88. Mitgliederversammung

Agaplesion Diakonieklinikum Hamburg

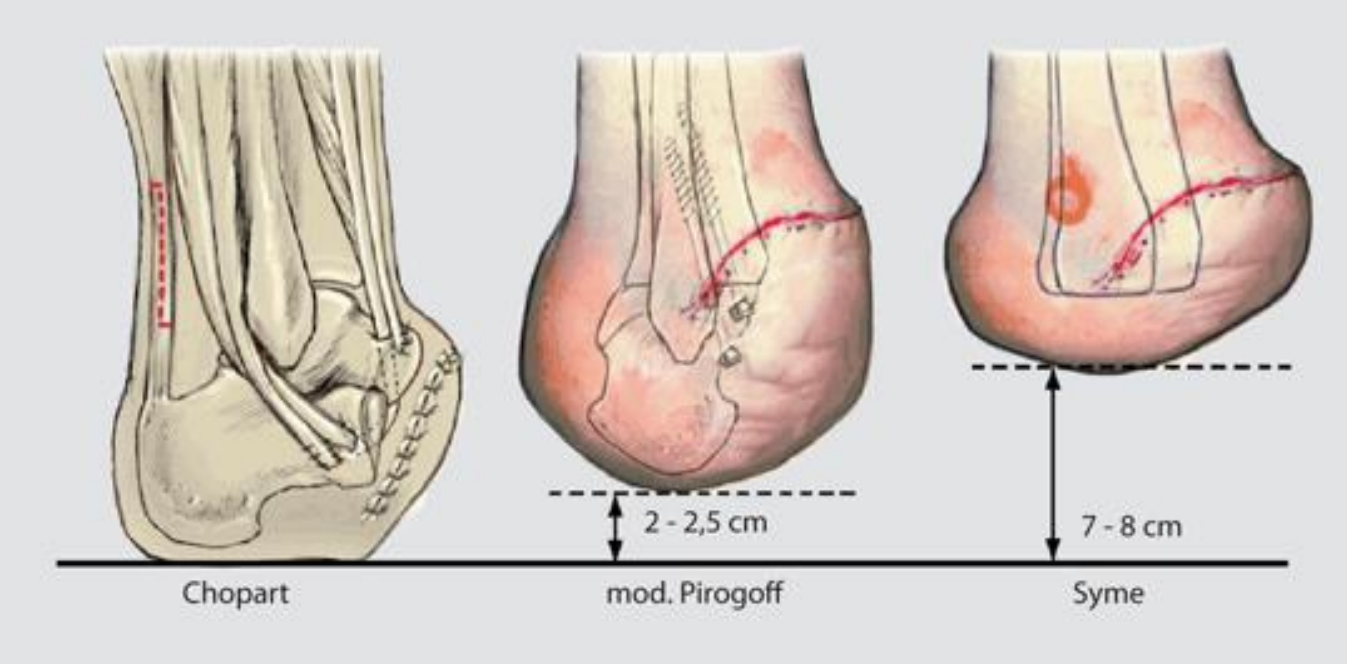
Themenabend Majormputationen

Prof. Dr. Axel Larena-Avellaneda, 05.09.2024

1. Vorsitzender Wundzentrum Hamburg e.V.

Majoramputationen

Alle Amputationen inklusive Ferse (Syme-Amputation)



https://link.springer.com/article/10.1007/s00104-011-2189-2/figures/6

Folgen einer Majoramputation für die Patienten

- Sterblichkeit
- Immobilität
- Schmerzen
- Beweglichkeit
- Lebensqualität

Major Lower Extremity Amputation

Outcome of a Modern Series

Bernadette Aulivola, MD; Chantel N. Hile, MD; Allen D. Hamdan, MD; et al

Article Information

Arch Surg. 2004;139(4):395-399. doi:10.1001/archsurg.139.4.395

	Gesamt	Oberschenkel	Unterschenkel
30-Tages-Mortalität	8,6%	16,5%	5,7%
Wundinfektionen	5,5%		
Kardiale Komplikationen	10,2%		
Nach-Operation		4,7%	18,4%
1-Jahres Überleben	69,7%	50,6%	74,5%
5-Jahres Überleben	34,7%	22,5%	38,7%

WOUND REPAIR AND REGENERATION
THE INTERNATIONAL JOURNAL OF TISSUE REPAIR AND REGENERATION

Original Research-Clinical Science

Prognosis of critical limb ischemia: Major vs. minor amputation comparison

Kyoichi Matsuzaki MD, PhD ✉, Ruka Hayashi MD, PhD, Keisuke Okabe MD, PhD, Noriko Aramaki-Hattori MD, PhD, Kazuo Kishi MD, PhD

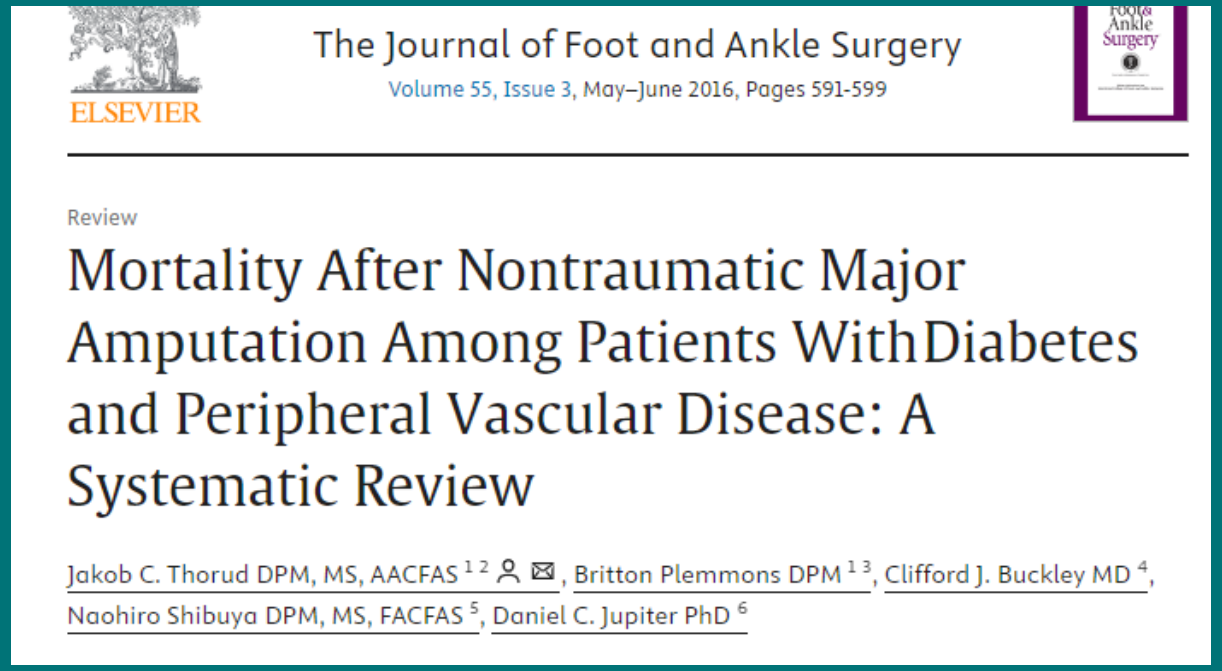
First published: 17 June 2015 | https://doi.org/10.1111/wrr.12329 | Citations: 11

Patienten mit diabetischer Nephropathie, Ergebnisse nach 2 Jahren

Minor-Amputation: n=56, Sterblichkeit 41,1%

Major-Amputation: n=10, Sterblichkeit 60%, statistisch nicht signifikant

=> Auch Minor-Amputationen gehen mit einer deutlich erhöhten Sterblichkeit einher



The Journal of Foot and Ankle Surgery
Volume 55, Issue 3, May–June 2016, Pages 591-599

Review

Mortality After Nontraumatic Major Amputation Among Patients With Diabetes and Peripheral Vascular Disease: A Systematic Review

Jakob C. Thorud DPM, MS, AACFAS [1 2], Britton Plemmons DPM [1 3], Clifford J. Buckley MD [4], Naohiro Shibuya DPM, MS, FACFAS [5], Daniel C. Jupiter PhD [6]

Systematisches Review – 5 Jahres-Ergebnisse

Gesamtsterblichkeit (alle, inkl. Minor)	Major	Oberschenkel	Unterschenkel
53-100%	52-80%	40-90%	40-82%

Risikofaktoren: Alter, Nierenerkrankung, Oberschenkelamp., pAVK

A meta-analysis of mortality after minor amputation among patients with diabetes and/or peripheral vascular disease

Kaissar Yammine, MD, MPH, PhD,[a,b] Fady Hayek, MD,[b,c] *and* Chahine Assi, MD,[a] *Beirut, Lebanon*

Table V. Mortality stratified by level of amputation

	Mortality rate			
Measurement point	Toes	Mid-foot	*P* value	Any level
30 Days, %	1.81	3.2	**.002**	5.4
95% CI, %	0.012-0.024	0.018-0.049		0.028-0.086
I^2	NA	68.6		82.4
Studies; patients, No.	2; 1858	5; 3283		5; 5122
1 Year, %	10.4	15.5	**.0001**	23.6
95% CI, %	0.060-0.157	0.097-0.223		0.166-0.313
I^2	76.2	79.1		97
Studies; patients, No.	3; 2043	4; 790		14; 7231
3 Years	22.5	23.5	**0.6**	32
95% CI, %	0.099-0.384	0.201-0.270		0.262-0.379
I^2	NA	27.9		89.8
Studies; patients, No.	2; 1980	3; 577		13; 5866
5 Years	44.7	54.5	**<.00001**	42.4
95% CI, %	0.425-0.469	0.424-0.663		0.381-0.468
I^2	NA	83.6		89
Studies; patients, No.	2; 1980	4; 629		16; 7905

CI, Confidence interval; *NA*, not applicable.
Boldface *P* values represent statistical significance.

Wenn die Entscheidung gefallen ist – keine Zeit verlieren

Delay Influences Outcome after Lower Limb Major Amputation

P.W. Moxey [a,*], D. Hofman [b], R.J. Hinchliffe [a], J. Poloniecki [b], I.M. Loftus [a], M.M. Thompson [a], P.J. Holt [a]

[a] Department of Outcomes Research, St George's Vascular Institute, 4th Floor, St James Wing, St George's Healthcare NHS Trust, London SW17 0QT, UK
[b] Department of Outcomes Research, Community Health Sciences, St George's University of London, London SW17 0RE, UK

	Overall
Number of patients	14168
Above knee amputation	6940 (49.0%)
Through knee amputation	404 (2.0%)
Below knee amputation	6937 (49.0%)
Age	70
Male gender	9336 (65.9%)
Diabetes mellitus	6197 (43.7%)
Chronic kidney disease	1496 (11.0%)
Gangrene or tissue loss	1795 (12.7%)
Elective admission	3577 (25.2%)
In-hospital mortality (Crude)	2403 (17.0%)
One year mortality (Crude)	5012 (35.4%)
Median Charlson score	2
Median deprivation rank	13611
Median total length of stay (days)	33
Median post amputation recovery time (days)	22

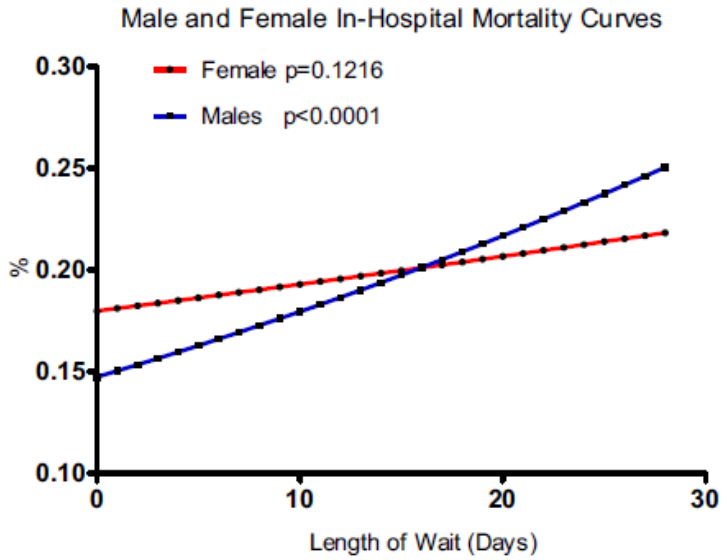


Figure 1. In-hospital mortality curves post major amputation plotted using predicted data from a 2 level regression model of a 70 year old male and female with median Charlson score undergoing no attempt at revascularisation on the index admission. The graph demonstrates the relationship between length of wait to surgery and increased mortality after major lower limb amputation.

European Journal of Vascular and Endovascular Surgery 44 (2012) 485–490

Phantomschmerz

Original Artide

Vascular and Endovascular Surgery
2024, Vol. 58(2) 142–150

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Phantom Limb Pain and Painful Neuroma After Dysvascular Lower-Extremity Amputation: A Systematic Review and Meta-Analysis

Mirte Langeveld, MD, MPH[1,2], Romy Bosman, BSc[1,2], Caroline A. Hundepool, MD, PhD[1],

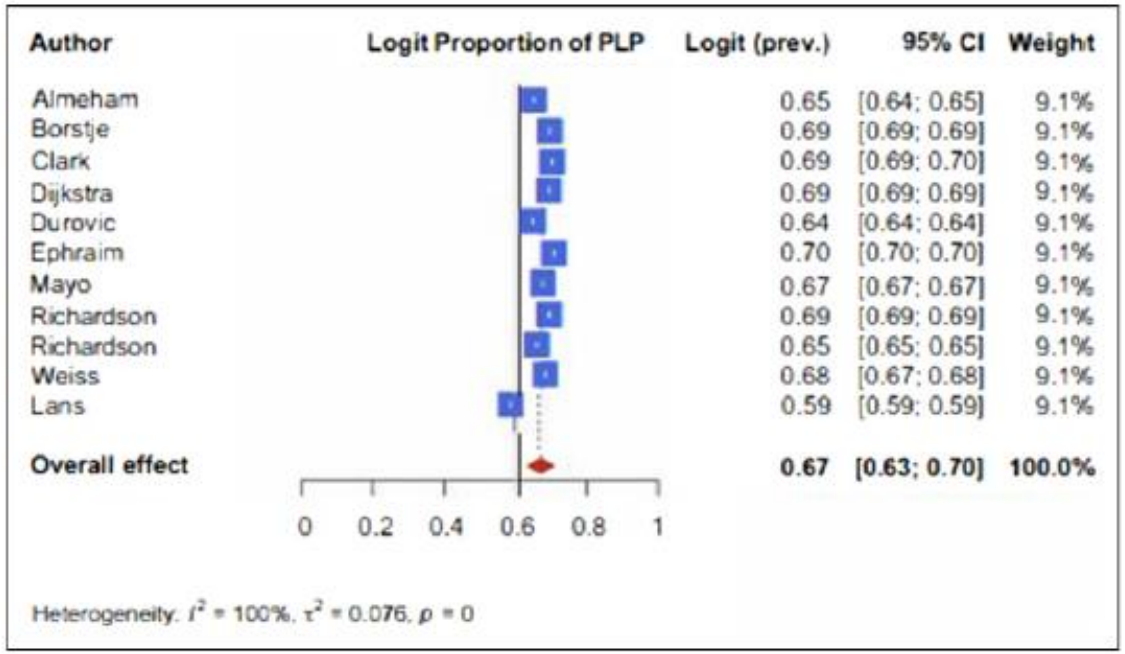

Figure 2. Meta-analysis of proportions of PLP in LLA.

Schmerzintensität: VAS-Skala 0-10:

2,3 ± 1,4 bis 5,5 ± 0,7

Neurome in 5% der Fälle

The impact a surgeon has on primary amputee prosthetic rehabilitation: A survey of residual lower limb quality

Prosthetics and Orthotics International
2018, Vol. 42(4) 428–436

DOI: 10.1177/0309364618757768
journals.sagepub.com/home/poi
SAGE

Sellaiah Sooriakumaran, Maggie Uden, Sarah Mulroy, David Ewins and Thomas Collins

Table 1. Example of descriptors given in guidance notes for the scoring of item 5 – bone end.

To be scored from clinical examination, X-ray and operation notes if available.		
	Transfemoral	**Transtibial**
Optimal (score 10)	Evidence of circumferential rounding of bone edge, no evidence of loose periosteum or bone spike. See X-ray.	Anterior bevelling, edges made smooth all around, fibula trimmed 1–1.5 cm shorter than tibia and bevelled. See X-ray.
Sub-optimal (score 5)	Evidence of smooth anterior cortical border only, rest of the bone edges appearing sharp. Presence of asymptomatic bone spike.	Partial bevelling, insufficient rounding of edges, fibula not trimmed shorter or inadequately bevelled.
Unsatisfactory (score 0)	Sharp edges all around with no evidence of bone contouring. Sharp symptomatic spike.	Clinically protuberant and tender tibial crest, no evidence of bevelling or edges being made smooth or fibula equal or longer than tibia on X-ray

Rehabilitation

Disabil Rehabil. 2013 Feb;35(3):221-7. doi: 10.3109/09638288.2012.690818. Epub 2012 Jun 11.

Rehabilitation outcome of post-acute lower limb geriatric amputees

Avital Hershkovitz [1], Israel Dudkiewicz, Shai Brill

117 Patienten, mittl. Alter 74,7 J, verlegt in Rehabilitation

Unterschenkel: 47,9%, Oberschenkel: 39,3%, bds: 12,8%

23,1% erhielten eine Prothese, bei einseitiger Amputation 24,5%

Positiver Einfluss:

- Unterschenkelamputation
- kongnitiver Status
- metabolischer Status
- längerer Aufenthalt

1 Jahres Sterblichkeit: 46,2%

Amputations were performed by 25 surgeons at 16 hospitals; the majority came from six hospitals, with the other 10 referring only one or two individuals (grouped together as 'other' for seven-way analysis). Kruskal–Wallis test indicated a significant difference in total score between at least one pair of hospitals ($p = 0.011$). Mann–Whitney tests of each pair showed that one hospital had a higher median score than all others ($p < 0.05$ for all six

There was no significant difference in total scores between transfemoral and transtibial levels. At transtibial level, two surgical techniques were employed: posterior flap ($n = 38$) and skew flap ($n = 17$). The skew flap limbs had significantly higher median score (90 compared to 80, Mann–Whitney $p = 0.0008$). However, there was a significant difference in median age (53 years – skew – compared to 68 years – posterior, Mann–Whitney $p = 0.0042$) and different distribution of cause of amputation, posterior flap predominantly for dysvascularity (78%), while skew flap more evenly distributed between trauma (29%), dysvascularity (29%) and neurological disorder (24%).

Skewflap versus long posterior flap in below-knee amputations: Multicenter trial

Charles Vaughan Ruckley, ChM, FRCSE, Peter Arno Stonebridge, FRCSE, and **Robin John Prescott, PhD,** *Edinburgh, Scotland*

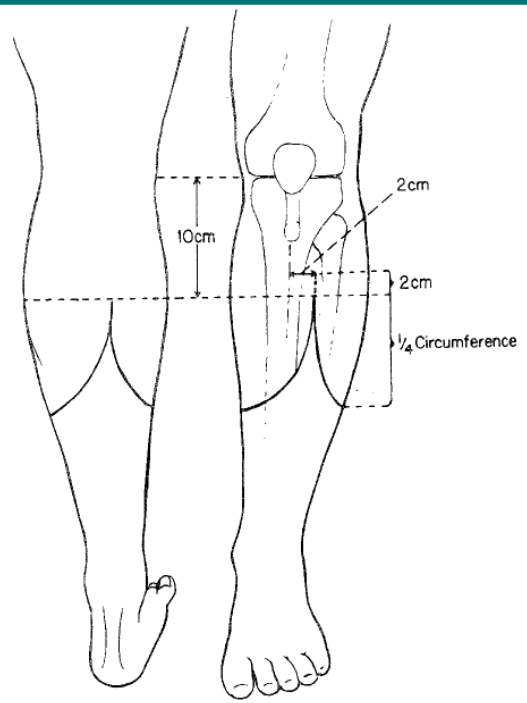

Fig. 1. Design of skin flaps for skew flap below-knee amputation. (Modified from Robinson K. Vascular surgical techniques. Philadelphia: WB Saunders, 1989.)

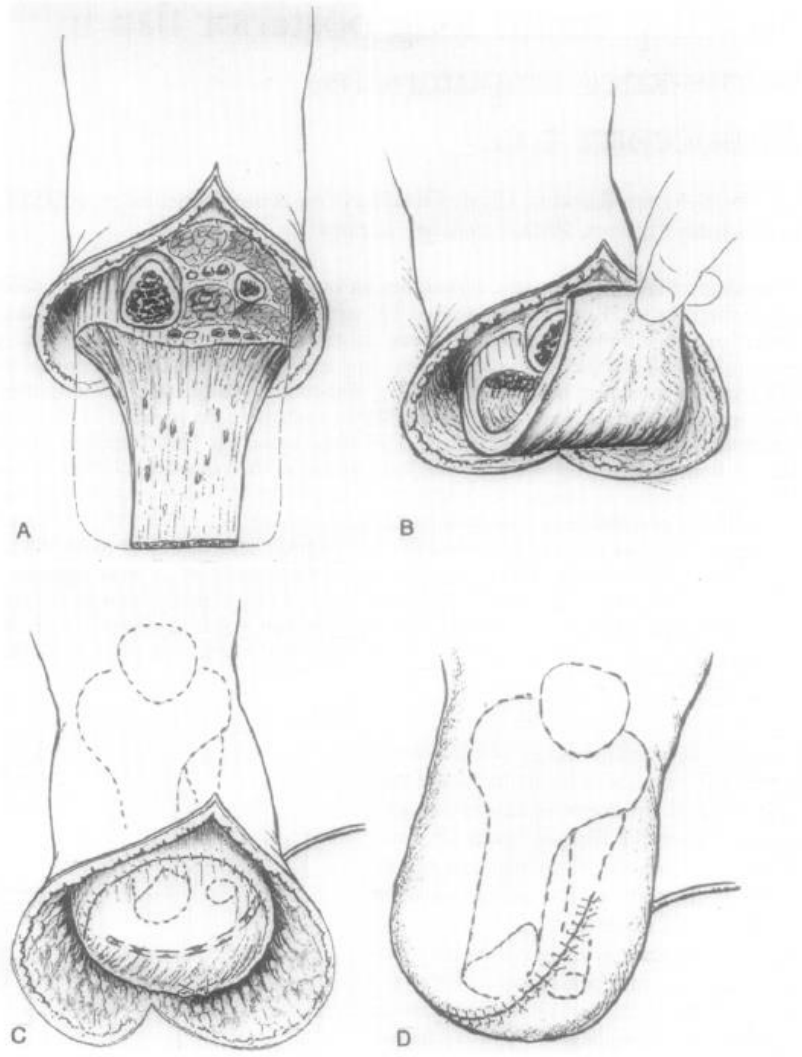

Fig. 2. A, Skew flap amputation. Gastrocnemius muscle, with deep fascia attached, is narrowed. **B,** The posterior flap is brought forward. **C,** The anterior border of the tibia is covered by suturing the posterior flap to deep fascia and periosteum. **D,** The flaps are closed over a vacuum drain. Note that the suture line does not lie directly in front of the divided bone. (Modified from Robinson K. Vascular surgical techniques. Philadelphia: WB Saunders, 1989.)

Clinical Trial > J Vasc Surg. 1991 Mar;13(3):423-7. doi: 10.1067/mva.1991.25644.

SwedeAmp—the Swedish Amputation and Prosthetics Registry: 8-year data on 5762 patients with lower limb amputation show sex differences in amputation level and in patient-reported outcome

Ilka KAMRAD [1], Bengt SÖDERBERG [2], Hedvig ÖRNEHOLM [1], and Kerstin HAGBERG [3]

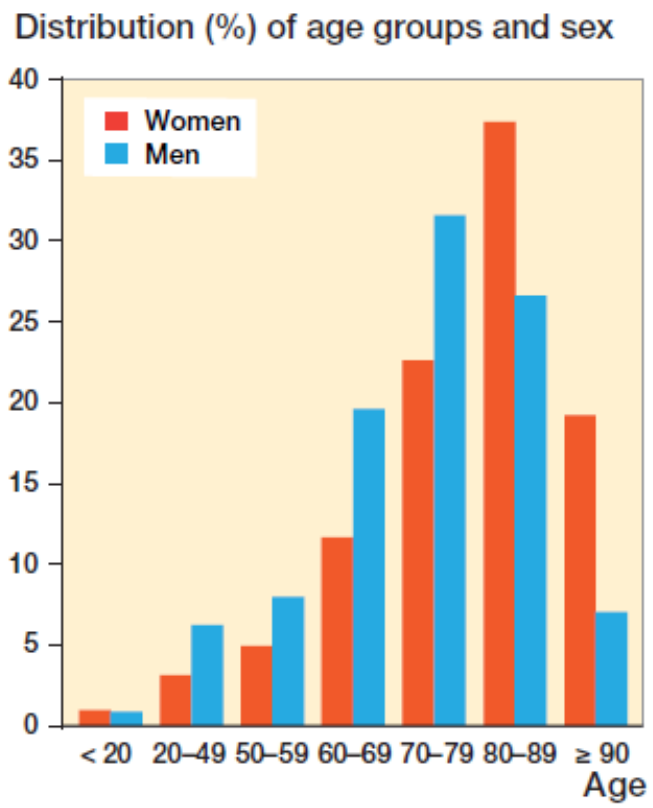

Figure 3. Age and sex at the time of the first registered amputation.

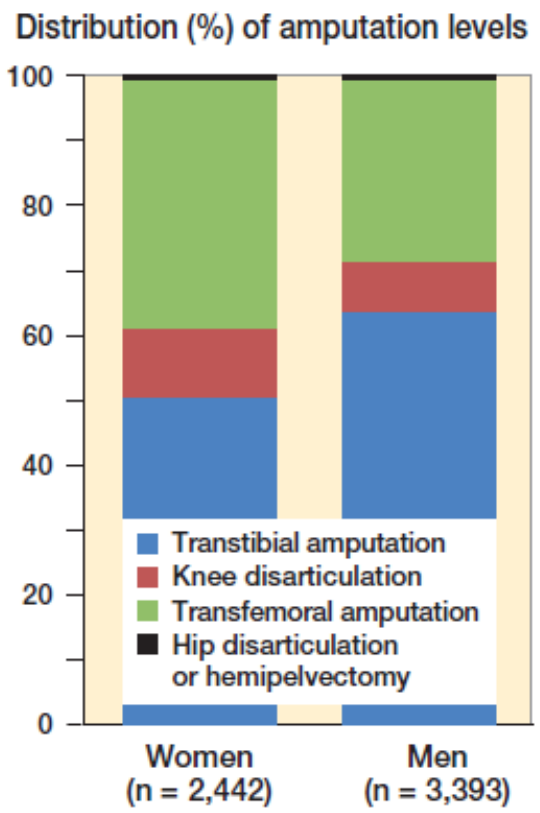

Figure 4. Differences in major amputation levels for men and women ($p < 0.001$).

The most frequently registered surgical technique for TTA was sagittal flaps (72%) followed by anterior/posterior flaps (14%), long posterior flaps (9%), and skew flaps (4%).

Postoperatively, 55% of patients with TTA, 25% with KD, and 21% with TFA were assessed as potential users of a functional prosthesis. Of the 2,652 registered prosthetic supplies, 79% were TTA prostheses. The most common type of TTA pros-

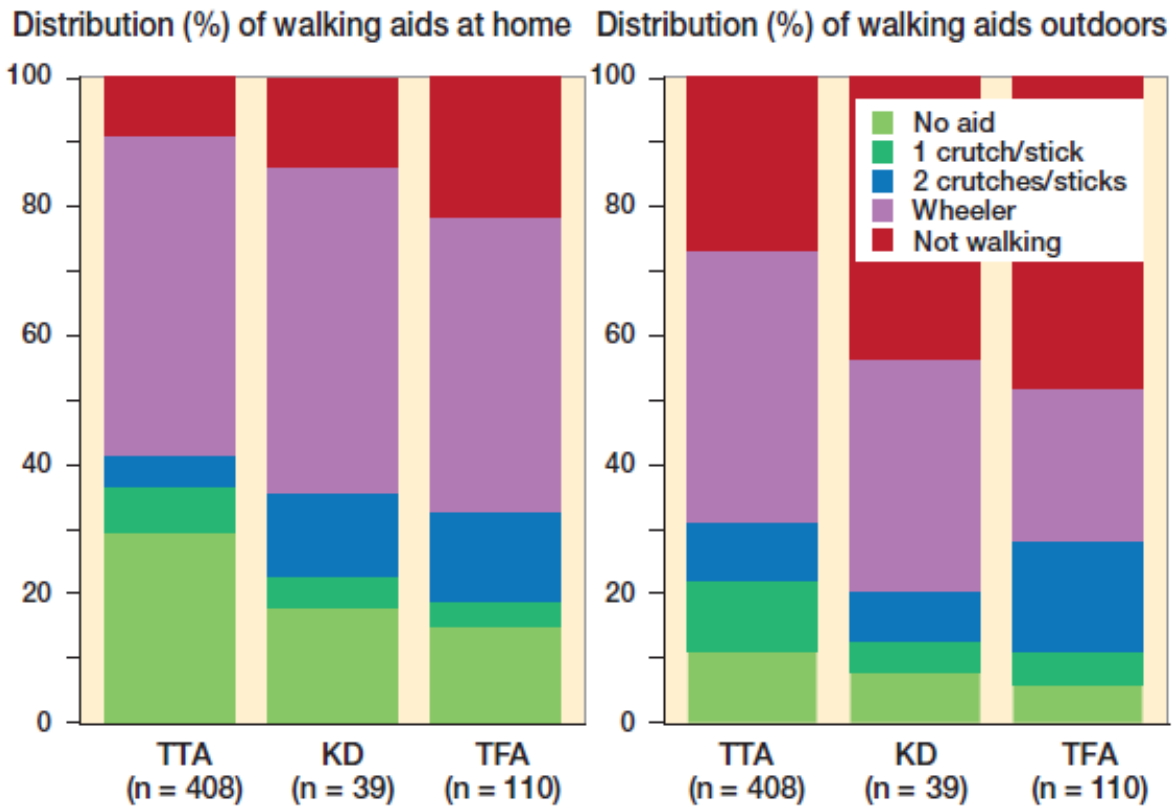

Figure 5. Use of walking aids when walking with the prosthesis at home (left panel) and outdoors (right panel) at 12-months' follow-up after unilateral amputation.

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Rehabilitation nach Majoramputation an der unteren Extremität (proximal des Fußes)

a) Da nach einer hohen Amputation, insbesondere bei den häufig betroffenen älteren Patienten aufgrund der dominierenden Aktivitätsbeeinträchtigungen, mangelnden Mobilität und negativen Kontextfaktoren (unzureichende Selbst- und häusliche Versorgung/Unterstützung) die individuellen Voraussetzungen zur Durchführung einer ambulanten Rehabilitation (Tab. 1) oft nicht erfüllt sind, sollte der Amputierte in der Regel frühzeitig ohne Prothese in eine in der Regel stationäre Rehabilitationseinrichtung verlegt werden, die über genügend Erfahrung in der Versorgung von Amputierten verfügt (Behandlung einer größeren Anzahl amputierter Patienten pro Jahr). Die Verlegung des Patienten in die Rehabilitationseinrichtung sollte in der Regel ohne Prothese erfolgen (siehe oben), da erst nach Oedemreduktion und Bestimmung des Rehabilitationspotentials durch ein qualifiziertes Team die Anfertigung einer (Interims-) Prothese sinnvoll ist. Nur so ist die Versorgung des Patienten mit einer „sinnvollen" Passteilauswahl garantiert. Zudem können notwendige Prothesenänderungen durch etwaige Volumenschwankungen des Stumpfes zeitnah in der weiterbehandelnden Klinik durchgeführt werden.

Fazit

Die Sterblichkeit im Verlauf Amputationen (major und minor) ist erschreckend hoch
Wenn die Entscheidung zur Majoramputation gefallen ist, keine Zeit verlieren
Man sollte die Technik anwenden, die man am besten beherrscht
Die Kniegelenks-Exartikulation hat kaum bessere Ergebnisse als die Oberschenkelamputation
Über Phantomschmerzen berichten ca. 70% der Amputierten
Die Verlegung in eine entsprechende AHB ist oft schwierig
Prothesenfähigkeit nach Major-Amputation: ca. 25%
Selbst nach Prothesenanpassung besteht eine Hohe Rate an Immobilität