

Biodex Balance System SD

- **Anterior Cruciate Ligament Reconstruction
Accelerated Rehabilitation**



**Cincinnati SportsMedicine
& Orthopaedic Center**

A Nationally Recognized Center of Excellence

A cooperative effort by Biodex Medical Systems, Inc. and Cincinnati SportsMedicine & Orthopaedic Center

BALANCE APPLICATION PROTOCOLS

Anterior Cruciate Ligament Reconstruction Accelerated Rehabilitation

PHASE I – one-two weeks

ACTIVITIES

- Weight Shifting 1-1

PHASE II – three-four weeks

ACTIVITIES

- Weight Shifting 1-2
- Single Leg Stance 1-3
- Base Line Test 1-3

PHASE III – five-six weeks

ACTIVITIES

- Bilateral Standing / Dynamic 1-4
- Single Leg Standing / Static 1-5

PHASE IV – seven-eight weeks

ACTIVITIES

- Bilateral Standing / Dynamic 1-6
- Pertubations 1-6
- Single Leg Standing / Static 1-7
- Postural Stability Test 1-7

PHASE V – nine-twelve weeks

ACTIVITIES

- Bilateral Standing / Dynamic 1-8
- Single Leg Stance / Dynamic 1-9
- Pertubation Training 1-10
- Postural Stability Test 1-10

PHASE VI – sixteen weeks

ACTIVITIES

- Bilateral Standing / Dynamic 1-11
- Single Leg Standing / Static 1-11

PHASE VII – twenty weeks

ACTIVITIES

- Single Leg / Dynamic 1-12
- Single Leg Dynamic with secondary activities 1-13
- Athletic Single Leg Test 1-13

Note: The balance progressions that follow are based on the protocols developed and provided by the Cincinnati Sports Medicine Center. The original protocols can be viewed at this link:

<http://www.cincinnati-sportsmed.com/csm/>

All phases are broken down into training and testing possibilities related to these protocols and potential stances utilized.

BIODEX

Biodex Medical Systems, Inc.

20 Ramsay Road, Shirley, New York, 11967-4704

Tel: 800-224-6339 (Int'l 631-924-9000)

Fax: 631-924-9338 Email: info@biodex.com, www.biodex.com

BALANCE APPLICATION PROTOCOLS

Anterior Cruciate Ligament Reconstruction Accelerated Rehabilitation

PHASE I – ONE-TWO WEEKS

Activities

- Weight shifting

Weight shifting side to side and forward to back

Frequency: 3x/day, 5 min.

Goal: 5 sets of 10 reps

Use the **Percent Weight Bearing training screens** to perform static medial / lateral weight shifting (*fig.1*), anterior posterior weight shifting and to re-establish center of balance (*fig.2*).



(fig.1)



(fig.2)

Use the **Postural Stability training screens** to re-establish center of balance (*fig.3*) and place target points to create a desired movement pattern (*fig.4*).



(fig.3)



(fig.4)

Use **Weight Shift training screens** to emphasize lateral shifting over the affected leg to prepare for full weight bearing ambulation. (*fig.5*)



(fig.5)

Positions and Conditions

Bilateral Standing / Holding On / Static Mode (*fig.6*)



(fig.6)

BALANCE APPLICATION PROTOCOLS

Anterior Cruciate Ligament Reconstruction Accelerated Rehabilitation

PHASE II – THREE-FOUR WEEKS

Activities

- Weight shifting
- Single leg stance
- Base line test

Weight shifting side to side and forward to back

Frequency: 3x/day, 5 min.

Goal: 5 sets of 10 reps

Use the **Weight Shifting training screens** to influence weight bearing to the affected side (*fig.1*) anterior / posterior (*fig.2*) and diagonally to prepare for ambulation (*fig.3*).



Use the **Limits of Stability training screen** to explore the patients sway envelope. Train their ability to move away from center, hit a target on the fringe of their allowable sway envelope and return to center (*fig.4*)



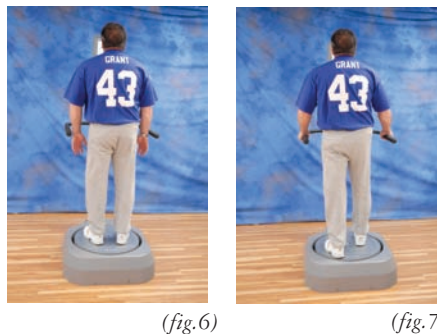
Use the **Postural Stability training screen** to facilitate center of gravity training with a single leg stance in static mode (*fig.5*).



Positions and Conditions

Use bilateral standing / no holding / static mode for **Weight Shifting** training (*fig.6*)

Use bilateral staggered stance / holding on / static mode for diagonal **Weight Shifting** training (*fig.7*)



BALANCE APPLICATION PROTOCOLS

Anterior Cruciate Ligament Reconstruction Accelerated Rehabilitation

PHASE II – THREE-FOUR WEEKS

Activities

- Weight shifting
- Single leg stance
- Base line test

Single Leg Stance

Frequency: 1-2 X/day, 5 min.

Use **Postural Stability** (fig.1) and **Percent Weight Bearing training** screens to re- introduce single leg standing in static mode (fig.2)



(fig.1)



(fig.2)

Positions and Conditions

Use single leg / stance / holding on / static mode for Postural Stability and Percent Weight Bearing training (fig.3)



(fig.3)

Testing: Baseline test at 4 weeks for postural stability / static

Perform a postural stability test to establish a baseline of postural stability in static mode. 3 trials of 20 second bilateral standing / no holding. (fig.4)



(fig.4)

BALANCE APPLICATION PROTOCOLS

Anterior Cruciate Ligament Reconstruction Accelerated Rehabilitation

PHASE III – FIVE-SIX WEEKS

Activities

- Bilateral Standing / Dynamic
- Single Leg Standing / Static

Bilateral Standing / Dynamic

Frequency: 3x/day, 5 min.

Use the **Postural Stability training screens** in dynamic mode to establish postural stability on a moveable surface (*fig.1*) and to have the patient control dynamic movement away from their center of balance (*fig.2*)



(fig.1)



(fig.2)

Use the **Maze Control training screen** to challenge the patient to control dynamic movement away from their center of balance (*fig.3*)



(fig.3)

Use the **Random Control training screen** to facilitate control of movement around the patients center of balance which are dictated by the machine (*fig.4*).



(fig.4)

Positions and Conditions

Use bilateral standing / holding on / dynamic mode for Postural Stability, Maze control and Random Control (*fig.5*).

Progress to bilateral standing / no holding / dynamic mode for Postural Stability, Maze control and Random Control (*fig.6*).



(fig.5)



(fig.6)

BALANCE APPLICATION PROTOCOLS

Anterior Cruciate Ligament Reconstruction Accelerated Rehabilitation

PHASE III – FIVE-SIX WEEKS

Activities

- Bilateral Standing / Dynamic
- Single Leg Standing / Static

Single Leg Standing / Static Frequency: 1-2X/Day, 5 min

Use **Percent Weight Bearing training screens** for single leg activities in static mode to facilitate center of balance on the affected leg medial / laterally (*fig.1*), anterior / posteriorly and in combined planes (*fig.2*)



(fig.1)



(fig.2)

Use **Postural Stability training screens** for single leg activity in static mode to facilitate center of balance (*fig.3*).



(fig.3)

Use Limit of **Stability training screen** to challenge the sway envelope of a single leg stance in static mode (*fig.4*).



(fig.4)

Positions and Conditions

Single leg standing / holding (*fig.5*).



(fig.5)

BALANCE APPLICATION PROTOCOLS

Anterior Cruciate Ligament Reconstruction Accelerated Rehabilitation

PHASE IV – SEVEN-EIGHT WEEKS

Activities

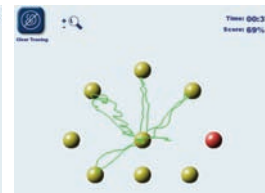
- Bilateral Standing / Dynamic
- Perturbations
- Single Leg Standing / Static
- Postural Stability Test

Bilateral Standing / Dynamic Frequency: 3x/day, 5 min.

Use the **Postural Stability with targets** (*fig.1*), **Limits of Stability** (*fig.2*) and **Maze Control** (*fig.3*) training screens to challenge dynamic postural stability in this phase.



(fig.1)



(fig.2)



(fig.3)

Positions and Conditions

Bilateral standing / no holding / dynamic (*fig.4*).



(fig.4)

Perturbations

Use Postural Stability (*fig.5*) and or Percent Weight Bearing (*fig.6*) training screens to re-establish center of balance after a perturbation.



(fig.5)



(fig.6)

Positions and Conditions

Bilateral standing / no holding / dynamic / therapist perturbation (*fig.7*).



(fig.7)

BALANCE APPLICATION PROTOCOLS

Anterior Cruciate Ligament Reconstruction Accelerated Rehabilitation

PHASE IV – SEVEN-EIGHT WEEKS

Activities

- Bilateral Standing / Dynamic
- Perturbations
- Single Leg Standing / Static
- Postural Stability Test

Single Leg Standing / Static
Frequency: 1-2x/day, 5 min.

Use **Percent Weight Bearing training screens** for single leg activities in static mode to facilitate center of balance on the affected leg medial / laterally (*fig.1*), anterior / posteriorly and in combined planes (*fig.2*)



(fig.1)



(fig.2)

Use **Postural Stability training screens** for single leg activity in static mode to facilitate center of balance (*fig.3*)
Use Limit of **Stability training screen** to challenge the sway envelope of a single leg stance in static mode (*fig.4*)



(fig.3)



(fig.4)

Positions and Conditions

Single leg standing / holding (*fig.5*) progress to no holding (*fig.6*)



(fig.5)



(fig.6)

Testing: Postural Stability / Dynamic test vs. normative data using Fall Risk protocol at 8 weeks (*fig.7*)



(fig.7)

BALANCE APPLICATION PROTOCOLS

Anterior Cruciate Ligament Reconstruction Accelerated Rehabilitation

PHASE V – NINE-TWELVE WEEKS

Activities

- Bilateral Standing / Dynamic
- Single Leg Stance / Dynamic
- Perturbation Training
- Postural Stability Test

Bilateral Standing Dynamic Frequency: 3x/day, 5 min.

Use **Dynamic Limits of Stability training screen** to test the outer limits of the patient's sway envelope (*fig.1*).



(*fig.1*)

Use **Postural Stability with targets** to facilitate patterned movement in dynamic mode (*fig.2*).



(*fig.2*)

Use **Weight Shift** with a low stability setting to facilitate recovery from lateral motions in dynamic mode (*fig.3*).



(*fig.3*)

Positions and Conditions

bilateral leg standing / holding (*fig.4*) progress to no holding and a staggered stance / no holding (*fig.5*).



(*fig.4*)



(*fig.5*)

BALANCE APPLICATION PROTOCOLS

Anterior Cruciate Ligament Reconstruction Accelerated Rehabilitation

PHASE V – NINE-TWELVE WEEKS

Activities

- Bilateral Standing / Dynamic
- Single Leg Stance / Dynamic
- Perturbation Training
- Postural Stability Test

Single Leg Stance / Dynamic Frequency: 1-2 X/day, 5 min.

Use **Postural Stability training screens** for single leg activity in dynamic mode to facilitate center of balance (fig.1)



(fig.1)

Use the **Random Control screen** with moderate circle speed, moderate difficulty level and a progressive difficult stability level (fig.2)



(fig.2)

Use **Limits of Stability screen** at a moderate difficulty level and a more stable platform setting (fig.3)



(fig.3)

Positions and Conditions

Single leg standing / holding (fig.4) progress to no holding (fig.5)



(fig.4)



(fig.5)

BALANCE APPLICATION PROTOCOLS

Anterior Cruciate Ligament Reconstruction Accelerated Rehabilitation

PHASE V – NINE-TWELVE WEEKS

Activities

- Bilateral Standing / Dynamic
- Single Leg Stance / Dynamic
- Perturbation Training
- Postural Stability/Dynamic Test

Perturbation

Use **Postural Stability** (fig.1) and or **Percent Weight Bearing** (fig.2) training screens to re-establish center of balance after a perturbation



(fig.1)



(fig.2)

Positions and Conditions

Single leg standing / holding (fig.3) progress to no holding (fig.4)



(fig.3)



(fig.4)

Testing: Postural Stability / Dynamic test vs. normative data with Fall Risk protocol at 12 weeks. (fig.5)



(fig.5)

BALANCE APPLICATION PROTOCOLS

Anterior Cruciate Ligament Reconstruction Accelerated Rehabilitation

PHASE VI – SIXTEEN WEEKS

Activities

- Single Leg Dynamic
- Athlete Single Leg Test

Single Leg / Dynamic

Frequency: 3x/day, 5 min.

Use **Percent Weight Bearing training screens** for single leg activities in dynamic mode to facilitate center of balance on the affected leg medial / laterally , anterior / posteriorly and in combined planes (fig.1).



(fig.1)

Use **Postural Stability training screens** for single leg activity in static mode to facilitate center of balance (fig.2).



(fig.2)

Use the **Random Control screen** with moderate circle speed, moderate difficulty level and a progressive difficult stability level (fig.3).



(fig.3)

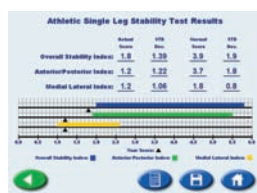
Positions and Conditions

Single leg standing / holding progress to no holding (fig.4).



(fig.4)

Testing: Athlete Single Leg Test vs. normative data at 16 weeks (fig.5).



(fig.5)

BALANCE APPLICATION PROTOCOLS

Anterior Cruciate Ligament Reconstruction Accelerated Rehabilitation

PHASE VII – TWENTY WEEKS

Activities

- Single Leg Dynamic
- Single Leg Dynamic with Secondary Activities
- Athlete Single Leg Test

Single Leg / Dynamic

Frequency: 3x/day, 5 min.

Use **Percent Weight Bearing training screens** for single leg activities in dynamic mode to facilitate center of balance on the affected leg medial / laterally , anterior / posteriorly and in combined planes (*fig.1*).



(fig.1)

Use **Postural Stability training screens** for single leg activity in static mode to facilitate center of balance (*fig.2*).



(fig.2)

Use the **Postural Stability with targets** (*fig.3*) and Maze Control (*fig.4*) training screens to challenge dynamic postural stability in this phase.



(fig.3)



(fig.4)

Positions and Conditions

Single leg standing / no holding (*fig.5*).



(fig.5)

BALANCE APPLICATION PROTOCOLS

Anterior Cruciate Ligament Reconstruction Accelerated Rehabilitation

PHASE VII – TWENTY WEEKS

Activities

- Single Leg Dynamic
- Single Leg Dynamic with Secondary Activities
- Athlete Single Leg Test

Single Leg Dynamic with Secondary Activities Frequency: 3x/day, 5 min.

Unlock the platform and get creative: **single leg / no holding perturbations** (fig.1), **bilateral squatting** (fig.2), **ball catching with a pivot** (fig.3) and **forward step ups on an unlocked platform** (fig.4)



(fig.1)



(fig.2)



(fig.3)



(fig.4)

Testing: **Athlete Single Leg test** vs. normative data at 20 weeks (fig.5).



(fig.5)