Use and Changes Through Use of Lower Limb Prostheses in Two Orthopaedic Centres in Malawi

Presentation for the 19th SPRU DPhil Day 2013

Victoria Blessing
Introduction

- Medical technologies in developing countries often imported from elsewhere
- What happens then to those technologies once they are deployed on the ground? Are they changed?
- Interest in details and sources of those changes
  - Focus on changes by patients as well as technicians
Enabling Innovation Framework

- Different participants go through learning selection process with technology
  - Experience
  - Making sense
  - Drawing conclusion
  - Taking action
- Participants are in contact
- Leads to trajectory of increasing fitness of technology
Framework

Douthwaite 2002

Other participants

Experience

Experience

Making sense

Action

Making sense

Drawing conclusion

Many replications of cycle

Participant i

Participant j

Time

Fitness of technology

Use and changes through use of lower limb prostheses
Victoria Blessing
Lower Limb Prostheses

- Changes by many participants possible
  - Both medical professionals and patients use them
  - Appropriate complexity, e.g. no electrical parts
Data Collection

- In two orthopaedic centres in Malawi

Strategy for each centre

- Observations
  - Start with observations to learn standard production process of prostheses

- Interviews
  - Technicians and patients about changes and context
  - Experts about context

- Documents
Changes by Patients

- Of 22 interviewed patients from both centres, 14 made changes to their prostheses.

- Most common changes:
  - tie together foot
  - sew or replace belt
  - add padding in distal end of socket

- In addition changes made by only one patient:
  - wear system of stockings
Reasons for Changes by Patients

- Maintenance, repairs
- Comfort
- Cosmetics
Motivation of Patients to Make Changes Themselves

- Distance to orthopaedic centre
- Financial means for transport
- Breakage needed to be fixed immediately
  - Happened at work
  - To get to exams at school
- Temporary fix until centre could be reached
Conclusions

- Enabling innovation framework and lower limb prostheses
  - Similarities
    - Patients = users making changes is general phenomenon
    - Reasons and motivation – learning selection process
  - Differences
    - Non-market environment
- Next steps: conclusions on how framework would need to be adjusted and generalisations
Feedback, Questions, Comments
Data collection – Centre A

- ICRC polypropylene technology
- Under Ministry of Health
- Established 1970
- Also provides orthoses, surgical footwear and wheelchairs
Data collection – Centre B

- Jaipur technology
- Under Christian Health Association of Malawi
- Established 2006
Use and changes through use of lower limb prostheses
Victoria Blessing

Framework

[Diagram showing the framework of technology adoption with phases such as fitness of technology, adaptation phase, and time, and the role of researcher knowledge and plausible promises in the process.]
Research Questions

- How are medical technologies in developing countries developed further while they are being used?
  - What are some of the changes being made to them?
  - How did those changes come about?
  - Who made those changes? Is making changes limited to a certain group of participants or not?
  - Did any of these changes spread beyond the individual who made it? If so, how?
- What mechanisms cause or foster those changes?
Production Process of Lower Limb Prostheses

Steps

- Cast taking
- Production
- Fitting
- Finishing

Combination of pre-made parts and raw materials
Changes by Technicians

- All technicians interviewed and observed made changes
- Changes during production
  - Changes in production
  - Standard changes after fitting
- Changes during repairs
Conclusions

- Enabling innovation framework
  - Patients
    - Many physical changes on prostheses
  - Technicians
    - Standard production process
    - Created many additional options
    - Many changes not disruptive
- Differences in changes by patients in two centres