



British Association of Chartered
Physiotherapists in limb Absence
Rehabilitation

Tool Box 2026

**Lower Limb,
Non-Limb Wearer**



Patient Category: Adult lower limb absence non prosthetic users

Domain:Pain

Popular	Research Led
Outcome measure	Outcome measure
<u>Visual Analogue Scale (VAS)</u>	<u>Trinity Amputation and Prosthesis Experience Scales (TAPES part II- pain scale)</u>
Type	Type
Single question scale	Scored questionnaire
Time	Time
1 min	5 min
Free	Free
Y	Y
Equipment	Equipment
Paper and pen	Print Out
Validated in Amputees	Validated in Amputees
N	Y
Used in Amputee Research	Used in Amputee Research
Y	Y
Validated in..	Validated in..
General population	Amputees
Comments	Comments
Quick, widely used, not validated in amputees.	Part of larger outcome measure. Assesses multiple pain types.

Domain: Quality of Life

Popular	Research Led
Outcome measure	Outcome measure
<u>Hospital Anxiety and Depression scale (HAD)</u>	<u>Euro Quality of Life Five Dimensions Questionnaire (EQ-5D)</u>
Type	Type
Scored questionnaire	Scored questionnaire
Time	Time
2-5 min	2-5 min
Free	Free
Y	Y
Equipment	Equipment
Print Out	Print Out / Digital Form
Validated in Amputees	Validated in Amputees
N	Y
Used in Amputee Research	Used in Amputee Research
Y	Y
Validated in..	Validated in..
Primary care patients	Lower-limb amputees
Comments	Comments
Anxiety and depression only, not validated in amputees.	Generic, not amputation-specific.

Domain: Functional

Popular/Validated	Popular/Validated
Outcome measure	Outcome measure
<u>One Leg Balance Test (OBLT)</u>	<u>Amputee Mobility Predictor without Prosthesis (AMPnoPRO)</u>
Type	Type
Performance based measurement	Structured performance assessment
Time	Time
5 min	15 min
Free	Free
Y	Y
Equipment	Equipment
Timer, Parallel bars	Two chairs, A 12 inch ruler, A 4' obstacle, steps, parallel bars
Validated in Amputees	Validated in Amputees
N	Y
Used in Amputee Research	Used in Amputee Research
Y	Y
Validated in..	Validated in..
Older Adults	Amputee prosthetic wearers (the AMNPPRO)
Comments	Comments
Validity remains unclear but quick and easy to perform.	Specifically devised for population.

Domain: Cognition

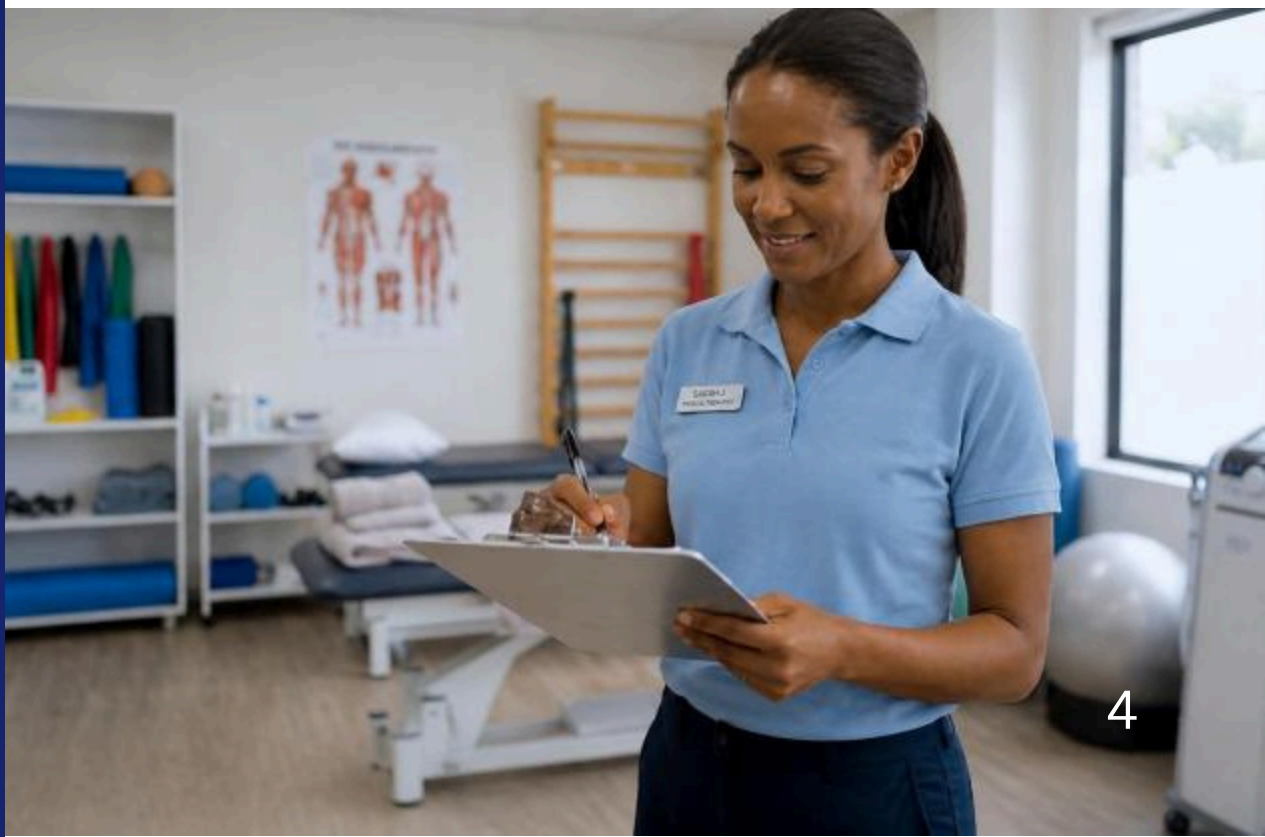
Popular (pay to use)	Research Led
Outcome measure	Outcome measure
<u>Montreal Cognitive Assessmentr (MOCA)</u>	<u>Rapid Clinical Test for Delirium Detection (4AT)</u>
Type	Type
Scored questionnaire	Clinical screening assessment
Time	Time
15 min	2-5 min
Free	Free
Y	Y
Equipment	Equipment
Printout	Printout / Digital form
Validated in Amputees	Validated in Amputees
N	Y
Used in Amputee Research	Used in Amputee Research
N	Y
Validated in..	Validated in..
Older adults	Peri-operative patients
Comments	Comments
Specifically devised for population. Comprehensive tool, requires training. Not validated in amputees.	Not validated in amputees. Free and easy to use.

Domain: Frailty

Popular
Outcome measure
<u>Clinical Frailty Scale (CFS)</u>
Type
Clinical judgment scoring questionnaire
Time
1 min
Free
Y
Equipment
App/ Printout
Validated in Amputees
N
Used in Amputee Research
Y (limited)
Validated in..
Older adults and general surgical populations
Comments
Subjective, not validated in amputees.

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Introduction

Notes to consider:

- This toolkit is intended to support clinicians, researchers, and people with limb difference in the selection and use of outcome measures across a range of assessment domains. It is important to emphasise that this is a living document. As new evidence, outcome measures, and clinical experience emerge, the toolkit will be reviewed and expanded over time.
- There are multiple assessment tools available for the different domains covered in this toolkit, and several measures span more than one domain. The working group reviewed commonly used outcome measures in both amputee and non-amputee populations and considered their relevance, feasibility, and potential value for people with limb difference.
- The evidence base specific to people with limb difference remains limited in many areas. Where population-specific evidence was unavailable, information from other clinical or non-clinical populations has been included to help readers understand the potential relevance, strengths, and limitations of the tools. Such information should be interpreted with appropriate caution.
- The toolkit highlights a set of recommended outcome measures. These recommendations are intended to promote greater consistency in assessment across clinics and services, facilitate comparison of outcomes between centres, and support the development of a stronger research evidence base. Over time, the use of common measures will help generate data that can be used to inform and strengthen clinical practice for people with limb difference.

1 Visual Analogue Scale

Summary: Popular pain test

Test of pain intensity which is quick to administer and widely used across conditions; lacks amputee-specific validation

At a glance

Short Name:
VAS

Measures:
Pain intensity
Change over time

Administration time:
< 1 minute

Test type:
Patient reported outcome measure

Format:
100 mm horizontal line anchored with
Left = No pain
Right = Worst pain imaginable

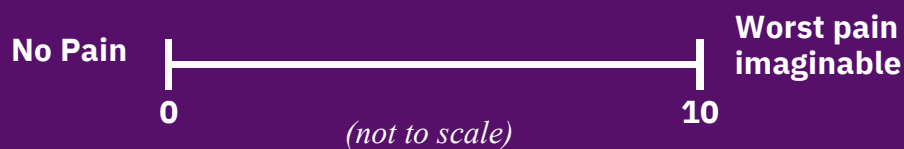
Interpreting:
Further distance from left
= more pain experienced

Validated in:
General population

How to perform the measure:

Setup the scale

1. Draw a horizontal line 10 cm (100mm) long, mark each end with a short vertical line (anchor).
2. Add labels or give a verbal explanation that left anchor = 'No pain' (0) and right anchor = 'Worst pain imaginable' (100).
3. Some patients may find it easier if you mark each 1 cm along the line with a vertical line, and label the left anchor 0 and the right anchor 10.
4. Ensure that you are consistent in the method you use each time for the same patient.
5. The line should look like below:



6. Explain to patient

- Show the paper to patient and explain clearly: e.g.
"Please mark on the line the point that best represents the intensity of your pain right now. The left end means no pain and the right end means the worst pain you can imagine."
- If you would like them to rate the average pain or the worst pain over time, ensure you make that clear and specify the time period e.g., *"Mark the line for your worst pain in the last 24 hours"*.

7. Patient marks the paper

- Give the patient the paper and a pen.
- Allow them to place a single vertical mark or dot on the line at the point that represents their pain intensity.

Notes:

If the patient cannot use a pen (e.g., poor dexterity), the clinician may mark the line where the patient points. An electronic version may also be used

How to Record in Notes

When reporting VAS results, include: scale orientation (horizontal/vertical), scale length (100mm), anchors used or not, exact wording ("current pain", "average pain last 24 hours" etc.), and whether 0–100 or 0–10 was used.

How to interpret the measure:

Once the patient marks the line, measure the distance in millimeters from the left anchor (0 mm) to the patient's mark using a ruler. Record the value (0–100mm).

Raw score: 0–100mm (0 = no pain; 100 = worst pain imaginable).

- Compare scores for the same patient over time to monitor treatment.
- Recheck the patient's scores across visits, ensure you use the same technique for the patient on each repetition, this will allow you to see if pain is improving or getting worse.

Common categories (based on research which looked at pain after surgery)

- No pain: 0–4mm
- Mild pain: 5–44 mm
- Moderate pain: 45–74 mm
- Severe pain: 75–100 mm

Important information for use of this outcome measure

Pros

- Quick (less than 1min)
- Sensitive to small change
- No training required

Cons

- Subjective
- Not validated in population
- Accuracy depends on consistent scale being used
- Cannot be delivered over phone or to visually impaired patients
- Sometimes confused with numerical scale (rating 0-10)

Advice for use

- Always show the scale
- Be consistent (orientation, length)
- Best used to track progress within the same patient

Words of caution

- This has not been validated in the specific amputee population.
- Small measurement differences can arise from variations in scale construction (for example 80 mm vs 100 mm), always document the exact instrument used.

Your printout

This test does not strictly require a specialised printout beyond a labeled line; however, many clinics use pre-printed forms with a 100 mm line and anchors to ensure consistency.

Background

The VAS measures one aspect of pain at a time but historically has been used to assess a wide range of types of pain in a wide range of patients. It is so routinely used that researchers may not reference the original paper or development of the scale. Research in 2019 (Yeung and Wong, 2019) explored the origins of the scale and identified a paper from 1921 (Hayes and Patterson) as the first description, in a scientific manner, of the graphic rating system which is thought to have been developed into the VAS.

Although some studies have found significant correlation between variables associated with specific pathologies, such as osteoarthritic grade (Alghadir et al., 2018), the lack of a gold standard for pain measurement that is valid across all patients and all domains, means it is a challenge to validate the VAS.

Justification for inclusion in Toolbox

This test was selected by the working group due to the following criteria:

Research Led		Clinically Suitable	
Reliable		Quick	✓
Valid in GP*	✓	No Equipment	✓
Valid in AP**		Free	✓
Used in AP**	✓	Well known	✓
		Easy for patients	✓



*GP=General population

**AP=Limb Absence
population

Further, it is sensitive to change, making it useful for monitoring response to analgesic interventions and rehabilitation over time.

Areas of discussion/additional information and research gaps

- The VAS is a simple to use format that patients are familiar with in all areas of care.
- There are limitations in use of the VAS as it only measures one aspect of pain.
- Although easy to use it is not the most common format used. The numerical rating is the most common format used by clinicians aiming to measure phantom limb pain (Jenson et al., 2025), where a scale of 0-10 is provided.
- Research in older adults (Bjelkarøy et al., 2024) shows that there may be poor agreement between the VAS and the numerical scale (Score out of 10) and they should not be used interchangeably.
- Although the VAS has not been validated as a single measure in amputee populations, it forms part of the prosthesis evaluation questionnaire, which has been validated for use in individuals with lower limb amputations (Legro et al., 1998).

Research Information

	Score	Comment	Reference
Reliability	ICC 0.97	Good test–retest reliability in testing acute pain when the same administration method is used	(Bijur, Silver and Gallagher 2001)
Validity		Pain is a self-reported measure; no gold standard exists	
Minimal Clinical Difference	30mm	Study conducted on hospital patient reporting acute pain	(Lee et al., 2003)
Minimal Detectable Change	10-14mm	Study conducted on emergency department patients reporting acute pain. outcome recorded when the patient reported feeling a little better or a little worse	(Kelly, 2001)
Repeatability	CoR range 4.1 - 36.0	Study conducted in healthy individuals	(Papas and Schultz, 1997)
Normative Values	Not applicable	p	

References/further reading

- Alghadir, A. et al. (2018) *"Test and retest reliability, validity, and minimum detectable change of visual analog, numerical rating, and verbal rating scales for measurement of osteoarthritic knee pain,"* Journal of Pain Research, Volume 11, pp. 851–856. Available at: <https://doi.org/10.2147/JPR.S158847>
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- Bjelkarøy, M.T. et al. (2024) *"Measuring pain intensity in older adults. Can the visual analogue scale and the numeric rating scale be used interchangeably?,"* Progress in Neuro-Psychopharmacology and Biological Psychiatry, 130, p. 110925. Available at: <https://doi.org/10.1016/j.pnpbp.2023.110925> (Not Open Source)
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2 Trinity Amputation and Prosthesis Experience Scale - Revised (pain scale section)

Summary: Researched-led pain test

The pain section of the TAPES-R test is quick to administer and assess pain type, frequency, duration, and intensity. TAPES-R-II was developed for lower-limb amputees; commonly used in prosthetics research and clinics. The full TAPES-R is a multidimensional self-report measure assessing psychosocial adjustment, activity restriction, and prosthesis satisfaction in people with limb loss.

At a glance

Short Name:
TAPES part II (Pain subscale)

Measures:
Residual limb pain, phantom limb pain, back pain, and other musculoskeletal pain

Administration time:
2-3 minutes (pain section only)

Test type:
Patient reported outcome measure, Questionnaire

Format:
4 questions , Linkert scale

Interpreting:
Higher score indicates greater or more frequent pain

Validated in:
The full measure has been validated in amputee populations

* If completing the full TAPES-R, refer to Appendix 1 for scoring of Part I (psychosocial, activity, and satisfaction subscales)

How to perform the measure:

1. Provide patient with TAPES-R questionnaire Part II (It is advisable to complete both parts I and II in order to gain more information, this takes approximately 15 minutes).
2. Explain clearly to patient that they should answer each question as honestly as possible and ensure each mark they make is clear on the form.
3. Ensure that the patient completes all questions, support can be given but try not to influence choices.

How to interpret the measure:

- Each item is scored separately.
- Higher scores show more frequent or more severe pain.
- A response of “No” to questions 4a, 5a and/or 6a show that the patient does not experience that type of pain.
- For questions 2, 3, 4d, 4e, 5d, 5e, 6e, 6f, responses can be converted to a score on a 5-point scale where:

5 = “Excruciating” or “A lot” (most severe/most frequent)
1= “Mild” or “Not at all” (no pain/never occurs)
- These separate scores can be used to identify pain burden and change over time.

How to Record in Notes?

When reporting TAPES-R pain results, include:

- The type of pain assessed (e.g. phantom limb, residual limb, other)
- The score out of 5 for each item or domain
- Any changes over time

Important information for use of this outcome measure

Pros

- Quick(3min max)
- Amputee-specific
- Captures multiple pain types

Cons

- Subjective (recall bias)
- Validation as subscale when used in full TAPES

Advice for Use

- Ensure patient is clear if rating intensity or frequency
- Consider use of full TAPES
- This has been translated and validated in a number of different languages

Words of caution

- Not a diagnostic pain tool, best used for monitoring burden and impact

NB: It is recommended to complete the whole scale, which covers several domains in one measure!

Your printout

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Background

The Trinity Amputation and Prosthesis Experience Scales (TAPES) were developed in the late 1990s by Gallagher and MacLachlan (Gallagher and MacLachlan, 2004) as one of the first multidimensional, amputee-specific patient-reported outcome measures. The scale was designed to capture adjustment to amputation and prosthesis use across psychosocial, functional, and satisfaction domains, with a pain subscale included to reflect the high prevalence and varied nature of pain among people with limb loss.

Since its development, the TAPES and its revised version (TAPES-R) have been translated and validated in multiple countries and languages, supporting its cross-cultural relevance. While TAPES-R has demonstrated good internal consistency and construct validity within the full questionnaire, further research is needed to confirm responsiveness and test–retest reliability for the pain subscale alone. Nonetheless, the TAPES-R remains one of the most widely used and clinically relevant tools for capturing the multidimensional impact of pain in people with limb absence.

Justification for inclusion in Toolbox

This test was selected by the working group due to the following criteria:

Research Led		Clinically Suitable	
Reliable	✓	Quick	✓
Valid in GP*	✓	No Equipment	✓
Valid in AP**	✓	Free	✓
Used in AP**	✓	Well known	✓
		Easy for patients	✓

*GP=General population

**AP =Limb Absence population



Please note that research-led factors can be evaluated only within the context of the full TAPES-R assessment; the pain section does not have an independent research basis as a standalone measure.

Areas of discussion/additional information and research gaps

The TAPES-R parts I and II is included in the Consensus Outcome Measures for Prosthetic and Amputation Services (COMPASS) developed by the International Society of Prosthetics and Orthotics (ISPO) in 2021.

The COMPASS was created as a standardised set of outcome measures to use before and after treatment of people with lower-limb absence, to assess both current status and changes over time. Within this framework, the TAPES-R Parts I and II is one of the six recommended assessments in the standard COMPASS assessment battery of tests.

- The TAPES-R section II has not been validated as a measure to be used independently from the rest of the questionnaire.
- The TAPES-R is designed to review different aspects of having a prosthesis and states “The questionnaire should be completed by the person with a prosthesis”.
- A study exploring possible outcome measures to test phantom limb pain (Jenson et al., 2025) concluded that there was no current outcome measure suitable for standardised diagnosis or monitoring of three key types of sensation experienced by those with limb loss; phantom limb pain (PLP), phantom limb sensation (PLS), and residual limb pain (RLP). This is as they are unable to distinguish between the pain types.
- Translation of the TAPES-R in its entirety has been validated in a number of languages (e.g., French / Arabic / Portuguese / Turkish).
- Using the TAPES-R with another pain measure may support consistent and multidimensional monitoring of pain.

Research Information

TAOES-II has been extensively researched but not for use of the pain scale alone. It is recommended to make use of the whole measure and associated research values.

	Score	Comment	Reference
Reliability		Not explored for part II alone	
Validity	Not applicable	Pain is a self-reported measure; no gold standard exists.	
Minimal clinically important difference		Not explored for part II alone	
Minimal detectable change		Not explored for part II alone	
Repeatability		Not explored for part II alone	
Normative values	Not applicable	Pain should be used as patient relevant comparison to baseline	

References/further reading

- Gallagher, P. and MacLachlan, M. (2000) 'Development and psychometric evaluation of the Trinity Amputation and Prosthesis Experience Scales (TAPES).', *Rehabilitation Psychology*, 45(2), pp. 130–154. Available at: <https://doi.org/10.1037/0090-5550.45.2.130>
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- Luthi, F. et al. (2020) 'Cross-cultural adaptation and measurement properties of the French version of the Trinity Amputation and Prosthesis Experience Scales—Revised (TAPES-R)', *PLOS ONE*. Edited by A. Blanch, 15(2), p. e0229084. Available at: <https://doi.org/10.1371/journal.pone.0229084>

3 Hospital Anxiety and Depression scale

Summary: Popular quality of life, anxiety and depression screening tool

The HADS is a brief, 14-item, self-report questionnaire designed to screen for anxiety and depression in patients with physical health problems, though not specifically validated for amputees.

At a glance

Short Name:
HADS

Measures:
Anxiety and depression symptoms (psychological not somatic)

Administration time:
2-5 minutes

Test type:
Patient reported outcome measure, Questionnaire

Format:
14 items, score 0-3
Separated into:
A - Anxiety scores
D - Depression scores

Interpreting:
Higher score indicates greater symptom severity

Validated in:
General population

How to perform the measure:

1. Provide patient with questionnaire (paper or electronic).
2. Give instructions to the patient: *“This questionnaire contains 14 statements about how you have been feeling during the past week. Please read each and select the response that best describes how you have felt”*.
3. Clinician should check all questions have been answered.

How to interpret the measure:

- Count score for each answer given (0, 1, 2, or 3).
- Calculate total score for A, anxiety section (out of 21).
- Calculate total score for D, depression section (out of 21).

Cut-offs (Zigmond & Snaith, 1983):

- 0–7 = Normal
- 8–10 = Borderline (possible need for referral)
- 11–21 = Probable clinical case (requires clinical referral)
- Interpretation should consider clinical context, as this is not a diagnostic tool but a screening measure.
- Compare repeated scores to monitor change over time.

How to Record in Notes

When reporting HADS results, include: HADS-A and HADS-D separately, cut-off category, timeframe (e.g., “past week”), if self reported or assisted, if completed on paper or electronically.

Important information for use of this outcome measure

Pros

- Quick (5min max)
- Widely used
- Free to use
- Avoids somatic symptoms (fatigue, change of appetite)

Cons

- Not a diagnostic tool
- May miss mild sub threshold cases

Advice for use

- Always score A and D separately
- Use as a screening tool

Words of caution

- Designed for hospital outpatients: not fully validated in community amputee populations.
- Cut-offs may vary across settings, languages, and cultures.
- Results should be considered alongside clinical judgment and other assessments.

Your printout

The Hospital Anxiety and Depression Scale© (HADS) is free to use clinically but is protected worldwide by international copyright laws in all languages, with all rights reserved to GL Assessment, UK. It cannot be used without permission so cannot be supplied here. For permission to use the HADS from a Licensee based in the United Kingdom of Great Britain and Northern Ireland, or the Republic of Ireland, or the Channel Islands, please contact permissions@gl-assessment.co.uk. Once permission is gained, a printable version of the scale can be found here: <https://gplocumcover.co.uk/docstore/hiddenHADS.pdf>. Electronic forms can also be available in most outcome measure platforms.

Background

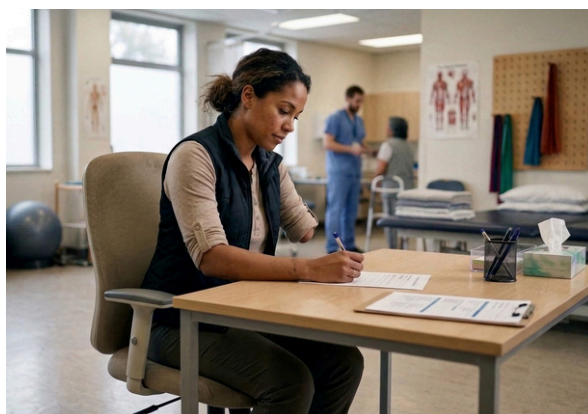
The Hospital Anxiety and Depression Scale (HADS) was developed in 1983 by Zigmond & Snaith (Zigmond and Snaith, 1983), the HADS was intended to provide a reliable measure of anxiety and depression in patients with physical illness without contamination from somatic symptoms such as fatigue or pain. It has become one of the most widely used screening measures in hospital and rehabilitation contexts, with translations into many languages and validation across diverse medical populations.

An online version is available here: <https://score.awellhealth.com/calculations/hads/documentation>

Justification for inclusion in Toolbox

This test was selected by the working group due to the following criteria:

Research Led		Clinically Suitable	
Reliable	✓	Quick	✓
Valid in GP*	✓	No Equipment	✓
Valid in AP**		Free	✓
Used in AP**		Well known	✓
		Easy for patients	✓
Validated in Danish adult undergoing lower limb amputation as a result of vascular conditions			



*GP=General population

**AP =Limb Absence population

Areas of discussion/additional information and research gaps

In research in older adults, the HADS was found to have a ceiling effect (cannot detect difference at top end of scale) (Djukanovic, Carlsson and Årestedt, 2017), while in amputees it was found to have a floor effect (cannot detect differences at the bottom end of the scale) (Phutane et al., 2024).

- It should not be used as a diagnostic tool but rather to highlight changes or the need for referral.
- There is some discussion as to the impact of gender on HADS, with some studies showing that women tend to score higher in the anxiety scale than their male counterparts.
- Although anxiety and depression are indicative of quality of life, this measure does not examine wider quality-of-life factors.
- The HADS has been used in studies to identify depression in people with amputation, with more than 50% found to have depression, which is worst over the 3 months post amputation and starts to improve 6 months post amputation (Phutane et al., 2024).

Research Information

	Score	Comment	Reference
Reliability	$\alpha = 0.86$.	In Danish vascular amputees - Floor effects were present ^Missing UK amputee data	(Abrahamsen, C. et al. (2025)
Validity	CFI = 0.954 (3-factor model)	Structural validity	(Phutane et al., 2024)
Minimal clinically important difference	8.5 points	As identified in patients undergoing total hip and knee arthroplasty ^Missing amputee data	(De Filippis et al., 2024)
Minimal detectable change		This varies greatly between populations	
Repeatability	ICC= 0.89	Estimation based on 41 studies across populations, suggesting high reliability (taken 2 weeks apart)	(Gough et al., 2023)
Normative values	6 in Woman 5 in men	Increases with age. From data from EpiFunD study of patients registered at 3 Northwest England GPs between 2001/02	(Breeman et al., 2015)

References/further reading

- Abrahamsen, C. et al. (2025) 'Validity and reliability of the Danish version of the Hospital Anxiety and Depression Scale (HADS) in patients with major lower extremity amputations: A psychometric study', *International Journal of Orthopaedic and Trauma Nursing*, 56, p. 101157. Available at: <https://doi.org/10.1016/j.ijotn.2025.101157> (Not Open Source)
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4 Euro Quality of Life Five Dimensions Questionnaire

Summary: Research-led quality of life measure (health-related)

The EQ-5D-5L is a standardised, patient-reported measure of health, capturing five key dimensions (aspects) of health across five severity levels. The five aspects are; Mobility, Self-care, Usual activities, Pain/Discomfort, and Anxiety/Depression. It is quick to administer, widely validated, and provides utility scores for economic evaluation.

Under each heading are 5 statements ranging from “I have no/I am not” to “I am unable/I am extremely” And a Visual Analogue Scale to mark current pain.

At a glance

Short name:
EQ-5D-5L

Measures:
Health related quality of life

Administration time:
2–4 minutes

Test type:
Patient reported outcome measure, Questionnaire

Format:
Descriptive system: 5 questions on aspects of health at 5 levels

Interpreting:
Converted into a 5 digit state of health (not a combined score)

Validated in:
General population, other clinical populations

How to perform the measure:

1. Provide the patient with the EQ-5D-5L form (paper or digital).
2. Explain to patient: E.g. “This questionnaire asks about your health today across five areas For each statement, please select the response that best matches your health”.
3. The patient should select 1 of 5 levels in each question (1 = no problems, 5 = extreme problems) and score EQ VAS.
4. The clinician should check that all items are completed.

How to interpret the measure:

- Each question is scored (1-5) in line with the level selected by the patient. Where 1 is no problem and 5 is a severe problem.
- Each score may be reviewed independently and reviewed against indexes once available.
- This produces a 5-digit code (e.g. 33425).
- The higher each score = the worse the health perception.
- The VAS can be scored as a measurement in mms.

Compare repeated scores to monitor change over time, these scores can also be converted into value sets, please refer to Value Sets section.

Note: Provide clarification only if the patient misunderstands the format (do not influence answers)

How to Record in Notes

When reporting EQ-5D-5L results, include: the score for each question separately, Cut-off category, Time frame (e.g., “past week”), if self reported or assisted, if completed on paper or electronically.

Important information for use of this outcome measure

Pros

- **Quick (4 min max)**
- **Widely validated**
- **Sensitive to change over time**

Cons

- Licensing restrictions (pay to use)
- Broad measure
- Ceiling effect
- Index values not established
- Not amputee specific validated but has been applied in rehabilitation research

Advice for use

- **Use alongside descriptive notes to create complete picture**

Words of caution

- **Work is being done to create index values which these codes can be mapped to, these will be country specific.**

Your printout

The EQ-5D-5L© is owned and copyrighted by the EuroQol Group. It is not freely available for reproduction or distribution. A license must be obtained before use.

For routine clinical use with individual patients, a license is usually provided free of charge. For research, commercial use, or electronic integration, formal permission and a license agreement are required.

Standard printouts (paper and digital) are available directly from the EuroQol Group To request permission and access official versions: visit: www.euroqol.org

Background

The EQ-5D, created by the EuroQol Group in the early 1990s, is a widely used, standardised tool for measuring health in clinical and economic contexts. Initially featuring three levels per dimension (EQ-5D-3L), a more sensitive five-level version (EQ-5D-5L) was launched in 2009. The EuroQol Group Association, now a global network of over 90 multidisciplinary researchers, oversees the scientific development of the EQ-5D.

Justification for inclusion in Toolbox

This test was selected by the working group due to the following criteria:

Research Led		Clinically Suitable	
Reliable	✓	Quick	✓
Valid in GP*	✓	No Equipment	✓
Valid in AP**	✓	Free	
Used in AP**		Well known	✓
		Easy for patients	✓

*GP=General population

**AP =Limb Absence population



Areas of discussion/additional information and research gaps

Institute for Health and Care Excellence (NICE) and policy partners, adapting the international EQ-5D-5L protocol to address previous concerns raised around quality, and to improve the reliability of data and analysis.

- Although the evidence supports use, being a generic measure (rather than amputee-specific) means it might not capture all issues unique to amputees (prosthesis fit/comfort, residual limb pain, phantom limb pain, prosthetic mobility nuances) as sensitively as a condition-specific measure.
- Responsiveness over time (i.e., ability to detect change) in amputee populations has more limited evidence compared to generic/orthopaedic populations. For example: in the Swedish study the focus was more on validity (discrimination, correlation) than on responsiveness, (Erasmus University Rotterdam).
- When using the EQ-5D-5L in amputees, it may be beneficial to supplement it with prosthetic-/amputation-specific outcome measures (for example, prosthetic mobility indices, residual limb pain scales) to get a fuller picture.
- Convergency validity of EQ-5D-5L with the EQ-5D-3L was strong in lower limb amputees (Ernstsson et al., 2022).
- There are ongoing developments to enhance the outcome measure's validity for assessing quality of life.

Value sets

A reference for UK Value sets is included at the end of the chapter (Rowen et al, 2026)

These may be called index values, index score, Qaly weight or EQ value and give a societal perspective on the score. The values are measured relative to full health (valued at 1) and being dead (valued at 0), states considered worse than being dead may be valued at less than 1.

These value sets are derived from studies of people from the general population and differ from country to country. These can change over time, so must be reviewed regularly.

The UK EQ-5D-5L value set was developed using the EuroQol Valuation Technology (EQ-VT) protocol, which combines two main techniques:

- Time Trade-Off (TTO): Participants are asked to choose between a shorter life in full health and a longer life in a given health state.
- Discrete Choice Experiment (DCE): Respondents select their preferred health state from a set of hypothetical scenarios, providing insights into the relative importance of different health dimensions.

These figures can be useful to evaluate the perceived societal benefit derived from different interventions. To calculate the index value a number of tools are available, including the R Package EQ5D, providing functions to compute the index scores using the UK value sets.

An alternative is the [EuroQol Crosswalk Index Value calculator](#), an online tool which allows input of the five digit scores to obtain a value set.

Research Information

	Score	Comment	Reference
Reliability	$\alpha = 0.74$	In Hong Kong general population ^Missing UK or amputee data	(Xu et al., 2022)
Validity	P = 0.522 Construct Validity	In Swedish amputee patients, shows correlation with other outcome measures and paper defined “ <i>overall situation as an amputee.</i> ” ^Missing UK amputee data	(Ernstsson et al., 2022)
Minimal clinically important difference	0.17	In post elective foot surgery patients in Spain ^Missing UK and amputee data	(Ginés-Cespedosa et al., 2023)
Minimal detectable change	0.03 to 0.125	This varies greatly between populations ^Missing UK and amputee data	(Zheng et al., 2023)
Repeatability	ICC= 0.74	In Hong Kong general population ^Missing UK or amputee data	(Xu et al., 2022)
Normative values		Refer to Indexes	

References/further reading

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5: One-Leg Balance Test

Summary: Popular functional balance test

The OLBT is a quick, performance-based test to assess static balance and postural stability by measuring the duration a participant can maintain balance while standing on one leg. It's commonly used in geriatric, neurological, and amputee rehabilitation, and has demonstrated predictive validity for functional mobility outcomes (e.g., prosthetic use, fall risk).

Note this appears under many names: Single leg balance test, Single-limb balance test.

At a glance

Short name:
OLBT

Measures:
Static Balance, postural control

Administration time:
5 minutes

Test type:
Performance based, clinician administered

Format:
Timed single leg stance

Interpreting:
Longer standing time indicated better balance and postural stability

Validated in:
Unilateral lower-limb amputees (vascular non limb wearers)

How to perform the measure:

1. Ensure you have the following equipment: stopwatch, parallel bars (or gait belt).

2. Prepare the environment: ensure the testing area is free of obstacles, with parallel bars or a stable surface available for safety. You may fit a gait belt for therapist control.

3. Explain the test: *“This test measures your ability to balance on one leg for as long as you can. You’ll have a short practice to get used to it, and then we’ll record how long you can balance.”*

4. Practice attempt: allow one untimed practice trial so the patient can experience the task.

5. Determine appropriate test level:

- **Level 1 (Standard):** Able to stand unassisted on one leg; time starts when both hands are removed from bars
- **Level 2 (One-hand assist):** Requires light support from one hand; time starts when one hand is lifted from the bar
- **Level 3 (Two-hand assist / full support):** Unable to stand independently; start from sitting and time begins when the patient achieves full upright stance with both hands on bars (time represents supported standing balance)

6. Instructions for timed test: *“We’ll start timing when you lift your hand(s) or when you’re fully standing. Try to stay balanced for as long as you can up to 30 seconds”.*

7. Starting position: for standard and one-hand versions, begin in standing within the bars.

- For two-hand version, begin seated if necessary, then rise to standing.

8. Timing: start the timer when the last point of support (hand or seat) is removed or when full upright stance is reached.

9. Stop timing when one or multiple of the following occurs:

- The raised limb touches the ground.
- Support hand(s) return to bars.
- The gait belt bears weight.
- The patient begins to sit.
- 30 seconds elapse.

10. Observation: Note any sway, trunk compensations, use of arms, or signs of fatigue.

11. If safe, repeat 2–3 trials and record the best time.

Optional: repeat once with eyes closed to assess sensory contribution to balance.

How to interpret the measure:

- Use the best time from the three trials as current maximum ability.
 - **0–5 sec** Poor balance, high fall risk
 - **6–15 sec** Moderate balance, moderate fall risk
 - **16–30 sec** Good balance

The interpretation of standard test has been made based on older adults with both limbs intact and should be used only as a general guide.

How to Record in Notes

When reporting OLBT results, include: time achieved in each trial (seconds), adaptations made and any observational comment such as compensatory movements made. Also note if performed with eyes closed.

Important information for use of this outcome measure

Pros

- Quick, low-cost, and easy to administer
- Sensitive to balance deficits in older adults
- Sufficient ability to predict future walking ability in vascular amputees
- Requires minimal equipment

Cons

- Ceiling effect, (especially in higher-functioning patients)
- May not be safe in very early (post-operative) phase
- Requires clinical judgment for safety
- Only tests one functional aspect

Advice for use

- Perform in a consistent environment each time
- Encourage patient to look straight ahead (not down)
- Record any assistive devices used

Words of caution

- As with other performance-based measures, results may be affected by fatigue, pain, or wound status.

Your printout

This is a simple test that does not require a print out.

Background

The One-Leg Balance Test (OLBT) was originally developed as a simple measure of static postural control in geriatric and neurological populations (Bohannon et al., 1984). Its ease of administration and established normative data have made it a common screening tool for balance and fall risk in community and rehabilitation settings.

More recently, the test has been adapted for use in lower-limb amputees (Schoppen et al., 2003) including those with vascular etiologies, where impaired postural stability and asymmetrical weight-bearing are common. Evidence from Essop et al. (2023) further supports its role as a feasible, low-demand assessment suitable for non-prosthetic or early-rehabilitation amputees. Evidence summarised in the Essop et al. (2023) systematic review highlights the OLBT as one of only a few performance-based outcome measures suitable for use in non-prosthetic or early-rehabilitation vascular amputees.

Justification for inclusion in Toolbox

This test was selected by the working group due to the following criteria:

Research Led		Clinically Suitable	
Reliable	✓	Quick	✓
Valid in GP*	✓	No Equipment	✓
Valid in AP**	✓	Free	
Used in AP**	✓	Well known	✓
		Easy for patients	✓

*GP=General population research

**AP=Limb Absence population research



Areas of discussion/additional information and research gaps

The OLBT is included in the 2023 systematic review '*Clinimetrics of performance-based functional outcome measures for vascular amputees*' conducted by researchers at the University of Leicester.

The review assessed the quality and suitability of existing performance-based outcome measures as clinic measures for vascular amputees. The OLBT was identified as one of four outcome measures suitable for non-ambulatory amputees.

Research Information

	Score	Comment	Reference
Reliability		Not established ^Missing UK amputee data	
Validity	r = 0.35 -0.80 Concurrent validity (see areas of discussion*)	In unilateral amputees when compared with the Berg Balance Scale, Functional Reach Test, Tandem Test, 2-Minute Walk Test, and Timed Up and Go Test	(Essop-Adam., 2023)
Minimal clinically important difference		Not established ^Missing UK and amputee data	
Minimal detectable change	10.78 – 19.62 sec	This varies greatly between populations ^Missing UK and amputee data	(Choi et al., 2014; Sarac, Unver and Karatosun, 2022)
Repeatability	ICC=0.87	Unilateral non traumatic amputees	(Kristensen et al., 2014)
Normative values		Although normative values exist for community-dwelling adults, no amputee-specific, nor non-prosthetic wearing amputee normative data have been established.	(McNamara et al., 2023)

References/further reading

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6 Amputee Mobility Predictor without Prosthesis

Summary: Research-led functional test

The AMPnoPRO (Amputee Mobility Predictor without Prosthesis) is a standardised, performance-based assessment used to evaluate functional mobility and balance in individuals with lower-limb amputation before prosthetic fitting. It measures abilities such as sitting and standing balance, transfers, gait-related tasks, and coordination, and is commonly used to estimate mobility potential and support prosthetic prescription and rehabilitation planning.

At a glance

Short name:
AMPnoPRO

Measures:
Functional mobility, balance, and ambulation potential

Administration time:
15 minutes

Test type:
Performance based, clinician administered

Format:
Functional tasks scored ranging from 0–2

Interpreting:
Higher scores indicate greater mobility potential

Validated in:
Unilateral lower-limb amputees

How to perform the measure:

1. Ensure you have the following equipment:

Chair (40-50cm) with arms, stopwatch, 4–5 m walkway, small obstacles, ruler/tape measure, aids for walking.

2. Ensure safe space for mobility test (may be performed in parallel bars for safety).

3. Explain the aim to patients: E.g. *“This test measures your ability to do common physical tasks without a prosthesis. You may not be able to complete some tasks. That’s fine – just try your best”*.

4. Explain each test in the test sheet to avoid extensive discussion between tasks.

**Note that there is no test number 8 (this is to align with tests in AmpPro, which assesses amputees with prosthetic leg/s).*

5. Perform each test from one through to twenty-one in order and back to back.

6. Score each task immediately after performance.

**A more in-depth step by step instruction for each test is available in the ISPO COMPASS user guide (International Society of Prosthetics and Orthotics, 2021).*

How to interpret the measure:

- Total the scores at the end, maximum score is 38.

Cut-offs for mobility potential /Medicare K-level prediction* (Gailey et al., 2002):

- K0: Not applicable.
- K1: 9.7 ± 9.5 .
- K2: 25.3 ± 7.3 .
- K3: 31.4 ± 7.4 .
- K4: 38.5 ± 3.0 .

***K-level is a classification system that evaluates how well an individual can use a prosthetic device.**
Learn more [here](#)

Scores can be compared over time to monitor functional recovery
Appendix 2 outlines details on how to interpret the results.

How to Record in Notes

When reporting AMPnoPRO results, include: total score, predicted functional K-level.

Important information for use of this outcome measure

Pros

- Amputee specific
- Usable in early rehab
- No specialised equipment needed

Cons

- Requires training
- Time to complete (10-15 mins)
- Outcome may be influenced by non-mobility factors (e.g. pain)
- Not suitable for bilateral amputees

Advice for use

- Ensure performed in safe environment and be aware of fall risk
- For tracking across rehabilitation use in conjunction with AMPpro
- Not possible in bilateral amputees

Words of caution

Predicted K-levels are guidelines, clinical judgment must also be applied

Your printout

This is a simple test that does not require a print out. The AMPnoPRO is published in the public domain. Paper forms with the 21 items and scoring instructions are freely available in the original publication and rehabilitation resources. A printable version of the scale can be found here: <https://www.physio-pedia.com/images/f/fa/AmpNoPro.pdf>, no license or fee is required.

Background

The Amputee Mobility Predictor (AMP) was developed by Gailey and colleagues (2002) as a reliable and valid instrument to evaluate and predict the functional ambulation potential of individuals with lower-limb amputation. The test is available in two versions: the AMPPRO (administered with a prosthesis) and the AMPnoPRO (administered without one). The AMPnoPRO enables clinicians to quickly assess a patient's functional status in the early stages of rehabilitation, prior to prosthetic fitting. By evaluating basic balance, transfers, and mobility tasks, the AMPnoPRO allows practitioners to estimate post-prosthetic functional mobility and classify patients according to the Medicare Functional Classification Levels (MFCL, K-levels). It is worth noting that much of the research focuses on the AMPPRO and extrapolates to AMPnoPRO without direct testing of the AMPnoPRO.

Justification for inclusion in Toolbox

This test was selected by the working group due to the following criteria:

Research Led		Clinically Suitable	
Reliable	✓	Quick	
Valid in GP*		No Equipment	
Valid in AP**	✓	Free	✓
Used in AP**	✓	Well known	
		Easy for patients	

*GP=General population research

**AP=Limb Absence population research



Additionally this measure was devised specifically for the patient group.

From the summary papers used to inform this toolbox there are several references to the AMPPRO and the AMPnoPRO. The AMPPRO is included in the BACPAR Toolbox version II and the Delaware review paper (Sions, Beisheim and Seth, 2020) due to good construct and concurrent validity and test-retest reliability and interrater reliability.

The AMPnoPRO is included in the United States department of defence, Clinical Assessment Management Portal (Munyoki, Campbell and Crunkhorn, no date) due to its validity and the systematic review of outcome measures for vascular amputees (Essop-Adam et al., 2023) conducted by researchers at the University of Leicester.

The review assessed the quality and suitability of existing performance-based outcome measures as clinic measures for vascular amputees. The AMPnoPRO was identified as one of four outcome measures suitable for non-ambulatory amputees. It is also included in the Consensus Outcome Measures for Prosthetic and Amputation Services (COMPASS) developed by the International Society of Prosthetics and Orthotics (ISPO) in 2021. The COMPASS was created as a standardised set of outcome measures to use before and after treatment of people with lower-limb absence, to assess both current status and changes over time.

Within this framework, the AMPnoPRO is one of the six recommended assessments in the standard COMPASS assessment battery of tests.

Areas of discussion/additional information and research gaps

- Large-scale evaluations of validity have been limited. Systematic review identified a lack of newer studies verifying measurement stability across diverse rehabilitation settings (Balk et al., 2018).
- Validation data primarily originate from unilateral transtibial amputees who are prosthetic wearers with a stronger focus on AMPPRO.
- Further psychometric work is needed to evaluate AMPnoPRO's validity and reliability in dysvascular and geriatric populations, to establish normative reference values, and to determine responsiveness to rehabilitation interventions. Longitudinal validation studies linking AMPnoPRO scores to prosthetic outcomes and community mobility would strengthen its clinical utility as both an assessment and predictive tool.
- Much of the data available combines the AMPnoPRO and the AMPPRO together, although participants are often prosthetic users and separate/ sufficient data for AMPnoPRO is not available.
- **Although the AMPnoPRO is endorsed for pre-prosthetic assessment, its predictive accuracy for long-term ambulation and prosthesis use is less well established. Correlations with future MFCL level assignment are moderate, and few longitudinal studies have verified its prognostic performance beyond early rehabilitation.**

Research Information

Please be aware that much of the following is reported as including the AMPnoPRO alongside the AMPPRO and the analysis was not separated. As a result, the reliability and validity of AMPnoPRO cannot be evaluated independently, limiting confidence in conclusions regarding its psychometric properties.

Check Box	Score	Comment	Reference
Reliability		Not established ^Missing UK amputee data	
Validity	R=67 P.001 Construct Validity	In unilateral amputees when compared with the amputee activity survey ^Missing UK and amputee data	(Gailey et al. 2002)
Minimal clinically important difference		Not established ^Missing UK and amputee data	
Minimal detectable change	3.4 points *only for AMPPRO	Lower-limb amputee prosthetic wearers ^Missing UK and amputee data	(Resnik and Borgia, 2011)
Repeatability	ICC=0.97	Lower-limb amputee prosthetic wearers ^Missing UK and amputee data	(Gailey et al. 2002)
Normative values	K1 9.7 K2 25.3 K3 31.4 K4 38.5	Lower-limb amputee prosthetic wearers ^Missing UK and amputee data	(Gailey et al. 2002)

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7 Montreal Cognitive Assessment

Summary: Popular cognition test

The MoCA is a widely used cognitive screening tool designed to detect mild cognitive impairment (MCI) and early dementia. It assesses multiple domains including memory, attention, executive function, language, and visuospatial skills.

At a glance

Short name:
MoCA

Measures:
Cognitive function across multiple domains

Administration time:
15 minutes (longer if cognition poor)

Test type:
Paper and pen based task, clinician administered

Format:
30-point scale, various tasks

Interpreting:
Higher scores indicate greater cognition
>26/30 normal cognition

Validated in:
Older adults, stroke, Parkinson's disease, dementia, type 2 diabetes, MCI and multiple medical populations

MOCA is available in 100 languages. Scores may be affected by the ethnicity of the patient. This is a screening tool only, not diagnostic; must be interpreted with clinical history and other tests. Please note that according to the MoCA® website only a health professional with expertise in the cognitive field may interpret the results.

How to perform the measure:

1. Ensure the patient is in a quiet space to complete the tasks.
2. Explain the aim to patients: E.g. *“This is a brief test of your thinking abilities. It includes tasks such as remembering words, drawing shapes, and answering questions. Just do your best.”* You may also advise how it will be used such as *“to guide prosthetic prescription”*.
3. Read the instructions on the administration and scoring instructions sheet as they are written (you might want to highlight the words for easier administration).
4. Score each task according to its indicated scoring rules.

If a patient asks why they are completing the MoCA partway through the assessment, it is recommended that the test be completed before providing an explanation. You can reassure the patient that any questions will be answered once the assessment is finished.

For anxious, angry, confused patients the assessment may take longer than 15 minutes .

How to interpret the measure:

- Total the score (0-30).

Cut-offs:

- Scores of 26 or more indicate no impairment.
- 18-25 = This indicates mild cognitive impairment.
- 10-17 = This indicates moderate cognitive impairment.
- Less than 10 = This indicates severe impairment.

It is essential that the MoCA is used in conjunction with other assessments.

How to Record in Notes

When reporting MoCA results, include: scores for each domain, total score and cut off.

Important information for use of this outcome measure

Pros

- Sensitive for early detection of cognitive decline
- Multiple cognitive domains
- Valid in many populations

Cons

- Licensing required
- Screening only
- Time to complete
- Outcome may be influenced by cultural and educational factors

Advice for use

- Ensure administered in a distraction free environment
- Three versions available in English to reduce repetition bias

Words of caution

- Do not diagnose dementia or MCI based on MoCA score alone.

Your printout

The Montreal Cognitive Assessment® (MoCA) is protected by international copyright. It cannot be reproduced or distributed without permission and therefore is not included here.

- Clinicians are no longer required to register but can receive official training, there may still be licensing, registration, training, or permission requirements.
- Authorised paper forms are available in multiple languages through the MoCA website
- A printable version of the scale can be found here: <https://geriatrictoolkit.missouri.edu/cog/MoCA-8.3-English-Test-2018-04.pdf>.
- Versions are also available for those with visual or hearing impairment and those with a lower reading levels.

Background

The MoCA was developed in 1996 by Dr. Ziad Nasreddine in Montreal, Canada, and first published in 2005. It was designed to improve sensitivity in detecting mild cognitive impairment compared to the MMSE. The MoCA has since become one of the most widely used cognitive screening tools globally, with over 100 language versions and validation in diverse populations.

Frengopoulos et al (2017) conclude that there is a statistically significant association between functional mobility and MoCA scores. But comment that this “does not indicate a need to exclude them from rehabilitation on the basis of cognitive impairment alone”.

Justification for inclusion in Toolbox

This test was selected by the working group due to the following criteria:

Research Led		Clinically Suitable	
Reliable	✓	Quick	
Valid in GP*	✓	No Equipment	✓
Valid in AP**		Free	
Used in AP**		Well known	✓
		Easy for patients	✓

*GP=General population

**AP =Limb Absence population



Areas of discussion/additional information and research gaps

- Although the MoCA is widely validated in neurological and general older adult populations, validation in individuals with limb absence remains limited. With no established normative values for this population.
- MoCA-Basic differs from the standard MoCA because it was developed to reduce the influence of literacy and educational attainment on test performance.
- No studies to date have comprehensively examined the measurement properties of MoCA in lower limb amputees, particularly in relation to functional outcomes or prosthetic rehabilitation. Existing evidence suggesting associations between cognitive status and mobility has not yet been supported by large-scale or longitudinal MoCA-specific analyses.
- The stability and responsiveness of MoCA scores for tracking cognitive changes associated with recovery, adaptation, or prosthetic training, have not been explored.

Research Information

	Score	Comment	Reference
Reliability	Cronbach's alpha = 0.908	Internal consistency in Vascular patients in Portugal ^Missing UK and amputee data	(Freitas et al., 2012)
Validity	$r = -0.13$ to 0.43 Convergent Validity	In 50+ year olds in USA Alzheimer's centres against a variety of measures ^Missing UK and amputee data	(Ang et al., 2023)
Minimal clinically important difference		Difficult to standardize as dependant on patient group and wider analysis of patient	
Minimal detectable change		Difficult to standardize as dependant on patient group and wider analysis of patient	
Repeatability	Cronbach's Alpha = 0.83	Patients with mild Alzheimer's ^Missing UK and amputee data	(Nasreddine et al., 2005)
Normative values	26 points	Considered the score for no impairment, apply caution interpreting in multicultural populations and educational levels ^Missing UK and amputee data	MoCA® website and (Rossetti et al., 2011)

*please note greatest validity has been found when using the 6-dimensional structure (Freitas et al., 2012)

References/further reading

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8 Rapid Clinical Test for Delirium Detection

Summary: Research-led cognitive test

The 4AT is a short structured tool to detect delirium and cognitive impairment in hospitalised patients. It does not require special training and can be used by any health professional.

At a glance

Short name:
4AT

Measures:
Delirium and cognitive impairment

Administration time:
<2 minutes

Test type:
Bedside test, clinician administered

Format:
4 domain scores

Interpreting:
Higher scores indicate suggest presence of delirium, and further assessment is needed

Validated in:
Acute care, older adults, stroke, surgical populations

How to perform the measure:

1. Ensure the patient is in a quiet space to complete the tasks.
2. Ensure you are able to record results either directly on test sheet or notes to apply to test.
3. Observe patient for alertness, if they are asleep attempt to wake them by speaking to them or with a gentle touch of the shoulder.
4. Patient should be asked to state their name and address.
5. Ask patient to speak out loud each of the following:
 - a) Age
 - b) Date of birth
 - c) Name of hospital/ location they are currently
 - d) Current year

Note correct answers.

6. Ask the patient *“Please tell me the months of the year in backwards order, starting at December.”* (If they struggle you can give the additional prompt *“what is the month before December?”*).

Note the number of correct answers.

7. Consider your experience of the patient, and review notes and comments from others who know the patient (including family and clinicians). Consider the last two weeks, has there been an acute change or fluctuations in any of the following;
 - a) Patient cognition (ability to understand what is happening around them)
 - b) Patient delirium (moments of confusion or lack of attention)
 - c) Other mental functions of the patient

Note if any changes have still been evident in the last 24 hours.

Scoring the measure:

1. Alertness

If alertness is normal throughout the assessment (without agitation), or if they show mild sleepiness for 10 seconds after waking consider this normal and score 4. If clearly abnormal, or if patient shows a significantly altered alertness (especially in a hospital setting) score 0.

2. Abbreviated Mental Test

If no mistakes score 4.

If 1 mistake score 3.

If 2 or more mistakes or if the patient cannot be tested or engage in the test score 0.

3. Attention

If they achieve 7 or more months in the correct order score 4.

If they achieve less than seven months in the correct order or refuse (verbally or otherwise) to perform the test score 0.

If they cannot start due to being unwell, drowsy, inattentive, not able to engage, score 0.

4. Acute Change - THIS CANNOT BE SCORED WITHOUT A RELIABLE HISTORY FOR REFERENCE

If no acute change or fluctuation noted, score 0.

If any acute change or fluctuation noted, score 4.

How to interpret the measure

- **0:** Delirium unlikely, but possible cognitive impairment.
- **1–3:** Possible cognitive impairment.
- **4+:** Possible delirium (+/– cognitive impairment).

Scores guide further assessment, not a diagnosis alone.

How to Record in Notes

When reporting 4AT results, include: total score, item breakdown, clinical context.

Important information for use of this outcome measure

Pros

- Very quick
- No special training needed
- Validated in multiple settings

Cons

- Screening only
- Requires patient participation

Advice for use

- Use as part of routine intake for 65+ and those at high risk
- Repeat if new suggestion of delirium

Words of caution

- False positives possible in patients with dementia without delirium.

Your printout

The 4AT© is available free of charge for clinical, educational, and research use. It is copyright to Prof. Alasdair MacLulich and colleagues. No license or fee is required. A link to a printable version of the scale can be found here: <https://www.the4at.com/4at-download>

Background

Developed in 2011 by MacLullich et al. in Edinburgh, the 4AT was designed to provide a rapid delirium screening tool for acute settings, prompted by a wide-spread under diagnosis of delirium in busy clinical environments. The 4AT allows quicker assessment with less training compared to previous test and allows scoring even if patient is unable to respond to questions in the test. It has since been validated internationally and recommended in guidelines such as the UK National Institute for Health and Care Excellence (NICE, 2018). . Amputees without a prosthesis rely entirely on safe transfers, early bed mobility, and balance training. Delirium stops a patient from focusing, following safety cues, or cooperating with a physical therapist. This puts them at high risk for falls and slows down their recovery.

Justification for inclusion in Toolbox

This test was selected by the working group due to the following criteria:

Research Led		Clinically Suitable	
Reliable	✓	Quick	✓
Valid in GP*	✓	No Equipment	✓
Valid in AP**		Free	✓
Used in AP**		Well known	✓
		Easy for patients	✓



*GP=General population

**AP =Limb Absence population

Areas of discussion/additional information and research gaps

- Although the 4AT is now widely validated across hospital, surgical, and geriatric populations, its validation in individuals with limb absence or post-amputation contexts remains extremely limited. No published studies have specifically used the 4AT in amputee cohorts.
- The potential influence of pain, phantom sensations, or medication regimens on 4AT scores remains unexamined.
- While NICE (2023) endorses the 4AT as the preferred delirium assessment tool for most clinical settings, it also highlights a need for further research into diagnostic accuracy and usability across diverse patient groups.

Research Information

	Score	Comment	Reference
Reliability	Cronbach's alpha = 0.80	Older hospitalized patients in two hospital settings in Italy ^Missing UK amputee data	(Bellelli et al., 2014)
Validity	R=75 Construct Validity	Older hospitalized patients in two hospital settings in Italy Validated against Confusion Assessment Method–Severity ^Missing UK and amputee data	(Bellelli et al., 2014)
Minimal clinically important difference		Not considered relevant for this measure	
Minimal detectable change		Not considered relevant for this measure	
Repeatability	ICC =0.998	Older adults admitted to Thai general medical ward ^Missing UK and amputee data	(Kuladee and Prachason, 2016)
Normative values		Not considered relevant for this measure as most adults should score 0	

References/further reading

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9 Clinical Frailty Scale

Summary: Popular frailty test

The CFS is a 9-point scale assessing frailty based on overall fitness, comorbidities, function and cognitive status. It is quick, relies on clinical judgement, and is widely used in geriatrics and acute medicine.

At a glance

Short name:
CFS

Measures:
Frailty

Administration time:
<2 minutes

Test type:
Assessment clinician rated

Format:
9-point pictorial scale with descriptive anchors

Interpreting:
Higher scores indicate more frail

Validated in:
Older adults, critical care, surgical populations

How to perform the measure

1. Please note this is a quick test.

2. Talk to the patient and their carers/family asking probing questions. Ask how, over the last two weeks, they have found the patient's:

- Movement
- Functional ability
- Thoughts
- Felt about their health

3. Ask about their activity levels.

- If you can, note down what medication the patient is taking. This may be vital information if you later refer the patient to another department.

4. Note that the score is based on function 2 weeks before acute illness.

5. Review categories and assign level to patient.

People's abilities can be different, even within the same level on the CFS scale. Most people (about 80% or more) will match the description for each level, but not everyone fits perfectly. If a person seems to fit two levels equally, it's usually best to choose the higher, more dependent level. Clinicians should also remember that there may be some differences in how the scale is judged in certain situations...

The Chartered Society of Physiotherapists have created resources to support the use of the CFS <https://agile.csp.org.uk/system/files/documents/2021-05/CFS.pdf>

How to interpret the measure			
1	VERY FIT	Patients are robust and active, energetic and motivated	➔
2	FIT	Patients have no active disease symptoms, they are less active than category 1	
3	MANAGING WELL	Patients' medical problems are well controlled, they are not regularly active	➔
4	VERY MILDLY FRAIL	Patients' medical problems are well controlled, they are not dependent on others	
5	MILDLY FRAIL	Patients need help with high order instrumental activities of daily living	➔
6	MODERATELY FRAIL	Patients need help with all outside activities and with keeping house	
7	SEVERELY FRAIL	Patients are completely dependent for personal care but not at high risk of dying	
8	VERY SEVERELY FRAIL	Patients are completely dependent for personal care and approaching end of life	
9	TERMINALLY ILL	Patients are approaching end of life, but are not otherwise living with severe frailty	
			CFS 1-2 FIT PATIENTS
			CFS 3-4 VULNERABLE PATIENTS
			CFS 5-9 MILDLY TO SEVERELY FRAIL PATIENTS

Figure 1 Table taken from study in diabetic amputees (Tillqvist et al., 2025)

Used as a prognostic marker and for risk stratification.

How to Record in Notes

When reporting CFS results, include: total score and clinical context.

Important information for use of this outcome measure

Pros

- Very quick and easy
- Strong prognostic value of outcome
- Widely validated

Cons

- Requires some clinical experience for consistent use
- Subjective element to scoring
- Some studies indicate only valid in those aged 65+

Pro Tips

- Always base score on baseline/pre-admission function
- Use alongside objective frailty measures if available

Words of caution

- Misclassification possible if acute illness or temporary disability is mistaken for baseline.
- Do not use alone to make decisions on treatment escalation or ceilings of care.

Your printout

A link to a printable version of the scale can be found here: https://www.bgs.org.uk/sites/default/files/content/attachment/2018-07-05/rockwood_cfs.pdf, no license or fee is required.

Background

The CFS was developed as a seven-point scale in 2005 as part of the Canadian Study of Health and Aging by Rockwood et al. During the initial phase of the global pandemic, this tool saw extensive use. In 2020, a revised version (2.0) was released, which introduced minor amendments to the descriptions and labels for each level. For instance, CFS level 2 shifted from "Well" to "Fit", level 4 became "Living with Very Mild Frailty" instead of "Vulnerable", and levels 5 to 8 were rephrased as "Living with..." mild, moderate, severe, and very severe frailty. Importantly, the scale offers an overarching assessment of frailty, factoring in comorbidities, functional status, and cognitive function. It has been widely validated and is now used internationally in geriatrics, critical care, and surgery.

Justification for inclusion in Toolbox

This test was selected by the working group due to the following criteria:

Research Led		Clinically Suitable	
Reliable	✓	Quick	✓
Valid in GP*	✓	No Equipment	✓
Valid in AP**		Free	✓
Used in AP**	✓	Well known	✓
		Easy for patients	✓

*GP=General population

**AP =Limb Absence population



This is well used in those aged 65+ but there are limited identified frailty scales for younger individuals. However, for clinical purposes it is the most suitable for the patient group in the experience of those in the working group.

Areas of discussion/additional information and research gaps

- The CFS is designed to help us understand frailty in older adults, and it hasn't been extensively tested or validated for use with younger people. The score therefore may not have the same implication for younger amputees.
- In diabetic amputees, one study showed that CFS is a significant predictor of overall survival (how long the patient is likely to live), amputation-free survival (how long the patient is likely to survive without needing another amputation), and leg salvage (how long the patient is likely to avoid needing a revision surgery) (Tillqvist et al., 2025).
- The subjective nature of the CFS means it relies heavily on the assessor's clinical judgment, which can introduce variability between raters, particularly in multidisciplinary settings with differing levels of frailty assessment experience.

Research Information

	Score	Comment	Reference
Reliability	ICC = 0.97, p<0.001	Older adults in Canada, as part of the Canadian Study of Health and Aging (CSHA) ^Missing UK amputee data	(Rockwood, 2005)
Validity		Criterion validity and construct validity. Older adults in Canada, as part of the Canadian Study of Health and Aging (CSHA) ^Missing UK and amputee data	(Rockwood, 2005)
Minimal clinically important difference		Not considered relevant for this measure	
Minimal detectable change		Not considered relevant for this measure	
Repeatability	ICC = 0.78	Emergency department patients aged 65+ Higher score reported by scale creator ^Missing UK and amputee data	(Rockwood, 2005; Hörlin et al., 2022)
Normative values		Not considered relevant for this measure	

References/further reading

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10 Glossary

Proms

- Patient reported outcome measures.

CoR

- Coefficient of Reproducibility.
- A measure of how consistent the results are when a test or measurement is repeated under the same conditions.

Reliability

- How consistent a test is when repeated under the same conditions.
- A reliable test gives similar results each time if nothing has changed.

Inter-rater Reliability = How consistent scores are when different clinicians use the same test on the same patient.

Intra-rater Reliability = How consistent scores are when the same clinician repeats a test under the same conditions.

Validity

- How well a test measures what it is supposed to measure.
- A valid pain scale truly measures pain intensity, not anxiety, fatigue, or other factors.

Construct validity = the test reflects the concept it's meant to measure.

Convergent validity = it agrees with other tests measuring the same thing.

Responsiveness

- The ability of a measure to detect clinically meaningful change over time.

Minimal Clinically Important Difference (MCID)

- The smallest change in a score that patients perceive as important, a difference that means something has genuinely improved (or worsened).

Minimal Detectable Change (MDC)

- The smallest change that reflects a real difference beyond random variation or measurement error.
- It tells you whether the change in score is likely due to true change, not just normal variation in testing.

Repeatability

- How well the same test produces consistent results when repeated by the same person under the same conditions.
- High repeatability means the test can be trusted to give similar results each time it's used correctly.

Normative Values

- Typical or average scores found in a healthy or general population, used for comparison.

Normative Data

- Average or expected values for healthy or general populations, used as reference points.

Ceiling/Floor Effect

- Occurs when a test cannot detect improvement (ceiling) or decline (floor) because many scores are already at the top or bottom limits.

Feasibility

- How practical the test is in clinical settings (time, equipment, training, patient tolerance).

Open Source

- Available to the public for free (especially referring to journal articles).



11 Additional information

Working group

This toolbox was created with thanks to the work of the working group:

Miranda Asher - BACPAR Research Officer, Lauren Young - BACPAR Research Officer, Amirah Essop-Adam -Research Physiotherapist Leicester, Kimberley Fairer, Specialist Physiotherapist London, Caroline Hardan - Specialist Physiotherapist Bristol, Moira Rahmanzadeh-Asl - Clinical Lead Physiotherapist Wrexham Park, Helen Saunders - Specialist Physiotherapist London, Siobhan Strike - Biomechanics Researcher, Callum Telford - Senior Physiotherapist Stafford, Chris Walker - Physiotherapist Dublin Ireland, Sarah-Louis Wainscot - Complex Trauma Physiotherapist Stanford.

Additional external reviewers:

Chantel Ostler, Hayley Graham, Katherin Atkin.

Development process

This iteration of the toolbox was created from the following process

- An initial BACPAR membership survey identifying need for broader range of patient groups .
- World café discussions with members at conference identifying need for domain lead selection criteria.
- Identification of summary articles which had already preformed systematic literature review of amputee outcome measures.
- Working group discussions on the gaps and needs for clinicians concluding:
 - Preferred patient subgroup for initial development- Adult with lower limb absence who are non-prosthetic users. -Prioritising 5-6 domains.
 - Domains to prioritise were decided based on patient subgroup. (highlighting potential relevance of other domains for other groups):
 - Pain, Quality of Life, Function, Cognition, Frailty.
- Criteria for outcome measures to be assessed for suitability defined.
- Suitable tests identified from reviewed articles.
- Working group submitted recommendations for each domain based on research as well as in-clinic experience.
- Working group voted on outcome measures for research criteria and popularity.
- Working group discussed presentation of Toolbox and key aims.
 - Easy to understand.
 - Easy to use in clinic when time is short.
 - Option for those who want quick reference guide as well as option for those interested in research and gaps.
- Photos and videos composed for functional outcome measures.
- Content edited and layout designed, working group and wider review.
- Final review from BACPAR executive board with recommended edits.

Scope and limitations

- The toolbox currently focuses on adults with lower limb absence and may require adaptation for upper-limb amputees, children, or patients with complex comorbidities.
- Many measures have strong general validation but limited amputee-specific evidence, meaning caution is needed when interpreting results outside studied populations.
- Some measures may not be sensitive to small changes in early rehabilitation or acute hospital settings.
- Language and cultural adaptations may affect scoring and interpretation; validated translations should be used where available.
- Technological versions (e.g., app-based scoring tools) can improve consistency but must use the same scoring criteria as paper forms.
- The toolbox is a living document — ongoing updates are encouraged as new evidence emerges, including psychometric testing in amputee cohorts.
- Toolbox covers a mix of generic, psychological, functional, and amputee-specific measures.
- Toolbox is intended as a practical guide for clinicians, not a prescriptive list.
- Some measures require licensing or permissions.
- The Toolbox does not replace clinical judgment.
- This was not performed as a Delphi process and remains a working document.

How to use the Toolbox

- The toolbox is primarily designed for clinical use.
- The toolbox is modular and clinicians can select outcome measures relevant to their domain (e.g., Pain, Quality of Life, Function, Cognition, Frailty) and patient subgroup.
- The toolbox is a living document and this current iteration is aimed at current non prosthetic wearing adult lower limb amputees. As the toolbox expands a wider range of patient groups will be incorporated.
- Measures can be selected depending on stage of rehabilitation (acute, pre-prosthetic, prosthetic training, long-term community).
- Clinicians should aim to combine a mix of patient-reported, performance-based, and global health measures.
- Before use, clinicians should check licensing requirements for each measure (some require permission or registration).
- Results can inform both individual treatment planning and service-level audit or research if used consistently.
- When possible, link outcomes to national frameworks (e.g., BACPAR, ISPO, NICE recommendations) to support shared learning and standardisation.
- The toolbox also aims to highlight gaps in research for patient populations relevant to BACPAR members.
- Consistency across services is encouraged to support benchmarking and research.

Key References

The 2025 working group used the following documents to assist in initial identification of relevant outcome measures:

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Munyoki, B., Campbell, S. and Crunkhorn, A. (no date) 'DOD Outcome Measures Guidebook for Amputation Care'. U.S. Government. Available at: <https://www.health.mil/Reference-Center/Presentations/2024/06/20/DOD-Outcome-Measures-Guidebook>

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Acknowledgements

- We would like to thank the Chartered Society of Physiotherapy for funding this project through their professional networks fund.
- Thanks to service users, clinical experts, and reviewers who contributed, especially BACPAR members and the working group.