AFO TYPES AND CONSIDERATIONS

AFO/Description	Benefits	Considerations that May Limit Success	Key AFO Design Considerations	Examples
Solid or Rigid Provides rigid support of ankle in desired position that has implications for knee control	○ ↑ DF in swing ○ Adjustability of stiffness by changing trimlines ○ ↑ stance phase knee flexion or extension by restricting ankle motion ○ ↓ equinovarus in stance ○ Possible ankle control with PF spasticity ○ ↑ static balance	○ Desire to allow volitional muscle activation ○ ↓ ankle PROM ○ Bulk & weight of AFO ○ Desire for allowing ankle DF during functional mobility	○ Material strength provides ↑ motion restriction & ankle control ○ ↑ AFO stiffness may lead to ↑ knee flexion at IC ○ Anterior trimlines ↑ ankle control & AFO rigidity ○ AFO set in DF leads to knee flexion in stance ○ AFO set in PF leads to knee extension in stance ○ ↑ AFO stiffness may ↑ knee flexion at IC	 **Solid AFO** ○ Anterior trimlines ○ Thicker materials ○ Fixed at ankle in slight PF, neutral, or DF based on control needed
Ground Reaction Provides knee stability through a posteriorly directed force on the proximal tibia	○ ↑ DF in swing ○ Strong stance phase knee flexion control ○ Possible ↑ gait speed if a soft heel or rocker sole is added to the shoe ○ ↑ static balance	○ Genu recurvatum ○ Strong hyperextension thrust in stance ○ Quadriceps spasticity ○ Bulk & weight of AFO	○ Anterior proximal contact of AFO leads to stance phase knee extension ○ ↑ AFO stiffness may ↑ knee flexion at IC ○ AFO set in PF leads to knee extension in stance	 **Ground Reaction AFO** ○ Fixed at ankle in slight PF ○ Anterior shell for added tibial control ○ Carbon or plastic options
Semirigid Provides varying degrees of rigidity based on design & materials used	○ ↑ DF in swing ○ Adjustability of stiffness by changing trimlines ○ ↑ stance phase knee flexion or extension by limiting ankle motion ○ ↑ gait speed if AFO has fewer restrictions to movement ○ May ↑ dynamic balance based on design	○ PF spasticity (≥MAS 3) ○ ↓ strength or control of the ankle or knee muscles ○ Equinovarus	○ Material property choices restrict or allow motion ○ AFO set in DF leads to knee flexion in stance ○ AFO set in PF leads to knee extension in stance ○ Anterior trimlines ↑ ankle control & AFO rigidity ○ Posterior trimlines ↓ ankle control & AFO rigidity	  **Semirigid AFO** ○ More posterior trimlines ○ Ankle in slight PF, neutral, or DF based on control needed ○ Some ankle motion allowed based on material thickness and flexibility

Flexible/ Posterior Leaf Spring Provides varying degrees of flexibility based on design & materials used	○ ↑ DF in swing ○ Lightweight ○ Pre-fabricated options ○ ↑ gait speed	○ PF spasticity (≥MAS 3) ○ ↓ strength or control of the ankle or knee muscles ○ ↓ dynamic balance	○ Material properties allow motion ○ Posterior trimlines ↓ ankle control & AFO rigidity	 **Posterior Leaf Spring AFO** ○ Most posterior trimline ○ More ankle motion allowed due to material flexibility ○ Minimal to no mediolateral ankle support ○ Minimal to no effect at the knee
Articulating Provides varying degrees of motion at the ankle through hinges with optional stops to limit ROM if desired	○ ↑ DF in swing ○ Adjustable as patient's needs change ○ Allows for volitional muscle activation ○ ↑ stance phase knee flexion or extension by allowing or restricting ankle motion ○ ↓ equinovarus in stance with design that encompasses more of the ankle ○ ↑ gait speed if AFO has less motion restrictions ○ ↑ static balance if AFO has more motion restrictions	○ PF spasticity (≥MAS 3) ○ ↓ ankle PROM ○ Bulk & weight of AFO ○ ↓ medial/lateral ankle stability	○ Hinges allow motion ○ Stops restrict motion ○ AFO set in more DF leads to ↑ knee flexion in stance ○ AFO set in more PF leads to ↑ knee extension in stance	 **Double Metal Upright AFO** ○ DF & PF stops set by adjusting screws/bars in each channel ○ Springs can be added for DF assist ○ Good option with edema & to allow modifications with recovery  **Articulating Plastic AFO** ○ Many options for hinge types ○ DF & PF stops achieved by straps, hinge types, and/or materials abutting ○ Good option to allow modifications with recovery
Dynamic Enhances or resists ankle motion while allowing some motion and/or energy storage	○ ↑ DF in swing ○ ↑ Push-off force ○ Allows for volitional muscle activation ○ Possible ↑ stance phase knee flexion or extension by supporting sagittal plane ankle motion ○ Possible ↓ equinovarus in stance with design that encompasses more of the ankle ○ ↑ gait speed	○ PF spasticity (≥MAS 3) ○ Equinovarus ○ Knee buckling ○ Genu recurvatum ○ ↓ ankle PROM	○ Material property and/or spring choices assist, restrict or allow motion ○ AFO set in DF leads to knee flexion in stance ○ AFO set in PF leads to knee extension in stance	 **Carbon fiber AFO** ○ Stores & releases force for push-off ○ Minimal medial/lateral support at ankle ○ Minimal to no adjustability  **Articulating AFO, DF assist** ○ Free DF with some DF assist from this hinge ○ PF stop created by contact of shells posteriorly ○ Pin or longer shells can be used posteriorly for more PF restriction

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