

Stance Control Orthoses: Similarities & Differences



AAOP



Advanced Training Seminar

Options, Choices, Alternatives!

1. Swing Phase Knee Extension Lock

- ◆ SPL/SPC
- ◆ Free Walk
- ◆ UTX Swing & Swing Fs

2. Stance Phase Flexion Block/Free Ext

- ◆ Horton's SCOKJ – WB or Activator
- ◆ Becker e-Knee

3. Enhanced Gait Ox but not SCO

- ◆ G-Knee to help extend weak knee
- ◆ LR for stance flexion during LR w/ locked swing

Universal Contraindications:

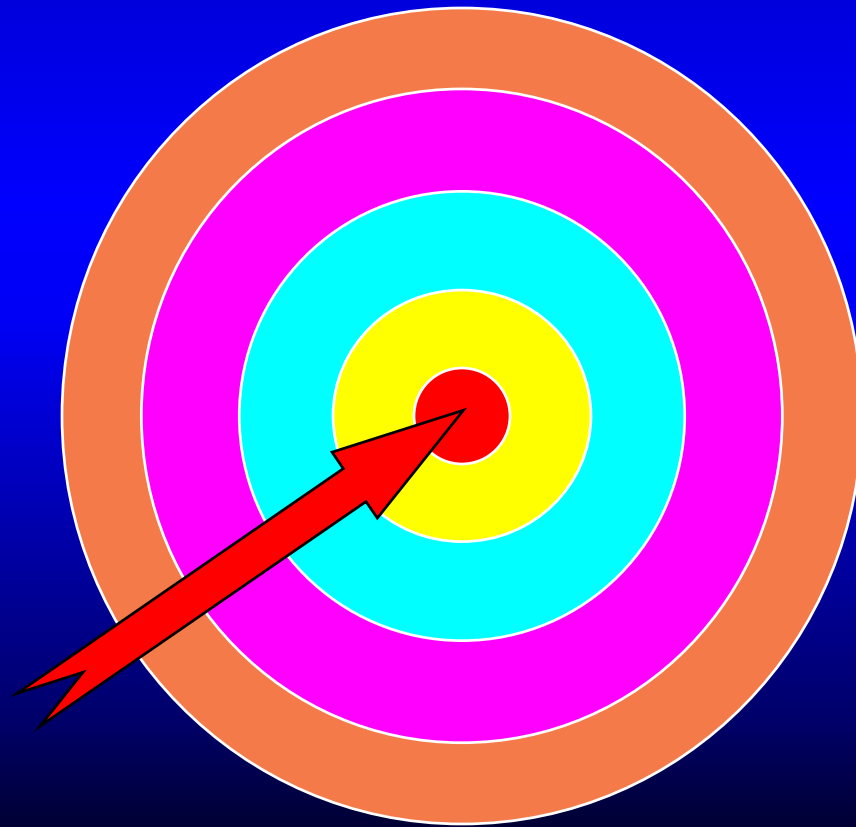
1. Significant impairments in:
 - ◆ Cognition
 - ◆ Balance
 - ◆ Motivation
2. Significant knee spasticity
3. Knee flexion contracture $> 10^{\circ}$
4. Follow-up or compliance uncertain

Universal Cautions:

- 1. Bilateral applications**
- 2. Upper limb involvement**
- 3. Hip flexors or extensors < grade 3**

Ideal Candidate:

Isolated Quadriceps Paresis



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Isolated Quadriceps Paresis

1. Unilateral knee extensor weakness or paralysis
2. Good or Normal ipsilateral hip and ankle musculature
3. No contractures or spasticity
4. Normal contralateral side

Technical Considerations:

Consideration	SPL	Free-Walk	UTX Swing	SCOKJ, Motion-Activated	SCOKJ, Weight-Activated	E-Knee
Weight Limit	None	80/120 Kg	80/120 Kg	102 Kg	102 Kg	100 Kk
Axial Weight Bearing?	No	No	No	Caution	Caution	No
Hip Flexion Contracture OK?	Minimal only	Yes	Yes	Yes	Yes	Yes
Hip Flexion Required [MMT]	3	3	None	None	None	None
Hip Extension Required [MMT]	None	3	3	None	None	None

Technical Considerations:

Consideration	SPL	Free-Walk	UTX Swing	SCOKJ, Motion-Activated	SCOKJ, Weight-Activated	E-Knee
Manage Knee Flexion Contracture?	<10°	<10°	<5°	<10°	<10°	<10°
Manage knee varus thrust?	No	No	No	Yes	Yes	Yes
Manage knee valgus thrust?	No	No	Yes, FS type < 10°	Yes	Yes	Yes
Manage ankle instability?	Yes	If controlled by FO	Yes	Yes	Yes	Yes
Passive Ankle Motion Required	None	10°	3°	3°	None	None
Manage ankle spasticity?	Yes	No	No	No	Yes	Perhaps

Technical Considerations:

Consideration	SPL	Free-Walk	UTX Swing	SCOKJ, Motion-Activated	SCOKJ, Weight-Activated	E-Knee
Can function as KO?	Yes	No	No	No	No	Yes, wire to inlay
Single Side Bar System?	Never	Always, lat only	Always, lat only	Not for adults	Not for adults	Never
Locking Mechanism	Pawl	Hammer	Sear	Cam	Cam	Gear Clutch
Actuation [w/ KE Moment]	Joint Angle	Ankle Motion	Ankle Motion	Ankle Motion	Weight Bearing	Weight Bearing
Stance Control Initiation	Full KE in TSw	Full KE in TSw	Full KE in TSw	None to slight PF	Foot contact	Foot contact
Stance Control Release	Hip Ext angle	10° DF + KE Mom.	3° DF + KE Mom.	3° DF + KE Mom.	Heel Off + KE Mom.	No sensor signal + KE Mom.

Technical Considerations:

Consideration	SPL	Free-Walk	UTX Swing	SCOKJ, Motion-Activated	SCOKJ, Weight-Activated	E-Knee
Free Swing Mode?	No	No	No	Yes	Yes	No
Manual Unlock Mode?	Yes	Yes	Yes	Yes	Yes	Yes
Manual Lock Mode?	Yes	No	No	Yes	Yes	Power Off
Full Knee Jt. Extension Necessary ?	Yes	Yes	Yes	No	No	No
Stable in Any Knee Flexion?	No	No	No	Yes	Yes	Yes
Permits Knee Extension w/ SC?	No	No	No	Yes	Yes	Yes

Technical Considerations:

Consideration	SPL	Free-Walk	UTX Swing	SCOKJ, Motion-Activated	SCOKJ, Weight-Activated	E-Knee
Required Equipment?	None	Starter Kit	None	None	None	None
Alignment Fixture?	Optional	Not Available	Not Available	Optional	Optional	Optional
Casting Attitude	5 degrees extra KF	Neutral	Neutral	Neutral	Neutral	Neutral
C-Fab available?	Yes	Required	Required	Yes	Yes	Yes
Fabricate in your lab?	Yes	No	No	Yes	Yes	Yes
Reshape in your lab?	Yes	Yes	No	Yes	Yes	Yes
Service Interval	6 months	12 months	12 months	3M steps	3M steps	12 months