The Role of Orthotics and Prosthetics in the MDfT

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What is an Orthotist?

• Orthotists are autonomous registered practitioners who provide gait analysis and engineering solutions to patients with problems of the neuro, muscular and skeletal systems.

• They are extensively trained at undergraduate level in mechanics, biomechanics, and material science along with anatomy, physiology and pathophysiology.

• Their qualifications make them competent to design and provide orthoses that modify the structural or functional characteristics of the patients' neuro-muscular and skeletal systems enabling patients to mobilise, eliminate gait deviations, reduce falls, reduce pain, prevent and facilitate healing of ulcers.
• Orthotists are also qualified to modify CE marked Orthoses or componentry taking responsibility for the impact of any changes.

• They treat patients with a wide range of conditions including Diabetes, Arthritis, Cerebral Palsy, Stroke, Spina Bifida, Scoliosis, MSK, sports injuries and trauma.

• Whilst they often work as autonomous practitioners they increasingly often form part of multidisciplinary teams such as within the diabetic foot team or neuro-rehabilitation team.

Definition obtained from the British Association of Prosthetists and Orthotists
What is an Orthosis?

“An externally applied device used to modify the structural or functional characteristics of the neuro-muscular-skeletal system”

An orthosis accomplishes its purpose by applying a force to a part of the body. The force may be required to help support weight or to maintain body parts in alignment. The forces applied may help to control the range and rate of the body components.
Functions of Orthoses.

- Limit Movement
- Correct Deformity
- Assist Movement
- Protection
Therefore...

The Orthosis:

– Protects a body part

– Supports a body part

– Alters the presentation of abnormal biomechanics
Benefits of Orthotics

• Orthotics services play an essential role in enabling quality of life for people with long term conditions, disabilities and limb loss

• Being able to access the right orthotics equipment, quickly, and with appropriate support, is of paramount importance
“Orthotic provision has the potential to achieve significant health, quality of life and economic benefits for the NHS if a comprehensive, integrated service can be provided, throughout the patient pathway. Service planning and contracting arrangements which emphasise the delivery of an integrated and comprehensive orthotic service are more likely to achieve the benefits to the NHS identified in the many reports.”

• Early orthotic intervention improves lives and saves money
• The provision of orthotics has a beneficial impact on a range of clinical conditions by relieving pain, increasing mobility, protecting tissues and promoting healing along with a whole host of other benefits including improved independence and self-image.

• The range of clinical conditions benefiting from orthotics includes chronic diseases and trauma as well as neurological, musculoskeletal and congenital conditions. A number of these remain as policy priorities for the Government and the NHS, All-Party Associate Parliamentary Limb Loss Group, 2014: Patient Led Orthotic Services Patients Charter.
• Commissioners and managers should be aware of the positive impact that orthotics services can have on commissioning priorities such as the reduction of hospital admissions, accident and emergency (A&E) attendances and prevention of complications from diabetes, peripheral vascular disease and cancer.

• Appropriate orthotic management of patients with these conditions can delay and reduce the need for more expensive and complex treatment and the need for surgery.

• In addition, there are also benefits to wider health and social care priorities including promoting well-being and supporting independence in the community, for example by reducing the probability of falls in frail, older patients and keeping them mobile and independent reducing the need for social care. All of which contribute to reducing inequity.
• It suggested that for every £1 spent on improving orthotics service provision, the NHS could save £4

What is a Prosthetist?

- Prosthetists are autonomous registered practitioners who provide gait analysis and engineering solutions to patients with limb loss.

- They are extensively trained at undergraduate level in mechanics, bio-mechanics, and material science along with anatomy, physiology and pathophysiology.

- Their qualifications make them competent to design and provide prostheses that replicate the structural or functional characteristics of the patients absent limb.
They are also qualified to modify CE marked prostheses or componentry taking responsibility for the impact of any changes.

They treat patients with congenital loss as well as loss due to diabetes, reduced vascularity, infection and trauma.

Military personnel are forming an increasing part of their caseload. Whilst they are autonomous practitioners they usually work closely with physiotherapists and occupational therapists as part of multidisciplinary amputee rehabilitation teams.

Definition obtained from the British Association of Prosthetists and Orthotists
Multi-Disciplinary Team

• Both Orthotists and Prosthetists are members of the Multi-Disciplinary Clinical Team, the collective responsibility of which is to effect the care and rehabilitation of the patient

• The team will ideally include all parties who have a direct input to the needs of the patient, which will vary from patient to patient

• An ideal clinical team consists of the following...
Good Practice

• Pertinent fields of knowledge required by the Orthotist and Prosthetist include normal anatomy, pathological anatomy, physiology, joint orientation, cause and effect of distortion.

• Good orthotic and prosthetic practice includes the following:

  1. Problem Identification
  2. Accurate Prescription
  3. Documentation
  4. Orthotic/Prosthetic Design and Fabrication
  5. Material science
  6. Biomechanics/pathomechanics
  7. Engineering
  8. Accurate Fitting
  9. Effective Evaluation
  10. Effective Follow-up Procedures
Pressure reduces when spread over larger areas

Image source: BAPO
Know the Patient

• Reason of referral
• Diagnoses
• Aims of intervention
• Risk level
• Previous history of diabetic foot complications
• Relevant medical/surgical history
• Clinical examination
• Level of knowledge/understanding
• Previous orthotic experience
• Aims and expectations of the patient
• Mental health
Apart from taking a full medical history of the individual, a full assessment of the lower limb is required in order to determine some of the following important factors:

- Age, gender, weight and socioeconomic status of the individual
- Is there a reduction or loss of protective sensation?
- Is there a reduction of blood flow to the foot?
- Is there any infection present?
- Is the patient able to recall a history of trauma or injury to the foot?
- Is there a deformity present?
- Is the anatomically normal role and range of movement of the foot/ankle complex compromised?
- Previous history of ulceration?
- Is there any rigidity or areas of increased flexibility about the foot/ankle complex or any musculoskeletal issues present?
- Are there any dermatological concerns present?
- Does the individual have any coexisting diagnoses?
- What is their mental health state?
The Role of the Prosthetic and Rehabilitation Services in the MDfT
Dilemmas

• Sensate / non sensate foot
• The ‘A’ word - when to consider / how to mention amputation ?
  – not too late
• Will QOL be improved ?
• Other foot
• Education
• What level ?
  – try to conserve the knee
South East London Prosthetic Amputee Services

**Bowley Close**
What can we offer you and your patients?

- **Pre amputation consultation**
  (As an MDT)
  Opportunity to meet established amputee.
  Patient able to make informed choice.

- **Inpatient ward rounds**
  Kings, GSTT, Mayday
  New primary’s – pre or post
  Start of pre/post prosthetic Rehab.
  Established amputees - check prosthetic fitting

- **Amputee Rehabilitation Unit**
  Opened in June 2013
  12 beded
  6/7 days rehab
  Specialist inpatient rehab

- **Large Specialist MDT/ Joint Clinics on site**
  Prosthetists, Orthotists
  Workshop Staff, Physios, OTs,
  Rehab Consultant, Counsellors
  Wheelchairs, Assisted Tech
Pre-amputation Consultation

• All about patient involvement and choice
• Service overview (Consultant in amp rehab, Prosthetics, Physio, OT, Counselling +/- nurse)
• View prosthetics
• Clinical pathway and long term life style discussed and explained

• Refer to local prosthetics centre.( google : UK disablement services centres)
Perceived Dangers and Reasons for not Completing Amputation...

- High Mortality
- Non healing wounds
- Prominent bony landmarks and skin breakdown.
Challenges

Meeting pts expectations
Aiding acceptance – counsellors, meeting prosthetics team +/- pts
Time: from surgery to complete prosthetic rehab
Ability to save knee
Wound healing
Non compliant patients – esp relevant to diabetic patients
Amputation readily undertaken

• We agree amputation should not be 1\textsuperscript{st} intervention in a Diabetic foot.

• Should have good diabetic foot care, attempts at limb salvage – angioplastys, bypasses.

• Need to question ultra distal bypasses and significant foot debridement leading to a healthy but non functional foot

Professor Cliff Shearman, President of the Vascular Society of Great Britain and Ireland, presented “Avoidance of Amputation”.
• However, when amputation is indicated:
  ❖ Patients should have informed choice
  ❖ Don’t delay
  ❖ Appropriate definitive level that will heal
  ❖ When a patient requests a 2\textsuperscript{nd} opinion
Appropriate Definitive Level

• “The fundamental aim of whichever treatment modality is adopted is restoration of maximum independence over the medium to long term and that short term limb salvage may not be consistent with this goal” (Davies AH, Beard JD and Wyatt MG 1999)
Consequences of Delayed Amputation

- Delayed amputation or definitive level
  - Immobility: Bed rest/NWB
  - Financial: multiple hospital admissions has impact on work
  - Risk of falls: increased risk of falls
  - DVT: Risk of DVT
  - Chest infection
  - Loss of independence: Ability to carry out ADLS
  - Mood: Decreased mood
  - Exercise tolerance: Deconditioning; ↓ exercise tolerance
  - Function: ↓ range and Muscle strength
  - Higher amputation, ↓ function
  - Death: medically unwell, death, higher amputation, ↓ function
  - Independence: loss of independence, ability to carry out ADLS
Benefits Of Having An Early Mobilisation programme

• Improving Quality of Life.
• Maintaining & improving joint ROM
• Maintaining & improving CV fitness
• Maintaining & improving M/S strength
• Psychological
• Reduced bed blockers / LOS
• No significant additional time or cost for the prosthetists
Our Thoughts on Amputation

• **Agree**: Should not be completed lightly...

However...

• It should **not** be considered as a ‘surgical failure’.

• Major Amputation should be **timely**.

• It should be considered as a treatment **option** by the clinician.

• Patients should be informed of the **choice**.

• Decision made to provide the patient with the best **Quality of Life** possible.
• “The fundamental aim of whichever treatment modality is adopted is restoration of maximum independence over the medium to long term and that short term limb salvage may not be consistent with this goal” (Davies AH, Beard JD and Wyatt MG 1999)
Food for thought...

HOWEVER: Are we looking at the wrong evidence to support our practice?

If we looked at traumatic amputee mortality rates would these be lower....

If we completed a definitive amputation earlier (patient in a well state), would perioperative and hospital mortality rates be lower?

These patients do not die due to having an amputation, they die due to their conditions that lead to amputation worsening. Nature of disease process attributing to 5 year survival rates.
‘Mortality appears to be independent of factors increasing ulcer risk. An aggressive MDT approach is warranted not only to manage foot problems in such patients but also to recognise and reduce risk of death from other comorbid conditions to save both limb and life.’
‘Although most surgeons consider amputation to be the ultimate surgical failure, a well-planned and executed amputation can remove a painful, dysfunctional limb and allow rehabilitation with a prosthetic limb to a functional, painless state. In this regard, amputation surgery may be considered reconstructive surgery, with results similar to amputation of an arthritic femoral head and prosthetic replacement (total-hip replacement)’.

Dr Thomas J. Moore, 1992
Conclusion

• Consider amputation as a treatment option.

• An Informed Patient.

• Refer for pre-amp consultations.

• Improved links between the Diabetic foot clinic, Vascular Surgeons and prosthetics.

• Timely amputation.

• Consider success in terms of functional Outcome Measures and Quality of Life Measures.