

Table 2. General information on the outcome measures under study

Author	Aim	Primary outcome(s) measure	Comparison	Sample selection	Number of subjects (≥20) Nb. "?" means unclear. [Total eligible/total accepting/total providing data]	Mean age (y)	Etiology	Level of amputation	Time from amputation or other milestone (mean unless stated otherwise)
MOBILITY MEASURES: GENERIC									
Schoppen et al., 1999	Inter- and intrarater reliability and validity of the timed up and go test with elderly amputees	Timed up and go test	SIP and GARS	Prospective, single center, O/P	?/32/32	73	Vascular, 100%	TTA, 84% TFA, 16% Bilat excluded	Unclear
Brooks et al., 2001	Construct validity and responsiveness of 2MWT as measure of function	2 Min TWT	SF-36 (PFS) and Houghton	Retrospective, convenience, single center, I/P	290 (197-56) Lack of intact data	66	Vascular, 67% Other, 33%	TTA, 62% TFA, 21% Bilat, 17%	At fitting T1, 48 hours prior to d/c T2, 3 months post d/c T3
Datta et al., 1996	Does 10 MWT assess outcome in amputees	10 m TWT	Barthel, FAI, Volpicelli Mobility Grading	Prospective, convenience, single center, O/P	53, 53, 53	70	PAD, 81% Trauma, 11% Other, 8%	TTA, 50% TFA, 50% No bilat	6 months to 10 y post amp
MOBILITY MEASURES: AMPUTEE-SPECIFIC									
Gatley et al., 2002	Development, reliability and validity of the AMP	AMPPro	6 min TWT, comorbidity index, age, time since amputation	Convenience, prospective, multicenter, I/P and O/P	?/?/167	55	Vascular, 46% Trauma, 37% Tumor, 14% Other, 17%	Validity study: TTA, 49% TFA, 40% Bilat excluded	119 months
Franchignoni et al., 2004	Reliability, validity, and responsiveness of LCI	LCI	RMI, 10 meter (m) TWT, FIM	Prospective, consecutive, 3 center, I/P	50 included, 50 participated	51	Vascular, 32% Trauma, 58% Other, 10%	TTA, 40% TFA, 60% No bilat	Median months from surgery, 7
Gauthier-Gagnon et al., 1998	Content validity and internal consistency of LCI and define underlying dimensions	LCI	No comparison	Prospective, multicenter, O/P	?/89/70	60	Vascular, 70%	TTA, 50% TFA, 42% Bilat excluded	Between 1 and 5 y post d/c
Treweek and Condie, 1998	To compare Barthel Index (BI), Russek's classification, and LCI	LCI	BI and Russek	Convenience, multicenter, O/P	?/938/938	67	Vascular, 87% Trauma, 5% Tumor, 2%	TTA, 74% TFA, 26% Bilat excluded	At d/c

(Table continues)

Table 2. Continued

Author	Primary outcome(s)	Aim	Comparison	Sample selection	Number of subjects (≥ 20) Nb. "?" means unclear. [Total eligible/total accepting/total providing data]	Mean age (y)	Etiology	Level of amputation	Time from amputation or other milestone (mean unless stated otherwise)
Miller et al., 2001	LCI	Comparison of reliability and validity of Houghton, LCI and PEQ mobility subscale	2 Min TWT, TUG and ABC scale	Single center, consecutive, O/P	For reliability study (Study 1), 55 of 76; for validity study (Study 2), 329 of 427	Study 1 = 58 Study 2 = 60	Study 1: Vascular, 55% Other, 45% Study 2: Vascular, 53% Other, 47%	Study 1: TTA, 72% TFA, 28%; Study 2: TTA, 74% TFA, 26%; Bilat excluded	Study 1: 7 y (mean); Study 2: 16 y (mean)
Franchignoni et al., 2004	LCI 5	Reliability, validity and responsiveness of LCI	RMI, 10 m TWT, FIM	Prospective, consecutive, 3 center, I/P	50 included, 50 participated	51	Vascular, 32% Trauma, 58% Other, 10%	TTA, 40% TFA, 60% No bilat	Median months from surgery, 7
Treweek and Condie, 1998	Russek's classification	To compare BI, Russek's classification, and LCI	BI and LCI	Convenience, multicenter, O/P	?/938/938	67	Vascular, 87% Trauma, 5% Tumor, 2%	TTA, 74% TFA, 26% Bilat excluded	At d/c
Ryall et al., 2003	SIGAM mobility grades	To develop a valid measure of mobility suitable for routine use, including monitoring change	RMI and TWT	Prospective, single center, O/P	For reliability study, ?/?/62; for validity study, ?/?/200. Data from a sensitivity study were excluded because it involved only 20 patients.	57	For reliability study, Vascular, 32% Trauma, 39% Tumor, 6% Other, 23%; for validity study, Vascular, 32% Trauma, 40% Tumor, 8% Other, 20%	For reliability study: TTA, 56% TFA, 47%; For validity study, TTA, 57% TFA, 41%; Bilat included in both studies	Mean of 5 y post-fitting for reliability study; mean of 18 y for validity study
MOBILITY MEASURES: NOT AMPUTEE-SPECIFIC									
Franchignoni et al., 2003	Internal consistency, validity, responsiveness, and test scalability of RMI		FIM and 10 m TWT	Prospective, consecutive (70 "randomly selected" from Gp 1 = Gp 2), multicenter, ?/I/P (free-standing rehab centers)	140 eligible, 140 (Gp 1) included and participated with RMI, 70 (Gp 2) participated with RMI, FIM, and TWT	57	Vascular, 53% Trauma, 32% Other, 15%	TTA, 42% TFA, 58% No bilat	T0, "at beginning rehab"; T2, "at end of rehab"

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Table 2. Continued

Author	Aim	Primary outcome(s) measure	Comparison	Sample selection	Number of subjects (≥ 20) Nb. "?" means unclear. [Total eligible/total accepting/total providing data]	Mean age (y)	Etiology	Level of amputation	Time from amputation or other milestone (mean unless stated otherwise)
Ryall et al., 2003	Reliability, concurrent and construct validity of the RMI	RMI	TWT (10 m + 180° turn + 5 m)	Convenience, single center, O/P	??/62 for reliability study, ??/200 for validity study	57	For reliability study, Vascular, 32% Trauma, 39% Tumor, 6% Other, 23%; for validity study; Vascular, 32% Trauma, 40% Tumor, 8% Other, 20%	For reliability study, TTA, 56% TFA, 47%; For validity study, TTA, 57% TFA, 41%; Bilat included in both studies	Mean of 5 y post-fitting for reliability study; mean of 18 y for validity study
Traballesi et al., 1995	Results of prosthetic fitting in elderly patients with nontraumatic TFA	RMI	Primarily regression analysis against BI; battery of other tests	Prospective, consecutive, single center, I/P	55	74	Vascular, 100%	TFA	114 days from amputation
FUNCTION: GENERIC									
Treweek and Condie, 1998	To compare BI, Russek's classification, and LCI	BI	Russek and LCI	Convenience, multicenter, O/P	??/938/938	67	Vascular, 87% Trauma, 5% Tumor, 2%	TTA, 74% TFA, 26% Bilat excluded	At d/c
Leung et al., 1996	To determine the value of FIM as a prognostic indicator for prosthetic use	FIM	Houghton	Prospective, consecutive, single center, I/P	??/41/33	Range 50-89	Vascular, 70% Tumor, 30%	TTA, 72% TFA, 24% Bilat included	Within 48 hours of admission and at d/c for FIM, between 3 months and 1 y after d/c for Houghton
Panesar et al., 2001	Responsiveness to change and validity of FIM, OPCS, and AAS	FIM	Comparison with other outcomes (e.g., length of stay)	Consecutive, single center, I/P	??/51/34	67 (median)	Vascular, 100%	TTA, 41% TFA, 50% Bilat included	At d/c and 8 weeks post d/c; time from amp not stated
Panesar et al., 2001	Responsiveness to change and validity of FIM, OPCS, and AAS	OPCS	Comparison with other outcomes (e.g., length of stay)	Consecutive, single center, I/P	??/51/34	67 (median)	Vascular, 100%	TTA, 41% TFA, 50% Bilat included	At discharge and 8 weeks post d/c; time from amp not stated

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Table 2. Continued

Author	Aim	Primary outcome(s) measure	Comparison	Sample selection	Number of subjects (≥20) Nb. "?" means unclear. [Total eligible/total accepting/total providing data]	Mean age (y)	Etiology	Level of amputation	Time from amputation or other milestone (mean unless stated otherwise)
FUNCTION: AMPUTEE-SPECIFIC									
Panesar et al., 2001	Responsiveness to change and validity of FIM, OPCS, and AAS	AAS	Comparison with other outcomes (e.g., length of stay)	Consecutive, single center, I/P	?/51/34	67 (median)	Vascular, 100%	TTA, 41% TFA, 50% Bilat included	At d/c and 8 weeks post d/c; time from amp not stated
Callaghan et al., 2002	Test retest reliability	FMA	n/a	Prospective, convenience, multicenter, O/P	Total eligible, 390; meeting criteria, 359; number consenting, 155; number responding, 133;	68	Vascular, 83% Trauma, 15% Other, 12%	TTA, 100% No bilat	Greater than 1 y post d/c from rehab
Devlin et al., 2004	Houghton : test-retest, responsiveness, sensitivity (floor and ceiling effects) (Gp 1); reliability and construct (convergent) validity (Gp 2).	Houghton	2 Min TWT and SF-36	Prospective, convenience, single center (poss. m/c as regional), O/P	Group 1, n = 49, 49. Group 2, n = 76, SF-36 n = 55 at d/c; "insufficient data at follow up." 2 min walk test, n = 61 at d/c and n = 56 at follow-up (data at both points, n = 50)	Gp 1, 61 Gp 2, 66	Gp 1: Vascular, 54% Other, 46%; Gp 2: Vascular, 82% Other, 18%	Gp 1: TTA, 68% TFA, 20% Other, 4% Bilat, 8%; Gp 2: TTA, 25% TFA, 10% Other, 4% Bilat, 61%	Gp 1: "Long standing users"; Gp 2: at d/c from initial rehab and 3 months later
Miller et al., 2001	Comparison of reliability and validity of Houghton, LCI and PEQ mobility subscale	Houghton	2 min TWT, TUC and ABC scale	Single center, consecutive, O/P	For reliability study (Study 1), 55 of 76; for validity study (Study 2), 329 of 427	Study 1, 58; Study 2, 60	Study 1: Vascular, 55% Other, 45%; Study 2: Vascular, 53% Other, 47%	Study 1: TTA, 72% TFA, 28%; Study 2: TTA, 74% TFA, 26%; Bilat excluded	Study 1, 7 y (mean); Study 2, 16 y (mean)
Streppel et al., 2001	To evaluate d/c status and maintenance of physical function at 2 months post d/c	PPA	SIP	Prospective, multicenter, O/P	50	61	Vascular, 74% Trauma, 16% Other, 10%	TTA, 48% TFA, 20%	165 days from surgery

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Table 2. Continued

Author	Aim	Primary outcome(s)	Comparison	Sample selection	Number of subjects (≥20) Nb. "?" means unclear. [Total eligible/total accepting/total providing data]	Mean age (y)	Etiology	Level of amputation	Time from amputation or other milestone (mean unless stated otherwise)
FUNCTION: NOT AMPUTEE-SPECIFIC									
Miller et al., 2004	Reliability and validity of original and modified FAI for LLA	FAI	TUG, Activity-specific Balance Confidence Scale, PEQ - Mobility Scale	Consecutive, prospective, single center, O/P	97/84	57	Traumatic, 60% or Vascular, 40%	Unilateral: TTA, 71% TFA, 31% Bilat excluded	>6 months post-delivery prosthesis
Miller et al., 2004	Reliability and validity of original and modified FAI for LLA	FAI 18	TUG, Activity-specific Balance Confidence Scale, PEQ - Mobility Scale	Consecutive, prospective, single center, O/P	97/84	57	Traumatic, 60% or Vascular, 40%	Unilateral: TTA, 71% TFA, 31% Bilat excluded	>6 months post-delivery prosthesis
QUALITY OF LIFE: GENERIC									
Callaghan et al., 2002	Adapt PGI for use with LLA, test-retest reliability and construct validity	PGI	SF-12	Prospective, multicenter, convenience, O/P	Total 90, 85 included, 43 consented (51%), 42 for assessment 1, 39 for assessment 2	69	Vascular, 90% Other incl. Trauma, 10%	TFA No bilat	More than 1 y from d/c from rehabilitation
Pezzin et al., 2000	To examine the long-term outcomes of trauma-related amputations	SF-36	No comparison	Prospective, single center, convenience, O/P	146/114/78	33 (at time of injury)	Trauma, 100%	TTA, 51% TFA, 21% Bilat included	7.5 y
Mackenzie et al., 2004	To examine functional outcome after trauma-related LLA and to compare outcome by level	SIP	FIM and walking speed, scores by amputation level	Prospective, multicenter, I/P and O/P	?/161/124	Range, 18-69	Trauma	TTA, 68% TFA, 21%	3, 6, 12, and 24 months after injury
QUALITY OF LIFE: AMPUTEE-SPECIFIC									
Fisher and Hanspal, 1998	Do patients' attitudes to prosthesis and body image influence mobility with prosthesis	AALQ	HADS, Harold Wood/Stammore Scale and satisfaction with prosthesis rating by physician (1-4)	Prospective, convenience, single center, O/P	Total included 108, 107 consented and participated	56	Vascular, 40% Trauma, 35% Other, 25%	TTA, 60% TFA, 30% Other, 10%	Mean time from amp, 13.9 y (1-54 y)

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Table 2. Continued

Author	Aim	Primary outcome(s) measure	Comparison	Sample selection	Number of subjects (≥20) Nb. “?” means unclear. [Total eligible/total accepting/total providing data]	Mean age (y)	Etiology	Level of amputation	Time from amputation or other milestone (mean unless stated otherwise)
Rybarczyk et al., 1995	To test whether poor psychosocial adjustment is predicted by poor scores on the ARBIS and PSSS	ARBIS	Perceived social support, self-rated health, Centre for Epidemiologic Studies Depression Scale (CES-D), Quality of Life Scale (SF47), Prosthetist adjustment rating	Prospective, “random,” multicenter, O/P	112/100/95	52	Vascular, 47% Trauma, 38% Tumor, 10% Other, 5%	TTA, 55% TFA, 38% Other, 8% Bilat not given	17 y
Fisher and Hanspal, 1998	Do patients' attitudes to prosthesis and body image influence mobility with prosthesis	BIQ	HADS, Harold Wood/Stanmore Scale and satisfaction with prosthesis rating by physician (1–4)	Prospective, convenience, single center, O/P	Total included 108, 107 consented and participated	56	Vascular, 40% Trauma, 35% Other, 25%	TTA, 60% TFA, 30% Other, 10%	Mean time from amp, 13.9 y (1–54 y)
Hart, 1999	Reliability and validity of OPOT	OPOT	None	Prospective, consecutive, multicenter, O/P	840/Various	57	Vascular, 58% Trauma, 29%	TTA, 73% TFA, 19% Other, 8%	Fitting and 8 weeks post d/c
Harness and Pinzur, 2001	To obtain health-related quality-of-life data from nontraumatic TTA	PEQ	SF-36, SIP social interaction subscale, Profile of Mood States-short form	Prospective, random, multicenter, O/P	?/60/60	66	Vascular, 100%	TTA, 100% Bilat excluded	38 months (average)
Legro et al., 1998	Development, test-retest reliability, internal consistency, and criterion validity of PEQ	PEQ	SF-36, SIP social interaction subscale, Profile of Mood States-short form	Prospective, convenience, single center, O/P	126/114/92	Range, 20–87	Vascular, 41% Trauma, 67% Tumor, 1% Other, 3%	TTA, 63% TFA, 25%	>1 y from amputation
Miller et al., 2001	Comparison of reliability and validity of Houghton, LCI, and PEQ mobility subscale	PEQ mobility subscale	2 min TWT, TUG and ABC scale	Single center, consecutive, O/P	Reliability study (Study 1), 55 of 76; Validity study (Study 2), 329 of 427	Study 1, 58; Study 2, 60	Study 1: Vascular, 55% Other, 45% Study 2: Vascular, 53% Other, 47%	Study 1: TTA, 72% TFA, 28%; Study 2: TTA, 74% TFA, 26% Bilat excluded	Study 1, 7 y (mean); Study 2, 1.6 y (mean)

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Table 2. Continued

Author	Aim	Primary outcome(s) measure	Comparison	Sample selection	Number of subjects (≥20) Nb. "?" means unclear. [Total eligible/total accepting/total providing data]	Mean age (y)	Etiology	Level of amputation	Time from amputation or other milestone (mean unless stated otherwise)
Rybarczyk et al., 1995	To test whether poor psychosocial adjustment is predicted by poor scores on the ARBIS and PSSS	Perceived social stigma scale (PSSS)	Perceived social support, self-rated health, Centre for Epidemiologic Studies Depression Scale (CES-D), Quality of Life Scale (SF47), Prosthetist adjustment rating	Prospective, "random," multicenter, O/P	112/100/95	52	Vascular, 47% Trauma, 38% Tumor, 10% Other, 5%	TTA, 55% TFA, 38% Other, 8% Bilat not given	17 y
Gallagher and MacLachlan, 2000	Development of TAPES	TAPES	No comparison for reliability; validity study is essentially the same study as that reported below	Convenience, single center, prospective, O/P	184/170 for reliability study; 166/104 for validity study	45	For reliability study, Vascular, 10% Trauma, 49% Tumor, 23% Other, 10%; for validity study, Vascular, 12% Trauma, 45% Tumor, 22%, Other, 21%	For reliability study, TTA, 48% TFA, 33% Bilat included; for validity study, TTA, 48% TFA, 33% Bilat included	8 y for reliability study; 10 y for validity
Gallagher and MacLachlan, 2004	Quality of life and TAPES	TAPES	WHO QOL-brief version	Convenience, single center, prospective, O/P	?/169/63	47	Trauma, 43% Tumor, 22%	TTA, 57% TFA, 40% Bilat excluded	10 y on average

y = years; SIP = Sickness Impact Profile; GARS = Groningen Activity Restriction Scale; O/P = outpatient; TTA = transtibial amputation; TTF = transfemoral amputation; Bilat = bilateral amputation; MWT = metre walk test; TWT = timed walk test; SF-36 = Short Form 36; PFS = Physical functioning subscale; I/P = inpatient; d/c = discharge; FAI = Frenchay Activities Index; PAD = peripheral arterial disease; AMP = Amputee Mobility Predictor; AMPPro = Amputee Mobility Predictor with Prosthesis; LCI = Locomotor Capabilities Index; RMI = Rivermead Mobility Index; FIM = Functional Independence Measure; PEQ = Prosthesis Evaluation Questionnaire; TUG = Timed Up and Go Test; ABC = Amputee Activity Score; n/a = not applicable; SIGAM = Special Interest Group in Amputee Medicine; Gp = group; OPCS = Office of Population Census and Surveys Scale; AAS = Amputee Activity Score; n/a = not applicable; FMA = Functional Measure for Amputees; m/c = multicenter; PPA = Prosthetic Profile of the Amputee; PGI = Patient Generated Index; SF-12 = Short Form 12; LLA = lower limb amputee; HADS = Hospital Anxiety and Depression Scale; AALQ = Attitude to Artificial Limb Questionnaire; ARBIS = Amputation Related Body Image Scale; PSSS = Perceived Social Stigma Scale; BIQ = Body Image Questionnaire; OPOT = Orthotics and Prosthetics National Outcomes Tool; TAPES = Trinity Amputation and Prosthesis Experience Scales; QOL = quality of life.

Table 3. Practicality of completion information for the outcome measures under study

Author	Primary outcome(s) measure	Time to complete	Method of completion for primary measure	Response rate	Comparison between responders and non-responders?	Are all questions routinely completed?	Authors' comments on suitability
MOBILITY MEASURES: GENERIC							
Schoppen et al., 1999	Timed up and go test	25 seconds (mean)	Observation	100%	N/A	N/A	Routine clinical practice and research
Brooks et al., 2001	2 min TWT	"Practical and quick"	Observation	Not stated	Not stated	N/A	Routine clinical practice
Datta et al., 1996	10 m TWT	Not stated	Observation	100%	N/A	N/A	Routine assessment of walking ability but not function
MOBILITY MEASURES: AMPUTEE-SPECIFIC							
Gailey et al., 2002	AMPPro	Less than 15 min	Observation	100%	N/A	Not stated	Routine clinical practice
Franchignoni et al., 2004	LCI	6.5 ± 2 min	Not stated	100%	N/A	Yes	Not stated
Gauthier-Gagnon et al., 1998	LCI	Not stated	Self-complete (post)	79%	Not stated	No	Not stated
Treweek and Condie, 1998	LCI	Not stated	Mixed	Not stated	Not stated	Not stated	Routine clinical practice
Miller et al., 2001	LCI	Not stated	Self-complete (post) or in clinic	Study 1, 92% Study 2, 77%	Not stated	Not stated	Not stated
Franchignoni et al., 2004	LCI 5	6.5 ± 2 min	Not stated	100%	N/A	Yes	Not stated
Treweek and Condie, 1998	Russek's classification	Not stated	Mixed	Not stated	Not stated	Not stated	Not suitable for amputees
Ryall et al., 2003	SIGAM mobility grades	Not stated	Self-complete (clinic)	82% (timed walk comparison)	Not stated	No	Routine clinical practice
MOBILITY MEASURES: NOT AMPUTEE-SPECIFIC							
Franchignoni et al., 2003	RMI	"Easy and quick"	Not stated	Not stated	No	Not stated	Research
Ryall et al., 2003	RMI	2 minutes 5 seconds (mean)	Face-to-face	100% (test-retest) and 82% (timed walk comparison)	Not stated	Not stated	Not useful for amputees
Traballesi et al., 1995	RMI	Not stated	Face-to-face	93%	No	Yes	Not stated
FUNCTION: GENERIC							
Treweek and Condie, 1998	Barthel Index	Not stated	Mixed	Not stated	Not stated	Not stated	Not suitable for amputees
Leung et al., 1996	FIM	Not stated	Face-to-face	80%	Not stated	Not stated	Not useful for amputees
Panesar et al., 2001	FIM	Not stated	Face-to-face	Not stated	Not stated	Not stated	Varied by measure and timing but generally routine clinical use
Panesar et al., 2001	OPCS	Not stated	Face-to-face	Not stated	Not stated	Not stated	Varied by measure and timing but generally routine clinical use (Table continues)

Table 3. Continued

Author	Primary outcome(s) measure	Time to complete	Method of completion for primary measure	Response rate	Comparison between responders and non-responders?	Are all questions routinely completed?	Authors' comments on suitability
FUNCTION: AMPUTEE-SPECIFIC							
Panesar et al., 2001	AAS	Not stated	Face-to-face	Not stated	Not stated	Not stated	Varied by measure and timing but generally routine clinical use
Callaghan et al., 2002	FMA	Not stated	Self-complete (post)	37%	Yes - no difference	Low response rate for two questions	Routine clinical practice and research
Devlin et al., 2004	Houghton	Not stated	Self-complete (telephone)	100% or 66% depending on group	No	N/A	Routine clinical practice
Miller et al., 2001	Houghton	Not stated	Self-complete (post) or in clinic	Study 1, 92% Study 2, 77%	Not stated	Not stated	Not stated
Streppel et al., 2001	PPA	Not stated	Self-complete (post)	Between 54% and 86% depending on timing of assessment	Not stated	No	Research
FUNCTION: NOT AMPUTEE-SPECIFIC							
Miller et al., 2004	FAI	Not stated	Self-complete (post) or in clinic	Not stated	Not stated	Not stated	Not stated
Miller et al., 2004	FAI 18	Not stated	Self-complete (post) or in clinic	Not stated	Not stated	Not stated	Not stated
Quality of life: generic							
Callaghan et al., 2002	PGI	Not stated	Self-complete (face-to-face interview)	51%	Yes - no difference	No	Research
Pezzin et al., 2000	SF-36	Not stated	Telephone	68%	Not stated	Not stated	Not stated
Mackenzie et al., 2004	SIP	Not stated	Face-to-face	Around 75%	Not stated	Not stated	Not stated
QUALITY OF LIFE: AMPUTEE-SPECIFIC							
Fisher and Hanspal, 1998	AALQ	Not stated	Self-complete (clinic)	99%	N/A	Not stated	Not stated
Rybarczyk et al., 1995	ARBIS	Not stated	Self-complete (clinic)	90%	N/A	Not stated	Not stated
Fisher and Hanspal, 1998	BIQ	Not stated	Self-complete (clinic)	99%	N/A	Not stated	Not stated
Hart, 1999	OPOT	Not stated	Self-complete (clinic) and observation	Not stated	Not stated	Not stated	Research
Harness and Pinzur, 2001	PEQ	Not stated	Self-complete (unclear where)	100%	N/A	Not stated	Not stated
Legro et al., 1998	PEQ	Not stated	Self-complete (post)	73% (1st questionnaire) and 64% (repeat questionnaire)	Not stated	No	Not stated
Miller et al., 2001	PEQ mobility subscale	Not stated	Self-complete (post) or in clinic	Study 1, 92%; Study 2, 77%	Not stated	Not stated	Not stated
Rybarczyk et al., 1995	PSSS	Not stated	Self-complete (clinic)	90%	N/A	Not stated	Not stated

(Table continues)

Table 3. Continued

Author	Primary outcome(s) measure	Time to complete	Method of completion for primary measure	Response rate	Comparison between responders and non-responders?	Are all questions routinely completed?	Authors' comments on suitability
Gallagher and Maclachlan, 2000	TAPES	5 to 10 min	Self-complete (post)	Reliability study, 61%; Validity study, 37%	Not stated	Not stated	Routine clinical practice and research
Gallagher and Maclachlan, 2004	TAPES	Not stated	Self-complete (post)	37%	No	No	Routine clinical practice and research

N/A = not applicable; TWT = timed walk test; AMPPro = Amputee Mobility Predictor with Prosthesis; LCI = Locomotor Capabilities Index; SIGAM = Special Interest Group in Amputee Medicine; RMI = Rivermead Mobility Index; FIM = Functional Independence Measure; OPCS = Office of Population Consensus and Surveys Scale; AAS = Amputee Activity Score; FMA = Functional Measure for Amputees; PPA = Prosthetic Profile of the Amputee; FAI = Frenchay Activities Index; PGI = Patient Generated Index; SF-36 = Short Form 36; SIP = Sickness Impact Profile; AALQ = Attitude to Artificial Limb Questionnaire; ARBIS = Amputation Related Body Image Scale; BIQ = Body Image Questionnaire; OPOT = Orthotics and Prosthetics National Outcomes Tool; PEQ = Prosthesis Evaluation Questionnaire; PSSS = Perceived Social Stigma Scale; TAPES = Trinity Amputation and Prosthesis Experience Scales.

reported in seconds, and the time to carry out the test is 1 to 2 minutes. The TUG has been reported to be quick, reliable (inter- and intrarater), and valid with a variety of conditions.³

The TUG has been found to have excellent test-retest and inter-rater reliability and poor to moderate construct validity with lower limb amputees, and it is recommended for routine clinical practice and research.¹²

Timed Walk Tests. Timed walk tests (TWTs) measure function in terms of mobility and have been used with a variety of clinical conditions,^{3,13} including lower limb amputees.^{14,15} Timing of walking can be carried out in several different ways, either testing speed over a short distance (e.g., 10 meters¹⁵ that can include an 180° turn¹⁶) or cardiovascular fitness/endurance in which the subject is asked to walk as far as he/she can in a given time (i.e., 2,¹⁵ 6,⁶ or 10 minutes^{3,13}). The results of the tests are reported in seconds or meters per second for the speed test and distance walked for the endurance test. Standard instructions should be used, and all tests require observation of the patient by a test administrator. TWTs are known to be valid and reliable with a variety of clinical conditions and are frequently used as the gold standard comparator test.^{6,15,17,18}

Checklist results indicated poor to moderate construct validity, depending on comparison measure. TWT seems to differentiate between levels ($p < 0.05$) and is recommended for clinical use.¹⁵

AMPUTEE SPECIFIC

Amputee Mobility Predictor with Prosthesis. AMPPro is a predictive tool to assess the ambulatory potential of lower

limb amputees, and it can also be used as an evaluative tool to measure function during or after rehabilitation.⁶ It consists of six domains containing 21 items in total: sitting balance, transfers, standing balance, gait, stairs, and use of an assistive device. Most items offer three scoring choices, and the AMPPro has a total score range from 0 to 42. It is completed based on observed performance, takes 10 to 15 minutes to complete, and the score is easily totaled.

The AMPPro appears to be very reliable and to have poor (when compared with age and co-morbidities index) to good (when compared to AAS and 6-minute TWT) validity and is recommended for clinical and research use.⁶

Locomotor Capabilities Index. The Locomotor Capabilities Index (LCI) measures a lower limb amputee's locomotor capabilities with a prosthesis during and after rehabilitation.¹⁹ It consists of 14 items divided into two subscales: basic and advanced. Each item is scored on a four-point ordinal scale giving a total maximum score of 42 with subscores of 21 for the basic and advanced activities. There is a new version, the LCI5, in which the upper ordinal level is split into two portions according to the use or nonuse of walking aids.²⁰ The higher the score of the LCI, the greater the capabilities of the amputee. It is a self-report tool, takes 5 minutes to complete, and scores are simple to total, as just described. It is available in several languages. The LCI is widely used.^{18,20-22}

Both the LCI and LCI5 demonstrate good internal consistency, test-retest reliability and construct validity, and the LCI5 has been shown to reduce the ceiling effect associated with the LCI by 50%.²⁰ It is recommended for clinical and research use.²⁰⁻²²

Table 4. Reliability information for the outcome measures under study

Author	Primary outcome(s) measure	Test-retest	Interrater reliability	Internal consistency
MOBILITY MEASURES: GENERIC				
Schoppen et al., 1999	Timed "up and go" test	0.93 (Spearman's r)	0.96 (Spearman's r)	N/A
Brooks et al., 2001	2 min TWT	Not stated	Not stated	N/A
Datta et al., 1996	10 m TWT	Not stated	Not stated	N/A
MOBILITY MEASURES: AMPUTEE-SPECIFIC				
Gailey et al., 2002	AMPPro	0.97	0.99	Not stated
Franchignoni et al., 2004	LCI	0.98	Not stated	0.95
Gauthier-Gagnon et al., 1998	LCI	Not stated	Not stated	>0.90
Treweek and Condie, 1998	LCI	Stated to be reliable but not evaluated in this study	Stated to be reliable but not evaluated in this study	Stated to be reliable but not evaluated in this study
Miller et al., 2001	LCI	0.88	N/A, same raters	0.89
Franchignoni et al., 2004	LCI 5	0.98	Not stated	0.95
Treweek and Condie, 1998	Russek's classification	Stated to be reliable but not evaluated in this study	Stated to be reliable but not evaluated in this study	Stated to be reliable but not evaluated in this study
Ryall et al., 2003	SIGAM mobility grades	0.79	0.86	Not stated
MOBILITY MEASURES: NOT AMPUTEE-SPECIFIC				
Franchignoni et al., 2003	RMI	Not stated	Not stated	0.85
Ryall et al., 2003	RMI	0.99	0.99	Not stated
Traballese et al., 1995	RMI	Not stated	Not stated	Not stated
FUNCTION: GENERIC				
Treweek and Condie, 1998	Barthel Index	Stated to be reliable but not evaluated in this study	Stated to be reliable but not evaluated in this study	Stated to be reliable but not evaluated in this study
Leung et al., 1996	FIM	Stated to be reliable but not evaluated in this study	Stated to be reliable but not evaluated in this study	Stated to be reliable but not evaluated in this study
Panesar et al., 2001	FIM	Stated to be reliable but not evaluated in this study	Stated to be reliable but not evaluated in this study	Stated to be reliable but not evaluated in this study
Panesar et al., 2001	OPCS	Stated to be reliable but not evaluated in this study	Stated to be reliable but not evaluated in this study	Stated to be reliable but not evaluated in this study
FUNCTION: AMPUTEE-SPECIFIC				
Panesar et al., 2001	AAS	Stated to be reliable but not evaluated in this study	Stated to be reliable but not evaluated in this study	Stated to be reliable but not evaluated in this study
Callaghan et al., 2002	FMA	0.64–0.96 (continuous items) and agreement of 20%–90% (categorical items)	Not stated	Not stated
Devlin et al., 2004	Houghton	0.96	Not stated	0.70 or 0.71 depending on timing of assessment
Miller et al., 2001	Houghton	0.85	N/A, same raters	0.68

(Table continues)

Table 4. Continued

Author	Primary outcome(s) measure	Test-retest	Interrater reliability	Internal consistency
Streppel et al., 2001	PPA	Not stated	Not stated	Not stated
FUNCTION: NOT AMPUTEE-SPECIFIC				
Miller et al., 2004	FAI	0.79	Not stated	0.81
Miller et al., 2004	FAI 18	0.78	Not stated	0.84
QUALITY OF LIFE: GENERIC				
Callaghan et al., 2002	PGI	0.48	Not stated	Not stated
Pezzin et al., 2000	SF-36	Not stated	Not stated	Not stated
Mackenzie et al., 2004	SIP	Stated to be reliable but not evaluated in this study	Stated to be reliable but not evaluated in this study	Stated to be reliable but not evaluated in this study
QUALITY OF LIFE: AMPUTEE-SPECIFIC				
Fisher and Hanspal, 1998	AALQ	Not stated	Not stated	0.83
Rybarczyk et al., 1995	ARBIS	Not stated	Not stated	0.85
Fisher and Hanspal, 1998	BIQ	Not stated	Not stated	0.9
Hart, 1999	OPOT	Not stated	Not stated	0.61–0.80 depending on subscale
Harness and Pinzur, 2001	PEQ	Not stated	Not stated	Not stated
Legro et al., 1998	PEQ	0.79–0.90	Not stated	0.73–0.89 depending on subscale
Miller et al., 2001	PEQ mobility subscale	0.77	N/A, same raters	0.95
Rybarczyk et al., 1995	PSSS	Not stated	Not stated	0.91
Gallagher and Maclachlan, 2000	TAPES	Not stated	Not stated	>0.80
Gallagher and Maclachlan, 2004	TAPES	Not stated	Not stated	0.75–0.99 (from previous study)
<p>N/A = not applicable; TWT = timed walk test; AMPPro = Amputee Mobility Predictor with Prosthesis; LCI = Locomotor Capabilities Index; SIGAM = Special Interest Group in Amputee Medicine; RMI = Rivermead Mobility Index; FIM = Functional Independence Measure; OPCS = Office of Population Consensus and Surveys Scale; AAS = Amputee Activity Score; FMA = Functional Measure for Amputees; PPA = Prosthetic Profile of the Amputee; FAI = Frenchay Activities Index; PGI = Patient Generated Index; SF-36 = Short Form 36; SIP = Sickness Impact Profile; AALQ = Attitude to Artificial Limbs Questionnaire; ARBIS = Amputation Related Body Image Scale; BIQ = Body Image Questionnaire; OPOT = Orthotics and Prosthetics National Outcomes Tool; PEQ = Prosthesis Evaluation Questionnaire; PSSS = Perceived Social Stigma Scale; TAPES = Trinity Amputation and Prosthesis Experience Scales.</p>				

Russek's Code. Russek's Code measures mobility of lower limb amputees fitted with a prosthesis.¹⁹ It is a six-point scale used to indicate an individual's functional ability with his or her prosthesis. It is a direct observation tool, i.e., the grading is based on the patient's actual performance during the preceding 1 to 2 weeks, and no further analysis is required. The time taken to complete is not reported.

Russek's Code is stated to have face and content validity and reliability, although they have not been investigated.²³ It appears to have construct validity (known groups) but requires large numbers. It is not recommended for use with amputees.²³

Special Interest Group in Amputee Medicine. The Special Interest Group in Amputee Medicine (SIGAM) measures function of lower limb amputees fitted with a functional or cosmetic prosthesis in terms of mobility. It was developed from the Harold Wood/Stammore Mobility Grades to improve accuracy of grade allocation.²⁴ It includes a benchmark distance of 50 meters and uses a questionnaire and algorithm. Each item in the questionnaire is a closed-ended question. The time taken to complete is not stated, and the final grading is assigned using the algorithm.

It is reliable (test-retest and inter-rater), responsive to change in mobility during the first 6 months after amputation, appears to

Table 5. Validity information for the outcome measures under study

Author	Primary outcome(s) measure	Face validity	Content validity	Construct validity	Criterion validity
MOBILITY MEASURES: GENERIC					
Schoppen et al., 1999	Timed up and go test	Yes	Yes	0.36–0.46	Not stated
Brooks et al., 2001	2 min TWT	Not stated	Not stated	Varied from 0.22 to 0.48 depending on comparison measure	Not stated
Datta et al., 1996	10 m TWT	Yes	Yes	Varied from 0.29 to 0.34 depending on comparison measure; Difference TT and TF ($p < 0.05$)	Not stated
MOBILITY MEASURES: AMPUTEE-SPECIFIC					
Gailey et al., 2002	AMPPRO	Not stated	Not stated	Varied from -0.38 to 0.82 depending on comparison measure	Not stated
Franchignoni et al., 2004	LCI	Stated to be valid but not evaluated in this study	Stated to be valid but not evaluated in this study	Varied from 0.61 to 0.74 depending on comparison measure	Not stated
Gauthier-Gagnon et al., 1998	LCI	Stated to be valid but not evaluated in this study	The item-to-item correlations range from 0.65 to 0.84	Not stated	Not stated
Treweek and Condie, 1998	LCI	Stated to be valid but not evaluated in this study	Stated to be valid but not evaluated in this study	No r but discriminated between TTA and TFA amputees and showed a difference due to age	Not stated
Miller et al., 2001	LCI	Stated to be valid but not evaluated in this study	Stated to be valid but not evaluated in this study	≥ 0.5 for all scales	Not stated
Franchignoni et al., 2004	LCI 5	Stated to be valid but not evaluated in this study	Stated to be valid but not evaluated in this study	Varied from 0.61 to 0.75 depending on comparison measure	Not stated
Treweek and Condie, 1998	Russek's classification	Stated to be valid but not evaluated in this study	Stated to be valid but not evaluated in this study	No r but discriminated between TTA and TFA amputees and showed a difference due to age but required large number of patients to do this	Not stated
Ryall et al., 2003	SIGAM mobility grades	Not stated	Not stated	Rasch analysis used; SIGAM was found to have construct validity above the lower acceptable limit for the Rasch approach	No r given although SIGAM scale found to be highly correlated to TWT (Table continues)

Table 5. Continued

Author	Primary outcome(s) measure	Face validity	Content validity	Construct validity	Criterion validity
MOBILITY MEASURES: NOT AMPUTEE-SPECIFIC					
Franchignoni et al., 2003	RMI	Stated to be valid but not for amputees	Stated to be valid but not for amputees	Varied from 0.69 to 0.83 depending on comparison measure and timing of assessment	Not stated
Ryall et al., 2003	RMI	Not stated	Not stated	Rasch analysis used. Problems with construct validity are mentioned in text of article, but Rasch analysis does not give an r	0.58 (TWT)
Traballesi et al., 1995	RMI	Not stated	Not stated	Varied from 0.70 to 0.71 depending on comparison measure	Not stated
FUNCTION: GENERIC					
Treweek and Condie, 1998	Barthel Index	Stated to be valid but not evaluated in this study	Stated to be valid but not evaluated in this study	No r but showed a difference due to age.	Not stated
Leung et al., 1996	FIM	Stated to be valid but not evaluated in this study	Stated to be valid but not evaluated in this study	Varied from 0.18 to 0.58 depending on comparison measure	Not stated
Panesar et al., 2001	FIM	Stated to be valid but not evaluated in this study	Stated to be valid but not evaluated in this study	No r given but all three measures were correlated with each other at $p < 0.001$	Not stated
Panesar et al., 2001	OPCS	Stated to be valid but not evaluated in this study	Stated to be valid but not evaluated in this study	No r given but all three measures were correlated with each other at $p < 0.001$.	Not stated
FUNCTION: AMPUTEE-SPECIFIC					
Panesar et al., 2001	AAS	Stated to be valid but not evaluated in this study	Stated to be valid but not evaluated in this study	No r given but all three measures were correlated with each other at $p < 0.001$	Not stated
Callaghan et al., 2002	FMA	Stated to be valid but not evaluated in this study	Stated to be valid but not evaluated in this study	Stated to be valid but not evaluated in this study	Not stated
Devlin et al., 2004	Houghton	Yes	Yes	Varied from 0.24 to 0.65 depending on comparison measure; nonsignificant relationship to age and level	Not stated
Miller et al., 2001	Houghton	Stated to be valid but not evaluated in this study	Stated to be valid but not evaluated in this study	≥ 0.5 for all scales	Not stated

(Table continues)

Table 5. Continued

Author	Primary outcome(s) measure	Face validity	Content validity	Construct validity	Criterion validity
Streppel et al., 2001	PPA	Stated to be valid but not evaluated in this study	Stated to be valid but not evaluated in this study	Not stated	Not stated
FUNCTION: NOT AMPUTEE-SPECIFIC					
Miller et al., 2004	FAI	Not stated	Stated to be valid but not evaluated in this study	Not stated	Varied from 0.39 to 0.55 depending on comparison measure
Miller et al., 2004	FAI 18	Not stated	Stated to be valid but not evaluated in this study	Varied from 0.39 to 0.55 depending on comparison measure	Not stated
QUALITY OF LIFE: GENERIC					
Callaghan et al., 2002	PGI	Not stated	Not stated	Varied from 0.11 to 0.56 depending on comparison measure	Not stated
Pezzin et al., 2000	SF-36	Not stated	Not stated	Not stated	Not stated
Mackenzie et al., 2004	SIP	Stated to be valid but not evaluated in this study	Stated to be valid but not evaluated in this study	Stated to be valid but not evaluated in this study	Not stated
QUALITY OF LIFE: AMPUTEE-SPECIFIC					
Fisher and Hanspal, 1998	AALQ	Not stated	Not stated	Not stated	Not stated
Rybarczyk et al., 1995	ARBIS	Yes	Yes	Discriminate validity at $r = 0.43$; convergent validity between CES-D and quality of life ($r = 0.65$)	Not stated
Fisher and Hanspal, 1998	BIQ	Stated to be valid but not evaluated in this study	Stated to be valid but not evaluated in this study	Not stated	Not stated
Hart, 1999	OPOT	Not stated	Not stated	>0.60 for all subscales	Not stated
Harness and Pinzur, 2001	PEQ	Stated to be valid but not evaluated in this study	Stated to be valid but not evaluated in this study	Stated to be valid but not evaluated in this study	Not stated
Legro et al., 1998	PEQ	Yes, via long development process	Yes, via long development process	>0.60 for most subscales	Authors claim criterion validity but comparison scales not gold standards
Miller et al., 2001	PEQ mobility subscale	Stated to be valid but not evaluated in this study	Stated to be valid but not evaluated in this study	≥ 0.5 for all scales	Not stated

(Table continues)

Table 5. Continued

Author	Primary outcome(s) measure	Face validity	Content validity	Construct validity	Criterion validity
Rybarczyk et al., 1995	PSSS	Yes	Yes	Discriminate validity at $r = 0.43$; convergent validity between CES-D and quality of life ($r = 0.65$)	Not stated
Gallagher and Maclachlan, 2000	TAPES	Yes though with little proof	Yes though with little proof	See study below	Not stated
Gallagher and Maclachlan, 2004	TAPES	Stated to be valid but not evaluated in this study	Stated to be valid but not evaluated in this study	≥ 0.60 for all subscales	Not stated

TWT = timed walk test; AMPPro = Amputee Mobility Predictor with Prosthesis; LCI = Locomotor Capabilities Index; TTA = transtibial amputation; TFA = transfemoral amputation; SIGAM = Special Interest Group in Amputee Medicine; RMI = Rivermead Mobility Index; FIM = Functional Independence Measure; OPCS = Office of Population Consensus and Surveys Scale; AAS = Amputee Activity Score; FMA = Functional Measure for Amputees; PPA = Prosthetic Profile of the Amputee; FAI = Frenchay Activities Index; PGI = Patient Generated Index; SF-36 = Short Form 36; SIP = Sickness Impact Profile; AALQ = Attitude to Artificial Limbs Questionnaire; ARBIS = Amputation Related Body Image Scale; CES-D = Centre for Epidemiologic Studies Depression Scale; BIQ = Body Image Questionnaire; OPOT = Orthotics and Prosthetics National Outcomes Tool; PEQ = Prosthesis Evaluation Questionnaire; PSSS = Perceived Social Stigma Scale; TAPES = Trinity Amputation and Prosthesis Experience Scales.

have construct and criterion validity, and it is recommended for routine clinical practice.²⁴

NOT GENERIC, NOT AMPUTEE SPECIFIC

Rivermead Mobility Index. The Rivermead Mobility Index (RMI) is a measure of function in terms of the capacity to perform a mobility activity and was developed and reported to be valid for use with stroke and various neurological conditions.¹³ It consists of 15 items: 14 closed-ended questions and one direct observation. It covers a range of mobility activities ranked according to their difficulty. It is a self-report instrument (self-administered or interview) with one item requiring direct observation. The RMI takes 2 to 5 minutes to complete; data analysis involves totaling the scores to give a maximum of 15 and minimum of 0.^{13,19}

Used with lower limb amputees, the RMI is reliable (internal consistency,²⁵ test-retest and interrater¹⁶) and responsive to change with rehabilitation.^{25,26} However, ceiling effects have been reported,¹⁶ and although two authors have found good to excellent construct validity,^{16,26} there are some concerns following a Rasch analysis, and these authors did not recommend its use with amputees.¹⁶

FUNCTION

GENERIC

Barthel Index. The Barthel Index is a well-documented and recognized measure of function.^{3,13,19,27} It originally was developed for use with neurological conditions but is now used with a wide range of conditions including amputation. It evaluates 10 activities of daily living. It is based on the

individual's actual performance during the previous 24 to 48 hours, ascertained by direct observation, interview (face-to-face or telephone, with respondent or significant other), or self-administration. It takes 5 minutes to carry out an interview or 20 to 60 minutes to observe. No training is needed, but guidelines are available with the original version. The Barthel Index has a three-point ordinal scale system using five-point increments. The scale is weighted, and values are assigned to each item based on time and amount of physical assistance needed. The total score varies from 0 (total dependence) to 100 (complete independence). It is available in many languages.

The Barthel Index is stated to have face and content validity and to be reliable with lower limb amputees but appears to have limited construct validity (known groups) and ceiling effects, and it is not recommended for use with amputees.²³

Functional Independence Measure. The Functional Independence Measure (FIM) is a well documented and recognized multidimensional functional status tool designed originally for neurological patients and now for all rehabilitation diagnostic groups.^{3,13,19,27} It contains 18 items pertaining to six basic life activities measuring level of dependency on a seven-point ordinal scale. The total FIM scores range from 18 to 126, where high scores indicate greater levels of independence. The FIM must be administered by a trained health care professional and can be based on observed performance or self report (face-to-face or telephone interview) at different points during the rehabilitation of an individual. There is a detailed, updated guide available; the tool takes 20 to 45

Table 6. Scaling information for the outcome measures under study

Author	Primary outcome(s) measure	Levels of measurement	Authors' information on floor or ceiling effects?	Responsiveness
MOBILITY MEASURES: GENERIC				
Schoppen et al., 1999	Timed up and go test	Interval	N/A	Not stated
Brooks et al., 2001	2 min TWT	Ratio	N/A	Yes, significant ($p < 0.001$) increase in distance walked in 2 min at d/c and f/u
Datta et al., 1996	10 m TWT	Ratio	N/A	Not stated
MOBILITY MEASURES: AMPUTEE-SPECIFIC				
Gailey et al., 2002	AMPPro	Ordinal	Not stated	Not stated
Franchignoni et al., 2004	LCI	Ordinal	46% patients scored top score at second assessment	Effect size 1.09; correlated positively with TTA and negatively with age
Gauthier-Gagnon et al., 1998	LCI	Ordinal	Not stated	Not stated
Treweek and Condie, 1998	LCI	Ordinal	For TTAs, 81% of patients scored maximum score on full LCI, 69% on advanced subscale	Not stated
Miller et al., 2001	LCI	Ordinal	Figures for TFA were 57% and 43%. For TTAs ≤ 40 scores were 100% and 100%; > 40 was 76% and 62%	Not stated
Franchignoni et al., 2004	LCI 5	Ordinal	37% (Study 1) and 40% (Study 2) scored ceiling score on PPA-LCI; floor scores were $\leq 2\%$	Effect size 1.4
Treweek and Condie, 1998	Russek's classification	Ordinal	LCI 5 less of ceiling effect than LCI, "top scores reduced by half"	Not stated
Ryall et al., 2003	SIGAM mobility grades	Ordinal	Not stated	Effect for SIGAM was 10.66
MOBILITY MEASURES: NOT AMPUTEE-SPECIFIC				
Franchignoni et al., 2003	RMI	Ordinal	13/187 showed ceiling or floor effects	Median change in scores initial to third assessment = 3 (effect size 1.35), 61% of patients showed a clinically significant change (more than 3)
Ryall et al., 2003	RMI	Ordinal	Not stated	"Person separation index of just 1.66"; a measure of the scale's ability to discriminate between patients with clearly different abilities
Traballesi et al., 1995	RMI	Ordinal	Not stated	RMI and BI showed significant ($p < 0.001$) change from admission to discharge

(Table continues)

Table 6. Continued

Author	Primary outcome(s) measure	Levels of measurement	Authors' information on floor or ceiling effects?	Responsiveness
FUNCTION: GENERIC				
Treweek and Condie, 1998	BI	Ordinal	"Very high median score"	Not stated
Leung et al., 1996	FIM	Ordinal	Not stated	Not stated
Panesar et al., 2001	FIM	Ordinal	Not stated	All measures responsive from admission to discharge $p < 0.00001$. Only AAS from discharge to follow up $p < 0.001$
Panesar et al., 2001	OPCS	Ordinal	Not stated	All measures responsive from admission to discharge $p < 0.00001$. Only AAS from discharge to follow up $p < 0.001$
FUNCTION: AMPUTEE-SPECIFIC				
Panesar et al., 2001	AAS	Ordinal	Not stated	All measures responsive from admission to discharge $p < 0.00001$. Only AAS from discharge to follow up $p < 0.001$
Callaghan et al., 2002	FMA	Nominal and Ordinal	Not stated	Not stated
Devlin et al., 2004	Houghton	Ordinal	"[Ceiling/floor effects] detected for individual but not overall scores"	Gp 2: d/c to f/u Houghton mean increase 6.1 ± -2.7 (effect size 0.60 = Moderate) Item 4 on its own not responsive.
Miller et al., 2001	Houghton	Ordinal	Ceiling effects were $\leq 10\%$. Floor scores were $\leq 2\%$.	Not stated
Streppel et al., 2001	PPA	Ordinal	Not stated	Not stated
FUNCTION: NOT AMPUTEE-SPECIFIC				
Miller et al., 2004	FAI	Ordinal	Not stated	Not stated
Miller et al., 2004	FAI 18	Ordinal	Not stated	Not stated
QUALITY OF LIFE: GENERIC				
Callaghan et al., 2002	PGI	Ordinal	Not stated	Not stated
Pezzin et al., 2000	SF-36	Ordinal	Not stated	Not stated
Mackenzie et al., 2004	SIP	Ordinal	Not stated	Not stated
QUALITY OF LIFE: AMPUTEE-SPECIFIC				
Fisher and Hanspal, 1998	AALQ	Nominal	Not stated	Not stated
Rybarczyk et al., 1995	ARBIS	Ordinal (Likert)	Not stated	Not stated
Fisher and Hanspal, 1998	BIQ	Nominal	Not stated	Not stated

(Table continues)

Table 6. Continued

Author	Primary outcome(s) measure	Levels of measurement	Authors' information on floor or ceiling effects?	Responsiveness
Hart, 1999	OPOT	Ordinal	Not clear although PF-15 subscale said to show fewer ceiling effects than PF-10	Sensitive to change but authors say more research needed to show responsiveness. Effect size Physical Component scale, 0.15; Mental Component = 0.1
Harness and Pinzur, 2001	PEQ	Ratio	Not stated	Not stated
Legro et al., 1998	PEQ	Ratio	Transfers 25% ceiling, frustration 22% floor	Not stated
Miller et al., 2001	PEQ mobility subscale	Ordinal	Ceiling effects were $\leq 10\%$. Floor scores were $\leq 2\%$.	Not stated
Rybarczyk et al., 1995	PSSS	Ordinal (Likert)	Not stated	Not stated
Gallagher and Maclachlan, 2000	TAPES	Ordinal	Not stated	Not stated
Gallagher and Maclachlan, 2004	TAPES	Ordinal	Not stated	Not stated

N/A = not applicable; TWT = timed walk test; d/c = discharge; f/u = follow-up; AMPPro = Amputee Mobility Predictor with Prostheses; LCI = Locomotor Capabilities Index; TTA = transtibial amputation; TFA = transfemoral amputation; PPA = Prosthetic Profile of the Amputee; SIGAM = Special Interest Group in Amputee Medicine; RMI = Rivermead Mobility Index; BI = Barthel Index; FIM = Functional Independence Measure; OPCS = Office of Population Consensus and Surveys Scale; AAS = Amputee Activity Score; FMA = Functional Measure for Amputees; Gp = group; PPA = Prosthetic Profile of the Amputee; FAI = Frenchay Activities Index; PGI = Patient Generated Index; SF-36 = Short Form 36; SIP = Sickness Impact Profile; AALQ = Attitude to Artificial Limbs Questionnaire; ARBIS = Amputation Related Body Image Scale; BIQ = Body Image Questionnaire; OPOT = Orthotics and Prosthetics National Outcomes Tool; PF-15 = Physical Functioning Scale 15; PEQ = Prosthesis Evaluation Questionnaire; PSSS = Perceived Social Stigma Scale; TAPES = Trinity Amputation and Prosthesis Experience Scales.

minutes to administer; and a total score is easily calculated. It is available in 11 different languages. FIM is thought not to be suitable for use with lower limb amputees because of ceiling effects and lack of responsiveness.¹⁹

FIM is reported to be reliable,^{28,29} but the same researchers found its construct validity to be poor to moderate.

Office of Population Consensus and Surveys Scale. The Office of Population Consensus and Surveys Scale (OPCS) measures functional capacity based on the World Health Organization (WHO) International Classification of Impairment, Disability and Handicap and was designed for use with disabled people in the community.¹³ It consists of 13 disability scales containing a total of 108 items. Each disability scale has been weighted so that different disabilities can be compared. An overall "severity of disability" score or category¹⁻¹⁰ can be derived from the individual disability scales using a formula. It is a self-report tool (self-administered or by interview). The time taken is not clear, and data analysis requires a computer.

OPCS is stated to be valid (content and face) and reliable.²⁹ It appears to have construct validity and to be responsive to change during rehabilitation, and it is recommended for use with inpatients.²⁹

AMPUTEE SPECIFIC

Amputee Activity Score. The Amputee Activity Score (AAS) is a measure of function intended for outpatient lower limb amputees fitted with a prosthesis; its use was first reported in 1981. It has eight subscales and 20 items. Each item is either a closed-ended question or is scored on a three-, four-, or five-point ordinal scale rating frequency of participation in an activity. The AAS is a self-report tool (face-to-face interview). The time taken to complete it is unclear, and data analysis is fairly complex, requiring a guide to assist.²⁹ The score is totaled (possible range is unclear); the greater the score, the better the level of activity. The AAS has been found to be reliable and is stated to have content and face validity.

AAS is responsive to change in mobility with rehabilitation and at follow-up, but construct validity is unclear; it is recommended for community practice.²⁹

Functional Measure for Amputees. The Functional Measure for Amputees (FMA) measures function of lower limb amputees in terms of prosthetic wear, use, and function with a prosthesis. It was modeled using selected elements of the Prosthetic Profile of the Amputee (PPA). It consists of 13 closed-ended questions

Table 7. Risk of bias information for the outcome measures under study

Author	Primary outcome(s) measure	Evaluation carried out by developer?	Person using the measure	Was this person trained?	Small sample size (20 - 50)?	Potential for bias because of differences between responders and non-responders?
MOBILITY MEASURES: GENERIC						
Schoppen et al., 1999	Timed up and go test	No	Partial-physiotherapist and other member of staff	Yes	Yes	N/A
Brooks et al., 2001	2 min TWT	No	Physiotherapist and rehabilitation assistant	Yes	No	No
Datta et al., 1996	10 m TWT	No	Physiotherapist	Yes	No	N/A
MOBILITY MEASURES: AMPUTEE-SPECIFIC						
Gailey et al., 2002	AMPPro	Yes	Clinician	Yes	No	No
Franchignoni et al., 2004	LCI	No	Physiotherapist	Not stated	Yes; for test-retest, n = 37; other tests, n = 50	Unclear
Gauthier-Gagnon et al., 1998	LCI	Yes	Patient	N/A	No	Unclear
Treweek and Condie, 1998	LCI	No	Physiotherapist	Not stated	No	Unclear
Miller et al., 2001	LCI	No	Patient	N/A	No	Unclear
Franchignoni et al., 2004	LCI 5	No but tool modified by author	Physiotherapist	Not stated	Yes; for test-retest, n = 37; other tests, n = 50	Unclear
Treweek and Condie, 1998	Russek's classification	No	Physiotherapist	Not stated	No	Unclear
Ryall et al., 2003	SIGAM mobility grades	Yes	Patients and physician	Not stated	No for data reported here: part analysis (on responsiveness) excluded because < 20 patients	Unclear
MOBILITY MEASURES: NOT AMPUTEE-SPECIFIC						
Franchignoni et al., 2003	RMI	No	Not stated	Not stated	No	Unclear
Ryall et al., 2003	RMI	No	Patients and physician	Not stated	No	Unclear
Traballese et al., 1995	RMI	No	Physiatrist	Not stated	No	Unclear
FUNCTION: GENERIC						
Treweek and Condie, 1998	BI	No	Physiotherapist	Not stated	No	Unclear
Leung et al., 1996	FIM	No	Not stated	Not stated	Yes	Unclear
Panesar et al., 2001	FIM	No	Occupational therapist and physician	Yes	Yes	Unclear
Panesar et al., 2001	OPCS	No	Occupational therapist and physician	Yes	Yes	Unclear
FUNCTION: AMPUTEE-SPECIFIC						
Panesar et al., 2001	AAS	No	Occupational therapist and physician	Yes	Yes	Unclear

(Table continues)

Table 7. Continued

Author	Primary outcome(s) measure	Evaluation carried out by developer?	Person using the measure	Was this person trained?	Small sample size (20 - 50)?	Potential for bias because of differences between responders and non-responders?
Callaghan et al., 2002	FMA	No but modified by authors	Patient	N/A	No	Yes
Devlin et al., 2004	Houghton	No	Research assistant	Yes	No	Unclear
Miller et al., 2001	Houghton	No	Patient	N/A	No	Unclear
Streppel et al., 2001	PPA	No	Patient	N/A	Yes	No
FUNCTION: NOT AMPUTEE-SPECIFIC						
Miller et al., 2004	FAI	No	Patient	N/A	No	No
Miller et al., 2004	FAI 18	Yes	Patient	N/A	No	No
QUALITY OF LIFE: GENERIC						
Callaghan et al., 2002	PGI	No but PGI adapted by author	Patient	Yes	Yes	Yes
Pezzin et al., 2000	SF-36	No	Not stated	Not stated	No	Unclear
Mackenzie et al., 2004	SIP	No	Patient or physiotherapist, physician, nurse	Not stated	Yes for some subgroups	Unclear
QUALITY OF LIFE: AMPUTEE-SPECIFIC						
Fisher and Hanspal, 1998	AALQ	Yes	Patient	N/A	No	N/A
Rybarczyk et al., 1995	ARBIS	Yes	Patient	N/A	No	No
Fisher and Hanspal, 1998	BIQ	Yes	Patient	N/A	No	N/A
Hart, 1999	OPOT	Yes	Patient or prosthetist	Yes	No	Unclear
Harness and Pinzur, 2001	PEQ	No	Patient	N/A	No	N/A
Legro et al., 1998	PEQ	Yes	Patient	N/A	No	Unclear
Miller et al., 2001	PEQ mobility subscale	No	Patient	N/A	No	Unclear
Rybarczyk et al., 1995	PSSS	Yes	Patient	N/A	No	No
Gallagher and Maclachlan, 2000	TAPES	Yes	Patient	N/A	No	No for reliability; Yes for validity
Gallagher and Maclachlan, 2004	TAPES	Yes	Patient	N/A	No	Yes

N/A = not applicable; TWT = timed walk test; d/c = discharge; f/u = follow-up; AMPPro = Amputee Mobility Predictor with Prosthesis; LCI = Locomotor Capabilities Index; TTA = transtibial amputation; TFA = transfemoral amputation; PPA = Prosthetic Profile of the Amputee; SIGAM = Special Interest Group in Amputee Medicine; RMI = Rivermead Mobility Index; BI = Barthel Index; FIM; Functional Independence Measure; OPCS = Office of Population Consensus and Surveys Scale; AAS = Amputee Activity Score; FMA = Functional Measure for Amputees; Gp = group; PPA = Prosthetic Profile of the Amputee; FAI = Frenchay Activities Index; PGI = Patient Generated Index; SF-36 = Short Form 36; SIP = Sickness Impact Profile; AALQ = Attitude to Artificial Limbs Questionnaire; ARBIS = Amputation Related Body Image Scale; BIQ = Body Image Questionnaire; OPOT = Orthotics and Prosthetics National Outcomes Tool; PF-15 = Physical Functioning Scale 15; PEQ = Prosthesis Evaluation Questionnaire; PSSS = Perceived Social Stigma Scale; TAPES = Trinity Amputation and Prosthesis Experience Scales.

(48 items) including the LCI. It is scored using a guide, and there is no overall score. The FMA is a self-report tool (face-to-face, telephone, and mail), the time to complete it is unclear, and data analysis requires a computer. It is stated to have face and content validity because it is modeled on the PPA. Construct

validity of the LCI has been reported,¹⁹ but additional validity testing of the FMA as a whole has not been done.

Test-retest reliability is moderate to good, and 9 of the 13 questions have good to excellent reliability; it is recommended for routine clinical practice.³⁰