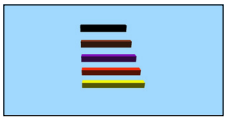
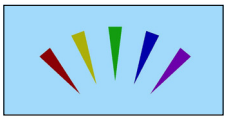
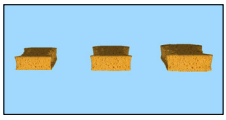
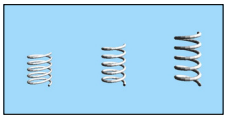
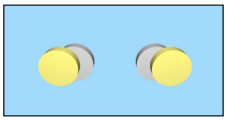
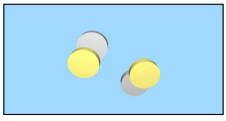
Exercise description	Visual feedback	Initial adaptation	Exercise parameters	Performance metric
E_1: Proprioception (Passive grip aperture identification) The robot closes the hand from an initial grasping aperture d_i (adjustable in the range [102, 122] mm based on hand size) to one out of N target apertures. The N target apertures differ by δ_d and are centered around d_i-22 mm.	 N sticks indicate the N grasping apertures. *Identification feedback*: a green check mark (correct ans.) or a red cross (wrong ans.) is displayed next to the correct (target) stick.	The difference between target apertures is a function of the assessed distance *DL*: $\delta_d = f$(distance *DL*) The assessed distance *DL* (assessment A_2) is limited to the range [2,10] mm	5 difficulty levels: Number of target apertures N = {3,4,5,5,5} Target aperture difference δ_d = {2,1.6,1.2,1.1,1} × (distance *DL*)	Percentage of correct identification trials
E_2: Proprioception (Passive pronosupination angle identification) The robot rotates the hand from an initial angle (-60°, i.e. counterclockwise) to one out of N target angles. The N target angles differ by δ_φ and are centered around 0°.	 N triangles indicate the N target angles. *Identification feedback*: a green edge (correct ans.) or a red edge (wrong ans.) is displayed around the correct (target) angle.	none	5 difficulty levels: Number of target apertures N = {3,4,5,6,7} Target aperture difference δ_φ = {30,25,20,15,10}°	Percentage of correct identification trials
E_3: Haptic perception (Stiffness identification during grasping) The robot renders N sponges (spring-damper combinations) which have to be identified based on their viscoelastic resistance during squeezing. Rendered stiffness and damping pairs vary by η percent from one to another and are centered around K_{medium} = 550 N/m and B_{medium} = 35 N/(m/s).	 All N sponges are displayed and animated during squeezing. *Identification feedback*: the rendered sponge is colored green (correct ans.) or red (wrong ans.).	The relative difference between the visco-elasticities is a function of the assessed stiffness *Wf*: η = *f*(stiffness *Wf*) The assessed stiffness *Wf* (assessment A_3) is limited to the range [7.5, 45] %	10 difficulty levels: Number of sponges N = {3,3,4,4,5,5,5,5,5,5} Relative difference between viscoelasticities η = {2,1.9,1.8,1.7,1.6,1.5, 1.4,1.3,1.2,1.1} × (stiffness *Wf*)	Percentage of correct identification trials
E_4: Haptic perception (Stiffness identification during pinching) The robot renders N springs (spring-damper combinations) which have to be identified based on their viscoelastic resistance during vertical index finger pinching. Rendered stiffness and damping pairs vary by η percent from one to another and are centered around K_{medium} = 300 N/m and B_{medium} = 20 N/(m/s).	 All N springs are displayed and animated when compressed. *Identification feedback*: the rendered spring is colored green (correct ans.) or red (wrong ans.).	The relative difference between the visco-elasticities is a function of the assessed stiffness *Wf*: η = *f*(stiffness *Wf*) The assessed stiffness *Wf* (assessment A_3) is limited to the range [7.5, 45] %	5 difficulty levels: Number of springs N = {3,4,5,5,5} Relative difference between viscoelasticities η = {2,1.8,1.6,1.4,1.2} × (stiffness *Wf*)	Percentage of correct identification trials
E_5: Sensorimotor memory (Grip aperture) *Teach*: the robot closes the hand from an initial grasping aperture d_i (adjustable in the range [102, 122] mm based on the hand size) to a randomly selected target grasping aperture d_t in the range [70, d_t-2] mm. After 2 seconds the hand is moved back to d_i. *Reproduce*: the patient is asked to move to the „taught" target grasping aperture and hold this position for 2 seconds (position logging). A trial is correct if the logged position lies within the error band [d_t-δ_e/2, d_t+δ_e/2]. A damped force field helps to smoothen the movement of the patient: B=β × 50 N/(m/s).	 No visual feedback is provided during „teach" and „reproduce" phases. After trial completion a green check mark is shown if the trial was correct. Additionally, the target position is shown in grey and the registered position in yellow (or in red if the trial was wrong).	The error band is a function of the assessed distance *DL*: $\delta_e = f$(distance *DL*) The assessed distance *DL* (assessment A_2) is limited to the range [2,10] mm	5 difficulty levels: Error band δ_e = {1.2,1.1,1,0.9,0.8} × (distance *DL*) Reduction of damping support: β={1,0.75,0.5, 0.25,0} **Exercise parameters:** Par = {val1,val2,val3,val4,val5} level 1 level 2 level 3 level 4 level 5	Percentage of correct reproduced trials
E_6: Sensorimotor memory (Pronosupination angle) *Teach*: the robot rotates the forearm from an initial angle (-60°, i.e. counter-clockwise) to a target angle φ_t randomly selected from a range R. After 2 seconds the hand is returned to φ_i. *Reproduce*: the patient is asked to rotate to the „taught" target angle and hold this angle for 2 seconds (angle logging). A trials is correct if the logged angle lies within the error band: [φ_t-δ_e/2, φ_t +δ_e/2]. A damped force field helps to smoothen the movement of the patient: B=β × 50 Nm/(°/s).	 No visual feedback is provided during „teach" and „reproduce" phases. After trial completion a green check mark indicates if the trial was correct. Additionally, the target angle is shown in grey and the logged angle in yellow (or in red if the trial was wrong).	Assessed rotational ROM_φ (assessment A_1) defines the range R from which the target angle is randomly selected: R=*f*(ROM_φ) The range R is limited to [-60, 60] °	5 difficulty levels: Range from which φ_t is randomly selected R = {1,1.05,1.1,1.15,1.2} × ROM_φ Reduction of damping support: β={1,0.75,0.5, 0.25,0} Error band δ_e = {10,8,6,4,2} °	Percentage of correct reproduced trials
E_7: Sensorimotor coordination (Haptically cued forearm rotation) The patient is asked to explore the rotational DOF in order to find a target angle φ_t which is indicated haptically by means of a small haptic valley/gap with amplitude *A* along the translational DOF. The robot has to be held in [φ_t-2°, φ_t+2°] for 2 seconds to register and verify the correctness of the current robot angle φ. A rotational damping field with damping constant B smooths the patient's movement. A trial is successful when the target angle is found within 60 seconds. Otherwise the robot moves the patient passively to φ_t.	 A rotating picture reflects the current robot angle φ. A green frame is drawn around the picture when the target angle has been found successfully. Only during task familiarization the target angle φ_t is visualized by a black square.	Assessed rotational ROM_φ (assessment A_1) defines the range R from which the target angle is randomly selected: R=*f*(ROM_φ) The range R is limited to [-60, 60] °	10 difficulty levels: Applicable range of target angles: R = {1,1.02,1.04,1.06,1.08, 1.1,1.12,1.14,1.16,1.18} × ROM_φ Reduction of damping support: B={0.9,0.8,0.7,0.6, 0.5,0.4,0.3,0.2,0.1,0} e-3 [Nm/(°/s)] Haptic valley amplitude: *A*={1.8,1.65,1.5,1.35,1.2,1.05,0.9, 0.75,0.6,0.45} [mm]	Number of successful trials within exercise time. 20 trials (or more) in 15 min corresponds to 100%.