SYDNEY WEST
Area Health Service

TEMPORARY PROSTHESIS SPECIFICATIONS

Compiled by: Tony Fitzsimons

Product Type	**Transtibial Temporary Prosthesis**
Intended Users	Transtibial / Below-Knee amputees in early stages of rehabilitation / gait re-education
Purpose	▪ Short term usage (weeks). ▪ Allow early return to weight-bearing / mobility ▪ Prevention of secondary complications through immobility, such as deconditioning / contractures / weakness. ▪ Prepare the residual limb for use of a definitive prosthesis through progressive shaping / oedema reduction. ▪ Assist pain reduction / wound healing through oedema reduction. ▪ Assist in determining mobility potential, and for use in prescription of components for definitive prosthesis.
Construction Principles	▪ Total Contact ▪ Selective weight bearing – patella tendon bearing.
Weight Bearing Surfaces	▪ Patella tendon ▪ Medial flare of tibia ▪ Tibialis Anterior muscle bulk
Other Pressure Tolerant Surfaces	▪ Posterior knee / popliteal area
Pressure Intolerant Surfaces	▪ Tibial crest ▪ Tibial tuberosity ▪ Distal ends of tibial / fibular remnant ▪ Head of fibula ▪ Distal Hamstring tendon insertions. ▪ Other bony prominences, eg around tibial plateau / femoral condyles. ▪ Areas of soft tissue scarring or superficial nerves/neuromas.
Safe Working Limit	▪ Socket: unknown. ▪ Other components have defined limits, usually up to 100-150kg. See separate listing for individual components.
Height	▪ Match intact limb length
Alignment Principles	▪ Socket in 5^0 flexion (plus contracture). ▪ Pylon 1cm medial to centre of socket. ▪ Knee axis 2.5 – 3.5cm anterior to the pylon. ▪ Patellar shelf horizontal and facing forwards in line of progression. ▪ Foot in slight dorsiflexion and 3^0 external rotation.
Suspension	▪ Suprapatellar cuff, attached to brady studs on either side of the socket.
Socket	▪ Single use, replaceable, custom made for the individual. ▪ Plaster of paris construction. ▪ Moulded for selective loading / relief. ▪ Includes individualised selective areas of internal padding for pressure relief & comfort. ▪ Incorporates basket for attachment of shank / foot components, typically Otto Bock 4R26 or 4R28 IPSF attachment plates. ▪ Incorporates studs on each side for attachment of suspension. ▪ May be reinforced with synthetic casting material. Note that even with reinforcement, the safe working limit of the socket should not exceed

	the safe working limit of other components. **Advantages:** ▪ Plaster is cheap & readily available; inexpensive replacement sockets. ▪ Plaster moulds to the shape of the residuum well, better than direct application of synthetic casting material. ▪ Some ability to modify internal surfaces to accommodate changes in stump size. ▪ Attachment plates re-usable. ▪ Can be manufactured, aligned & modified without delay on site by physiotherapists with sufficient knowledge. ▪ Variety of products can be used for internal padding. ▪ Synthetic casting material can add strength without contributing to weight. ▪ Other materials used with interim prostheses are expensive, not readily available, and require specialised equipment and expertise for the manufacturing process. **Disadvantages:** ▪ Safe working limit is unknown. ▪ Heavy in comparison to interim sockets made of plastic materials. ▪ Not tolerant to high levels of usage – plaster may crack or soften, or basket may work loose inside the cast. ▪ Not tolerant to exposure to water. ▪ Hard internal surfaces, unforgiving against skin / soft tissue. ▪ Ability to make modifications is limited, may require socket replacement if fit is inadequate.
Socket / shank interface	▪ Modular, male socket adaptor. ▪ Aluminium, steel or titanium ▪ Typically Otto Bock 4R23, 4R54, 4R74 ▪ Safe working limits vary with material used, 100-150kg. ▪ New or second hand.
Shank	▪ Modular. ▪ Pylon consists of tube adaptor – tube construction of steel, titanium or carbon fibre, with connected female adaptor / pyramid receiver with 4 adjustment screws. Safe working limits vary with material and diameter up to 150kg. ▪ Tube clamp adaptor – aluminium, steel or titanium with female adaptor / pyramid receiver with 4 adjustment screws. Typically Otto Bock 4R23, 4R54. Safe working limits vary with material up to150kg. ▪ New or second hand.
Shank / Foot interface	▪ SACH foot adaptor with Bolt accessory, aluminium, steel or titanium. Safe working limit depends on model serial number & material, up to 125kg. ▪ Other systems may be used, depending on foot selected, eg Endolite multiflex ankle for use with Blatchford feet. Safe working limits up to 120kg. ▪ New or second hand.
Foot	▪ SACH foot, firmer heel cushion. Multiple possible manufacturers. Safe working limit 75-125kg. ▪ Blatchford multiaxial foot. Safe working limit 100-120kg. ▪ There may be other modular single axis or multiaxial feet that may be used, depending on patient functionality, reliability, and availability.

	▪ Size to fit inside appropriate footwear. ▪ New or second hand.
Recommended Footwear, suppled by patient	▪ Flat, or minimal heel height. ▪ Broad heel width. ▪ Non-slip soles. ▪ Able to be secured to prosthetic foot –enclosed, velcro, laces or buckles. Low heel counter or straps not recommended.
Other considerations	▪ Consider recommended torque settings for tightening grub / adjustment screws. ▪ Consider use of loctite or other adhesive to prevent loosening of grub / adjustment screws.

Note

Second hand components must satisfy inspection, maintenance, infection control, and total usage criteria.

TEMPORARY PROSTHESIS SPECIFICATIONS

Compiled by: Tony Fitzsimons

Product Type	**Transfemoral Temporary Prosthesis**
Intended Users	Transfemoral / Above-Knee amputees in early stages of rehabilitation / gait re-education
Purpose	▪ Short term usage (weeks). ▪ Allow early return to weight-bearing / mobility ▪ Prevention of secondary complications through immobility, such as deconditioning / contractures / weakness. ▪ Prepare the residual limb for use of a definitive prosthesis through progressive shaping / oedema reduction. ▪ Assist pain reduction / wound healing through oedema reduction. ▪ Assist in determining mobility potential, and for use in prescription of components for definitive prosthesis.
Construction Principles	▪ Total Contact ▪ Selective weight bearing – quadrilateral socket with ischial weight bearing.
Weight Bearing Surfaces	▪ Ischial tuberosity
Other Pressure Tolerant Surfaces	▪ Lateral aspect of thigh. ▪ Posterior aspect of thigh. ▪ Proximal / anterior thigh – Scarpa's triangle.
Pressure Intolerant Surfaces	▪ Distal end of femur – anterior & lateral. ▪ Pubic ramus.
Safe Working Limit	▪ Socket: unknown. ▪ Other components have defined limits, usually up to 100-150kg. See separate listing for individual components.
Height	▪ Match intact limb length. ▪ In some cases may be up to 12mm shorter on prosthetic side to assist with foot clearance during swing phase.
Alignment Principles	▪ Socket in 5^0 flexion (plus contracture). ▪ Quadrilateral socket alignment: • Posterior brim is parallel with the ground • Medial brim is horizontal • Medial brim runs in line of progression • Medial wall is vertical ▪ Ischial tuberosity 1cm medial to centre of basket. ▪ Knee 3^0 externally rotated. ▪ TKA (trochanter/knee/ankle) line sits 5-15mm anterior to the centre of the knee joint (safety knee). ▪ Foot in slight dorsiflexion.
Suspension	▪ Pelvic band / belt. ▪ Silesian band.
Socket	▪ Single use, replaceable, custom made for the individual. ▪ Upper part (weight bearing area) use a pre-fabricated quadrilateral inlet. Lower part is plaster of paris construction. ▪ Moulded for selective loading / relief. ▪ Includes individualised selective areas of internal padding for pressure

	relief & comfort. ▪ Incorporates basket for attachment of knee / shank / foot components, typically Otto Bock 4R26 IPSF attachment plate (6 wires). ▪ Pelvic band attached laterally to quadrilateral inlet. ▪ May be reinforced with synthetic casting material. Note that even with reinforcement, the safe working limit of the socket should not exceed the safe working limit of other components. **Advantages:** ▪ Plaster is cheap & readily available; inexpensive replacement sockets. ▪ Plaster moulds to the shape of the residuum well, better than direct application of synthetic casting material. ▪ Some ability to modify internal surfaces to accommodate changes in stump size. ▪ Attachment plates re-usable. ▪ Can be manufactured, aligned & modified without delay on site by physiotherapists with sufficient knowledge. ▪ Variety of products can be used for internal padding. ▪ Synthetic casting material can add strength without contributing to weight. ▪ Other materials used with interim prostheses are expensive, not readily available, and require specialised equipment and expertise for the manufacturing process. **Disadvantages:** ▪ Safe working limit is unknown. ▪ Quadrilateral inlet is prefabricated / 2nd hand, not customised to individual – tend to use "best fit" inlet. No ability to modify fit of inlet. ▪ Heavy in comparison to interim sockets made of plastic materials. ▪ Not tolerant to high levels of usage – plaster may crack or soften, or basket may work loose inside the cast. ▪ Not tolerant to exposure to water. ▪ Hard internal surfaces, unforgiving against skin / soft tissue. ▪ Ability to make modifications is limited, may require socket replacement if fit is inadequate.
Socket / shank interface	▪ Modular, female socket adaptor. ▪ Aluminium, steel or titanium ▪ Typically Otto Bock 4R22, 4R55, 4R95; or 4R37, 4R51 rotatable adaptor. ▪ Safe working limits vary with material used, 100-150kg. ▪ New or second hand.
Knee Joint	▪ Modular. ▪ Typical knee joints include Otto Bock safety knee with extension assist (3R15 steel, 3R49 titanium) or lock knees (3R17 steel, 3R33 titanium, 3R40 aluminium). ▪ May require use of a double adaptor, such as Otto Bock 4R72, between socket & knee joint to lengthen the thigh segment in the case of short stumps. ▪ Safe working limit varies with model & material. Safety knee limited to 100kg, lock knees 100-150kg. ▪ New or second hand.
Shank	▪ Modular.

	▪ Pylon consists of tube adaptor – tube construction of steel, titanium or carbon fibre, with connected female adaptor / pyramid receiver with 4 adjustment screws. Safe working limits vary with material and diameter up to 150kg. ▪ Tube clamp adaptor – aluminium, steel or titanium with female adaptor / pyramid receiver with 4 adjustment screws. Typically Otto Bock 4R23, 4R54. Safe working limits vary with material up to150kg. ▪ New or second hand.
Shank / Foot interface	▪ SACH foot adaptor with Bolt accessory, aluminium, steel or titanium. Safe working limit depends on model serial number & material, up to 125kg. ▪ Other systems may be used, depending on foot selected, eg Endolite multiflex ankle for use with Blatchford feet. Safe working limits up to 120kg. ▪ New or second hand.
Foot	▪ SACH foot, softer heel cushion. Multiple possible manufacturers. Safe working limit 75-125kg. ▪ Blatchford multiaxial foot. Safe working limit 100-120kg. ▪ There may be other modular single axis or multiaxial feet that may be used, depending on patient functionality, reliability, and availability. ▪ Size to fit inside appropriate footwear. ▪ New or second hand.
Recommended Footwear, suppled by patient	▪ Flat, or minimal heel height. ▪ Broad heel width. ▪ Non-slip soles. ▪ Able to be secured to prosthetic foot –enclosed, velcro, laces or buckles. Low heel counter or straps not recommended.
Other considerations	▪ Consider recommended torque settings for tightening grub / adjustment screws. ▪ Consider use of loctite or other adhesive to prevent loosening of grub / adjustment screws.

Note

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