Falls in the Amputee Population: a literature review

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Prevalence of falls

- 32% of inpatients (Gooday & Hunter 2004)
- 58% of rehabilitation inpatients (Kulkarni et al 1996)
- 52% of outpatients (Miller et al 2001)

- ie significant numbers!
Risk factors

An amputee is more likely to fall:

• if they have an AKA, back or joint pain, multiple problems with prosthesis or stump (Miller et al 2001)

• if they have a cognitive impairment, are older than 70, were deaf (Gooday and Hunter 2004)
Risk factors

- while leaning or reaching out of the wheelchair or transferring from/to wheelchair (Gooday and Hunter 2004, Vlahov et al 1990)

- in their room or the bathroom (Gooday and Hunter 2004, Vlahov et al 1990)
Risk factors

An amputee if less likely to fall:
• If they have had the amputation for more than 4 years (Miller et al 2001)
Risk factors

• Amputees have increased postural sway cf non-amputee subjects (Isakov et al 1992) esp. vascular amputees (Hermodsson et al 2003)

• This reduces during rehabilitation (Isakov et al 1992)
Risk factors

• Balance confidence positively affects mobility performance and social activity (Miller et al. 2001)

• All amputees score low on the balance confidence scale (ABC) (Miller et al. 2002)
Causes of falls

- Patient-related **
- Prosthesis-related
- Environment-related
- Combination of above 3
Consequences of falls

- Femoral fractures (Gonzalez and Mathews 1980)
- Stump trauma (Behar et al 1991)
- Increased fear of falling (Miller et al 2001)
- Prolonged hospital stay and discharge to long-term care (Bates et al 1995)
- Restriction of mobility and social activity (Miller et al 2001a)
Intervention

• Devise a risk assessment sheet (Gooday and Hunter 2004)

• Notices around ward to remind patients to transfer safely (Gooday and Hunter 2004)

• Teach patients to transfer safely (Gooday and Hunter 2004)
Intervention

• Provision of WC if MMSE less than 24
  (Gooday and Hunter 2004)

• Designation of ‘safe rooms’ on a ward
  (Gooday and Hunter 2004)

• POP stump protection for at-risk patients
  (Gooday and Hunter 2004)
Intervention

• Advice on environmental hazards (Kulkarni et al 1996)

• Education about prosthesis eg knee locking mechanism, don/doff procedure (Kulkarni et al 1996)
Intervention

- Gait training to include high risk areas such as kerbs and obstacles (Kulkarni et al 1996)

- Balance training (Kulkarni et al 1996) specifically
  * Use of limb load monitor or mirror/verbal instruction to enhance feedback (Gauthier-Gagnon et al 1986)

  * Use of task-orientated balance training (Matjacic and Burger 2003)
Intervention

- Good training in fitting of socket to enhance sensory feedback from the stump (Kulkarni et al 1996)

- On/off floor instruction (Kulkarni et al 1996)
Intervention

- Use of walker inlet-closure strap to limit patients advancing too far into their PUF (Kirby et al 1999)

- Strengthening of hip abductor muscles (Nadollek et al 2002)
A risk assessment tool

- MMSE < 24
- a cognitive impairment
- back or joint pain
- multiple problems with prosthesis
- multiple problems with stump
- are older than 70
- deaf
- increased postural sway with eyes open and closed
- weak hip abductors