

muscle strength testing **BASELINE®** <u>PUSH-PULL</u> DYNAMOMETER

A simple, easy-to-use, ergonomically designed instrument that **objectively** measures push, pull and lift forces for manual muscle testing, functional capacity evaluation and job task evaluation at a remarkably **affordable** price. Because the instrument is lightweight, small and **portable**, you can perform precise, objective evaluations in your office, at the client's location, or in the field. Ergonomically designed dynamometer is easy to grasp while testing small forces. The easy-to-attach single or dual grip handle can be used when measuring larger forces. Can be used with functional lift platform to perform lifting evaluations.

muscle strength measurement

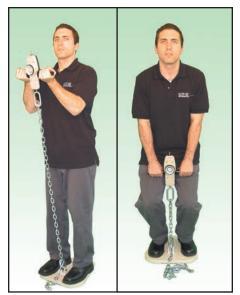
This hand-held dynamometer lets you *objectively* measure manual muscle strength.

job task analysis

Measure actual push, pull and lift forces needed to perform a particular task (function).

functional capacity evaluation

Quantitatively evaluate an individual's push, pull or lift capacity to perform a given task (function).



functional capacity evaluation



job task evaluation

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Introduction to Manual Muscle Testing (MMT)

General Testing Concepts

This instruction manual contains some standard test protocols to demonstrate the types of tests that can be performed using various Baseline® dynamometers. Refer to appropriate textbooks and manual muscle testing resources and guides for patient conditions suitable for dynamometry testing, further testing methods and protocols, and for evaluation of test data.

Reasons for Muscle testing:

Screening: measurement of the subject's strength against a know norm (i.e., grip strength of fireman) or against a benchmark value needed to perform a given task (i.e., ability to lift a box)

Comparative: to measure the subject's strength dominant side vs. non-dominant side (right hand against left hand) to ascertain extent of "impairment." To measure the subject's strength over time to ascertain the effectiveness of a treatment protocol.

Muscle testing methodology:

Positioning the subject: The angle of the joint during the test has a direct effect on the strength measurement result. If the objective is to simulate a given activity, then the joint angle should be as close as possible to the angle required by the activity to be performed.

Stabilizing the subject: The subject's body should be stabilized to ensure that the muscle or muscle group being tested is isolated.

Testing methodology:

Break test: The tester firmly holds the dynamometer and applies force against the subject's body until it begins to move. The reading represents the muscle strength "break" point at which the subject could not overcome the tester's force.

Make test: The subject initiates and exerts a force against the dynamometer (that is firmly held by the tester) until it begins to move. The reading represents the muscle strength "make" point at which the subject overcomes the tester's force of resistance.

Instrument test: The subject gradually (no sudden, jerky or abrupt movements) exerts force against the instrument until the strength or pain threshold in reached. The final result is not dependent upon the tester's resistance, only upon the instrument.

Consistent results: Regardless of the test, the subject should be made to perform the test three (3) times. If the individual readings are inconsistent, wait a few minutes and repeat the test. If possible, test the uninjured side first.

Baseline® Push-Pull Dynamometer The heavy-duty dynamometer features the hydraulic system that is used in the industry accepted Baseline® and Jamar® hand dynamometers and pinch gauges. Hydraulic system ensures accurate readings. Much lighter (11/2 lb. vs. 6lb.) and easier to use than



digital or analog



comes in carrying case

spring push-pull dynamometers that are in common use today.

Dial continuously shows instantaneous force and holds the maximum force reading. This maximum reading should be manually recorded prior to resetting for the next test.

Available with either an analog (dial) or a digital (LCD) readout. Choose either 50 lb., 100 lb., 250 lb., or 500 lb. force capacity unit. Comes with 3 push pads (padded curved, padded straight, and 1cm² circular), 1 pull hook and 1 snap-lock hook. Comes in cushioned carrying case with muscle test manual. 1 year warranty. CE certified.



optional accessories

handles

12-0385	single grip				
12-0389	dual grip				
functional	lift bases				
12-0406	regular (15"x15")				
12-0407	large (24"x24")				
WalSlide [⊤]	^M wall anchor				
slides and	slides and locks to any				
position alo	ong 6' system.				
10-5094	adjustable anchor				
hardware					
12-0443	chain (per foot)				
12-0445	snap oval (pair)				
12-0446	threaded oval (pair)				





use without handle



use with functional lift platform base

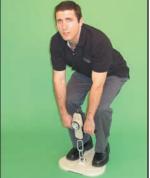
push-pull dynamometers

analog (Dial) readout

12-0392	50 lb./22.5 kg.
12-0393	100 lb./45 kg.
12-0394	250 lb./115 kg.
12-0388	500 lb./225 kg.

Digital (LCD) readout

12-0397	50 lb./22.5 kg.
12-0398	100 lb./45 kg.
12-0399	250 lb./115 kg.
12-0387	500 lb./225 kg.



use with dual grip handle

Testing Protocol: Elbow and Forearm





elbow extension



	PATIENT START POSITION	PLACEMENT OF DYNAMOMETER	POSITION OF THERAPIST	TEST
FLEXION (RIGHT/LEFT)	- seated - shoulder flexed 45° - elbow flexed 45° - palm up	On the inside of the arm just above the wrist of the arm being tested.	Hand not holding dynamometer stabilizing underneath the upper arm of patient.	Break test - exert force to push arm downward
EXTENSION (RIGHT/LEFT)	- seated - shoulder flexed 45° - elbow flexed 45° - palm up	On the outside of the arm just above the wrist of the arm being tested.	Hand not holding dynamometer stabilizing on the front of the upper arm of patient.	Break test - exert force to push arm upward.
FOREARM ROTATOR	- seated - shoulder flexed 45° - elbow flexed 45° - palm in	On the outside of rod held by hand.	Hand not holding dynamometer stabilizing on the front of the upper arm of patient.	Break test - exert force on rod to push arm inward.

Testing Protocol: Wrist



wrist flexion



ulnar deviation



wrist extension



radial deviation

	PATIENT START POSITION	PLACEMENT OF DYNAMOMETER	POSITION OF THERAPIST	TEST
FLEXION (RIGHT/LEFT)	 seated with arm stabilized on table edge. palm in, wrist slightly flexed and fingers relaxed. 	On the palm of the hand being tested just below the bend of the fingers.	In front of patient, stabilizing patient's forearm against table.	Break test - exert force to push hand out
EXTENSION (RIGHT/LEFT)	 seated with arm stabilized on table edge. palm down, wrist slightly extended and fingers relaxed. 	On the back of the hand being tested just below the bend of the fingers.	In front of patient, stabilizing patient's forearm against table.	Break test - exert force to push hand down
ULNAR DEVIATION (RIGHT/LEFT)	 seated with arm stabilized on table edge. palm down, wrist flexed slightly towards the ulna. 	On the outside of the hand being tested just below the bend of the little finger.	In front of patient, stabilizing patient's forearm against table.	Break test - exert force to push hand in
RADIAL DEVIATION (RIGHT/LEFT)	 seated with arm stabilized on table edge. palm down, wrist flexed slightly towards the radius. 	On the inside of the hand being tested just below the bend of the index finger.	In front of patient, stabilizing patient's forearm against table.	Break test - exert force to push hand out

Testing Protocol: Shoulder





shoulder extension





shoulder adduction shoulder abduction



internal rotation



external rotation



upper trapezius

	PATIENT START POSITION	PLACEMENT OF DYNAMOMETER	POSITION OF THERAPIST	TEST
FLEXION (RIGHT/LEFT)	- seated - shoulder flexed to 90° - elbow straight - palm facing in	Slightly above elbow of test arm.	At patients side, opposite hand on shoulder of test arm.	Break test - exert force to push arm downward.
EXTENSION (RIGHT/LEFT)	 prone w/ head to side arms at sides w/ arm being tested slightly extended & straight palm facing in 	Slightly above elbow of test arm.	To the side of test arm, opposite hand stabilizes test shoulder.	Break test - exert force to push arm downward.
ADDUCTION (RIGHT/LEFT)	- standing - arm being tested out to side 8-10" from body - palm facing in	Slightly above elbow on inside of test arm.	To the front-side of patient, with opposite hand on patient's hip.	Break test - exert force to push arm out.
ABDUCTION (RIGHT/LEFT)	- seated - arm out to side at 90° - elbow flexed 90° - palm facing down	Slightly above elbow of test arm.	Behind and to the side of patient with the opposite hand on test shoulder.	Break test - exert force to push arm downward.
INTERNAL ROTATION (RIGHT/LEFT)	- seated - arms at sides with 90° elbow flexion - palm facing in	Slightly above wrist on inside of test arm.	In front of patient with other hand stabilizing the outside of elbow.	Break test - exert force to push arm out.
EXTERNAL ROTATION (RIGHT/LEFT)	- seated - arms at sides with 90° elbow flexion - palm facing in	Slightly above wrist on outside of test arm.	In front of patient with other hand stabilizing the inside of elbow.	Break test - exert force to push arm in.
UPPER TRAPEZIUS (RIGHT/LEFT)	- seated - arms at sides - test shoulder shrugged slightly	On top of test shoulder.	Behind patient, stabilizing non test- side shoulder.	Break test - exert force to push shoulder downward.

Testing Protocol: Hip



hip flexion



hip extension



hip abduction



hip abduction



internal rotation



external rotation

	PATIENT START POSITION	PLACEMENT OF DYNAMOMETER	POSITION OF THERAPIST	TEST
FLEXION (RIGHT/LEFT)	- Supine with knees bent and feet flat - hip of test leg flexed to about 90°	Slightly above knee of test leg.	To the side of test leg.	Break test - exert force to push leg downward.
EXTENSION (RIGHT/LEFT)	- prone w/ arms at side - test leg is bent at knee with hip extended and knee off table	Slightly above knee on back of test leg.	To the side of test leg.	Break test - exert force to push leg downward.
ADDUCTION (RIGHT/LEFT)	 lye on side w/ test (bottom) leg touching table, in line with trunk. top leg in step position to allow movement. 	Slightly above knee on inside of test leg.	To the side of patient.	Break test - patient lifts lower leg slightly off table, then exert force to push leg out.
ABDUCTION (RIGHT/LEFT)	 - lye on side w/ test leg on top, in line with trunk. - bottom leg bent to stabilize body. 	Slightly above knee on outside of test leg.	To the side of patient.	Break test - patient lifts upper leg slightly off table, then exert force to push leg down.
INTERNAL ROTATION (RIGHT/LEFT)	- seated w/ legs over edge of table - knees bent 90° - hip rotated in slightly	Slightly above ankle on outside of test leg.	In front of patient with non-testing hand on inside of patient's knee.	Break test - exert force to push leg in.
EXTERNAL ROTATION (RIGHT/LEFT)	- seated w/ legs over edge of table - knees bent 90° - hip rotated out slightly	Slightly above ankle on inside of test leg.	In front of patient with non-testing hand on outside of patient's knee.	Break test - exert force to push leg in.

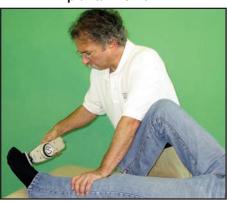
Testing Protocol: Ankle



plantar flexion



dorsi flexion



inversion

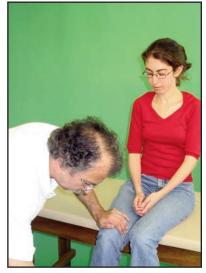


eversion

	PATIENT START POSITION	PLACEMENT OF DYNAMOMETER	POSITION OF THERAPIST	TEST
PLANTAR- FLEXION (RIGHT/LEFT)	- prone with feet of end of table - foot in neutral position	On ball of test foot.	Non-dynamometer hand stabilizes lower leg against table.	Break test - exert force to push down foot.
DORSI- FLEXION (RIGHT/LEFT)	- supine - test leg straight - ankle in neutral position	On top of foot positioned below toe.	Non-dynamometer hand stabilizes lower leg against table.	Break test - exert force to push down foot.
INVERSION (RIGHT/LEFT)	- supine - test leg straight - ankle inverted slightly	On inside of foot positioned below toe.	Non-dynamometer hand stabilizes lower leg against table.	Break test - exert force to push out foot.
EVERSION (RIGHT/LEFT)	- supine - test leg straight - ankle everted slightly	On outside of foot positioned below toe.	Non-dynamometer hand stabilizes lower leg against table.	Break test - exert force to push in foot.

Testing Protocol: Knee





knee flexion

knee extension

	PATIENT START POSITION	PLACEMENT OF DYNAMOMETER	POSITION OF THERAPIST	TEST
FLEXION (RIGHT/LEFT)	- prone - test leg flexed 90° - non-test leg straight	On the back of leg slightly above ankle.	Aside patient. Non- dynamometer hand stabilizes thigh.	Break test - exert force to push leg down.
EXTENSION (RIGHT/LEFT)	 sitting with legs over the table edge test leg extended slightly 	On the front of leg slightly above ankle.	In front of patient. Non-dynamometer hand under knee of test leg.	Break test - exert force to push leg down.

Testing Protocol: Cervical (neck)



flexion



lateral flexion



rotation



extension

	PATIENT START POSITION	PLACEMENT OF DYNAMOMETER	POSITION OF THERAPIST	TEST
FLEXION	- supine - head mid-line - chin slightly tucked - knees bent & feet flat	On forehead.	Aside the patient.	Break test - have patient lift head slightly while keeping chin tucked. Exert force to push head down.
EXTENSION	- prone - head mid-line - arms at sides - chin slightly tucked	On back of head (occipital).	Aside the patient.	Break test - have patient lift head slightly while keeping chin tucked. Exert force to push head down.
LATERAL FLEXION (RIGHT)	 supine head turned to left chin tucked slightly knees bent & feet flat 	On right temple.	Aside the patient.	Break test - have patient lift and keep head turned and chin tucked. Exert force to push head down.
ROTATION (RIGHT)	 prone head turned to right arms at side chin tucked slightly 	Above and behind the ear on the right temporal area.	Aside the patient.	Break test - have patient lift and keep head turned and chin tucked. Exert force to push head down.

Testing Protocol: Lumbar



lumbar flexion





lateral flexion

lumbar flexion

	PATIENT START POSITION	PLACEMENT OF DYNAMOMETER	POSITION OF THERAPIST	TEST
FLEXION	- supine - knees bent - feet flat - arms resting at side - head mid-line	On the sternum at the center of the chest.	Above and to side of patient.	Break test - patient's arms are relaxed and head + shoulders lifted off table, exert force to push down head.
EXTENSION	- prone - arms resting at side - head mid-line	At the inferior angle of the scapulae on the center of the back between the shoulder blades.	Above and to side of patient.	Break test - patient's arms are relaxed and head and chest lifted off table, exert force to push down body.
LATERAL FLEXION (RIGHT)	 - seated on table - back laterally flexed to right - arms resting in lap - head mid-line 	Under the arm of the rib cage (right side).	In front of and to side of patient with non- dynamometer hand isolating the left hip.	Break test - have patient lean right slightly with buttocks on table, exert force to push patient inward.

Baseline[®] Lift (Back-Leg-Chest) Dynamometer



Baseline® back-leg-chest dynamometer

Measure strength of back, leg and chest. Base provides sure footing. Chain length is adjusted to accommodate for height differences or to vary the point of force application. Shows pounds and kilograms. Pointer remains at maximum until reset. Comes with specified base.

12-0403	large base, 660 lb. adult
12-0400	regular base, 660 lb. adult
12-0401	regular base, 330 lb. adolescent
12-0402	regular base, 165 lb. child



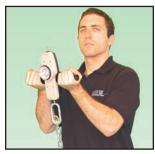


back-leg-chest hardware accessories Complete with 5 foot chain, snap hook and threaded oval.

functional lift bases

12-0406 regular bases (15x15") 12-0407 large base (24x24")

Baseline® push-pull dynamometers with lifting accessories



Dial (analog) hydraulic		
12-0392	50 lb./22.5 kg.	
12-0393	100 lb./45 kg.	
12-0394	250 lb./115 kg.	
12-0388	500 lb./225 kg.	



Digital (LCD) hydraulic 12-0397 12-0398 100 lb./45 kg. 12-0399 250 lb./115 kg. 12-0387 500 lb./225 kg.

50 lb./22.5 kg.



electronic		
12-0340	50lb/22.5kg	
12-0341	100lb/45kg	
12-0342	250lb/112.5kg	
12-0343	500lb/225kg	



Baseline[®] push-pull handles Handle system screws onto pushpull dynamometer body. Allows for a variety of tests. Fits Baseline® hydraulic and electronic push-pull dynamometers.

12-0363 Single Onp Handle	12-0385	Single Grip Handle
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Baseline[®] pull accessories

Attachments can be used for a variety of tests

raneey or cook	
12-0377	Medium Hook
12-0376	Small Hook
12-0379	Oval Snap Hook
12-0371 12-0370 12-0372 12-0373	curved push pad straight push pad small circular tip large circular tip



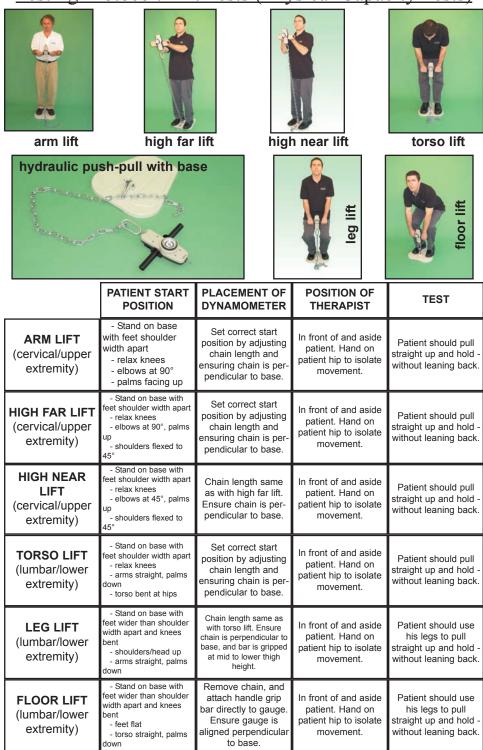
back-leg-chest hardware accessories

	chains/straps
12-0443	chain (ft)

ova	ls		
		7	

12-0445	snap oval (pair)
12-0446	threaded oval (pair)

Testing Protocol: Lift Tests (Physical Capacity Tests)



Baseline[®] grip and pinch strength dynamometers



200 Pound

The 200 pound Baseline hand dynamometer has become the standard tool used bv therapists all across the world. The regular sized head is the industry standard and our most popular size. But...The new HiRes large head makes for easier reading. Comes standard with case.

200 lb. regular head 12-0240 standard

200 lb. HiRes™ large head12-0243HiRes large head300 lb. HiRes™ large head12-0246HiRes large head

300 lb. digital head 12-0247 digital LCD sys.



300 Pound

The 300 lb. (135 kg) digital hand dynamometer uses the same hydraulic system but has the added advantage of an easy-toread LCD display. Features an electronic zero calibration system, a power management system that assures at least 1000 hours of use without changing the 2 "AAA" batteries, a low battery light, and an automatic shut off Push button console includes a button to zero the last maximum reading stored in memory, a maximum button to display the highest reading since the last press of the maximum clear button, and a lb./kg. toggle change the button to measurement reading.

Hydraulic Hand Dynamometer

The Baseline® hand dynamometer gives accurate grip strength readings without the subject being able to "feel" the handle move. Results are consistent with published Baseline® and Jamar® studies. The internationally accepted design assures reliability, user convenience and measurement repeatability. The five position adjustable handle can accommodate any hand size. The maximum reading remains until the unit is reset. The strength reading can be viewed as pounds or kilograms. Each dynamometer comes in a molded carrying case. The unit is made in the USA and has a 1-year warrantee. CE certified.

Hydraulic Pinch Gauge

The Baseline® hydraulic pinch gauge uses the improved hydraulic system of the hand dynamometer to assure convenience, product reliability and measurement accuracy and repeatability. The therapist can support the pinch gauge during testing. This yields a more accurate result for all pinch tests (tip, key and palmer). The results are consistent with the published Baseline[®] and Jamar[®] studies. The maximum reading remains until the unit is reset. The strength reading can be viewed kilograms. as pounds or Each dynamometer comes in a rugged carrying case. The unit is made in the USA and has a 1-year warrantee. CE certified.



Baseline® Mechanical Pinch Gauges

Measure tip, key and palmer pinch strength in both pounds and kilograms. Measurements are accurate and repeatable. Results are consistent with published Markowitz studies. Indicator remains at the maximum reading until reset. Comes with hard shelled, padded protective case.

orthopaedic & sports medicine		
12-0200	30 lb. with case, blue	
12-0201	60 lb. with case, red	

weak and damaged hand

12-0202	2 lb. with case, gold
12-0203	10 lb.with case, silver



Baseline® Hydraulic Pinch Gauges

The 50 pound hydraulic pinch gauge offers accurate and repeatable pinch strength measurements. The HiRes large head offers a bigger viewing dial and more measurement gradations.

12-0235	50 lb. regular head standard
12-0228	50 lb. HiRes™ large head HiRes large head
12-0228	100 lb. HiRes™ large head HiRes large
12-0237	100 lb. digital head digital LCD system

Testing Protocol: Grip and Pinch

	PATIENT START POSITION	PLACEMENT OF DYNAMOMETER	POSITION OF THERAPIST	TEST
POWER GRIP (RIGHT/LEFT)	 seated or upright test arm at side with elbow flexed 90° palm facing inward 	Adjust handle to appropriate rung, where grip is comfortable and the thumb overlaps the fingernail of middle finger.	In front of and to the side of patient.	Have patient squeeze, hold and release. Patient should not feel grip move nor see gauge.



hand grip

lateral pinch



chuck pinch







lateral pinch

	PATIENT START POSITION	PLACEMENT OF PINCH GAUGE	POSITION OF THERAPIST	TEST
LATERAL (KEY) PINCH (RIGHT/LEFT)	 seated or upright test arm at side with elbow flexed 90° palm facing inward 	Pinch gauge between flexed PIP joint of index finger and thumb.	In front of patient, to the side, stabilizing pinch gauge.	Have patient squeeze, hold and release.
CHUCK PINCH (RIGHT/LEFT)	 seated or upright test arm at side with elbow flexed 90° palm facing down 	Pinch gauge between thumb and the index and middle fingers.	In front of patient, to the side, stabilizing pinch gauge.	Have patient squeeze, hold and release.
PULP PINCH (RIGHT/LEFT ON EACH FINGER)	 seated or upright test arm at side with elbow flexed 90° palm facing down test finger on button 	Pinch gauge between thumb and test finger (make sure other fingers do not interfere).	In front of patient, to the side, stabilizing pinch gauge.	Have patient squeeze, hold and release.

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