

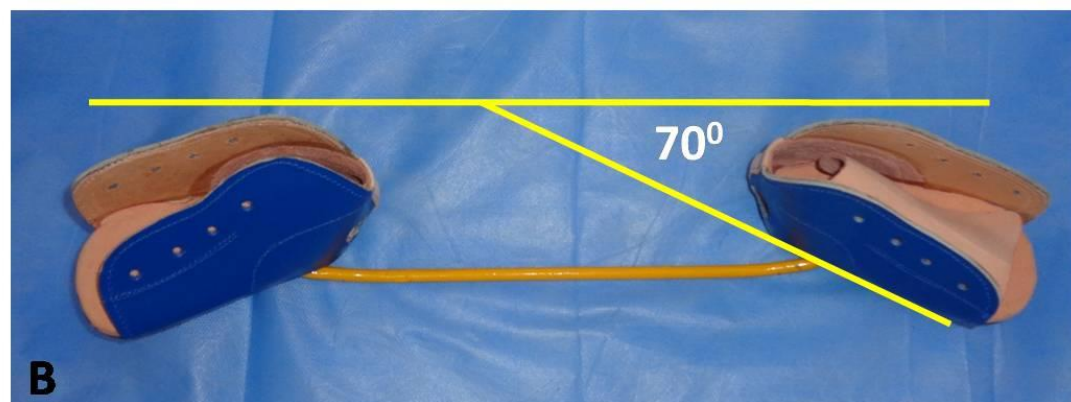
eP-33. Does change of inbuilt brace dorsiflexion, abduction and bar length affect its functionality? A clinical research on foot abduction brace used for clubfoot



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Methods

31 clubfoot children
 Modular brace used (C,D,E)
 One parameter changed at a time
 Technique : Ankle dorsiflexion (DF) with brace on & changed parameters ; knee flex & extended
 Outcomes measured : Maximum possible DF (*stretch*) & range of movement (*arc* i.e. *freedom in brace*) determined
 Statistical analysis: repeated measures ANOVA



FAB is necessary for clubfoot (A,B)

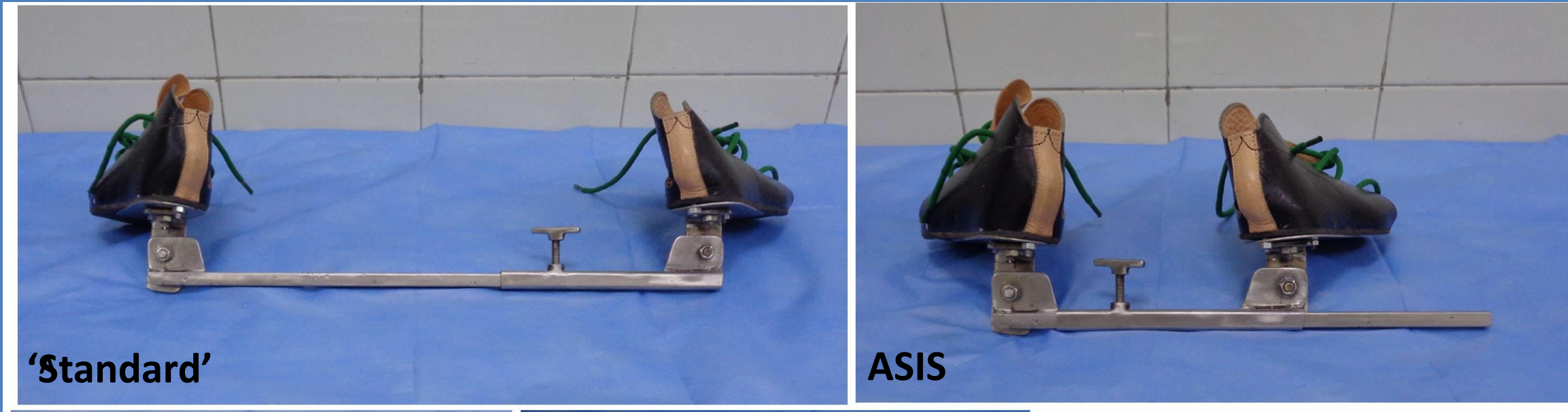
Research Q.

What happens when its

- Dorsiflexion (0, 15 and 30 degrees)
- Abduction (30, 45 and 70 degrees)
- Bar length [anterior superior iliac spine, shoulder and 'as available for use'] is changed?



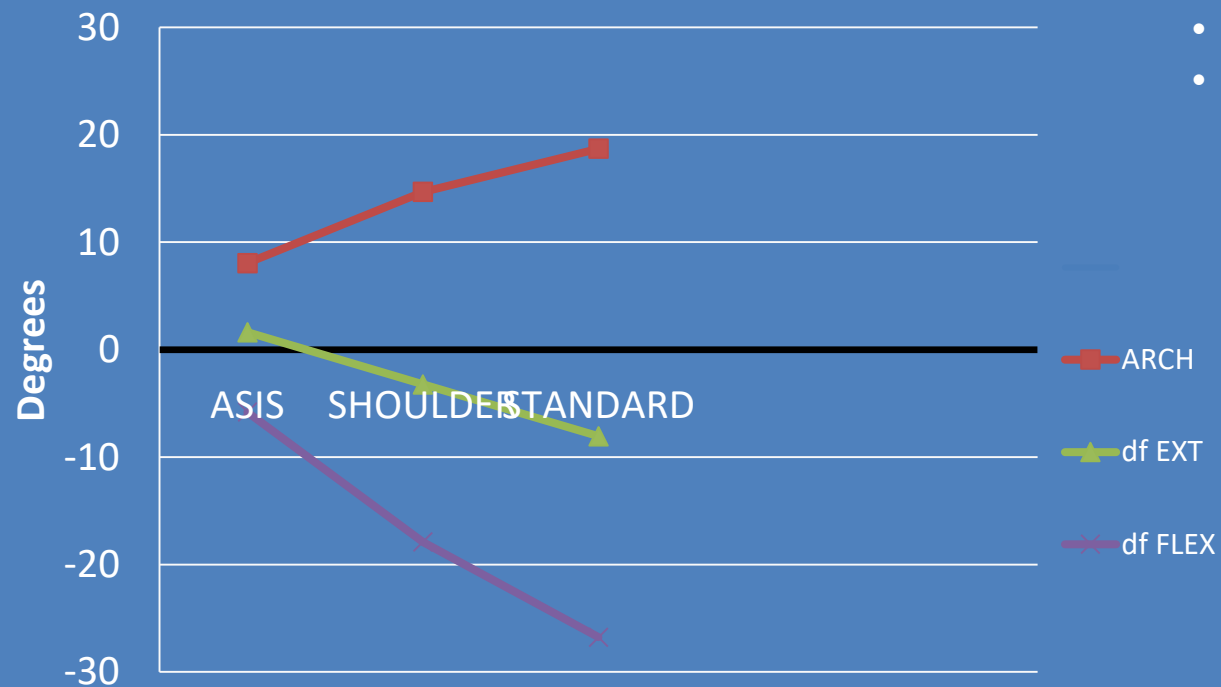
Parameter varied: Bar length



Effects

- Ankle DF decreased following an increase in bar width
- ankle DF better in knee extended position
- Arc increased following an increase in bar width
- Positive values for ankle DF & arc were possible only with bar width greater than ASIS
- **Inference: bar length shoulder/ or greater is useful**

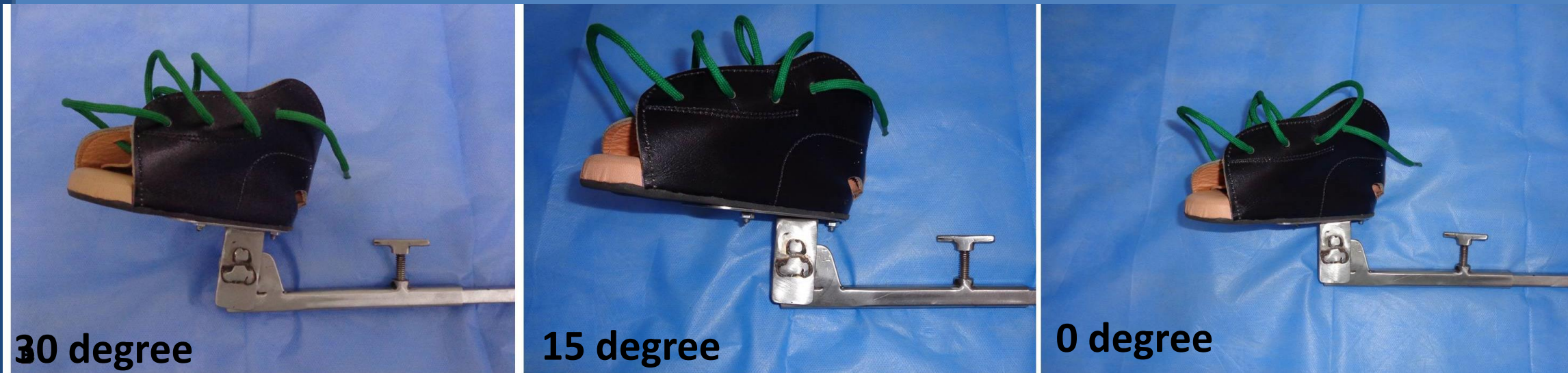
Parameter varied: Bar length



- Df Ext- ankle dorsiflexion in extension
- Df Flex- ankle dorsiflexion in flexion
- Arch- range of movement

| Constant parameter » | Configuration: Dorsiflexion 15 degrees; Abduction 70 degrees | | | | | | | |
|-------------------------------------|--|-----------|------------|---------|---------|----------|------------|----------|
| Parameter varied: Bar length | Ankle dorsiflexion with knee extended | | | | Arch | | | |
| | ASIS | Shoulder | "Standard" | ANOVA | ASIS | Shoulder | "Standard" | ANOVA |
| | 1.6±4.0 | -3.2±5.6 | -8.1±6.3 | p<0.001 | 8.1±5.9 | 14.7±6.7 | 18.7±8.1 | P <0.001 |
| Ankle dorsiflexion with knee flexed | | | | | | | | |
| | -5.8±7.3 | -17.9±6.7 | -26.8±8.6 | p<0.001 | | | | |

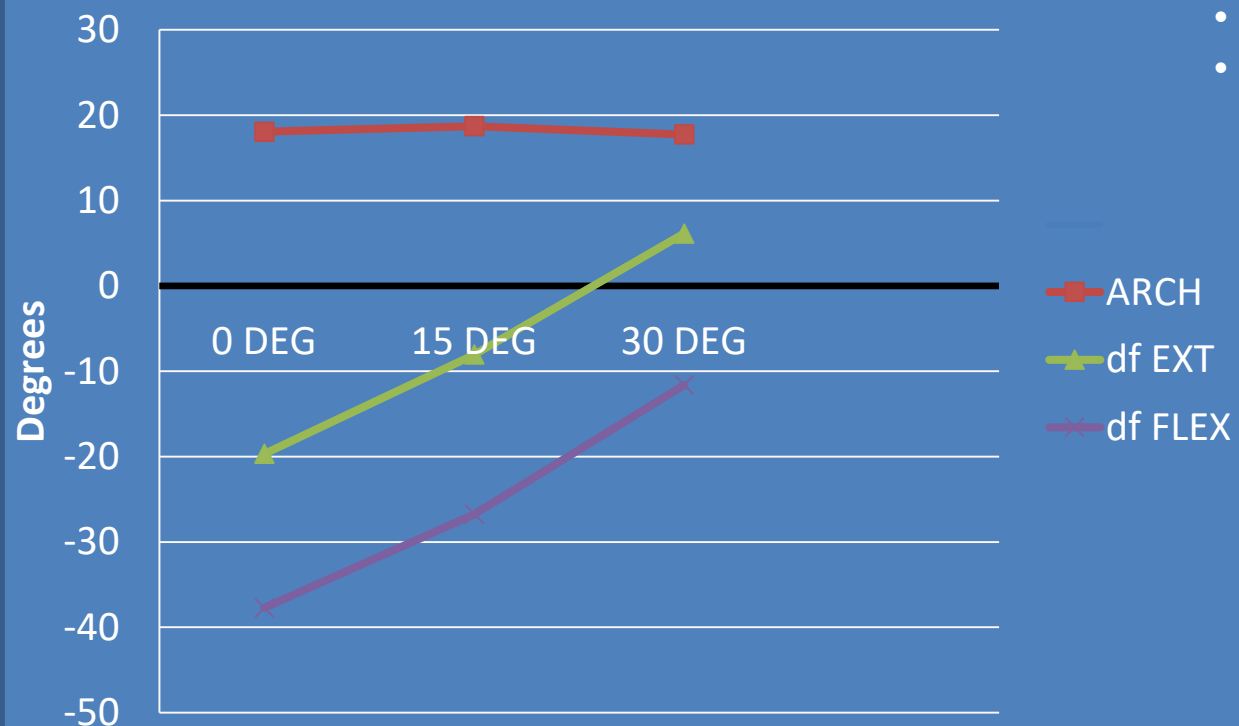
Parameter varied: brace dorsiflexion



Effects

- Ankle DF increased with increasing brace DF
- Arc did not change significantly with change in brace DF
- Positive values for ankle DF & arc were possible only with brace DF > 15 degrees
- Inference: Brace DF of 15 or 30 degrees is useful

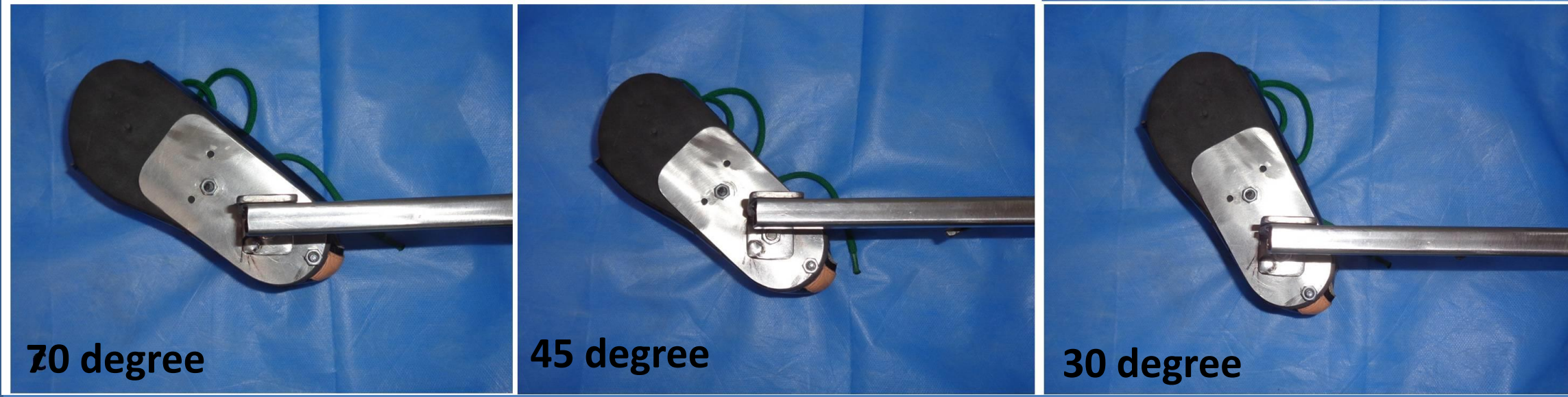
Parameter varied: Brace dorsiflexion



- Df Ext- ankle dorsiflexion in extension
- Df Flex- ankle dorsiflexion in flexion
- Arch- range of movement

| Constant parameter » | Configuration: Bar width "standard"; Abduction 70 degrees | | | | | | | |
|---|---|-----------|-----------|---------|----------|-----------|-----------|--------|
| Parameter varied: Orthotic dorsiflexion | Ankle dorsiflexion with knee extended | | | | Arch | | | |
| | 0 degree | 15 degree | 30 degree | ANOVA | 0 degree | 15 degree | 30 degree | ANOVA |
| | -19.7±4.1 | -8.1±6.3 | 6.1±7.3 | p<0.001 | 18.1±5.4 | 18.7±8.1 | 17.7±6.1 | p=0.84 |
| | Ankle dorsiflexion with knee flexed | | | | | | | |
| 0 degree | 15 degree | 30 degree | ANOVA | | | | | |
| -37.7±6.8 | -26.8±8.6 | -11.6±9.3 | p<0.001 | | | | | |

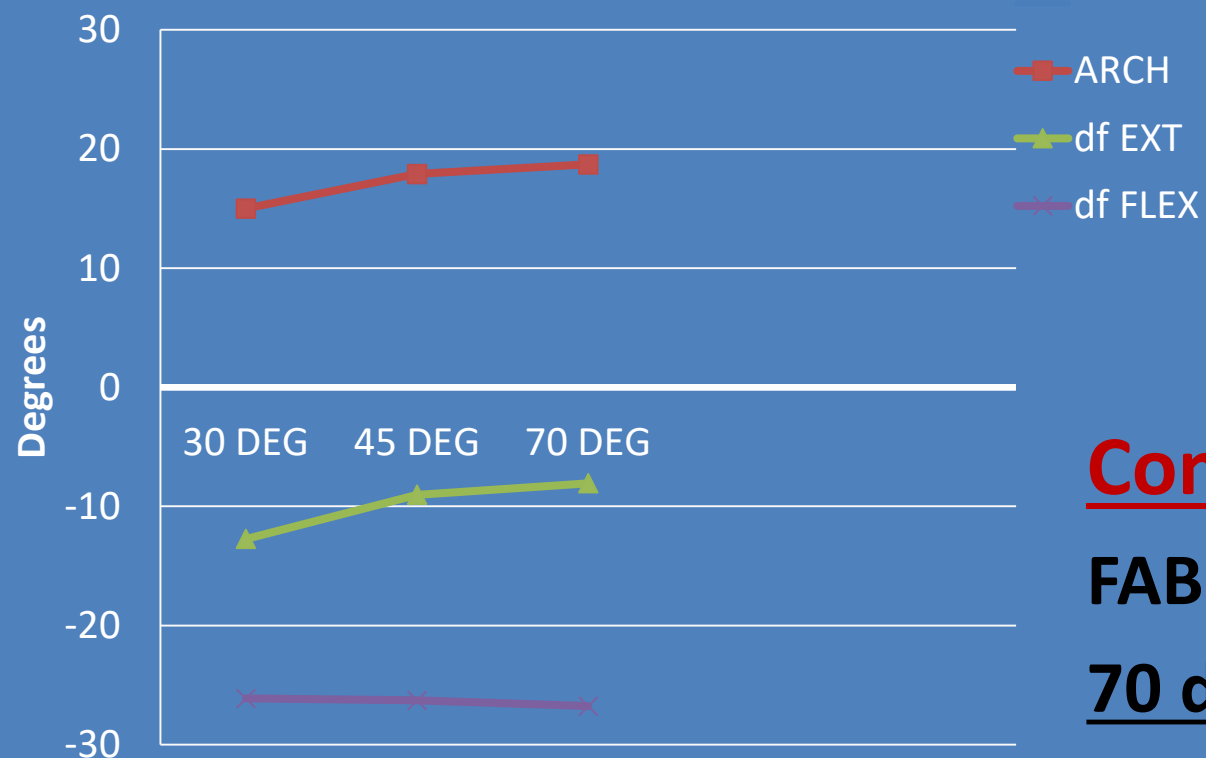
Parameter varied: brace abduction



Effects

- Both ankle DF & arc decreased with decreasing brace abduction
- *Inference: A greater brace abduction is desirable*

Parameter varied: Brace abduction



| Constant parameter » | Configuration: Bar width "standard"; Dorsiflexion 15 degrees | | | | | | | |
|--------------------------------------|--|------------|-----------|--------|-----------|-----------|-----------|--------|
| Parameter varied: Orthotic abduction | Ankle dorsiflexion with knee extended | | | | Arch | | | |
| | 30 degree | 45 degree | 70 degree | ANOVA | 30 degree | 45 degree | 70 degree | ANOVA |
| | -12.7±11.0 | -9.0±7.2 | -8.0±6.3 | p=0.07 | 15±12.9 | 17.9±11.1 | 18.7±8.1 | p=0.28 |
| | Ankle dorsiflexion with knee flexed | | | | | | | |
| | 30 degree | 45 degree | 70 degree | ANOVA | | | | |
| | -26.1±11.8 | -26.3±10.2 | -26.8±8.6 | p=0.93 | | | | |

Conclusions

FAB with shoulder or more length, 30 degrees inbuilt DF & 70 degrees abduction may result in better foot dynamics