

BIONIK

Reference Cards

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MK-1062 R1

Recommendations!

*We recommend patients complete a minimum of two sessions/week.
Over 300 repetitions can be achieved in a 30-minute session.*

How often should I do an Evaluation and Active Movement Test?

- **Evaluation:**
 - On first session and every 3rd-5th session after, including last session.
- **Active Movement Test:**
 - At the beginning and end of a typical session.
 - At end of therapy on evaluation days.

How should I position my patient?

- Patients should have their abdomen as close to the opening in the table as possible.
- Adjust the table and arm height so the shoulder is relaxed and not in a 'hiked' position.

How Much Force is Applied?

DARK BLUE activities apply additional forces for strengthening

PINK activities apply forces to assist patient to target path only

GRAY activities are customizable

*Active-assisted
Error augmentation*

Obstacle Training

Squeegee

Maze

4-Way Paddle

*Resistance
Stabilization
Curl Perturbation
Maze (send forces)*



How Much Force is Applied?

Resistance and Stabilization Modes

Robotic resistance therapy and stabilization against forces at an end-point

Large Circle (14cm Radius)

Level 50 - 7 Newtons = 1.57 pounds/force

Level 100 - 14 Newtons = 3.15 pounds/force

Level 150 - 21 Newtons = 4.72 pounds/force

Level 200 - 28 Newtons = 6.29 pounds/force

How Much Force is Applied?

Resistance and Stabilization Modes

Robotic resistance therapy and stabilization against forces at an end-point

Small Circle (10cm Radius)

Level 50 - 5 Newtons = 1.12 pounds/force

Level 100 - 10 Newtons = 2.25 pounds/force

Level 150 - 15 Newtons = 3.37 pounds/force

Level 200 - 20 Newtons = 4.5 pounds/force

Error Augmentation Mode

Amplifies movement errors by a rate of 2X, 3X or 4x. Good for motor, visual and attention impairments

Error Augmentation 2 = Error magnification X2

Error Augmentation 3 = Error magnification X3

Error Augmentation 4 = Error magnification X4

How Much Force is Applied?

Curl Perturbation

Motor learning activity requiring adaptation to external forces

- Curl Perturbation CW 12:
Up to 12 Newtons, clock-wise pattern = up to 2.7 pounds/force
- Curl Perturbation CW 24:
up to 24 Newtons, clock-wise pattern = up to 5.4 pounds/force
- Curl Perturbation CCW 12:
up to 12 Newtons, counter clock-wise pattern = up to 2.7 pounds/force
- Curl Perturbation CCW 24:
up to 24 Newtons, counter clock-wise pattern = up to 5.4 pounds/force



Patient Pop-up

Occurs after 80 repetitions on ARM active-assisted activities including error augmentation



Patient Pop-up

Definitions for patient pop-up screen

Robot Initiate

The number of times of robot-initiated movement out of 80 attempts. A score of zero indicates the patient initiated all 80 movements.

Motion Jerk

The control of arm motion and ability to produce smooth movement. Lower scores indicate better control. Healthy individuals show an average score of 100. At speeds greater than 1.4 s to reach target, this number will increase.

Distance From Target

This is a measure of movement accuracy, provided as the distance in millimeters from the target. Trials with healthy individuals average a score of 2-4 mm.

Distance From Straight Line

This metric reflects a patient's ability to move in a straight line between targets. A lower score indicates better aim. Healthy individuals average a score of 2-4 mm.



Patient Pop-up Cont.

Robot Power

- How much power, on average, the robot provided to reach the target, in milliwatts. The ideal score of zero indicates no robot assistance was required to complete the task.

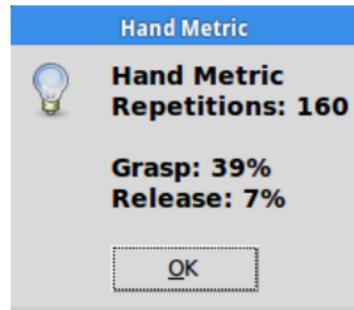
Score Ranges (Robot Power)

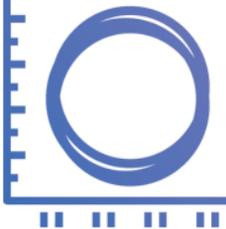
- Active - Scores below 70 - patient demonstrates active movement.
- Flaccid - Score between 70-120 - the robot carries the weight of the arm and the patient is largely passive.
- High Tone - Scores above 120 - represent high tone or resistance against the robot.



ARM/Hand Pop-ups

- These metrics appear after 80 repetitions. The grasp and release movements are scored by their proximity to the targets and presented as a percentage. Higher percentages indicate more successful attempts in reaching the targets.





Evaluation Cheat-Sheet

Patients with Limited Active Range of Motion

- Small movement circle
- 1-2 repetitions of each eval metric (ie once around circle assessment)
- Resistance test - at therapist discretion

Patients Close to Full Active Range of Motion

- Two or more repetitions of evaluation metrics
- Large movement circle
- Consider resistance

Evaluation metrics can be performed 1/5 repetitions to be completed in 8 minutes



Therapy Activities Cheat-Sheet

- 320 movement repetitions in therapy = 80 repetitions of four activities. This meets the minimum neuroplasticity requirement of 300 repetitions in the upper extremity.
- Skip resistance mode with a flaccid patient



Hand Mode Activities

- Stop after each 40 repetitions for a short break on hand-only active-assisted mode.
- Stop after each 20 repetitions for a short break on arm-hand activities.





Keyboard Shortcuts

Therapy Activities

- Spacebar = Start or stop an activity (except Additional Activities)
- ESC key = Exit an activity
- 'B' = Stop or start 'beeping' audio feedback
- 'P' = Create or remove a visual path to targets

Additional Activities

- 'Q' = Quit
- ALT M = Open or close menu (interact with menu when open)
- 'N' = New activity/picture (Squeegee)

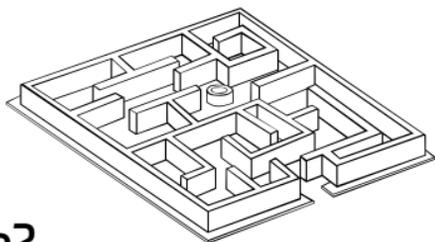
Squeegee

- '-' = Horizontal squeegee, 'i' = vertical squeegee, 'o' square squeegee.

Maze FAQ's

How many reps is the maze?

The maze is 39 repetitions



What does adding 'send forces' do?

Adding send forces makes the maze an eccentric strengthening activity.

The therapist can encourage the patient to slow the pointer down and stabilize a couple seconds at markers.

What is the number in the right-hand corner?

The number represents the total game time for the activity.



4-Way Paddle FAQ's



What do the compass directions mean?

North and south indicate movement into internal/external rotation, east and west indicate movement into flexion/extension.

Why can't I close the activity?

Click 'q' if you are not within the menu. If the menu is up exit using menu tabs.

What levels are recommended?

Levels 1-30 are most commonly used clinically.

What are the success metrics?

Bounces = # of repetitions, wall hits = failure metric, paddle hits = success metric

Obstacle Training



What does planar 'X' and 'Y' mean?

- Plane 'X' refers to internal and external rotation
- Plane 'Y' refers to flexion/extension

What are the default repetitions?

- Obstacle training defaults to 80 repetitions

Can you define the menu buttons?

- Game length = Game time
 - Gate Width = Change size of racing gates
 - Level = Speed up game, or slow down. Grade level of difficulty
 - Horizontal Motion = Change plane to internal/external rotation
- 