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Univerza v Ljubljani



# **Ethical Issues in Rehabilitation of Persons after Amputation**

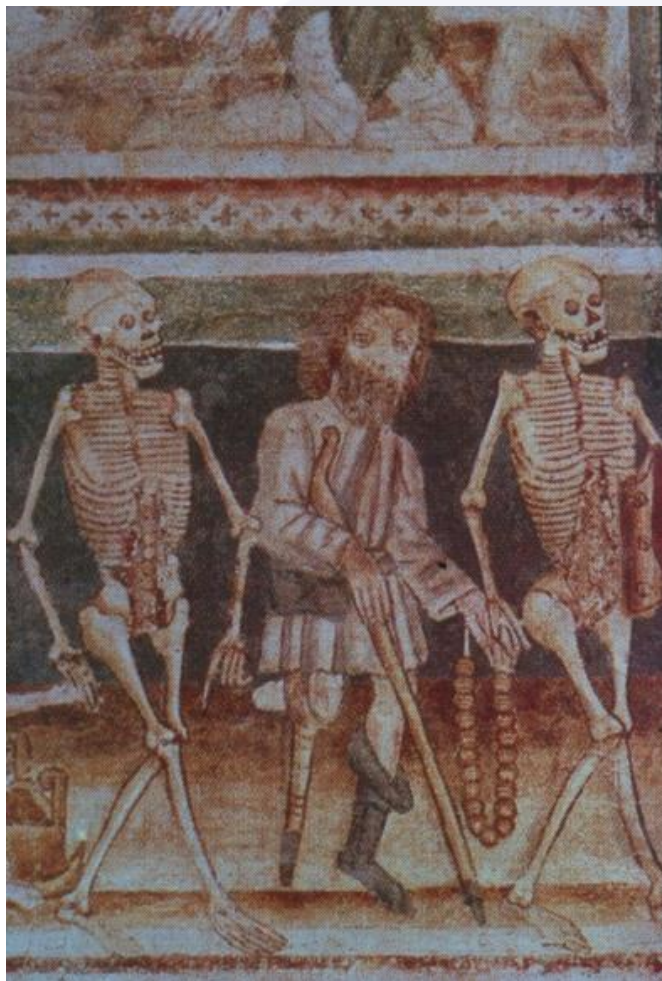
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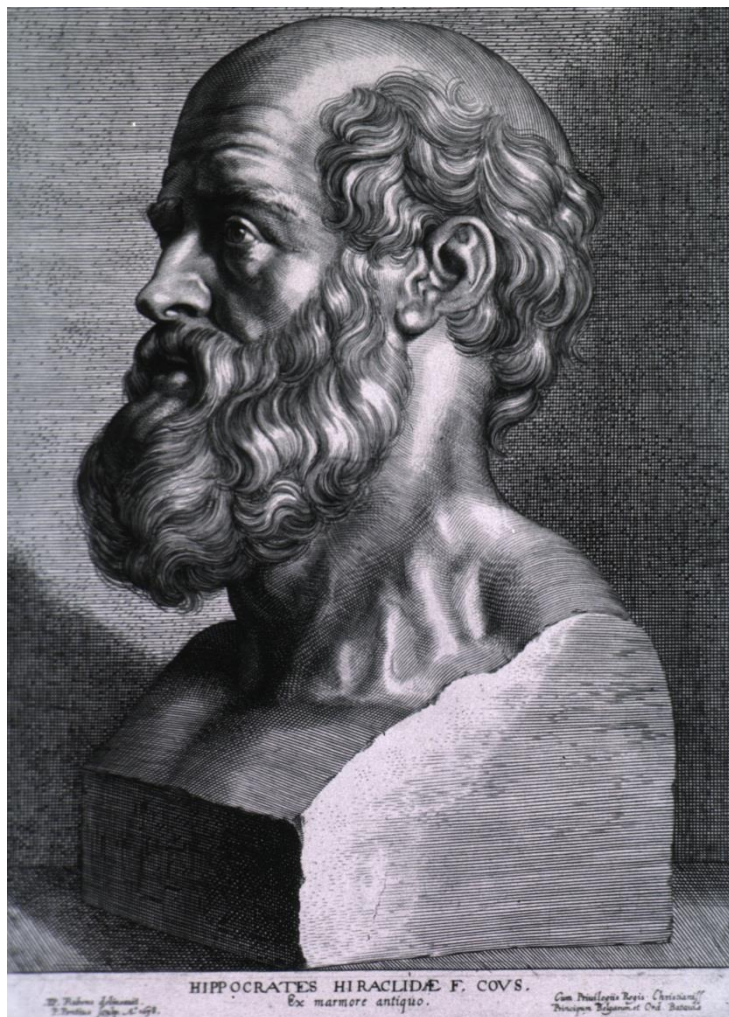
# Introduction



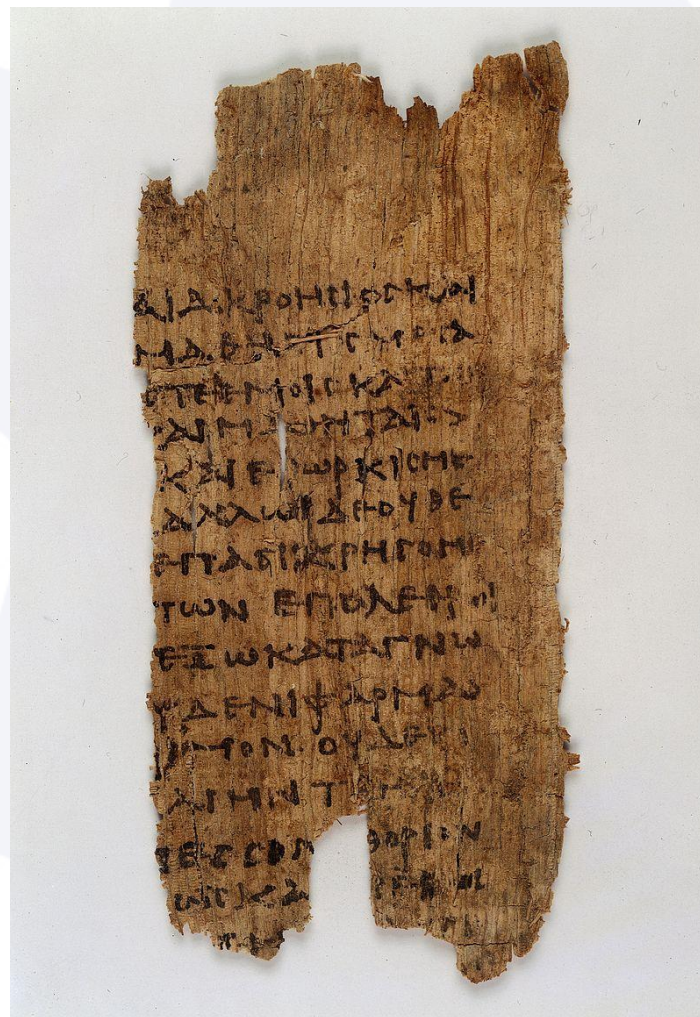
Marinček Č. The iron hand from Slovenia. *Prosthet Orthot Int* 1992;16: 153-156.

Janez iz Kastva, 14<sup>th</sup> century





Peter Paul Rubens 1638



A fragment of the Oath on the 3rd-century Papyrus Oxyrhynchus



# Amputation

Yes?



No?

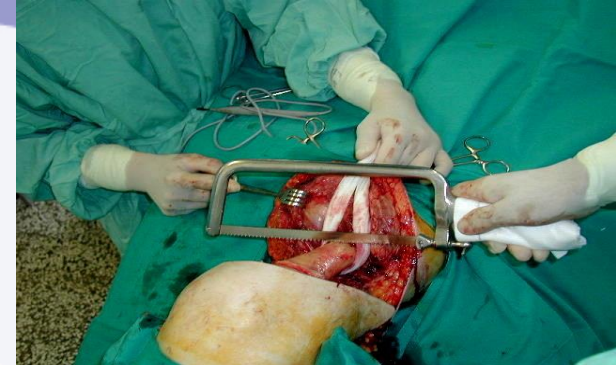




# Amputation

\* No

- Other vascular surgery?
- Replantation?
- Transplantation?
- Conservative treatment?
- Role of PRM specialist?



# Amputation

- \* When?
- \* Who?
- \* The role of PRM specialist?





# When?

- \* PVD, DM – Deconditioning
- \* Injury<sup>1</sup>:
  - Lower limb reconstruction is more acceptable psychologically
  - The physical outcome for both is more or less the same

1 – Akula M et al. Injury, Int J Care Injured 2011; 42: 1194 – 7.



# Who?

- \* Amputation has to be done by a surgeon specialised in amp. surgery – recommendation A BSRM, Australian and Dutch guidelines



Chakrabatry BK. Prosthet Orthot Int 1998; 22: 136 – 46.

Cosgrove CM et al. Ann Roy Coll Surg Eng 2002; 84: 344 – 7.





**Amputation is  
not the end but  
the beginning of  
the new way.**

**G Murdoch**





# Role of PRM specialist

- \* Before each planned operation surgeon has to consult rehabilitation team and the patient<sup>1,2</sup>
- \* Other role?



1 – Australian guidelines. Amputee care standards in New South Wales 2008

2 – Dutch guidelines. POI 2015; 39: 351 – 71.





# After amputation

- \* All patients want prosthesis
- \* Most wanted is the “best” prosthesis







# Outcome Predictors

- \*Shape of the stump - ↑ fitting <sup>1, 2</sup>
- \*Amp. one LL <sup>3</sup>
- \*More distal amp. <sup>3</sup>
- \*Cause of amputation – PVD → ↓ outcome <sup>3</sup>

1 – Chakrabatry BK. Prosthet Orthot Int 1998; 22: 136 – 46.

2 – Cosgrove CM et al. Ann Roy Coll Surg Eng 2002; 84: 344 – 7.

3 – Sansam K et al. J Rehabil Med 2009; 41: 593 – 603.



# Outcome Predictors



- \*Residual limb wounds and ulcers
  - Despite use of prosthesis 64% healed in 6 weeks <sup>1</sup>
  - Vacuum-assisted socket system vs standard suction socket after ulcer/wound healing <sup>2</sup>

1 – Salawu A et al. Prosthet Orthot Int 2006; 30: 279 – 85.

2 – Traballesi M et al. Eur J Phys Rehabil Med 2012; 48: 613 – 80.



# Outcome Predictors

\*Up to 30 different comorbidities<sup>1</sup>

→39.2% Hypertension

→16.9% Congestive heart failure

→15.1% Chronic pulmonary disease

→13.1% Renal failure<sup>2</sup>

→8 – 18% Stroke<sup>3</sup>

1 – Kurichi JE et al. Gerontology 2007; 53: 255 – 9.

2 – Arneja AS et al. Am J Phys Med Rehabil 2015; 94: 257 – 68.

3 – Hebert JS et al. Disabil Rehabil 2012; 34: 1943 – 9.



# Outcome

\*1 year after rehabilitation and fitting only 9% of persons in institutional care use a prosthesis<sup>1</sup>

1 – Remes L et al. Aging Clin Exp Res 2009; 21: 129 – 53.





# Outcome Predictors

- \*Cognitive impairment is more prevalent among persons after LLA than in the general population <sup>1</sup>

- \* $\frac{1}{4}$  had dementia<sup>2</sup>

- \*Memory – only predictive factor for independent donning of prosthesis <sup>3</sup>

1 – Coffey L et al. Disabil Rehabil 2012; 34: 1950 – 64.

2 – Schuch V et al. Inter Med Appl Sci 2012; 4: 175 – 80.

3 – Sansam K et al. J Rehabil Med 2009; 41: 593 – 603.



# Rehabilitation

- \* Everybody will not be fitted with a prosthesis,
- \* Everybody can benefit from rehabilitation <sup>1</sup>





# Prosthetic prescription

\* Who prescribes the prosthesis?

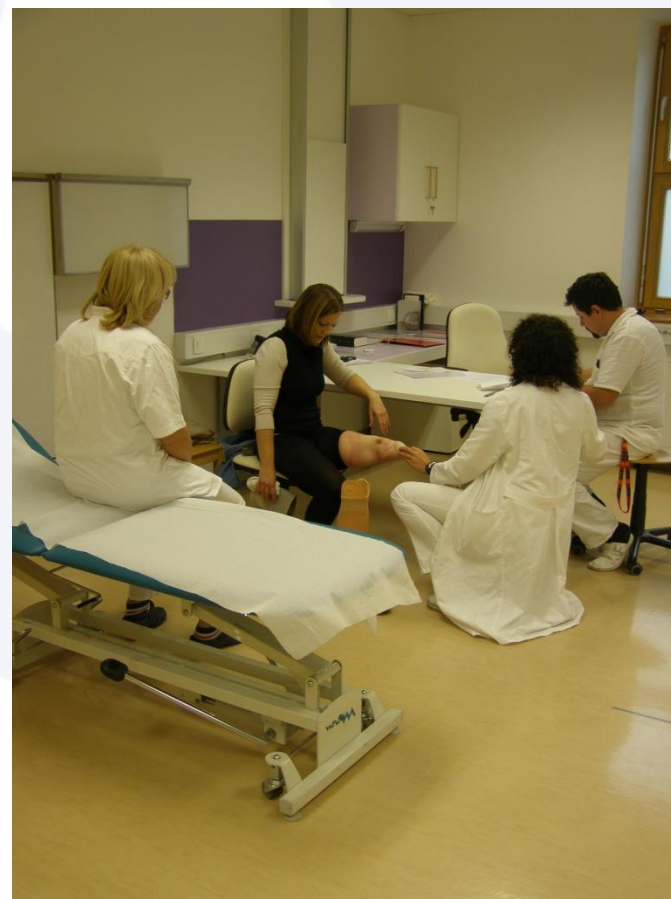
→ MD:

- Surgeon
- PRM specialist

→ Team

→ CPO

→ PT





# Prosthetic prescription <sup>1</sup>

- \* National clinical guidelines for prescription of LL P Delphy technique:

- 21 MD
- 8 CPO
- 3 PF

- \* General:
  - Activity level
  - Amputation level
- \* Socket
- \* (knee)
- \* Foot





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# The “Best” Prosthesis





# The “Best” Prosthesis

- \* For whom?
  - For all users?
  - For individual?

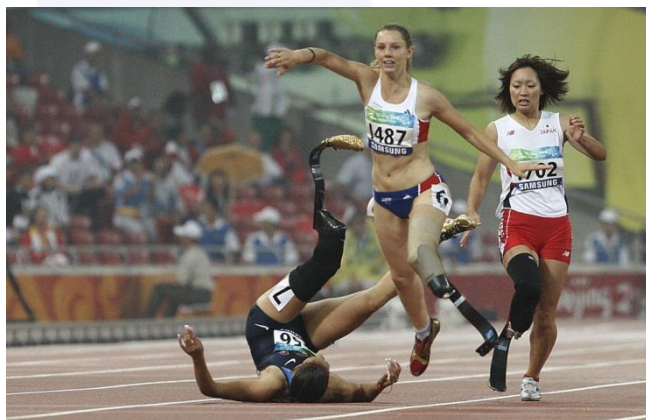






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# For which activity?





# Work



Burger H. In Murray C (ed). Springer 2010: 101 – 14.





# Driving





# Prosthesis – bad fitting





# Prosthesis



- \* 52 – 80% persons after LLA are at risk of falling<sup>1, 2</sup>
- \* Balance problems – ↑ sway<sup>3</sup>
- \* Asymmetry in body weight<sup>3</sup>

1– Miller W et al. Arch Phys Med Rehabil 2001; 82: 1031 – 7.

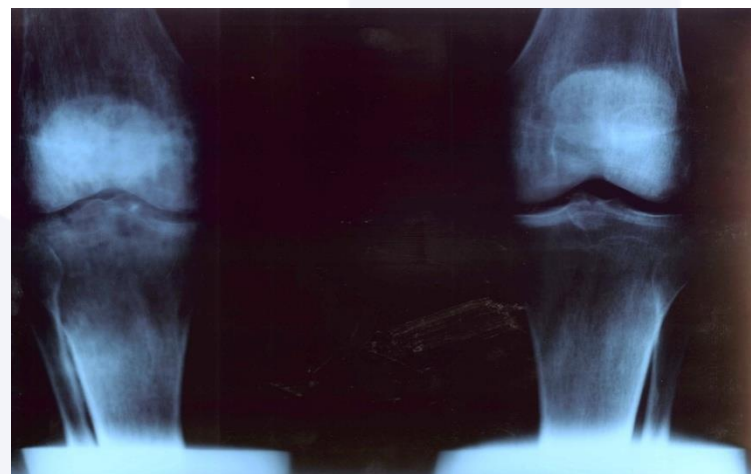
2 – Ülger Ö et al. Top Geriatr Rehabil 2010; 26: 156 – 63.

3 – Xuan Ku P et al. Gait & Posture 2014; 39: 672 – 82.



# Prosthesis

- \* Persons after LLA have secondary impairments <sup>1</sup>
- \* Can prosthesis decrease secondary impairments?



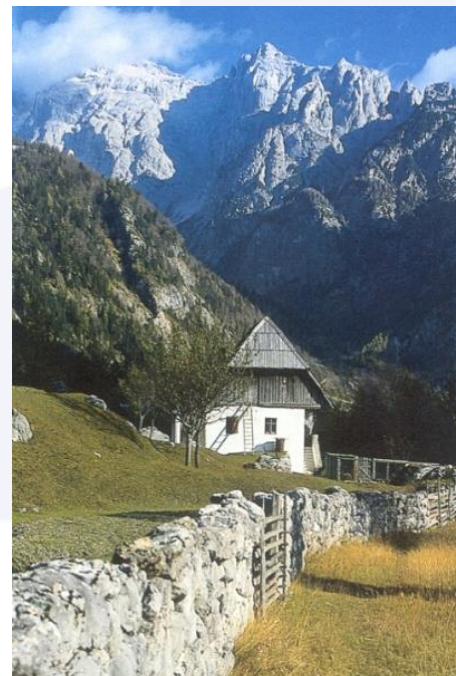
1– Gailey R et al. J Rehabil Res Dev 2008; 45: 15 – 29.





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# Prosthesis







# Prosthesis

- \* To construct the most appropriate prosthesis we must consider the psychological construct of the person.



Malcolm MacLachlan,

ISPO World Congress 2015, Lyon, Fr



# Prosthesis

- \* Who is the owner of information collected by modern prosthetic components (microprocesor knees, feet)?





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# Patients Expectations





# Prosthesis

- \* Buying a prosthesis/ component privately?





# Other Stakeholders

- \* Payer
- \* Manufacturers
- \* ....







# Prosthesis



Current market  
beneficiaries

Making high-quality products affordable for all – WHO  
(Chapal Khasnabis, ISPO World Congress 2015, Lyon, Fr)



# Conclusion

- \* There are many ethical issues with no clear answers
- \* We need more good clinical studies



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# Thank you!