

BASELINE[®] EVALUATION INSTRUMENTS

7-Piece Hand Evaluation Set

Instruction Manual

REF

- 12-0100 **Standard** Kit
- 12-0102 **LITE™** Kit
- 12-0117 **HD™** Kit
- 12-0111 **ER™ HiRes™** Kit
- 12-0113 **ER™ Digital** Kit



FEI
FABRICATION
ENTERPRISES INC.

Manufacturer and Master
Distributor of Physical Therapy
and Rehabilitation Products

7-piece hand evaluation sets

2
year
warranty



Standard Kit Includes (12-0100):

- (1) **Standard** Hydraulic Hand Dynamometer (12-0240)
- (1) 14 kg Mechanical Pinch Gauge (12-0200)
- (1) 15 cm Stainless Steel Goniometer (12-1010)
- (1) 2-point discriminator with 3rd point (12-1481)
- (1) Wartenburg pinwheel (12-1450)
- (1) finger circumference gauge (12-1220)
- (1) functional finger motion gauge (12-1060)
- (1) Protective Carrying Case

1
year
warranty



LiTE™ Kit Includes (12-0102)

- (1) **LiTE™** Hydraulic Hand Dynamometer (12-0241)
- (1) 14 kg Mechanical Pinch Gauge (12-0200)
- (1) 15 cm Stainless Steel Goniometer (12-1010)
- (1) 2-point discriminator with 3rd point (12-1481)
- (1) Wartenburg pinwheel (12-1450)
- (1) finger circumference gauge (12-1220)
- (1) functional finger motion gauge (12-1060)
- (1) Protective Carrying Case

5
year
warranty



HD™ Kit Includes (12-0117):

- (1) **HD™** Hydraulic Hand Dynamometer (12-0221)
- (1) 14 kg Mechanical Pinch Gauge (12-0200)
- (1) 15 cm Stainless Steel Goniometer (12-1010)
- (1) 2-point discriminator with 3rd point (12-1481)
- (1) Wartenburg pinwheel (12-1450)
- (1) finger circumference gauge (12-1220)
- (1) functional finger motion gauge (12-1060)
- (1) Protective Carrying Case

2
year
warranty



ER™ HiRes™ Kit Includes (12-0111)

- (1) **ER™ HiRes™** Hydraulic Hand Dynamometer (12-0246)
- (1) 27 kg Mechanical Pinch Gauge (12-0201)
- (1) 15 cm Stainless Steel Goniometer (12-1010)
- (1) 2-point discriminator with 3rd point (12-1481)
- (1) Wartenburg pinwheel (12-1450)
- (1) finger circumference gauge (12-1220)
- (1) functional finger motion gauge (12-1060)
- (1) Protective Carrying Case

Digital kit Includes (12-0113):

- (1) **Digital** Hydraulic Hand Dynamometer (12-0247)
- (1) 27 kg Mechanical Pinch Gauge (12-0200)
- (1) 15 cm Stainless Steel Goniometer (12-1010)
- (1) 2-point discriminator with 3rd point (12-1481)
- (1) Wartenburg pinwheel (12-1450)
- (1) finger circumference gauge (12-1220)
- (1) functional finger motion gauge (12-1060)
- (1) Protective Carrying Case

2
year
warranty



7-piece hand evaluation set

Hydraulic Hand Dynamometer

The hand dynamometer can be used to measure grip strength. It is calibrated in pounds and kilograms of force.

The grip handle is adjustable to accommodate various hand sizes. Always use the same grip setting and dynamometer when evaluating a specific subject for hand trauma or disease.

Set the handle to the desired position. Have the subject hold the dynamometer in a comfortable position. The shoulder should be adducted and neutrally rotated, the elbow flexed to 90 degrees, and the forearm and wrist should be in a neutral position. Have the subject squeeze the handle using his/her maximum effort.

The red maximum pointer will remain at the subject's maximum reading until it is reset. The red maximum pointer must be reset before each grip test. Rotate the small knurled knob on top of the dial indicator in a counterclockwise direction until it rests against the black pointer at the zero marking. Each grip test should be repeated three times and the average result should be used.

Grip strength varies depending upon the size of the object being grasped. The adjustable handle allows for quantification of grip strength for different sized objects.

To determine whether a subject is exerting maximum effort use the following protocol:

- Take readings with adjustable handle in all five positions
- Test the normal hand and then the injured hand
- Repeat the test after five minutes

If maximum effort was exerted there should be approximately a 10% variation in the two sets of test results.

Mechanical Pinch Gauge

The finger pinch gauge can be used to measure pinch strength. It is calibrated in pounds and kilograms of force.

Apply pinch force at the pinch groove while holding the pinch gauge between your thumb and finger(s). When force is applied farther toward the tip the reading will be slightly higher. When force is applied farther toward the rear the reading will be



Standard Hydraulic Hand
Dynamometer
(12-0240)

slightly lower.

The gauge must be “zeroed” before each pinch test. Grasp the knurled ring of the dial indicator and rotate it until the zero on the dial indicator is directly under the black pointer.

The red maximum pointer must be reset before each pinch test. Rotate the small knurled knob on top of the dial indicator in a counterclockwise direction until it rests against the black pointer at the zero marking. The red maximum pointer will remain at the subject’s maximum reading until it is reset.



14 kg Mechanical Pinch Gauge (12-0200)

Use the pinch gauge to perform the three basic pinch tests:

- **Tip Pinch** - thumb tip to index fingertip
- **Key Pinch** - thumb pad to lateral aspect of middle phalanx of index finger
- **Palmar Pinch** - thumb pad to pads of the index and middle fingers

Finger Goniometer

The finger goniometer can be used to measure active or passive joint range of motion (ROM). It measures joint flexion and hyper-extension. It is calibrated in degrees.

Align the fulcrum of the goniometer with the anatomical fulcrum of the joint being measured. Place the flat arm of goniometer that is attached to the dial indicator on the center of the limb (or extremity) to be measured. Hold both arms of the goniometer



15 cm Stainless Steel Goniometer (12-1010)

and move the joint through its entire range-of-motion (this can be done actively by the subject or passively by the examiner). The range of motion can be read directly from the dial indicator

3-Point Aesthesiometer

The aesthesiometer is a sensory device that measures a subject’s perception of the cutaneous two-point threshold. The third point makes it possible to alternate between single-and double-point stimulation without changing the distance setting. The device is very lightweight so as not to influence the touch and/or pain threshold. The tips are plastic to minimize the influence of temperature sensation.



2-point discriminator with 3rd point (12-1481)

Blindfold the subject or have the subject close his/her eyes. Set

the two points close together (minimal distance reading). Lightly touch both points simultaneously to the subject’s skin. Ask the subject whether he/she feels one or two points. If the answer is one point then reset the two points farther apart and repeat the test until the subject reports that he/she feels two points. Read the two points’ cutaneous threshold directly from the calibrated scale on aesthesiometer body.

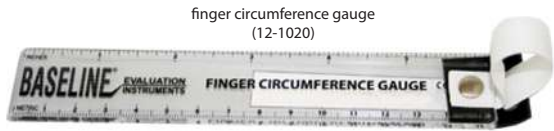
During the trial, as a check, one point only should be used to touch the skin on some trials. This can be done by using the convenient third point or by separating the two points so that only one point can be used.

Different areas of the skin have markedly different two-point thresholds. It is interesting to note that there is an increase in two-point cutaneous sensitivity brought about by practice and a transfer effect from one symmetrical skin area to another after practice on the first area.

Finger circumference gauge

The finger circumference gauge can be used to measure finger diameter and/or swelling associated with edema. It is calibrated in inches and centimeters.

Wrap the webbing around the finger to be evaluated. Thread the webbing through the eyelet on the ruler. Pull the webbing taut and read the finger circumference measurement directly from the ruler.



finger circumference gauge
(12-1020)

Pinwheel

Use to elicit a subject's cutaneous sensory and/or pain perception. The test elicits a gross yes/no (on/off) response. There is no specific calibration unit.



Wartenburg pinwheel
(12-1450)

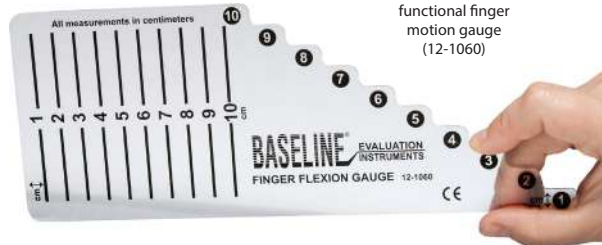
Move the pinwheel over the skin area to be tested. Ask the subject whether he/she feels one or two points. If subject responds negatively the test may be repeated using more pressure on the pinwheel.

Functional finger motion gauge

Measures composite finger flexion and thumb-finger opposition. It is calibrated in centimeters.

Composite finger flexion: Place the flat end of the plastic gauge on the subject's palmar crease and have the subject flex his/her fingers. Read the composite flexion of each finger directly from the gauge (distance from the palmar crease to the fingertip of the maximally flexed fingers).

Thumb and finger opposition: Have the subject grasp the smallest step possible between the thumb and finger. Repeat for each finger (index, middle, ring and pinky).



functional finger
motion gauge
(12-1060)

Grip Dynamometer Norms for Adult Grip Strength (kgs)

Average Performance of all Subjects on Grip Strength (kilograms) - Test results									
		Men				Women			
age	hand	mean	SD	SE	low-high	mean	SD	SE	low-high
20-24	dominant	54.88	9.34	1.72	41.3 - 75.7	31.93	6.58	1.27	20.9 - 43.1
	non-dominant	47.40	9.89	1.81	32.2 - 68.0	27.67	5.94	1.18	15.0 - 39.9
25-29	dominant	54.79	10.43	2.00	35.4 - 71.7	33.79	6.30	1.22	21.8 - 44.0
	non-dominant	50.12	7.35	2.00	34.9 - 63.0	28.80	5.53	1.09	21.8 - 44.0
30-34	dominant	55.25	10.16	1.95	31.8 - 77.1	35.70	8.71	1.72	20.9 - 62.1
	non-dominant	50.08	9.84	1.91	29.0 - 65.8	30.84	8.03	1.59	16.3 - 52.2
35-39	dominant	54.30	10.89	2.18	34.5 - 79.8	33.61	4.90	1.00	22.7 - 44.9
	non-dominant	51.21	9.84	1.91	33.1 - 71.2	30.07	5.31	1.04	22.2 - 41.3
40-44	dominant	52.98	9.39	1.86	38.1 - 74.8	31.93	6.12	1.09	17.2 - 46.7
	non-dominant	51.17	8.48	1.68	33.1 - 71.2	28.26	6.26	1.13	15.9 - 42.6
45-49	dominant	49.85	10.43	1.95	29.5 - 70.3	28.21	6.85	1.36	17.7 - 45.4
	non-dominant	45.72	10.34	1.95	26.3 - 72.6	25.40	5.76	0.95	16.8 - 37.6
50-54	dominant	51.53	8.21	1.63	35.8 - 68.5	29.85	5.26	1.04	17.2 - 39.5
	non-dominant	46.22	7.71	1.54	31.8 - 64.9	25.99	4.85	0.95	15.9 - 34.5
55-59	dominant	45.86	12.11	2.63	26.8 - 64.9	25.99	5.67	1.13	15.0 - 39.0
	non-dominant	37.74	10.61	2.31	19.5 - 58.1	21.45	5.40	1.09	14.1 - 34.5
60-64	dominant	40.69	9.25	1.91	23.1 - 62.1	24.99	4.58	0.91	16.8 - 34.9
	non-dominant	34.84	9.21	1.86	12.2 - 52.6	20.73	4.58	0.91	13.2 - 29.9
65-69	dominant	41.32	9.34	1.81	25.4 - 59.4	22.50	4.40	0.82	15.9 - 33.6
	non-dominant	34.84	8.98	1.72	19.5 - 53.1	18.60	3.72	0.68	13.2 - 28.6
70-74	dominant	34.16	9.75	1.91	14.5 - 49.0	22.50	5.31	1.00	15.0 - 35.4
	non-dominant	29.39	8.21	1.68	14.5 - 42.2	18.82	4.63	0.86	10.4 - 30.4
75+	dominant	29.80	9.53	1.91	18.1 - 61.2	19.32	4.99	1.00	11.3 - 29.5
	non-dominant	24.95	7.71	1.54	14.1 - 54.0	17.06	4.04	0.77	10.9 - 27.7
ALL	dominant	47.31	12.84	0.73	14.5 - 79.8	28.49	7.71	0.44	11.3 - 62.1
	non-dominant	42.23	12.52	0.73	12.2 - 72.6	24.45	7.12	0.40	10.4 - 52.2

TIP PINCH NORMS (KGS)

NORMS FOR ADULT PINCH STRENGTH							
Tip Pinch strength performance of all subjects (kilograms)							
age	hand	men			women		
		mean	SD	low-high	mean	SD	low-high
20-24	dominant	8.16	1.36	4.9 - 10.4	5.03	0.95	3.6 - 7.2
	non-dominant	7.71	1.04	5.4 - 14.9	4.76	0.77	3.6 - 6.3
25-29	dominant	8.30	2.00	4.5 - 15.4	5.40	0.82	3.6 - 7.2
	non-dominant	7.94	2.36	5.4 - 16.3	5.13	0.82	4.0 - 8.1
30-34	dominant	7.89	3.04	5.4 - 11.3	5.72	1.36	3.6 - 9.0
	non-dominant	7.98	2.18	4.5 - 12.2	5.31	1.27	3.1 - 7.7
35-39	dominant	8.16	1.63	5.4 - 12.2	5.26	1.13	3.6 - 8.6
	non-dominant	8.03	1.72	4.5 - 10.8	5.40	1.09	3.6 - 7.2
40-44	dominant	8.07	1.81	4.9 - 11.3	5.22	1.22	2.2 - 6.8
	non-dominant	8.03	1.59	5.4 - 11.3	5.03	1.36	2.7 - 7.7
45-49	dominant	8.48	2.22	5.4 - 13.6	5.99	1.36	4.0 - 8.6
	non-dominant	7.98	1.86	5.4 - 12.7	5.49	1.22	3.1 - 8.1
50-54	dominant	8.30	1.81	4.9 - 10.8	5.67	1.00	4.0 - 8.1
	non-dominant	8.07	1.77	5.4 - 11.7	5.17	1.09	3.1 - 7.2
55-59	dominant	7.53	1.50	4.9 - 10.8	5.31	0.77	4.0 - 7.2
	non-dominant	6.80	1.68	4.5 - 11.7	4.72	0.64	3.6 - 5.8
60-64	dominant	7.17	1.77	4.0 - 9.97	4.58	0.95	3.1 - 7.7
	non-dominant	6.94	1.68	4.0 - 10.4	4.49	0.91	2.7 - 6.8
65-69	dominant	7.71	1.91	4.9 - 12.2	4.81	0.91	3.1 - 6.8
	non-dominant	6.99	1.32	4.5 - 9.52	4.76	1.09	3.1 - 7.7
70-75	dominant	6.26	1.18	4.9 - 9.52	4.58	1.18	3.1 - 6.8
	non-dominant	6.03	1.18	4.5 - 9.52	4.45	1.04	2.7 - 7.7
75+	dominant	6.35	1.54	3.1 - 9.52	4.35	1.27	1.8 - 7.2
	non-dominant	6.30	1.68	3.6 - 11.3	4.22	1.09	1.8 - 5.8
ALL	dominant						
	non-dominant						

KEY PINCH NORMS (KGS)

NORMS FOR ADULT PINCH STRENGTH							
Key Pinch strength performance of all subjects (kilograms)							
		men			women		
age	hand	mean	SD	low-high	mean	SD	low-high
20-24	dominant	11.79	1.59	9.5 - 15.4	7.98	0.91	6.4 - 10.4
	non-dominant	11.25	1.54	8.6 - 14.1	7.35	0.95	5.9 - 10.4
25-29	dominant	12.11	2.22	8.6 - 18.6	8.03	0.95	6.4 - 10.0
	non-dominant	11.34	2.13	8.6 - 17.7	7.53	0.95	5.9 - 10.0
30-34	dominant	11.97	2.18	9.1 - 16.3	8.48	1.36	5.9 - 11.3
	non-dominant	11.88	2.31	7.7 - 16.3	8.07	1.63	5.4 - 11.8
35-39	dominant	11.84	1.45	9.5 - 14.5	7.53	0.91	5.4 - 9.5
	non-dominant	11.61	1.77	8.2 - 14.5	7.26	1.22	5.4 - 10.0
40-44	dominant	11.61	1.18	9.5 - 14.1	7.57	1.41	4.5 - 10.9
	non-dominant	11.39	1.81	8.6 - 14.1	7.17	1.41	3.6 - 10.0
45-49	dominant	11.70	1.77	8.6 - 15.9	7.98	1.45	5.9 - 10.9
	non-dominant	11.25	2.00	8.2 - 19.1	7.53	1.32	5.4 - 10.9
50-54	dominant	12.11	2.00	9.1 - 15.4	7.57	1.13	5.4 - 10.0
	non-dominant	11.84	1.91	9.1 - 16.8	7.30	1.22	5.4 - 10.0
55-59	dominant	10.98	1.91	8.2 - 15.4	7.12	1.13	5.0 - 9.5
	non-dominant	10.43	2.13	5.9 - 14.1	6.67	1.00	5.4 - 8.6
60-64	dominant	10.52	2.45	6.4 - 16.8	7.03	1.22	4.5 - 9.1
	non-dominant	10.07	1.86	7.3 - 15.0	6.40	1.13	4.5 - 8.6
65-69	dominant	10.61	1.77	7.7 - 14.5	6.80	1.18	4.5 - 9.5
	non-dominant	9.98	1.63	7.7 - 12.7	6.49	1.27	4.5 - 9.1
70-75	dominant	8.75	1.09	7.3 - 11.3	6.58	1.32	3.6 - 10.0
	non-dominant	8.71	1.36	5.9 - 12.7	6.26	1.36	4.1 - 10.0
75+	dominant	9.30	2.09	4.1 - 14.1	5.72	1.04	3.6 - 7.7
	non-dominant	8.66	1.36	5.9 - 10.9	5.17	1.18	3.2 - 7.3
ALL	dominant	11.11	2.09	4.1 - 18.6	7.35	1.36	3.6 - 11.3
	non-dominant	10.70	2.09	5.0 - 19.1	6.94	1.41	3.2 - 11.8

PALMAR PINCH NORMS (KGS)

NORMS FOR ADULT PINCH STRENGTH							
Palmar Pinch strength performance of all subjects (kilograms)							
		men			women		
age	hand	mean	SD	low-high	mean	SD	low-high
20-24	dominant	12.07	2.40	8.2 - 20.4	7.80	1.04	6.4 - 10.4
	non-dominant	11.66	2.63	6.8 - 19.1	7.39	1.27	5.0 - 10.9
25-29	dominant	11.79	1.95	8.6 - 15.9	8.03	1.45	5.9 - 13.2
	non-dominant	11.39	1.91	8.6 - 16.3	7.71	1.36	5.9 - 11.8
30-34	dominant	11.20	2.13	7.3 - 15.4	8.75	2.27	5.4 - 15.4
	non-dominant	11.52	2.59	6.8 - 16.8	8.21	2.18	5.4 - 14.5
35-39	dominant	11.88	1.86	8.6 - 16.3	7.94	1.91	5.9 - 13.2
	non-dominant	11.75	2.45	6.4 - 18.1	7.76	1.54	5.4 - 10.9
40-44	dominant	11.11	1.95	7.7 - 16.8	7.71	1.41	4.5 - 10.4
	non-dominant	11.25	2.22	6.8 - 16.8	7.53	1.59	6.4 - 11.3
45-49	dominant	10.89	1.50	8.6 - 15.0	8.12	1.36	5.4 - 12.2
	non-dominant	10.75	1.72	3.6 - 15.0	7.94	1.27	5.4 - 10.9
50-54	dominant	10.80	2.45	6.8 - 16.3	7.85	1.41	5.4 - 10.4
	non-dominant	10.89	2.63	7.3 - 16.3	7.44	1.32	5.4 - 10.0
55-59	dominant	10.75	2.18	7.3 - 15.4	7.26	1.41	5.0 - 11.8
	non-dominant	9.66	2.04	5.4 - 11.3	6.99	1.36	5.0 - 9.5
60-64	dominant	9.89	1.50	7.3 - 12.7	6.71	1.41	4.5 - 9.1
	non-dominant	9.62	1.45	6.8 - 12.2	6.49	1.22	4.5 - 9.1
65-69	dominant	9.71	1.36	6.8 - 11.3	6.44	1.41	3.6 - 9.1
	non-dominant	9.62	1.86	6.4 - 13.6	6.21	1.54	3.6 - 10.0
70-75	dominant	8.21	1.54	6.4 - 12.2	6.53	1.18	4.1 - 8.6
	non-dominant	8.53	1.50	5.9 - 12.2	6.35	0.86	4.5 - 7.7
75+	dominant	8.48	1.91	4.1 - 11.8	5.44	1.18	3.6 - 7.7
	non-dominant	8.30	1.72	4.5 - 11.8	5.22	1.18	2.7 - 7.3
ALL	dominant	10.61	2.27	4.1 - 20.4	7.39	1.72	3.6 - 15.4
	non-dominant	10.43	2.40	4.5 - 19.1	7.12	1.63	2.7 - 14.5

the most complete line of instruments for the physical therapist



3-piece HiRes™ hand evaluation set



8-piece evaluation set



wrist evaluation set



digital hand dynamometer



Absolute+Axis™ goniometer



6-piece plastic HiRes™ goniometer set



6-piece stainless steel goniometer set



Bubble® inclinometer



digital hydraulic pinch gauge



mechanical pinch gauges



2-sided skinfold caliper



back-leg-chest dynamometer



hydraulic push-pull dynamometer



tuning forks



circumference tape



fingertip pulse oximeter



hand volumetric edema gauges



scoliometer



hand held body fat analyzer

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