A SCORING TOOL TO PREDICT FUNCTIONAL OUTCOME IN LOWER LIMB AMPUTEES (BLARt) - A PILOT STUDY

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History

• Primary patient expectations too high
  – “you will be walking into clinic in 2 weeks”
  – “you will be up and dancing in 6 weeks”

• Rehabilitation MDT dealing with the fallout when expectations not matched
Consenting Patients

• No validated methods of predicting outcome prior to surgery

• Consent / Pre-operative advice is based largely on non-prosthetic clinicians’ opinions

• Patient expectations are often unrealistic, particularly with the elderly dysvascular patient
Can We Predict Outcome?

Our aim was to identify pre-operative factors that could predict the likelihood of successful prosthetic rehabilitation and mobility after lower limb amputation.
Clinical Use

• Informed consent based upon an objective assessment
• Completed by any clinician that doesn’t require specialist practitioner knowledge
• May affect what course of treatment patients decide
• Pre-operative use of tool could result in a higher level of primary amputation
Observational Study - 2009

• Eight year study looking at all patients who had an amputation within our area
• 31% Transfemoral and 74% Transtibial achieved functional mobility
Will They? Won’t They?

• For 80 patients we tried to predict their outcomes on initial contact
• Use of knowledge gained from observational study / clinical judgement - purely subjective
• 94% accurate prediction
Development of BLARt

• Information from the creation dataset, previously published literature, clinical judgement and experience.

• Nine preoperative variables were identified as potentially impacting on the success of rehabilitation and having a significant impact on patient outcomes.

• A weighted scoring system was then assigned to these variables.
<table>
<thead>
<tr>
<th>Sex</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Female</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>&lt;49</th>
<th>50-64</th>
<th>65-74</th>
<th>75-80</th>
<th>81+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BMI</th>
<th>Average (18.5 - 25)</th>
<th>Above average (25-30)</th>
<th>Obese (&gt;30)</th>
<th>Below average (&lt;18.5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cause of amputation</th>
<th>Trauma</th>
<th>Congenital</th>
<th>Cancer</th>
<th>Orthopaedic</th>
<th>Vascular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cause of amputation</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cognitive Capacity</th>
<th>Confused</th>
<th>Limited carry over</th>
<th>Alert/aware</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Capacity</td>
<td>5</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level of Amputation</th>
<th>Above / through knee</th>
<th>Below knee</th>
<th>Hip disarticulation</th>
<th>Bilateral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of Amputation</td>
<td>3</td>
<td>1</td>
<td>5</td>
<td>4-6</td>
</tr>
</tbody>
</table>

Pre-amp mobility
- Wheelchair bound for 12 mths + 5
- Wheelchair bound for < 12 mths 4
- Indoor mobility only 3
- Outdoor mobility with aids 2
- Unaided outdoor mobility 1
- Walking >3 miles 0

Special risks
- CVA / Neurological 3
- Renal problems 4
- Respiratory problems 5
- Contralateral limb issues 2-4
- Recent MI / Angina 2

BLARt SCORE FOR AMPUTEE OUTCOMES
(Blatchford Leicester Allman Russell tool)

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Total Score
Pilot Study

- 199 patients (101 from Leicester, 98 from Sheffield)
- BLARt score recorded at initial contact
- SIGAM outcome recorded at primary discharge
Plot of BLARt score against chances of achieving any functional mobility

Pearson correlation coefficient $R^2=0.86$, $p<0.001$
# Results of Pilot

<table>
<thead>
<tr>
<th></th>
<th>BLARt score</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-12</td>
<td>13-23</td>
<td>24-32</td>
<td></td>
</tr>
<tr>
<td>(n=57)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full or partial functional rehabilitation (n=105)</td>
<td>54 (95%)</td>
<td>50 (47%)</td>
<td>1 (3%)</td>
<td></td>
</tr>
<tr>
<td>No rehabilitation (n=74)</td>
<td>2 (3%)</td>
<td>48 (45%)</td>
<td>24 (69%)</td>
<td></td>
</tr>
<tr>
<td>Death (n=20)</td>
<td>1 (2%)</td>
<td>9 (8%)</td>
<td>10 (29%)</td>
<td></td>
</tr>
</tbody>
</table>
Limitations

• Better at predicting poor outcome
  • Some factors not measurable (motivational/social)
  • Unpredictable post amputation factors (wound healing, post-op illness)

• Some who scored high did achieve functional rehab so not a prescriptive tool
Next Steps

• Pilot study in the process of being published
• Currently validating with proposed dataset of 1000 in centres across England

Leicester
Sheffield
Nottingham
Derby
Northampton

Luton
Crystal Palace
Charing X
Stanmore
Carlisle
Questions?

Thank you