

# Orthotic Prescribing for Older Adults

## Adapting Assessment, Prescription, and Materials for the Ageing Foot

The ageing foot presents a distinct clinical profile: reduced soft tissue elasticity, loss of plantar fat pad, progressive joint stiffness, multi-morbidity, polypharmacy, and fall risk. These factors require systematic adaptation of the standard orthotic prescribing approach. This reference covers the key differences and evidence-based adjustments across assessment, prescription, materials, and follow-up.

### 1 Age-Related Changes and Their Orthotic Implications

| Change with Ageing                  | Orthotic Prescription Implication                                                                                                                                                                                                                                                        |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Plantar fat pad atrophy             | Loss of natural cushioning under the heel and metatarsal heads. Prescribe full-contact devices with generous heel and forefoot cushioning (Poron 4000, Plastazote base). Avoid hard shell materials in direct contact with the foot without adequate cushioning top covers.              |
| Reduced plantar fascia elasticity   | Less capacity for energy storage and release. Reduced Windlass efficiency contributes to increased forefoot pressure. Metatarsal offloading domes or bars become more relevant. Softer forefoot materials preferred over rigid forefoot posting.                                         |
| Decreased ankle dorsiflexion range  | Gastrocnemius tightness common; equinus increases heel pressure and forefoot overloading. Heel raise (4–6mm, matched bilaterally) often beneficial. Refer for stretching programme to address gastrocnemius-soleus complex.                                                              |
| Reduced proprioception and balance  | Fall risk is a key outcome parameter in this population. Textured top covers (Poron XRD or similar) may marginally improve sensory feedback. Avoid overcorrecting rearfoot posting — wide-base stable platform is the priority. Firm heel counter in footwear essential.                 |
| Joint stiffness and OA              | Rigid orthoses may not be tolerated if joints cannot accommodate correction. Semi-rigid or flexible shells preferred. Accommodative devices (total contact, Plastazote moulded) often the primary approach for moderate-to-severe OA. Functional correction secondary to symptom relief. |
| Skin fragility and vascular changes | Increased risk of pressure injury from edge loading or rigid materials. All device edges must be smoothly finished. Use Plastazote or PPT under bony prominences. Review footwear depth — volume-accommodating footwear often required.                                                  |
| Polypharmacy / multi-morbidity      | Anticoagulants: monitor for bruising from pressure points. Corticosteroids: skin fragility increased. Diabetes co-morbidity: apply diabetic foot prescribing protocol (see M18). Peripheral vascular disease: maximise pressure redistribution; avoid rigid materials.                   |

## 2 Fall Risk Assessment and Orthotic Design

| Principle                                    | Detail                                                                                                                                                                                                                                                                    |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Falls are a primary outcome for older adults | More than 1 in 3 adults over 65 fall annually. Falls are the leading cause of fracture, functional decline, and care home admission in this population. Orthotic design should actively consider fall risk alongside biomechanical correction.                            |
| Rearfoot posting and balance                 | High-angle rearfoot posting (> 4 degrees) can destabilise lateral balance and increase fall risk. In older adults, limit rearfoot posting to 2–3 degrees maximum unless well-tolerated and reviewed. Use accommodative designs that do not narrow the base of gait.       |
| Heel geometry                                | A heel bevel (posterior chamfer on footwear or orthosis) reduces the ground reaction force spike at initial contact — beneficial for reducing loading on arthritic heels. Avoid raised heel heights > 6mm as these shift centre of mass forward and increase fall risk.   |
| Flared heel (footwear feature)               | A laterally flared midsole increases the lever arm for ankle plantarflexion at loading response, marginally increasing fall risk in those with balance deficits. Consider stability footwear with medial post rather than lateral flare for very high fall-risk patients. |
| Footwear compatibility                       | Firm heel counter, low heel-to-toe drop (< 10mm), non-slip sole, and adequate width are the footwear priorities in older adults. Orthotics must be compatible with the patient's realistic footwear — assess footwear at every appointment.                               |
| Timed Up and Go (TUG) test                   | A simple clinical balance screen: time patient from sitting to standing, walk 3 metres, turn, and return. > 12 seconds = increased fall risk. Document at baseline. Can be repeated at review to assess functional change.                                                |

## 3 Material Selection for Older Adults

| Material                             | Role in Older Adult Prescription                                                          | Best Used For                                                                                   | Avoid If...                                                                                                 |
|--------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Plastazote L40 / L60 (base layer)    | Total contact moulded base; accommodates bony prominences; soft and conforming            | Diabetic foot; heel fat pad atrophy; rheumatoid arthritis; thin fragile skin                    | Active patients with high gait activity — will compress quickly                                             |
| Poron 4000 / PPT (top cover)         | Durable shock absorption; good rebound; standard top cover for high cushion demand        | Metatarsal head offloading; plantar fat pad replacement; general cushioning                     | Already using Plastazote full contact — may not need both; assess device total thickness vs. footwear depth |
| EVA 35–45 Shore A (shell or base)    | Lightweight semi-rigid structure; some correction with reduced rigidity vs. polypropylene | Mild-moderate pronation control where full polypropylene not tolerated; lightweight build       | Severe pronation requiring firm correction; high body weight with significant deformity                     |
| Polypropylene 3–4mm (shell)          | Standard rigid shell; provides controlled rearfoot correction                             | Where patient can tolerate rigid correction and footwear allows adequate depth                  | Severe OA or rigid foot where joint cannot accommodate correction; skin fragility                           |
| 3D-printed TPU (flexible/semi-rigid) | Adjustable infill density allows custom stiffness graduation; can add cushion zones       | Custom stiffness profiles; accommodative forefoot with functional rearfoot; complex foot shapes | Very fragile skin without adequate cushioning layer above TPU shell                                         |

## 4 Common Presentations: Tailored Approach

| Presentation                  | Prescription Approach                                                                                                                                                                                                                                                   |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Heel fat pad syndrome         | Full-contact accommodative device with deep heel cup (minimum 20mm). Poron 4000 heel pad minimum 6mm thick; Plastazote L40 moulded into heel cavity. Advise cushioned heel-counter footwear. Review at 6 months.                                                        |
| Hallux rigidus / first ray OA | Rigid forefoot rocker in footwear is most effective intervention. Stiff carbon-fibre insole or Morton's extension modification to limit 1st MTPJ motion. Footwear prescription may be more impactful than orthoses alone for severe cases.                              |
| Metatarsalgia / forefoot pain | Metatarsal dome (proximal to met heads, not under them). Full-contact forefoot padding. Consider met bar for pan-metatarsalgia. Soft EVA or Poron forefoot platform. Forefoot rocker footwear as adjunct.                                                               |
| Subtalar / ankle OA           | Accommodative device; total contact moulding; 4–6mm heel raise bilaterally if equinus component. Ankle-foot orthosis (AFO) may be indicated for severe instability — refer if appropriate. Prioritise symptom relief over mechanical correction.                        |
| High fall risk with flat foot | Avoid aggressive medial posting. Use medial arch support only (3–4mm arch fill) without rearfoot post. Prioritise stable footwear with firm heel counter, low heel drop, and grip sole. Physiotherapy for balance and lower limb strengthening as primary intervention. |

In older adults, the goal often shifts from biomechanical correction to pain relief, function preservation, and fall prevention. An accommodative device that reduces pain and enables continued activity is a superior outcome to a corrective device that is not tolerated or worn.