical, and rehabilitation phases. Care is coordinated and all members of the clinical team contribute to the care plan and treatment program.

The composition of the team will vary depending on the unique needs of the person and the phase of their care. Each phase of care must have oversight from a clinician experienced in the management of amputation or limb loss.



Applying the standard in practice

- A pre-amputation consultation is conducted for all planned amputations, with the surgeon and representatives of the rehabilitation team involved with rehabilitation care after the surgery.
- When amputation occurs unexpectedly, for example, due to trauma, the surgical team refers the person to the rehabilitation service.
- The person who has undergone an amputation knows who and how to access their specialist teams in order to review their changing needs and access ongoing rehabilitation care as required.
- The person's primary care provider is an important member of the care team and is kept informed of changing care needs.





Evidence base

Multidisciplinary team-based care is recognised both nationally and internationally as the preferred model of care for people with an amputation, however there is little published evidence to support this. The benefits of multidisciplinary and interdisciplinary⁽⁴⁾ team work have been extensively described and are supported by expert opinion in rehabilitation care.⁽⁵⁾

- A report by the National Confidential Enquiry into Patient Outcome and Death, *Lower Limb Amputation: Working Together* (2014) recommends the development of a dedicated multidisciplinary team (MDT) for care planning of amputees and access to other medical specialists and health professionals both pre- and post-operatively.
- US Veterans Affairs/Department of Defence (VA/DoD) Clinical Practice Guideline for Rehabilitation of Lower Limb Amputation⁽⁶⁾ recommend an interdisciplinary team approach for people undergoing upper or lower limb amputation.



Quality measures

System Measurements

- All health services that perform amputations have local processes and structures in place to support the provision of interdisciplinary care to people undergoing amputation.
- Amputee services demonstrate evidence of communication strategies between clinical services involved in amputee care (including surgical, rehabilitation, endocrinology, orthopaedic and vascular streams), primary care and community health, and community support services.
- Pre-surgical amputation consultations are attended by rehabilitation providers with expertise in the management of amputation.
- Information on the proportion of persons undergoing amputation referred to rehabilitation are collected by services performing amputations.

Patient Measurements

- Patient reported measures.
- The person and their valued others are aware of the different clinical specialities involved in their care.



Resources

Also refer to Standards S3, S4 and P3.

- **Navigating the Healthcare Neighbourhood** provides information and resources relating to the patient centred medical home and healthcare neighbourhood initiatives.
www.aci.health.nsw.gov.au/nhn
- **The Care Coordination webpages** hold resources from NSW Health to support good care coordination processes
www.health.nsw.gov.au/pfs/Pages/carecoordination.aspx
- The **In Safe Hands program** provides a platform for building and sustaining efficient and effective healthcare teams within a complex healthcare environment
www.cec.health.nsw.gov.au/quality-improvement/team-effectiveness/insafehands
- An **ACI resource for patient reported measures**
www.aci.health.nsw.gov.au/make-it-happen/prms

Standard S2 – Comprehensive care

A comprehensive care plan is developed and updated throughout the care journey

A comprehensive care plan tailored to the needs of the individual is developed and updated throughout the care journey. The care plan should include a thorough integrated and interdisciplinary person-centred assessment that outlines specific interventions required. With the exception of unplanned amputations, the care plan is developed pre-operatively, and with input from the rehabilitation team.

Interventions that may assist with maintenance of current function and prevention of secondary complications should be commenced prior to surgery where possible and continue through the care journey. By linking with care providers across the care continuum including general practitioners, seamless, effective and integrated care can be delivered.



Applying the standard in practice

- A comprehensive assessment that evaluates the person's physical condition (including body system review), nutrition, pain, cognitive function, psychological status and social support systems is completed.
- The person's valued goals and priorities, including independence, preferred activities and participation are documented prior to surgery.
- The care plan includes information on the person's accommodation, living arrangements and environment.
- The comprehensive assessment and care plan documented in the pre-surgical phase of care is reviewed and updated throughout the care journey and includes care of the residual limb.
- Access to a specialist interdisciplinary team is available for all persons undergoing amputation.
- Planning for life after amputation begins once the decision to amputate is made.
- Except in cases of extreme urgency, surgical interventions consider the potential for future rehabilitation and prosthetic use.
- Rehabilitation addresses the person's changing function and needs.
- There is information provided and discussion regarding rehabilitation options including non-prosthetic, prosthetic and osseointegration management.





Evidence base

Existing guidelines recommend the development of a written, comprehensive care plan that is person-centred and based on the goals and values of the person as central to the provision of a coordinated rehabilitation program.⁽⁷⁾ The care plan should include evaluations from all key members of the care team and address rehabilitation, medical, surgical and psychosocial issues.⁽⁶⁾



Quality measures

System Measurements

- Amputee services demonstrate evidence of communication strategies between clinical services involved in amputee care (including surgical, rehabilitation, endocrinology, orthopaedic and vascular streams) and primary care and community health providers.
- Collection of data relating to the use of evidence-based interventions is supported (e.g. proportion of transtibial amputees using a rigid dressing).

Patient Measurements

- The person is involved in developing their care plan and is informed of the outcome of all assessments.



Resources

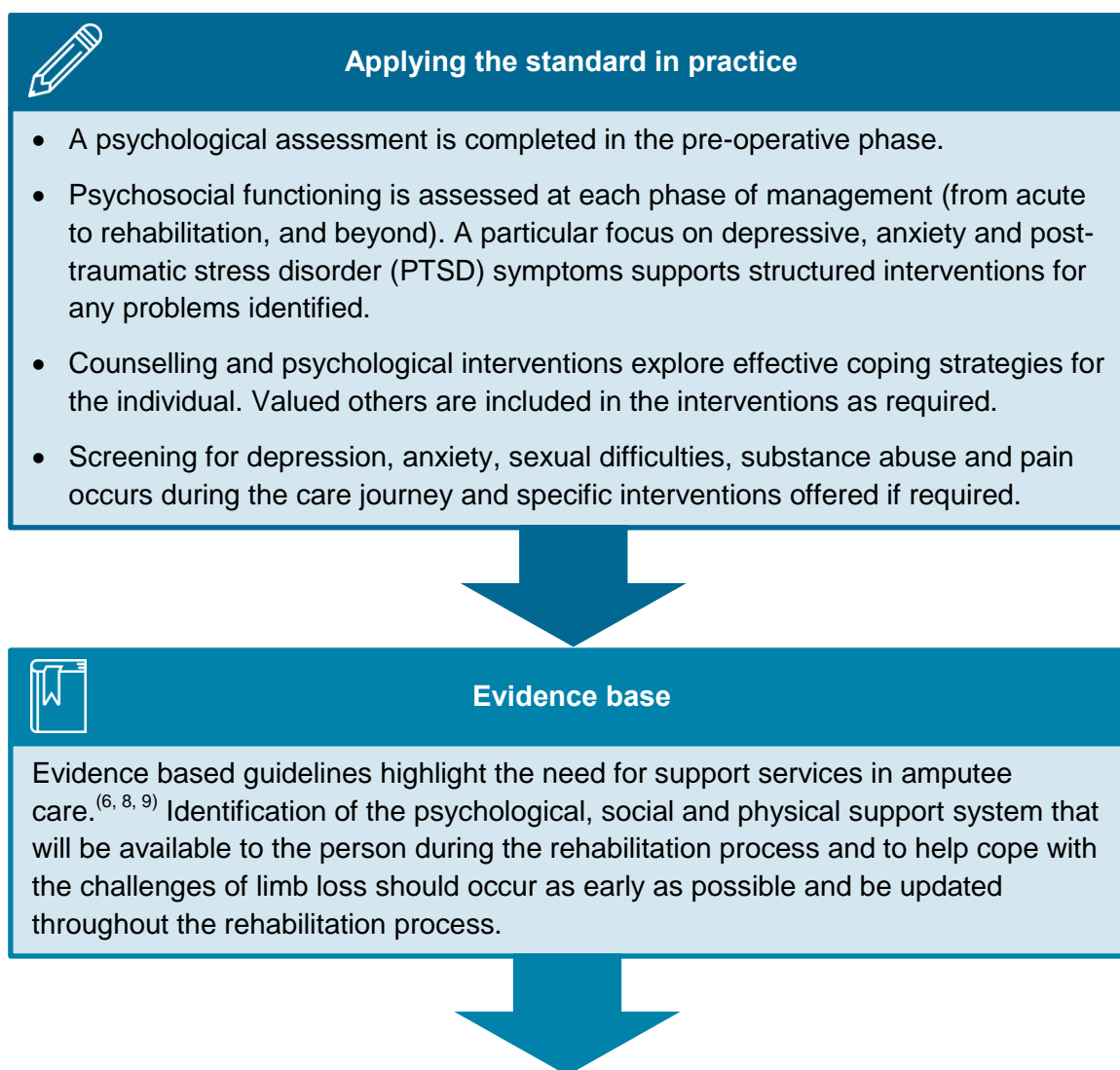
- **Integrated Care for People with Chronic Conditions** contains information and resources to support the provision of integrated care across the care journey.
<http://www.health.nsw.gov.au/integratedcare/Pages/ic-chronic-conditions.aspx>
- The **ACI Rehabilitation Implementation Toolkit** provides resources to support the use of a comprehensive assessment form for care teams
www.aci.health.nsw.gov.au/resources/rehabilitation/rehabilitation-model-of-care/implementation-toolkit

Standard S3 – Counselling and psychological support

Counselling and psychological support is available across all stages of care

Counselling and psychological support is available to the person and their valued others pre-operatively and continues as part of lifelong management. Experienced clinical counselling and psychological support is available to assist with issues such as adjustment and pain management from the acute phase, and throughout lifelong management.

Psychosocial issues are evaluated and addressed as part of the overall treatment plan and reviewed regularly throughout the care journey.





Quality measures

System Measurements

- Amputee services support the provision of specific interventions for depression, anxiety, sexual difficulties, substance abuse and pain across the care journey.
- Proportion of persons screened for depression, anxiety, sexual difficulties, substance abuse and pain.
- Psychosocial assessment is conducted during each phase of care.

Patient Measurements

- Evidence of the use of validated tools for screening and assessment.



Resources

- The **Short Form 36 (SF-36)** Health Survey measures the degree of burden or dysfunction a medical condition has in a person's life
www.rand.org/health/surveys_tools/mos/36-item-short-form.html
- The **Hospital Anxiety and Depression Scale (HADS)** is a 14-item highly sensitive brief screening for anxiety and depression
www.rehabmeasures.org/Lists/RehabMeasures/DispForm.aspx?ID=911
- The **Depression Anxiety and Stress Scale (DASS)** is a 42-item self-report instrument designed to measure the three related negative emotional states of depression, anxiety and tension/stress
www2.psy.unsw.edu.au/dass/

Standard S4 – Peer support

Referral is offered to a managed peer support program

Referral to a managed peer support program is offered either pre- or post-amputation. It is often emotionally challenging to adjust to an amputation. Peer support allows the person to speak directly with someone who has shared their experience and can provide a valuable resource for the person and their valued others during the early stages of their recovery and/or throughout their lifetime.

Peer support can:

- assist people to adapt to the challenges of amputation
- promote social inclusion
- provide access to information and resources
- assist people to re-engage with their communities.



Applying the standard in practice

Referral to a managed peer support program* is made as early as possible, in line with individual needs and wishes. Referral to a managed peer support program is important given the nature of peer support discussion and that people seeking support are often vulnerable.

*Managed peer support programs ensure that peer support volunteers:

- are matched to the needs of the individual person (e.g. age, sex, cause of amputation)
- have completed a formal program of training that reinforces strict guidelines and boundaries relating to program policies and procedures for dealing with people in vulnerable situations, support them in the development of skills for communication and listening
- have access to post-visitation debriefing and reporting
- have lived with amputation a minimum of 2–3 years and have adapted to limb loss
- undergo police and reference checks
- agree to abide by the policies and procedures of the program.





Evidence base

Existing guidelines highlight the importance of peer support programs in helping with the emotional adjustment to an amputation.^(10, 11) Peer support has been found to be an effective intervention for individuals and family members in the face of a variety of medical conditions and illnesses. In addition, peer support programs have been found to have a positive impact on personal sense of empowerment and self-efficacy.



Quality measures

System Measurements

- Amputee services demonstrate linkages to managed peer support program.
- Proportion of persons accessing managed peer support services annually.

Patient Measurements

- Patient reported measures.



Resources

- **Amputee peer support manual** to establish a peer support visitation program
www.enable.health.nsw.gov.au/home/publications/manuals
- The **Amputee Association of NSW Inc.** offers a managed peer support program
www.amputeesnsw.org.au/cta/peer-support-program/
- **Limbs4Life** offers training for amputees interested in becoming peer support volunteers as well as matching amputees with volunteers
www.limbs4life.org.au/peer-support.html?option=peer
- **Volunteering Australia** provides resources for volunteer managers including national standards, definitions, principles and training guides
www.volunteeringaustralia.org/volunteering-resources/volunteer-managers/

Standard S5 – Falls prevention

Education and training on falls prevention and safety, including how to get up from the floor in the event of a fall is provided to persons and their valued others

All health professionals and care providers involved in amputee care are aware of the increased risk of falls for this population, particularly for those with lower limb amputation. Strategies to minimise the risk of falling both with and without a prosthesis are initiated in the immediate post-operative phase and reviewed throughout the course of care.

Limb protection is emphasised, especially during the early phases when the risk of falling is greatest and awareness of the amputation may be variable. External protective devices, such as rigid removable dressings may be used to increase protection of the residual limb.



Applying the standard in practice

- All persons are assessed using a valid falls risk screening tool and any identified risks are addressed.
- A balance and falls prevention exercise program delivered by a physiotherapist is offered to people at risk of falls.
- Gait training and provision of appropriate gait aids commence as early as possible.
- Rigid removable dressings (RRD) are used for transtibial amputees to help protect the limb in the event of a fall. (See Standard P1).
- All persons receive a home safety review delivered by an occupational therapist.
- The person is encouraged to maintain an active lifestyle.
- Risks are addressed and educational opportunities are provided both formally and informally on an ongoing basis.





Evidence base

Incidents relating to falls are relatively common for people with amputations affecting the lower limb, with around seven falls per month related to a person with an amputation in hospital.⁽¹²⁾ Falls can have serious consequences for older people, their families and carers. They can lead to reduced quality of life, disability, functional decline and even death.⁽¹³⁾

Falls are more likely to occur in persons with lower limb amputations with impaired cognition or hearing who are over 70 years of age. Falls are also often associated with transferring.⁽¹⁴⁾



Quality measures

System Measurements

- Completion of falls risk screening tool.
- Processes exist to allow early application of RRDs in transtibial amputations.
- Access to balance and falls prevention training programs.
- Falls rates.

Patient Measurements

- Patient reported measures
- There is documented evidence of the use of RRDs for transtibial amputees.



Resources

Also refer to Standard P2.

- **Enable NSW factsheet** – Avoiding falls after amputation
www.enable.health.nsw.gov.au/about/publications/fact-sheets
- **Australian Commission on Safety and Quality in Health Care** leads improvements in safety and quality in health care
www.safetyandquality.gov.au/about-us/governance/
- **Clinical Excellence Commission falls prevention program** to help reduce incidence and severity of falls among older people
www.cec.health.nsw.gov.au/patient-safety-programs/adult-patient-safety/falls-prevention
- **The Falls Prevention Network**
fallsnetwork.neura.edu.au
- **Berg Balance Scale** is a 14-item scale that measures balance in older adults
fallssa.com.au/residential-aged-care/screening-assessment-referral/falls-screening-assessment-tools/

Standard S6 – Discharge planning

Discharge planning and transfer of care arrangements commence as early as possible with communication between all key stakeholders.

The person is supported in their ongoing management through discharge arrangements and follow-up services that reflect their individual rehabilitation goals.

Frequently the care pathway for the person varies between admitted and non-admitted person care. The care pathway may not be continuous, with a period of time at home prior to rehabilitation with the prosthesis. At any point in the care journey, it is crucial that the person and their valued others are aware of the next steps in the process, and the lifelong nature of their care needs. Knowledge of service re-entry points and triggers for prosthetic review should be clearly communicated.



Applying the standard in practice

- Discharge recommendations and transfer of care plans are provided in writing to the person and any significant others involved in their ongoing care. Providing the discharge and ongoing care plan in advance gives the person and their valued others an opportunity to discuss any areas of the plan that they do not understand. This helps to maximise discharge safety and supports continuity of care.
- Each person has a designated contact for the service who is responsible for coordinating their rehabilitation and discharge planning. The contact person is named, and contact details provided at the initial entry point to the service.
- When transferring to another service, a new contact person is notified of the impending transfer and their contact details are provided.
- When the initial post-operative rehabilitation goals are met, the person is provided with a summary of their rehabilitation progress together with contact details for follow-up and re-entry to the service, and a follow-up plan.
- Follow-up occurs regularly in the initial period for example, fortnightly/monthly for a few months, then 3-monthly, then 6-monthly. Once the residual limb has stabilised, follow-up should occur, at minimum, on an annual basis. This plan may vary depending on the needs of the person.
- Follow-up is lifelong.





Evidence base

Care for amputees occurs across numerous care settings and with numerous healthcare providers. Coordination of care transitions and discharge planning is key to supporting the person across their care journey. Multidisciplinary hospital-coordinated discharge care plans have a positive impact on quality of life; person and primary care provider satisfaction with discharge care; health service access; and confidence in the discharge process.⁽¹⁵⁾ There is a high association between continuity of care, health outcomes of the person and satisfaction. These benefits are particularly apparent when care continuity extends across care providers and settings.⁽¹⁶⁾

Lifelong care maintains the quality and functionality of the prosthetic limb and the person's abilities, goals and quality of life.⁽⁴⁾



Quality measures

System Measurements

- Proportion of amputees provided with a discharge plan at separation from inpatient services.
- The service has a documented process for providing designated contact details at point of entry to the service.
- A documented follow-up pathway exists for the service.

Patient Measurements

- The person knows who is their designated contact for the service.
- The person received a discharge report.
- The person received a follow-up plan at completion of the initial post-operative rehabilitation period.



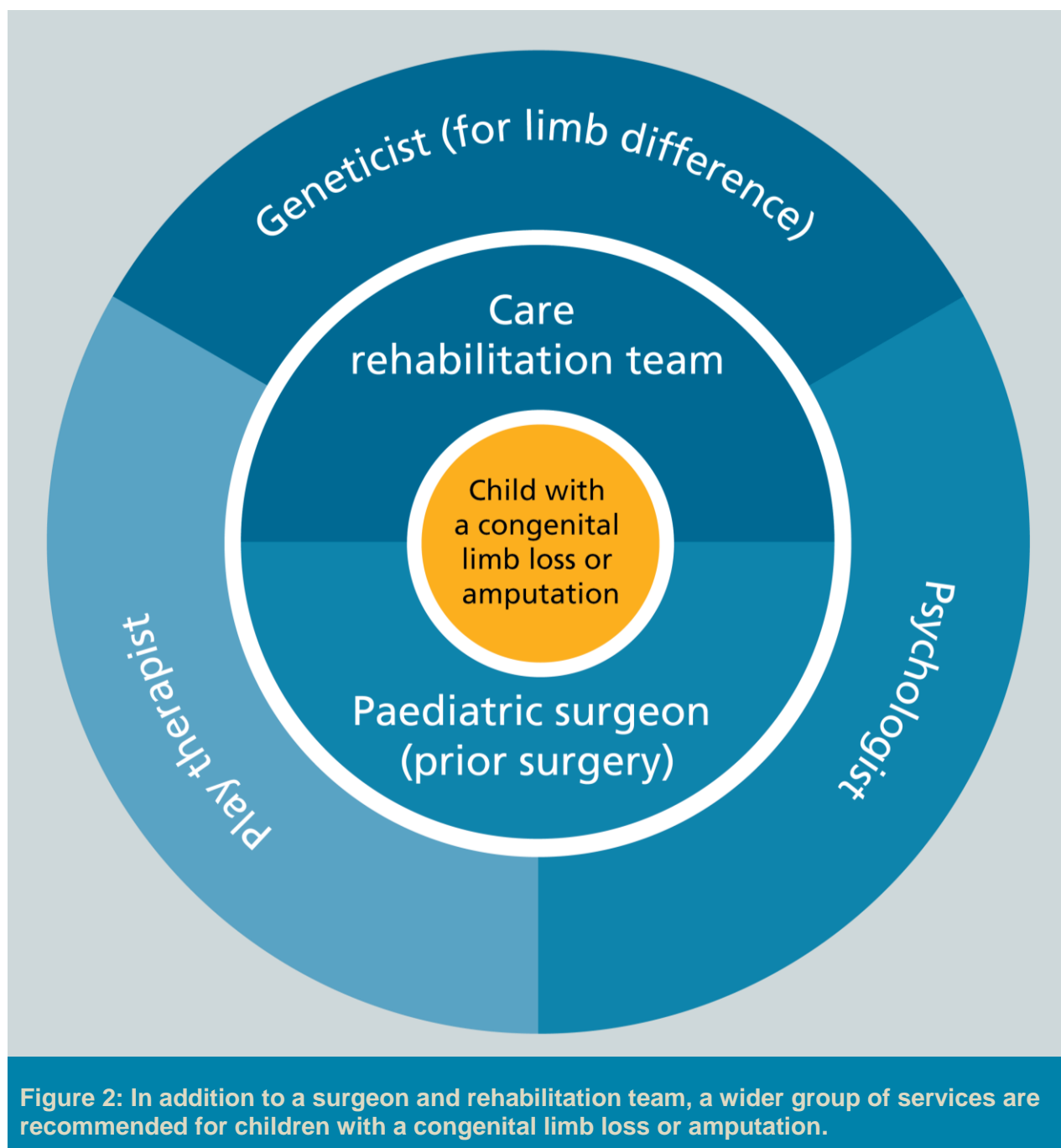
Resources

- **NSW Health** – Care coordination: Planning from admission to transfer of care in NSW public hospitals
www.health.nsw.gov.au/pfs/Pages/care-coordination-staff-b.aspx
- The **ACI Criteria Led Discharge toolkit** provides best practice for criteria led discharge
www.aci.health.nsw.gov.au/networks/acute-care-taskforce/criteria-led-discharge

Standard S7 – Specialist paediatric care

A child with a congenital limb loss or limb difference requires specialist care including access to a specialist Paediatric Limb Loss service

All children with a congenital limb loss or amputation should have access to a specialist team with experience in paediatric management of these conditions. The team should include a psychologist, and access to a play therapist (Figure 2). In the case of a congenital limb difference, referral to a geneticist should occur as soon as the limb difference is detected.





Applying the standard in practice

- Upon detection of congenital limb loss (and antenatally, if indicated), valued others (to the child) are referred to their local genetics service for advice on diagnosis and to one of the Sydney Children's Hospital Network (Westmead or Randwick) limb clinics for antenatal counselling and management.
- Where surgery may be helpful in improving functional outcomes for congenital limb loss, a discussion about best management is held with valued others, a senior surgeon experienced in the field, a rehabilitation paediatrician, prosthetists and relevant allied health staff to support valued others to make an informed decision.
- All children under the age of 12 years with limb loss have access to a multidisciplinary team where all team members are experienced in paediatrics (Westmead and Randwick).
- For acquired amputation in childhood, contact is made prior to surgery with a paediatric surgeon (generally orthopaedic) or rehabilitation paediatrician with expertise in surgical strategies particular to children. Contact is also made with the paediatric rehabilitation team for pre-amputation counselling, and treatment is discussed. The paediatric pain team is available to advise on pre-amputation pain management.
- For adolescents (13–18 years), particularly those who have reached skeletal maturity in the affected limb, early contact with the local adult clinic is facilitated to aid with transition. A shared model is an option, particularly for those who have difficulty accessing Sydney. The paediatric clinic remains available up to 18 years but can be used in consultation.
- Adolescents transitioning to adult services are able to maintain their current prosthetic provider which aids the transition between specialist clinics and gives options for the person. (See Standard P4 – section Transition to adult services)
- Young people with limb loss have access to support so they can participate in sport and physical activity, including sport-specific prosthetic strategies.





Evidence base

For children and young people, preparation within the multidisciplinary team is crucial to minimising the impact of amputation. The team may include a play team, psychologist and physiotherapist.⁽¹⁷⁾ Further, psychological care and/or intervention should begin as early as possible.

Children require new prostheses in line with their growth and development; this could be as often as twice a year between the ages of 5 and 12 years. The prosthetist has a key role to restore maximum function, cosmesis and symmetry.⁽¹⁷⁾

Physical activity is part of the compulsory school curriculum and has lifelong benefits.



Quality measures

System Measurements

- Service availability at tertiary clinic.
- There is a documented process for access and referral to both local genetics service and tertiary limb service for antenatal clinics.
- There is documented evidence of contact with both local genetics and tertiary limb services prior to birth.
- There is documented evidence of face-to-face contact at one of the paediatric clinic before 3 months of age.

Patient Measurements

- Patient reported measures.
- Evidence of participation in physical activity.
- Age of entry to the service for children with congenital limb absence.



Resources

- **Physiopedia** provides physiotherapy and physical therapy resources to help improve global health
www.physio-pedia.com/Paediatric_limb_deficiency
- **Healthy Kids** provides physical activity guidelines and resources for children
www.healthykids.nsw.gov.au/
- **University of New Brunswick – test of prosthetics function** tests for unilateral upper extremity amputees for children up to 13 years of age
www.unb.ca/research/institutes/biomedical/forms/index.html
- **Prosthetic Upper Extremity Functional Index (PUFI)** evaluates the extent to which a child actually uses the prosthetic limb for daily activities, the comparative ease of task performance with and without the prosthesis, and its perceived usefulness

Standard S8 – Upper limb amputation

The person who has experienced an upper limb amputation requires access to a specialist upper limb amputee rehabilitation service.

Each person with an upper limb amputation has access to a specialist team that includes a rehabilitation physician, prosthetist and occupational therapist with experience in upper limb rehabilitation (Figure 3). In addition, it is also highly desirable to have access to a physiotherapist, social worker and psychologist experienced in managing upper limb amputation.

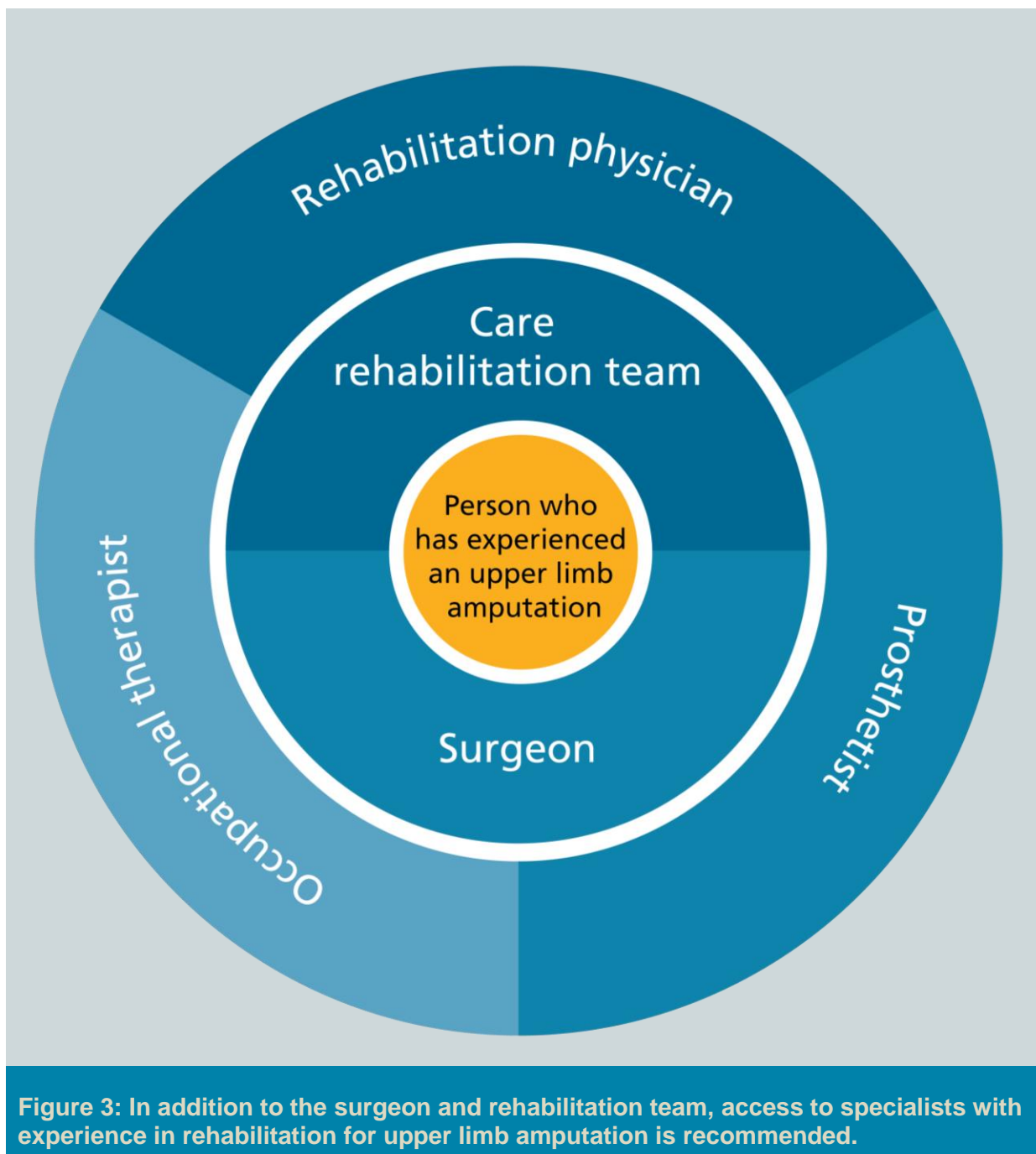


Figure 3: In addition to the surgeon and rehabilitation team, access to specialists with experience in rehabilitation for upper limb amputation is recommended.



Applying the standard in practice

- Amputee services have documented links with specialist upper limb amputee services.
- Training by an occupational therapist with experience in upper limb rehabilitation is provided to the person, including:
 - Education and functional retraining in non-prosthetic management of activities of daily living (ADL) which may include dominance retraining, one-handed ADL techniques, and the use of adaptive equipment.
 - Bimanual functional training using a prosthesis.
- Occupational therapy training and team involvement is essential when a new prosthesis is prescribed or if a change in prosthetic prescription occurs (e.g. from a body-powered to a myoelectric prosthesis).
- All people with upper limb amputations engaging in education and/or employment have access to specialist advice to assist with meaningful return to work or study.





Evidence base

- Given the high rate of prosthetic abandonment by upper limb amputees,⁽¹⁸⁾ prescription and training should be person-centred, and that multidisciplinary teams communicate effectively with the person.⁽¹⁹⁾ Particularly for proximal amputees who have the highest rates of prosthetic abandonment.⁽¹⁸⁾
- Although team composition may vary between centres, an intensive bimanual functional training program will typically be delivered by an occupational therapist with expertise in upper limb prosthetics.
- Occupational therapy involves evaluation and treatment of ADL, desensitisation, scar management, pain management, strengthening, contribution to prosthetic prescription and myoelectric site testing/training.⁽²⁰⁾
- Occupational therapists also provide training on non-prosthetic upper limb rehabilitation strategies, such as dominance retraining, one-handed techniques, and use of adaptive equipment; as well as community reintegration and return to the work where appropriate.⁽²¹⁾
- Occupational therapists should continually assess the abilities of the person to progress to the next stage of skills, manage expectations, seek out available resources and understand the componentry to determine training needs.⁽²²⁾
- Upper limb prosthetic users demonstrate superior performance in ADL compared to non-users.⁽²³⁾ Therefore, upper limb amputees should be provided an opportunity to undergo prosthetic training with focus on tasks or occupations that are meaningful to them and that focus on the person's specific vocational or leisure pursuits.⁽²⁴⁾
- When expectations do not meet goals, poor satisfaction may be evident.⁽²⁵⁾ Accurate information and realistic outcomes need to be discussed with the person.



Evidence base (cont'd)

For persons with an upper limb prosthesis:

- Prosthetic acceptance is enhanced by involving and referring to specialised upper limb services, and by early commencement of prosthetic training; particularly for those from non-metropolitan areas of the country.^(26, 27)
- Constant collaboration and frequent communication between the occupational therapist and prosthetist is required.⁽²²⁾
 - Occupational therapists contribute information when deciding the most appropriate prescription of the prosthesis based on the person's functional goals⁽²⁰⁾ and help the person learn to use their prosthesis in ADL and identify any possible viable muscle activity in the residual limb.⁽²²⁾
- Treatment effectiveness, function and prosthetic satisfaction should be assessed using effective outcome measures to assist with addressing participation in meaningful activities.⁽²⁸⁾



Quality measures

System Measurements

- There is a documented process for access and referral to local occupational therapy and prosthetic team.
- Service availability at specialist upper limb amputee clinic.
- There is a documented process for access and referral to specialist upper limb amputee clinics.

Patient Measurements

- Patient reported measures.
- Participation in activities of daily living.
- Functional upper limb assessments and outcome measures.
- Quality of life measurement scales.



Resources

- **The Canadian Occupational Performance Measure** provides an outcome measure that is individualised and person-centered
www.thecopm.ca/
- **Goal Attainment Scaling (GAS)** may be helpful in developing a rehabilitation plan
clik.dva.gov.au/rehabilitation-policy-library/15-goal-attainment-scaling/151-introduction-goal-attainment-scaling
- **Box and Blocks test** is a functional test used in upper limb rehabilitation
www.rehabmeasures.org/Lists/RehabMeasures/DispForm.aspx?ID=917
- **Nine hole peg test** is a brief, standardised, quantitative test for upper limb function
www.rehabmeasures.org/lists/rehabmeasures/dispform.aspx?id=925
- **Disability Arm Shoulder Hand assessment (DASH)** is a 30-item, self-report questionnaire to measure physical function and symptoms
www.dash.iwh.on.ca/
- **Assessment of Capacity for Myoelectric Control** is an observational assessment developed to assess the ability to control a myoelectric prosthetic hand
www.acmc.se/
- **Jebsen-Taylor Hand Function test** assesses a broad range of uni-manual hand functions required for ADL
www.rehabmeasures.org/lists/rehabmeasures/dispform.aspx?id=1025
- **Southampton Hand Assessment Procedure (SHAP)** validated hand function test
www.shap.ecs.soton.ac.uk
- **Trinity Amputation and Prosthesis Experience Scale measure (TAPES)** examines the psychosocial processes involved in adjusting to an amputation and a prosthesis
psychoprosthetics.ie/tapes-r/
- **The Upper Extremity Functional Index** determines difficulties in ADL
www.worksafe.vic.gov.au/documents

Person-based standards

Standard P1 – Care of the residual limb

Care of the residual limb and management of risk factors for further amputation are addressed.

Management of the residual limb is vital to the ongoing health, vitality and activities of daily living for the person. To facilitate engagement in everyday activities, it is important to prevent contractures, wound breakdown, skin issues, and revisions or further amputation. Education specifically addressing these issues is provided as early as possible and reinforced throughout all phases of care.



Applying the standard in practice

- Discussion with the person about the likely appearance of the residual limb, where their limb will end, residual limb pain, phantom pain, phantom sensation, expected healing times and potential for prosthetic use occurs pre-operatively.
- Immediate post-surgical care includes education on wound healing and oedema management; prevention of contractures; and ongoing care of the residual limb.
- RRDs are utilised in transtibial amputations, where there are no clinical contraindications. (see Appendix 3)
- Care and hygiene of the residual limb and contracture prevention are emphasised in all phases of care.
- Education is provided regarding prosthetic use and fit, sock management and hygiene, weight management and fluid fluctuations.
- A plan for ongoing care is provided and includes provision of contact details (therapy, clinic and prosthetic) should any residual limb issues occur.





Evidence base

Skin issues are common after an amputation, particularly in the person with an amputation of a lower limb. Between 34 and 74% of amputees will have skin issues such as hyperhidrosis, odours, dermatoid cysts, dermatitis (contact and allergic) and verrucous hyperplasia.⁽²⁹⁻³²⁾ Surgical interventions such as debridements, revisions or re-amputations are commonly undertaken to address these issues, however, prevention is possible with education and fastidious management of risk factors.

Prevention of wounds and their breakdown must be the focus of education as they can occur at any time throughout the course of care.



Quality measures

System Measurements

- Skin integrity measures.
- Re-amputation rate.
- Revision rate.

Patient Measurements

- Patient reported measures.
- Proportion of people provided with specific education regarding care and hygiene of the residual limb, prevention of contractures, skin care.



Resources

Also refer to Standard P2.

Care of the residual limb and the contralateral limb

- **Enable NSW factsheet** – Caring for residual and intact limbs
www.enable.health.nsw.gov.au/about/publications/fact-sheets
- **Limbs4life factsheets** including Skincare tips for amputees, Skin care for amputees and Hygiene for amputees
www.limbs4life.org.au/peer-support.html
- **Diabetic Foot Australia** – Information for persons and healthcare professionals for foot disease related to diabetes
www.diabeticfootaustralia.org
- The **ACI Standards for High Risk Foot Services (HRFS) in NSW** are standards of care for people with diabetes and those with diabetic foot complications
www.aci.health.nsw.gov.au/networks/endocrine/resources

Contracture prevention

- The Amputee Coalition article for health professionals on **contracture prevention**
www.amputee-coalition.org/resources/preventing-contractures/

Prosthetic socks

- The Amputee Coalition in USA article on **prosthetic socks**
www.amputee-coalition.org/resources/prosthetic-socks/

Rigid removable dressings (RRDs)

- The **ACI Guide for the use of post-operative rigid dressings for transtibial amputations** is in Appendix 3 of this document
- **Enable NSW person and nurse information** on RRDs/rigid casts and **factsheet** on how to fabricate rigid dressings
www.enable.health.nsw.gov.au/about/publications

Standard P2 – Education across all stages of care

Education begins in the preoperative phase and continues across all phases of care.

The person and their valued others receive appropriate education regarding the surgical procedure itself, the components of post-operative care, their expected rehabilitation outcomes and their ongoing care requirements including prevention and self-management strategies. A variety of formats are used including verbal, written and digital formats to accommodate the preferences of the person and their valued others.

The provision of information, coping skills training, and self-management training is provided during all of the phases of care. Provision of education is the responsibility of the person's care team and is delivered by the most appropriate team member responsive to the person's education requirements. Education is continuous and should be repeated and reinforced to meet the ever changing needs of the person. All team members are responsible for delivering education across the care journey.



Applying the standard in practice

Education addressing the following topics is provided and is tailored to the individual, appropriate to their information needs:

Impairment-based interventions

- Residual limb management.
- Wound management.
- Oedema control.
- Rigid removable dressings.

Activity- and participation-based interventions

- Care of the residual and contralateral limb.
- Pain and sensation management.
- Counselling/coping skills.
- Chronic disease management/secondary prevention:
 - Diabetes management including podiatry management
 - Management of lifestyle risk factors such as smoking cessation, nutrition, diet and weight control, exercise maintenance.
- Prosthetic and non-prosthetic management.
- Falls prevention/management.
- Driving/vocation/leisure.

Environmental factors

- Interdisciplinary team members and their role.
- Phases of rehabilitation care:
 - Pre-operative
 - Post-operative
 - Rehabilitation
 - Lifelong care.
- Peer support.





Evidence base

Education supports self-management for the individual and all members of the care team should provide education as part of their interaction with the person and their valued others.⁽⁴⁾



Quality measures

System Measurements

- Documented process for the provision of educational resources.
- Educational resources are available in a variety of formats that reflect the demographic of the service population.
- Use of service-specific or generic education information such as education fact sheets, booklets and flyers.

Patient Measurements

- Pre- and post-education questionnaires.
- Patient experience of education survey.
- Documentation of education provided.



Resources

Also refer to Standards S4, S5, P1 and P3. Educational resources listed below.

Care of the prosthesis

- **Enable NSW factsheets** – Caring for your prosthetic lower limb and Caring for your prosthetic upper limb
www.enable.health.nsw.gov.au/about/publications/fact-sheets

Pain and sensation management

- **Enable NSW factsheet** – Managing pain
www.enable.health.nsw.gov.au/about/publications/fact-sheets
- **ACI Pain Management Network** contains resources for chronic pain including videos and tools for clinicians
www.aci.health.nsw.gov.au/chronic-pain/chronic-pain

Falls prevention/management (see Standard S5)

Chronic disease management

- The **NSW Integrated Care for People with Chronic Conditions** strategy supports a statewide model for local delivery of integrated care to patients with chronic conditions.
www.health.nsw.gov.au/integratedcare/Pages/ic-chronic-conditions.aspx
- NSW Health has a range of tools for health professionals to help in **smoking cessation** and supporting smokers to quit
www.health.nsw.gov.au/tobacco/Pages/tools-for-health-professionals.aspx
- **Get Healthy** offers free and confidential telephone-based expert advice and motivation to help with healthy eating, physical activity, alcohol reduction and maintaining a healthy weight
www.gethealthynsw.com.au/

Booklets and factsheets

- **Enable NSW factsheets** are available in English, Arabic, Chinese, Vietnamese, Greek, Italian, and Spanish
www.enable.health.nsw.gov.au/about/publications/fact-sheets
- **Limbs4Life** – Providing those who have undergone limb loss with resources and information (Over 10 fact sheets and guides available)
www.limbs4life.org.au/peer-support.html



Resources (cont'd)

- Websites of associations (for literature, peer support assistance):
 - Amputee Association of NSW Inc: www.amputeesnsw.org.au
 - Limbs4Life: www.limbs4life.org.au
 - Amputees and Family Support Qld Inc: afsg.org.au
 - Amputees in Touch SA: www.amputeesintouch.org.au
 - Amputee Coalition (America): www.amputee-coalition.org

Leisure and sports

- **Sailing**
 - Sailability: www.sailability.org
 - Sailors with disABILITIES: www.sailorswithdisabilities.com
- **Surfing**
 - Disabled Surfers Association of Australia: www.disabledsurfers.org/nsw/
- **Wheelchair sports** (basketball, tennis etc.)
 - Wheelchair Sports NSW: www.wsnsw.org.au
- **Lawn bowls**
 - Bowls NSW: www.bowlsnsw.com.au
 - Women's Bowls NSW: www.womensbowlsnsw.org
 - Bowls Australia: www.bowlsaustralia.com.au
- **Golf**
 - Amputee Golf NSW: www.amputeegolfnsw.org/
- **Horseback riding**
 - Riding for the Disabled Association (NSW): www.rdansw.org.au
- **Special Olympics and other events**
 - www.nursegroups.com/special-olympics-and-other-recreation-programs

Driving/vocation/leisure

- **Roads and Maritime** issues driving licences for upper and lower limb amputees after passing a disability driving test
www.rms.nsw.gov.au/roads/licence/health/driving-with-disability.html

Standard P3 – Pain

Pain is assessed, managed and monitored at all stages of care.

Pain management is an important part of care for the person. Pain may occur before, during and/or after amputation. The person may experience pain for a number of reasons including the initial injury or illness, amputation surgery, phantom limb pain, residual limb pain, secondary musculoskeletal pain (for example, low back pain, pain in non-affected limb) or chronic pain.

The assessment and monitoring of the person's pain should commence pre-operatively and continue throughout rehabilitation and lifelong management phases. Knowledge of the potential causes of pain is needed to guide proper management. The pain treatment approach taken will vary depending on the cause and acuity of the pain and may include pharmacological and non-pharmacological interventions.



Applying the standard in practice

- During the pre-amputation consultation, the person is:
 - i) assessed for any pre-existing pain including type and acuity, and
 - ii) educated on the possible types and management of pain post-amputation.If any pre-existing pain is well controlled, the same pain management should continue post-amputation with adjustments made depending on new causes of pain.
- A formal pain management plan is developed in advance based on the pre-operative pain assessment.
- Referral is made to specialist pain team, as required.
- Clinicians are aware of possible reasons of pain including the initial injury or illness, amputation surgery, phantom limb pain, residual limb pain, secondary musculoskeletal pain or chronic pain.
- Acute post-operative pain is treated in accordance with established guidelines for post-operative treatment of pain, for example, the National Prescribing Service (NPS) MedicineWise Acute Pain Postoperative Pain project summary.⁽³³⁻³⁵⁾
- Any ongoing pain intervention is evaluated for its efficacy and adverse events.
- Pain management is monitored and addressed from an interdisciplinary perspective during all phases of care.
- Where specific treatable causes of pain are evident, appropriate treatments are applied based on the underlying aetiology.
- At each service contact throughout lifelong care, pain control is reviewed. Associated musculoskeletal pain may develop over time and it is assessed and treated appropriately. Ongoing review of pain medication needs to be conducted by the medical physician and the pharmacist.
- Changes in a person's life role, prosthetic use, or functional ability may impact on the person's experience of pain. Access to a team experienced in management of amputation, and a pain medicine team is recommended.





Evidence base

Pain management is an important aspect of amputee care and should be assessed at all phases of rehabilitation.⁽⁴⁾ The following table contains interventions that may be considered for pain management.

Interventions	Management
Pharmacological interventions <ul style="list-style-type: none">• Should be considered for acute postoperative pain• May be considered for people with phantom pain⁽⁷⁾	<ul style="list-style-type: none">• Paracetamol• Non-steroidal anti-inflammatory drugs (NSAIDs)• Opioids• Antineuropathic agents• Amitriptyline
Non-pharmacological interventions <ul style="list-style-type: none">• Should be considered for people with residual limb pain• May be considered for people with phantom limb pain or residual limb pain⁽³⁶⁾• May be considered for people with secondary musculoskeletal pain• May be considered for chronic pain	<ul style="list-style-type: none">• Mindfulness mediation• Skin desensitisation techniques• Transcutaneous Electrical Nerve Stimulation (TENS)⁽³⁷⁾• Sensory discrimination training• Appropriate physiotherapy interventions• Cognitive behavioural therapy
More advanced specialised pain management interventions	<ul style="list-style-type: none">• Dorsal root ganglion stimulation• Regional blockades• Intraoperative anti-neuropathic agents





Quality measures

System Measurements

- Initial assessment or consultation forms that include items on pain assessment, education and management.
- Information booklets or written handouts include content on different types of pain and management strategies.
- Pain interventions offered are both pharmacological and non-pharmacological.

Patient Measurements

- Documented use of a validated pain assessment tool.



Resources

Also refer to Standard P3.

- **Pain assessment tools** provided to assist with assessing the severity and quality of pain experienced by persons
 - National Initiative on pain control, including visual analogue scale (VAS), numeric rating scale (NRS), verbal descriptor scale (e.g. none/mild/moderate/severe) and Wong-Baker FACES scale
www.painedu.org/tools.asp
- Other scales to explore:
 - Orebro scale
 - Behavioural pain scale
 - Brief Pain Inventory
 - Short-form McGill Pain Questionnaire
 - Pain Interference Scale
 - Pain Assessment in Advanced Dementia (PAINAD)
 - Abbey Pain Scale (for people with dementia and cannot verbalise)
 - Doloplus-2
- **Quality improvement activity** to in the area of acute postoperative pain
www.nps.org.au/health-professionals/cpd/activities/due-for-hospitals/acute-postoperative-pain
- **Enable NSW factsheet** – Managing pain
www.enable.health.nsw.gov.au/about/publications/fact-sheets

Standard P4 – Special consideration for specific populations

Special consideration is given to the needs of specific populations when managing the person with an amputation.

Membership of the multidisciplinary team is expanded for persons with special needs, this includes:



Aboriginal and
Torres Strait
Islander people/s



Older persons



Transition to
adult services



Persons
engaged in
highly physical
activities



Culturally and
linguistically
diverse
populations



Applying the standard in practice

- The Aboriginal Liaison Worker and Aboriginal Chronic Care team are part of the multidisciplinary team for persons of Aboriginal or Torres Strait Islander background from the decision to amputate or earlier.
- Access to geriatric team expertise including geriatricians, dementia specialists and aged health clinical nurse consultants are available for people over the age of 65 years.
- The transition care coordinator is part of the multidisciplinary team for young people transitioning to adult services.
- An exercise physiologist is part of the multidisciplinary team for people engaged in highly physical activities and there is consideration for their leisure activities.
- There is access to culturally and linguistically diverse-appropriate resources for culturally and linguistically diverse populations





Evidence base



Aboriginal and Torres Strait Islander people/s are around 3 times more likely to have diabetes,⁽³⁸⁾ 10 times more likely to be admitted for diabetic foot complications⁽³⁹⁾ and about 30 times more likely to have diabetes-related lower limb amputations than non-Aboriginal and Torres Strait Islander people.⁽⁴⁰⁾ With just over 30% of the total Aboriginal population of Australia residing in NSW, and a high prevalence of chronic conditions associated with foot pathology amongst Aboriginal communities, special consideration regarding education, assessment and management of lifestyle risk factors such as diabetes, obesity, and smoking is required.



The older person at risk of a limb amputation often has other chronic medical conditions that increase the risk of complications arising post-surgery.⁽⁴¹⁾ Decreasing the amount of time the older person spends in bed post-surgery will decrease the likelihood of immobility-related complications, however falls risk should be assessed and managed proactively. Falls risk increases with the presence of delirium or dementia, both of which are more prevalent in the population aged over 65 years.



Planning for transition to an appropriate adult amputee clinic should commence 1–2 years prior to leaving school. ACI Transition Care coordinators work together to provide support to clinicians, young people and their valued others across NSW. They help young people find appropriate adult health services, provide information and support during the transition period and help young people stay engaged with adult services.⁽⁴²⁾



People wishing to engage in highly physical activities after an amputation (including younger people and those still actively engaged in the workforce) have different requirements regarding prosthetic use. Information and support regarding future options is provided to this population.





Evidence base (cont'd)



Cultural and linguistic diversity is a major feature of the NSW population with approximately 31.4% of the NSW population born overseas reported in the 2011 Census. People from culturally and linguistically diverse backgrounds within NSW are diverse in terms of religion, cultural values, and social structures.⁽⁴³⁾ Multicultural health units and interpreter services should be utilised when required to meet the specific needs of all culturally, religiously and linguistically diverse groups in NSW.



Quality measures

System Measurements

- The service has documented linkages with specialist service providers including:
 - an Aboriginal liaison worker
 - an Aboriginal chronic care team
 - an aged care clinical nurse consultant
 - the transition care coordinator(s).
- Evidence of referral to supporting services.

Patient measurements

- Patient reported measures.
- All people identifying as Aboriginal or Torres Strait Islander are provided access to the Aboriginal Liaison Worker.



Resources

Aboriginal and Torres Strait Islander people/s

- The **Australian Indigenous Health *InfoNet*** is an innovative Internet resource that aims to inform practice and policy in Aboriginal and Torres Strait Islander health by making research and other knowledge readily accessible
www.healthinfonet.ecu.edu.au

Older persons

- **Physiopedia** provides physiotherapy resources to help improve global health
www.physio-pedia.com/Older_people_with_amputations

Transition to adult services

- **ACI Transition Care Network** contains systems and processes for effective transition of young people to adult health services
www.aci.health.nsw.gov.au/networks/transition-care

Persons engaged in highly physical activities

- **Sport NSW** provides assistance in implementing inclusion of people with a disability into sports clubs throughout NSW.
www.sportnsw.com.au/sport-for-all/people-with-disability/
- **ActiveAmp** contains information about sports and activities for people keeping active
www.activeamp.org/sport_dir.htm

Culturally and linguistically diverse populations

- **NSW Health** has resources and services for translation
www.health.nsw.gov.au/multicultural/Pages/Multicultural-health-services.aspx

4. Glossary

Activities of Daily Living	Self-care tasks or ADLs that include feeding, dressing, bathing and showering, toileting, personal hygiene, and functional mobility.
Adaptive equipment	Aides and devices used to assist in carrying out ADLs.
Adolescent	Young people aged between 13 to 18 years.
Amputation	Surgery to remove a limb or digit.
Amputee	The person who has undergone an amputation.
Congenital	A condition present at birth, when all or part of a limb fails to develop normally.
Contracture	Muscle shortening due to fibrosis causing a reduction in movement of a joint and often accompanied by pain.
Contralateral limb	The corresponding limb on the opposite side of the body to the amputated limb.
De-bridement	The medical removal of dead or damaged tissue to promote healing.
Dermatitis	Inflammation of the skin.
Dermatoid cysts	Small bumps or nodules on the skin caused by constant rubbing of the prosthesis, more common in lower limb amputations.
Hyperhidrosis	Excessive sweating that can occur with prosthesis use.
Interdisciplinary	Integrating knowledge and methods from separate disciplines using a synthesis approach.
Limb loss	Limb absence or loss due to a congenital limb defect.
Managed peer support	Peer support programs with an overarching governance structure to ensure policies and procedures are followed.
Multidisciplinary	Utilising the skills and experience of individuals from different disciplines, with each discipline approaching the patient from their own perspective.
Multispecialty	Involving more than one clinical specialty area such as orthopaedics endocrinology, rehabilitation and chronic disease.
Patient reported measures	Outcomes that matter to the patient which may relate to their clinical progress (patient reported outcome measures) or their experience of care (patient reported experience measures).
Re-amputation	A second amputation performed on the same limb.
Residual limb	The part of the limb that remains after an amputation has been performed.
Revision	Surgery that occurs after the initial amputation usually for bony or soft tissue pathology, infection or pain.
Rigid dressing	A cast applied soon after amputation to control swelling and pain; used to promote shrinkage and shaping of the residual limb in preparation for a prosthetic fitting.
Shrinker sock	An elastic sock that is used to help control swelling, promote healing and assist in shaping the residual limb.
Sock management	Changes in residual limb volume in the lower limb is managed through the application or removal of additional limb socks.
Stump sock	A wool or cotton sock worn over residual limb to provide a cushion between the skin and socket interface.
Transfemoral	Transfemoral amputation is the removal of a leg above the knee.
Transtibial	Transtibial amputation is the removal of a leg below the knee.
Transition	Transition to adult services for children occurs from around age 16 to 18 years.
Valued others	Valued others may include family, friends and carers.
Valued activities	Valued activities are the activities that the person prefers to engage in.

5. References

1. Dillon MP, Fortington LV, Akram M, Erbas B, Kohler F. Geographic Variation of the Incidence Rate of Lower Limb Amputation in Australia from 2007-12. PLOS ONE. 2017;12(1):e0170705.
2. Tivey D, Duncan J, Scarfe A, Lambert R, Cameron A. Amputee care standards: an Evidence Check rapid review brokered by the Sax Institute (www.saxinstitute.org.au) for the NSW Ministry of Health, 2015. . In: Health NMO, editor. 2015.
3. Stewart J, McCarroll A, Cameron ID, Wilson S. Review of the New South Wales Artificial Limb Service. 2004.
4. Nancarrow SA, Booth A, Ariss S, Smith T, Enderby P, Roots A. Ten principles of good interdisciplinary team work. Hum Resour Health. 2013;11:19.
5. Gough MJ, Juniper M, Freeth H, Butt A, Mason M. Lower Limb Amputation: Working Together. 2014.
6. U.S. Department of Veterans Affairs. VA/DoD Clinical Practice Guideline for Lower Limb Amputation. In: Affairs DoV, Defence Do, editors. USA2008. p. 166.
7. Australasian Faculty of Rehabilitation Medicine. Standards for the provision of Inpatient Adult Rehabilitation Medicine Services. 2011.
8. Netherlands Society of Physical and Rehabilitation Medicine. Guideline Amputation and prosthetics of the lower extremities. Utrecht, The Netherlands: Netherlands Society of Physical and Rehabilitation Medicine; 2012 October 2012.
9. Wallace AC, Talelli P, Dileone M, Oliver R, Ward N, Cloud G, et al. Standardizing the intensity of upper limb treatment in rehabilitation medicine. Clin Rehabil. 2010;24(5):471-8.
10. Fitzgerald DM. Peer visitation for the preoperative amputee patient. J Vasc Nurs. 2000;18(2):41-4; quiz 5-6.
11. Peers for Progress. Peer support around the world [Available from: <http://peersforprogress.org/>].
12. Ministry of Health NSW. Incident Information Management System (IIMS) data, January 2012-March 2016. Australia.
13. Ministry of Health NSW. Snapshot: Preventing falls and harm from falls. 2014.
14. Gooday HM, Hunter J. Preventing falls and stump injuries in lower limb amputees during inpatient rehabilitation: completion of the audit cycle. Clin Rehabil. 2004;18(4):379-90.
15. Preen DB, Bailey BE, Wright A, Kendall P, Phillips M, Hung J, et al. Effects of a multidisciplinary, post-discharge continuance of care intervention on quality of life, discharge satisfaction, and hospital length of stay: a randomized controlled trial. Int J Qual Health Care. 2005;17(1):43-51.
16. van Walraven C, Oake N, Jennings A, Forster AJ. The association between continuity of care and outcomes: a systematic and critical review. J Eval Clin Pract. 2010;16(5):947-56.
17. Andrews L, Anderson L, Fairbain S, Downing L. Care planning for children with lower limb amputation. Nursing Children and Young People. 2012;24(1):14-9.
18. Biddiss EA, Chau TT. Upper limb prosthesis use and abandonment: a survey of the last 25 years. Prosthet Orthot Int. 2007;31(3):236-57.
19. Ligthelm EJ, Wright SC. Lived experience of persons with an amputation of the upper limb. International Journal of Orthopaedic and Trauma Nursing. 2014;18(2):99-106.
20. Klarich J, Brueckner I. Amputee rehabilitation and preprosthetic care. Phys Med Rehabil Clin N Am. 2014;25(1):75-91.
21. Gulick K. The occupational therapy role in rehabilitation for the person with an upper-limb amputation. Bethesda, MD: American Occupational Therapy Association. 2007.
22. Johnson SS, Mansfield E. Prosthetic training: upper limb. Phys Med Rehabil Clin N Am. 2014;25(1):133-51.

23. Kejlaa G. Consumer concerns and the functional value of prostheses to upper limb amputees. *Prosthetics and orthotics international*. 1993;17(3):157-63.
24. Smurr LM, Gulick K, Yancosek K, Ganz O. Managing the upper extremity amputee: a protocol for success. *Journal of hand therapy*. 2008;21(2):160-76.
25. O’Keeffe B. Prosthetic rehabilitation of the upper limb amputee. *Indian journal of plastic surgery: official publication of the Association of Plastic Surgeons of India*. 2011;44(2):246.
26. Resnik L, Meucci MR, Lieberman-Klinger S, Fantini C, Kelty DL, Disla R, et al. Advanced upper limb prosthetic devices: implications for upper limb prosthetic rehabilitation. *Archives of physical medicine and rehabilitation*. 2012;93(4):710-7.
27. Roeschlein R, Domholdt E. Factors related to successful upper extremity prosthetic use. *Prosthetics and orthotics international*. 1989;13(1):14-8.
28. Resnik L, Borgia M. Reliability and validity of outcome measures for upper limb amputation. *JPO: Journal of Prosthetics and Orthotics*. 2012;24(4):192-201.
29. DesGroseilliers JP, DesJardins JP, Germain JP, Krol AL. Dermatologic problems in amputees. *Can Med Assoc J*. 1978;118(5):535-7.
30. Dudek NL, Marks MB, Marshall SC, Chardon JP. Dermatologic conditions associated with use of a lower-extremity prosthesis. *Arch Phys Med Rehabil*. 2005;86(4):659-63.
31. Hachisuka K, Nakamura T, Ohmine S, Shitama H, Shinkoda K. Hygiene problems of residual limb and silicone liners in transtibial amputees wearing the total surface bearing socket. *Archives of physical medicine and rehabilitation*. 2001;82(9):1286.
32. Koc E, Tunca M, Akar A, Erbil AH, Demiralp B, Arca E. Skin problems in amputees: a descriptive study. *Int J Dermatol*. 2008;47(5):463-6.
33. NPS Medicinewise. Acute postoperative pain management. 2007.
34. NPS Medicinewise. Educational resources for hospitals. 2009.
35. NPS Medicinewise. Acute postoperative pain (APOP) project overview. 2012.
36. Alviar MJ, Hale T, Dungca M. Pharmacologic interventions for treating phantom limb pain. *Cochrane Database Syst Rev*. 2011(12):Cd006380.
37. Johnson MI, Mulvey MR, Bagnall A-M. Transcutaneous electrical nerve stimulation (TENS) for phantom pain and stump pain following amputation in adults. *Cochrane Database of Systematic Reviews*. 2015(8).
38. Australian Government, Australian Institute of Health and Welfare. Diabetes: Australian facts 2008. 2008. p. 150.
39. Norman PE, Schoen DE, Gurr JM, Kolybaba ML. High rates of amputation among Indigenous people in Western Australia. *Med J Aust*. 2010;192(7):421.
40. Ramsey SD, Newton K, Blough D, McCulloch DK, Sandhu N, Reiber GE, et al. Incidence, outcomes, and cost of foot ulcers in patients with diabetes. *Diabetes Care*. 1999;22(3):382-7.
41. Coletta EM. Care of the elderly patient with lower extremity amputation. *J Am Board Fam Pract*. 2000;13(1):23-34.
42. NSW Agency for Clinical Innovation. Transition Care Network 2017 [Available from: <https://www.aci.health.nsw.gov.au/networks/transition-care>].
43. Ministry of Health NSW. NSW Health Policy & Implementation Plan for Culturally Diverse Communities 2012-2016. 2012.

6. Appendices

6.1 Appendix 1: Standards Steering Committee & Working Group Members

Many individuals and organisations have contributed to the development of these standards with their time and expertise. In particular, the ACI wishes to thank the Amputee Care Standards Steering Committee and Working Group Members and other key experts who provided feedback and advice in the development of this document. The involvement and willingness of all concerned to share their expertise was greatly appreciated.

Name	Role	Organisation
Louis Baggio	Rehabilitation Physician	Wagga Wagga Rural Referral Hospital
Fiona Barnett	Prosthetist	APC Prosthetics
Amy Brown	Physiotherapist	Royal Rehab
Leigh Clarke	Executive Officer	Australian Orthotic Prosthetic Association
Richard Collins	Physiotherapist	Prince of Wales Hospital
Michael Dillon	Prosthetist/Orthotist	National Centre for Prosthetics and Orthotics
Adrienne Epps	Rehabilitation physician	Sydney Children's Hospital
John Estell	Rehabilitation Physician	St George Hospital
Scott Foster	Physiotherapist	Camden/Campbelltown
Lina Goh	Physiotherapist	St George Hospital
Sandeep Gupta	Physiotherapist	Balmain Hospital
Anna Hartley	Prosthetist	Enable NSW PS
Ross Hawthorn	Rehabilitation Physician	Concord Hospital
Li Khim Kwah	Physiotherapist	University of Technology Sydney
Melissa Leong	Occupational Therapist	Prince of Wales Hospital
Kathy McCosker	Business Manager	Enable NSW
Melissa Noonan	Consumer Organisation	Limbs for Life Inc
Jana Pinkova	Clinical Nurse Consultant	Royal Prince Alfred Hospital
Ian Robertson	Manager/Prosthetist	APC Prosthetics (Hunter)
Michael Storey	Prosthetist	APC Prosthetics (Hunter)
Andrea Thatcher	Clinical Nurse Consultant	Port Kembla Hospital
Louise Tofts	Paediatric Rehabilitation	Sydney Children's Hospital
Daniel Treacy	Physiotherapist	Prince of Wales Hospital
David Wiseman	Prosthetist	Northern Prosthetics

6.2 Appendix 2: Practical tool and guide

Self-assessment tool

Minimum standards of care for the person following amputation – Self-assessment tool

This self-assessment tool can be used by health services to evaluate their existing service provision and identify areas for improvement necessary to meet the expected standards of care in NSW as outlined in the Minimum Standards document.

Standard S1: Care is coordinated, multi-specialty and interdisciplinary across all phases			
Element and rationale		Self-rating and your evidence	Action plan and timeframe
There are documented processes and structures that support interdisciplinary care to the person	→ Ensure the service is equipped with the correct resourcing of staff	Fully documented <input type="radio"/> Not documented <input type="radio"/> Supporting evidence: _____	_____
There is regular communication between other clinical services involved in amputee care	→ Allows for seamless transfer of care	Regular <input type="radio"/> None <input type="radio"/> Supporting evidence: _____	_____
Rehabilitation providers attend all pre-surgical amputation clinics	→ Allows the person to plan for the future and understand post-surgical care/ rehabilitation	Always <input type="radio"/> Never <input type="radio"/> Supporting evidence: _____	_____
Tips for implementation:			
<ul style="list-style-type: none"> • Outline the care journey and the role and function of specialty teams and desired outcomes for the person • List and explain to the person the role of each specialty involved in their care 			

Standard S2: A comprehensive care plan is developed and updated throughout the care journey			
Element and rationale		Self-rating and your evidence	Action plan and timeframe
There is regular communication between other clinical services involved in amputee care when developing the person's care plan	→ Ensures all areas of care are considered for the person	Regular <input type="radio"/> None <input type="radio"/> Supporting evidence: _____	_____
The person is involved in developing their care plan prior to surgery (excluding unplanned amputations)	→ Prepares the person for post-surgery and allows for empowerment and involvement	Always <input type="radio"/> Never <input type="radio"/> Supporting evidence: _____	_____
Care plans include a comprehensive biopsychosocial assessment as well as integrated and interdisciplinary actions	→ A comprehensive biopsychosocial assessment pre-surgery allows for a baseline measurement so improvement can be tracked throughout the journey	Always <input type="radio"/> Never <input type="radio"/> Supporting evidence: _____	_____
Care plans are regularly reviewed and updated throughout the care journey	→ Assists in care planning in the future	Always <input type="radio"/> Never <input type="radio"/> Supporting evidence: _____	_____
Tips for implementation:			
<ul style="list-style-type: none"> • Consider the person's goals and priorities (e.g., what are their preferred activities) when developing a care plan • Consider those involved (e.g., valued others) when planning care, preferences and needs of the person 			



Standard S3: Counselling and psychological support is available across all stages of care			
Element and rationale		Self-rating and your evidence	Action plan and timeframe
There is a documented assessment for psychological support as part of the care journey	→ Assessment and referral to speciality services is planned and coordinated along the care journey. Allows for timely assessment and referral.	Fully documented <input type="radio"/> Not documented <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Supporting evidence:	
Validated assessment tools are incorporated at key stages during the care journey	→ Best practice and evidence-based practice are incorporated into care plans by care teams.	Always <input type="radio"/> Never <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Supporting evidence:	
Interventions for depression, anxiety, sexual difficulties, substance abuse and pain across the care journey are available	→ Ensures that counselling and psychosocial support are integrated within the care journey. Services are defined and networks are established to ensure effective coordination of care.	Always <input type="radio"/> Never <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Supporting evidence:	
Referral pathways are defined and determined based on the needs of the person	→ Referral pathways support effective coordination of counselling and psychological support at all stages of the care journey.	Always <input type="radio"/> Never <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Supporting evidence:	
Validated psychosocial assessment is conducted and issues are addressed at each phase of care	→ Any psychosocial issues identified can be addressed as part of the overall treatment plan and reviewed.	Always <input type="radio"/> Never <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Supporting evidence:	
Tips for implementation:			
<ul style="list-style-type: none"> • Screen people for depression, anxiety, sexual difficulties, pain and risk of substance abuse at regular intervals • Psychological, social and physical support is not only for the person – think about their valued others too 			

Standard S4: Referral is offered to a managed peer support program			
Element and rationale		Self-rating and your evidence	Action plan and timeframe
There is a documented process for peer support program referral, either pre- or post-amputation	→ Provides person with access to information and peer support to adjust emotionally.	Fully documented <input type="radio"/> Not documented <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Supporting evidence:	
Tips for implementation:			
<ul style="list-style-type: none"> • Document and monitor managed peer support program involvement in the person's care plan 			



Standard S5: Falls prevention and falls safety education is provided			
Element and rationale		Self-rating and your evidence	Action plan and timeframe
There is a documented process allowing early application of rigid removable dressings in transtibial amputations, where there are no contraindications	→ Rigid removable dressings help protect the limb in the event of a fall	Fully documented <input type="radio"/> Not documented <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> Supporting evidence:	
Each person is reviewed for the risk of falls and home safety	→ Helps the person feel that their home is safe and that any risks are identified and addressed	Always <input type="radio"/> Never <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> Supporting evidence:	
The balance and falls prevention training program is accessed when required	→ Help minimise the risk of falling	Always <input type="radio"/> Never <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> Supporting evidence:	
Tips for implementation:			
<ul style="list-style-type: none"> • Use a validated screening tool to help standardise reviews • A guide to rigid removable dressings can be found in Appendix 2 			

Standard S6: Discharge planning and transfer of care arrangements occur with communication between all key stakeholders			
Element and rationale		Self-rating and your evidence	Action plan and timeframe
There are documented processes for providing designated contact details at point of entry to service and follow-up pathway(s)	→ Continuity of care is associated with better health outcomes and satisfaction to the person	Fully documented <input type="radio"/> Not documented <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> Supporting evidence:	
A contact person is named for the person being transferred to another service	→ To allow for continuity of care	Always <input type="radio"/> Never <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> Supporting evidence:	
Inpatients are provided with a discharge plan and discharge report in advance, prior to discharge	→ Provides the person and their valued others an opportunity to discuss any areas of the plan they do not understand and to seek required support in advance	Always <input type="radio"/> Never <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> Supporting evidence:	
Tips for implementation:			
<ul style="list-style-type: none"> • Check that the person knows their designated contact for the service, their contact details and the next steps in their care plan • Ensure regular follow-up with the person 			

Standard S7: A child with a congenital limb loss or limb amputation requires specialist care and including access to a specialist paediatric limb loss service			
Element and rationale		Self-rating and your evidence	Action plan and timeframe
There is a documented process for accessing and referring to local genetic and specialist paediatric limb loss services	→ Facilitates optimal outcomes for the person; in particular, geneticists provide advice on diagnosis, counselling and management	Fully documented <input type="radio"/> Not documented <input type="radio"/> Supporting evidence: _____ _____ _____	_____ _____ _____
Contact is made with the local adult clinic when treating adolescents (13–18 years)	→ Facilitates with transition of care	Always <input type="radio"/> Never <input type="radio"/> Supporting evidence: _____ _____ _____	_____ _____ _____
Tips for implementation:			
<ul style="list-style-type: none"> • Review and update details of specialist paediatric limb loss service(s), as required • Locate local areas to suggest to parents/carers where the child can participate in sport and/or physical activity • Consider having resources that are paediatric-specific, e.g., educational material and referral pathways 			

Standard S8: The person who has experienced an upper limb amputation requires access to a specialist upper limb amputee rehabilitation service			
Element and rationale		Self-rating and your evidence	Action plan and timeframe
There is a documented process for accessing specialist upper limb amputee clinics	→ Specialist upper limb amputee clinics may help the person return to their activities of daily living	Fully documented <input type="radio"/> Not documented <input type="radio"/> Supporting evidence: _____ _____ _____	_____ _____ _____
Limb amputee rehabilitation referral is early and timely within the care journey	→ Rehabilitation services effectively work with amputees to optimise return to independent living	Always <input type="radio"/> Never <input type="radio"/> Supporting evidence: _____ _____ _____	_____ _____ _____
Tips for implementation:			
<ul style="list-style-type: none"> • Review and update details of specialist upper limb amputee clinic(s) and rehabilitation services, as required • Ask and assess the person at review whether the amputation is significantly affecting them in everyday life 			



Standard P1: Care of the residual limb and management of risk factors for further amputation are addressed			
Element and rationale		Self-rating and your evidence	Action plan and timeframe
<p>There are documented processes for providing education on:</p> <ul style="list-style-type: none"> • Contracture prevention • Wound breakdown • Skin issues • Infection control • Further amputations 	→ Managing and reducing issues in the upper limb is vital to ongoing health, vitality and activities of daily living	<p>Fully documented <input type="radio"/> Not documented <input type="radio"/></p> <p>Supporting evidence:</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>Prior to surgery, there is a discussion with the person about expected outcomes</p>	→ Prepares the person for surgery and allows the person to clarify any areas that remain unclear	<p>Always <input type="radio"/> Never <input type="radio"/></p> <p>Supporting evidence:</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>Rigid removable dressings are used in transtibial amputations, where there are no contraindications</p>	→ Rigid removable dressings help protect the limb in the event of a fall	<p>Always <input type="radio"/> Never <input type="radio"/></p> <p>Supporting evidence:</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>Contact details (therapy, clinic and prosthetic) are given to the person along with their ongoing care plan</p>	→ Immediate contact can be made should any residual limb issues occur	<p>Always <input type="radio"/> Never <input type="radio"/></p> <p>Supporting evidence:</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>Tips for implementation:</p> <ul style="list-style-type: none"> • Communicate any detected risks to the wider multispecialty team to ensure continuity of care • A guide to rigid removable dressings can be found in Appendix 2 			

Standard P2: Education occurs across all stages of care			
Element and rationale		Self-rating and your evidence	Action plan and timeframe
<p>There is a documented process for the provision of educational resources</p>	→ Education supports self-management for the person and their valued others	<p>Fully documented <input type="radio"/> Not documented <input type="radio"/></p> <p>Supporting evidence:</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>The majority of educational resources are available in a variety of formats</p>	→ Different demographics are engaged in education	<p>Yes <input type="radio"/> No <input type="radio"/></p> <p>Supporting evidence:</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>The person and their valued others receive education on:</p> <ul style="list-style-type: none"> • The surgical procedure • Components of post-surgery care • Rehabilitation outcomes • Psychological needs • Ongoing care requirements 	→ Supports empowerment and enablement, and facilitates a shared decision model	<p>Always <input type="radio"/> Never <input type="radio"/></p> <p>Supporting evidence:</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>Tips for implementation:</p> <ul style="list-style-type: none"> • Education is not the responsibility of any single member or discipline, but should be delivered throughout all stages of care by the care team • Reiterate education along the care journey to help reinforce and meet the person's needs 			



Standard P3: Pain is assessed, managed and monitored across all stages of care		
Element and rationale	Self-rating and your evidence	Action plan and timeframe
Pain assessment, education and management is documented in each care journey → Comfort of the person is considered throughout the journey	Always <input checked="" type="radio"/> Never <input type="radio"/> Supporting evidence:	
A pain management plan exists for each individual → Individual circumstances have been considered, e.g., contraindications to pharmacological interventions	Always <input checked="" type="radio"/> Never <input type="radio"/> Supporting evidence:	
Pain management is monitored and addressed from an interdisciplinary perspective during all phases of care → All aspects of pain are considered	Always <input checked="" type="radio"/> Never <input type="radio"/> Supporting evidence:	
Pain intervention (pharmacological and/or non-pharmacological) is offered → Pain can be managed in the most effective way possible	Always <input checked="" type="radio"/> Never <input type="radio"/> Supporting evidence:	
Tips for implementation: <ul style="list-style-type: none"> Use validated pain assessment tools in the resource section of the standard (page 45) 		

Standard P4: Special consideration is given to the needs of specific populations		
Element and rationale	Self-rating and your evidence	Action plan and timeframe
Specialist services are accessed when required → For Aboriginal and Torres Strait Islander people/s: • Aboriginal liaison worker • Aboriginal chronic care team For people over 65 years of age: • aged care clinical nurse consultant For children transitioning to adult services: • transition care coordinators For physically active people: • exercise physiologist For culturally and linguistically diverse populations: • translation services, where required	Always <input checked="" type="radio"/> Never <input type="radio"/> Supporting evidence:	
Tips for implementation: <ul style="list-style-type: none"> There may be other populations that require specific care that you see in everyday practice – list specialist services that you access and add them to an internal process document Locate specific patient support groups that could help with different populations 		



Guide to the use of post-operative rigid dressings for transtibial amputations

Introduction

In standards S5 and P1, a rigid dressing has been recommended to be applied to the transtibial amputated limb immediately post-operatively.

The purpose of this guide is to recommend the use of a removable rigid dressing (RRD) in patients who have undergone a transtibial amputation. An RRD is a post-operative dressing used after a below knee amputation to protect and reduce oedema in the residual limb.

Types of Dressings

Following a transtibial amputation, there are two main types of dressings that can be applied: soft or rigid dressings. Both types of dressings are applied with a degree of compression to reduce stump swelling before the first prosthetic fitting.⁽¹⁾ Soft dressings such as elastic or crepe bandages are low cost and easily applied⁽²⁾ however rigid dressings are reported to offer a number of advantages over soft dressings including greater reduction in swelling, faster wound healing and shorter time to prosthetic fitting.^(3, 4)

There are two main types of rigid dressings commonly applied after transtibial amputation: RRD and non-RRD (NRRD):

- **A non-removable rigid dressing (NRRD)** is often a plaster cast dressing that encompasses the knee and ceases midthigh, keeping the knee in extension. It is usually applied in theatre by the surgeon or person who has been suitably trained in the application of NRRD and remains in place for approximately three days after surgery. After the NRRD is removed, it is usually replaced by an RRD.
- **A removable rigid dressing (RRD)** is usually a plaster or synthetic cast dressing that finishes just below the patella and allows the knee to flex. Easily removed, it allows frequent wound inspection and simulates the donning and doffing of a prosthesis. It is applied directly post-operatively (and within 3 days of surgery) by an appropriately qualified person trained in the application of RRDs. This may be a surgeon, physiotherapist, prosthetist, or other suitably trained professional. Once fitted, the RRD should not be removed from the residual limb for longer than 10-minute periods. A delay in the reapplication of the RRD may result in an increase in the residual limb volume and lead to difficulties in reapplying the RRD.

A sample information sheet for patients and anyone involved in their care regarding removing and re-applying an RRD is in Supplement 1.

RRDs allow the knee to flex and can be easily removed to allow the wound to be observed.⁽¹⁾ They have also been shown to:

- reduce swelling and facilitate wound healing,⁽⁵⁾
- protect the residual limb from possible trauma,⁽⁵⁾
- shape the residual limb in preparation for prosthetic fitting,⁽³⁾
- assist with pain control.⁽³⁾

There is consensus amongst expert clinicians and professional organisations that rigid dressings are preferred over soft dressings.⁽⁶⁻⁸⁾ There is the biological rationale that the hard surface of rigid dressings offers a more consistent pressure around the stump which results in a greater reduction in stump volume.^(5, 9) In addition, the hard surface also offers greater protection of the stump from trauma.^(5, 10) All of these factors are believed to contribute to faster wound healing, reduced risk of wound breakdowns and infections, reduced pain, shorter time to prosthetic fitting, reduced length of stay in the hospital and improved quality of life.⁽³⁾

While there are limitations in the existing literature, no study reported safety issues associated with the use of RRDs. Emergent research suggests the use of RRDs are associated with better clinical outcomes for people with transtibial amputation and, as such, it is recommended that RRDs be used in clinical practice.



Evidence

The available evidence suggests that RRDs confer a variety of benefits. As part of the process of updating the amputee care standards, the NSW ACI Amputee group commissioned the Sax institute to conduct a review of the evidence on rigid dressings in transtibial amputations. The full report can be found at

www.saxinstitute.org.au/publications/evidence-check-library/amputee-care-standards/

Based on this evidence review, five systematic reviews and an additional six primary studies investigating the use of post-operative dressings following transtibial amputation were identified. RRDs were consistently associated with faster wound healing compared to soft dressings,⁽¹¹⁾ and rates of surgical revision were lower among patients receiving RRDs. RRDs were also consistently associated with equal or faster prosthetic fitting times than soft dressings. RRDs have been associated with a significant reduction in time from amputation to wound healing, initial prosthetic casting⁽¹²⁾, and independent walking for individuals with transtibial amputation.

While there are a number of limitations to the existing evidence, including a lack of randomised controlled trials, inconsistent outcome measures, a failure to blind outcome assessors, and a risk of bias in some studies, the emergent research suggests the potential benefits support better clinical outcomes for people with transtibial amputation and as such it is recommended that RRDs be used in clinical practice.

Summary of findings

- There is consensus amongst expert clinicians and professional bodies regarding the use of rigid dressings over soft dressings for transtibial amputations, except where contraindicated.
- Appropriate training of staff is essential for the application of rigid dressings and the ongoing care of the residual limb.
- Training resources to educate staff in the initial fitting of rigid dressings is available through Enable NSW
- Supplement 1 provides a sample information sheet on removing and re-applying an RRD.



Resources

- **Enable NSW patient information** – Removable rigid dressings/rigid casts
www.enable.health.nsw.gov.au/about/publications

How to put on your removable rigid dressing (RRD)

One of the initial steps in preparing your residual limb for a prosthesis is the use of a removable rigid dressing (RRD). An RRD is a cast that goes up to the kneecap and is custom made to the shape of your limb. The purposes of the RRD are to:

- reduce the amount of fluid or oedema in the limb
- keep the residual limb at a more consistent volume
- “shape” the residual limb so that it is a more ideal shape and size to fit into a prosthesis
- protect the limb from bumps or falls
- allow for easy access to the limb for inspection and cleaning.

Important note:

A delay in reapplication of the RRD may result in an increase in limb volume. Please **do not** remove the RRD from your residual limb for longer than **10-minute** periods.

Reminders:

Wear the RRD at all times, day and night, except when you are bathing yourself or the limb is being inspected.

Keep your leg straight when sitting or laying down. Do not let your leg hang downward when sitting. Do not sit with your knee bent.

Fitting

1. Apply stump sock to the residual limb

- It is important at this stage to remove all wrinkles in the sock

2. Gently slide on cast

- When sliding the cast on, note the location of the kneecap (this is marked on the cast).
- The application of talcum powder to the inside of the cast will assist with donning.
- If the cast is loose on the residual limb after donning, an extra stump sock may need to be applied.

3. Apply outer stockinette

- Tightly pull the outer suspension stockinette over the cast to mid thigh level.

4. Snugly fit supracondylar cuff

- Note the kneecap cut out in the supracondylar cuff, and fit the cuff immediately above the kneecap.
- Secure the elastic strap around the thigh.
- Ensure that no tension is applied to the elastic strap.

5. Secure the suspension stockinette

- To secure the suspension stockinette, fold it backward over the cuff.

References

1. Kwah LK, Goh L, Harvey LA. Rigid dressings versus soft dressings for transtibial amputations. *Cochrane Database of Systematic Reviews*. 2016(11).
2. Choudhury SR, Reiber GE, Pecoraro JA, Czerniecki JM. Postoperative management of transtibial amputations in VA hospitals. *Journal of rehabilitation research and development*. 2001;38(3):293.
3. Churilov I, Churilov L, Murphy D. Do rigid dressings reduce the time from amputation to prosthetic fitting? A systematic review and meta-analysis. *Ann Vasc Surg*. 2014;28(7):1801-8.
4. Nawijn SE, van der Linde H, Emmelot CH, Hofstad CJ. Stump management after transtibial amputation: a systematic review. *Prosthet Orthot Int*. 2005;29(1):13-26.
5. Duwayri Y, Vallabhaneni R, Kirby JP, Mueller MJ, Volshteyn O, Geraghty PJ, et al. Early protection and compression of residual limbs may improve and accelerate prosthetic fit: a preliminary study. *Ann Vasc Surg*. 2012;26(2):242-9.
6. Bouch E, Burns K, Geer E, Fuller M, Rose A. Guidance for the multidisciplinary team on the management of post-operative residuum oedema in lower limb amputees. *British Association of Chartered Physiotherapists in Amputee Rehabilitation*; 2012.
7. Ministry of Health NSW. *Amputee Care Standards in New South Wales*. Sydney, Australia: Ministry of Health, NSW; 2008.
8. U.S. Department of Veterans Affairs. *VA/DoD Clinical Practice Guideline for Lower Limb Amputation*. In: Affairs DoV, Defence Do, editors. USA2008. p. 166.
9. Golbranson FL, Asbelle C, Strand D. Immediate postsurgical fitting and early ambulation. A new concept in amputee rehabilitation. *Clin Orthop Relat Res*. 1968;56:119-31.
10. Wu Y, Keagy RD, Krick HJ, Stratigos JS, Betts HB. An innovative removable rigid dressing technique for below-the-knee amputation. *J Bone Joint Surg Am*. 1979;61(5):724-9.
11. Deutsch A, English RD, Vermeer TC, Murray PS, Condous M. Removable rigid dressings versus soft dressings: a randomized, controlled study with dysvascular, trans-tibial amputees. *Prosthet Orthot Int*. 2005;29(2):193-200.
12. Hordacre B, Birks V, Quinn S, Barr C, Patriiti BL, Crotty M. *Physiotherapy Rehabilitation for Individuals with Lower Limb Amputation: A 15-Year Clinical Series*. *Physiother Res Int* 2013;18(2):70-80.