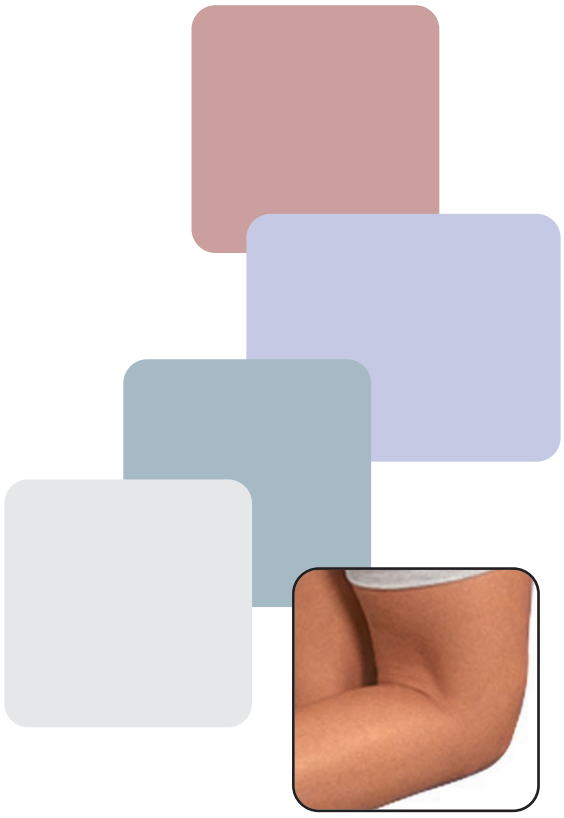

Biodex Balance System SD

- **Anterior Cruciate Ligament Reconstruction**
  Delayed Rehabilitation

Cincinnati SportsMedicine & Orthopaedic Center
A Nationally Recognized Center of Excellence

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

FN: 08-144 5/08

BALANCE APPLICATION PROTOCOLS

Anterior Cruciate Ligament Reconstruction Delayed Rehabilitation

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.cincinnatisportsmed.com/csm/

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

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Anterior Cruciate Ligament Reconstruction Delayed 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 targets 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)

PHASE II – THREE-FOUR WEEKS

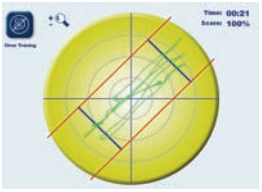
Activities
- Weight shifting
- Base line test

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)*.

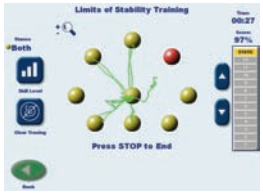
(fig.1)

(fig.2)


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



(fig.4)

(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)*.

(fig.6)

(fig.7)

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.8)*.

(fig.8)

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)

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)*

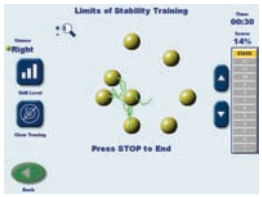
(fig.1)

(fig.2)

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

(fig.3)

Use Limits 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)*.

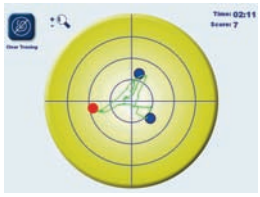
(fig.5)

PHASE IV – SEVEN-EIGHT WEEKS

Activities
– Bilateral Standing / Dynamic
– Single Leg Standing / Static
– Postural Stability Test

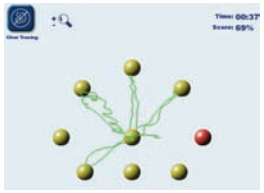
Bilateral Standing / Dynamic
Frequency: 3x/day, 5 min.

Use the **Postural Stability with targets** *(fig.1)*,



(fig.1)

Limits of Stability *(fig.2)* and **Maze Control** *(fig.3)* training screens to challenge dynamic postural stability in this phase.



(fig.2)

(fig.3)

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

(fig.4)

PHASE IV – SEVEN-EIGHT WEEKS

Activities
– Bilateral Standing / Dynamic
– Pertubations
– Single Leg Standing / Static
– Postural Stability Test

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

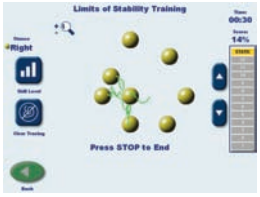
Use **Percent Weight Bearing training screens** for single leg activities in static mode to facilitate center of balance on the affected leg medial / laterally *(fig.1)*, anterior / posteriorly and in combined planes *(fig.2)*

(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)

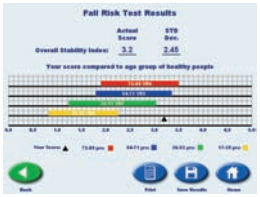


(fig.4)

Positions and Conditions
Single leg standing / **holding** *(fig.5)*


(fig.5)

Testing: Postural Stability / Dynamic test vs. normative data using Fall Risk protocol at 8 weeks *(fig.6)*



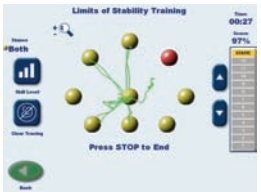
(fig.6)

PHASE V – NINE-TWELVE WEEKS

Activities
– Bilateral Standing / Dynamic
– Single Leg Stance / Dynamic
– Pertubation 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)

PHASE V – NINE-TWELVE WEEKS

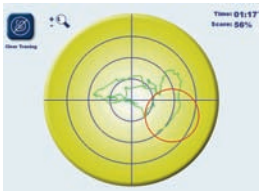
Activities
– Bilateral Standing / Dynamic
– Single Leg Stance / Dynamic
– Pertubation Training
– Postural Stability Test

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)

PHASE V – NINE-TWELVE WEEKS

Activities
– Bilateral Standing / Dynamic
– Single Leg Stance / Dynamic
– Pertubation Training
– Postural Stability/Dynamic Test

Pertubation

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)

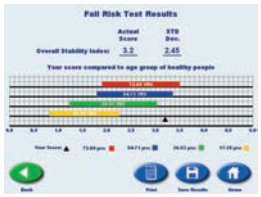
(fig.2)

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)

PHASE VI – SIXTEEN WEEKS

Activities
– Bilateral Standing / Dynamic
– Single Leg Dynamic
– Athlete Single Leg 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 training screens** for single leg activity in static mode to facilitate center of balance *(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)

PHASE VI – SIXTEEN WEEKS

Activities
– Bilateral Standing / Dynamic
– 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)

PHASE VI – SIXTEEN WEEKS

Activities
– Bilateral Standing / Dynamic
– Single Leg Dynamic
– Athlete Single Leg Test

Pertubation

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

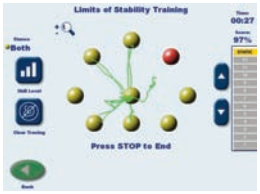
(fig.5)

PHASE VII – TWENTY WEEKS

Activities
– Bilateral Standing / Dynamic
– Single Leg Dynamic
– Pertubations
– Athlete Single Leg 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 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 (1) progress to no holding and a staggered stance / no holding *(fig.4 and fig. 5)*.

(fig.4)

(fig.5)

PHASE VII – TWENTY WEEKS

Activities
– Bilateral Standing / Dynamic
– Single Leg Dynamic
– Pertubations
– 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)

PHASE VII – TWENTY WEEKS

Activities
- **Bilateral Standing / Dynamic**
- **Single Leg Dynamic**
- **Pertubations**
- **Athlete Single Leg Test**

Pertubations

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

(fig.5)