

Sports Science & Sports Medicine

1. Functional Evaluation & Training System- Isokinetic System

ISOKINETIC SYSTEM



Without a system that provides Isokinetics, you simply can't rehabilitate or strengthen joints and their surrounding musculature in the fastest, safest and most efficient manner possible

Humac Norm (Cybex) = HUMAC NORM is your solution for measuring and improving human performance. Only with testing can you determine baselines, set goals, and track change.

Most physical rehabilitation involving rang-of-motion and force output requires four basic modes of evaluation and exercise/training:

PASSIVE - Subject co-operate with the equipment in extension/flexion through a certain range-of-motion. In Passive Mode, gentle range of motion exercise can facilitate the healing process and restore normal range of motion necessary for function.

ISOMETRIC- Concentrates on strengthening of muscles at certain specific angles where weakness is measured.

ISOTONIC - Subject exercises at constant inertia but varying the speed.

ISOKINETIC - Here the force applied by the subject which is the angular velocity, remains constant throughout the range of motion.

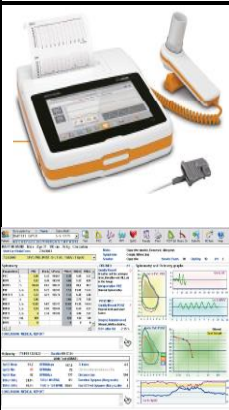
The HUMAC NORM includes attachments to perform 22 isolated patterns covering the shoulder, elbow, wrist, hip, knee, ankle and back.

Single attachment for bilateral evaluation of upper & lower extremities (all joints), Avoiding need to change or reset attachments when changing sides.

Work Simulation: Handles and knobs of different sizes and shapes simulate a variety of real-time hand/wrist movements: From turning a doorknob or opening a jar, to operating a valve or wheel.

2. Computerized Spirometer

PORTABLE DESKTOP SPIROMETER



Spirolab® 7 inch Touch screen Model

Lung age estimation, Pre Post bronchodilator comparison.

With Indian population database.

Spirometry parameters: FVC, FEV1, FEV1/FVC, FEV1/VC, PEF, FEF25, FEF50, FEF75, FEF25-75, Lung Age, Extrap. Volume, FET, FEV3, FEV3/FVC, FEV6, FEV1/FEV6, FIVC, FIV1, FIV1/FIVC, PIF, VC, IVC, IC, ERV, Rf, VE, VT, tI, tE, VT/tI, tE/tTOT, MVV

Oximetry parameters (optional): SpO2. Min/Max/Avg, pulse rate, test duration, T90% [SpO2 time ≤89%], T89% [SpO2 time ≤88%], total SpO2 events, T40 (bradycardia duration with pulse rate <40 BPM) T120 (Tachycardia duration with pulse rate >120 BPM)

COMPUTERISED SPIROMETER



MinSpir - Connects directly to any PC/ Laptop with standard USB Port.

Lung age estimation, Pre Post bronchodilator comparison.

With Indian population database.

Computerized Spirometer with Oximetry (optional)

Embedded Temperature sensor for BTSP conversion

3. Metabolic Analyzer



BBB1LP = Cardiopulmonary Exercise Testing System, complete with the CPX Metabolic Analyzer for breath by breath CO2 and O2 exchange measurements

Laser Diode Oxygen Sensor & NDIR Co2 Sensor responds in less than 100 milliseconds and never needs replacement.

System reports the following Measured Data: FE02, FECO2, Breath Flow, Ventilation, Work Load, Oxygen Saturation, Heart Rate, Temp., Pressure, RH

Calculated Parameters: Respiratory Rate, VE, VO2, VCO2, VT, ET02, ETCO2, Dead Space Fraction (VD/VT), Respiratory Quotient (R), VE/O2, VE/CO2, Ventilatory Reserve, Ventilatory Threshold, Heart Rate Reserve, Oxygen Pulse, Flow Volume Loop, Maximum Voluntary Ventilation





METABOLIC ANALYSER – MOBILE - Q-Track wearable ambulatory system for monitoring VO2 and VCO2 in a moving subject indoors or outdoors.




The Q-Track is a wearable breath by breath CPX system that allows you to conduct CPX measurements almost anywhere. Data are displayed on a battery-powered interface and analyzed using sophisticated, but intuitive software.

The Complete System with : Fuel cell O2 Sensor, NDIR CO2 Analyzer, Disposable/ Sterilizable Pneumotach, Adjustable Face Masks, Mask and Attachments only 85g, System Weight only 1.2 Kg, Automated VO2 and VCO2 Calculations, Heart Rate Monitor Included, +8 Hour Battery Life

4. Non Invasive Cardiac Output Monitoring


NON INVASIVE CARDIAC OUTPUT MONITORING	
	<p>Physio Flow Enduro - Signal Morphology-based Impedance Cardiography (SM-ICG) Accuracy is comparable to invasive techniques Continuous non-invasive cardiac output measurements are made possible: Exercise at all levels, obesity, thoracic fluid overload, COPD, low cardiac outputs etc Parameter Reporting : Stroke Volume/Index, Cardiac Output/Index, Contractility Index, Early Diastolic Filling Ratio (Preload Index), Systemic Vascular Resistance (After load), Left Cardiac Work Index (surrogate of MVO₂), Ventricular Ejection Time, Ejection Fraction (est.)/End Diastolic Volume (est.) APPLICATIONS: Pulmonology/COPD, Pulmonary Hypertension, Physiology (extreme conditions, military), Pharmacology (and toxicology), Sports medicine Intensive Care staff- Assess Shocked patients, Manage fluid and drug administration (plus weaning patients off ventilators), Monitor unstable patients Cardiologists and Internists- Diagnose and follow up of Heart Failure and Hypertensive patients, Manage Bi-Ventricular PM patients optimally, Improve sensitivity of CAD and dyspnoea diagnosis during exercise test</p>
	

5. Lactate Analyzer

LACTATE ANALYSER	
	<p>Fast, Accurate & reliable Lactate measurement in 3 steps The maximum lactate steady state is at 4 mmol/L, If the exercise is continued at high intensity more lactate will be produced than eliminated. Increasing lactate values over 6 mmol/L indicate the limit of performance.</p>
	<p>FEATURES: Sample volume : 0.2 µl Test duration : 10 seconds Data storage : 500 test with date, time and step test allocations Lactate measurement value, date/time, measuring mode, temperature, heart rate and memory ID on a single display Lactate Scout Assistant software for performance management. Smart phone and tablet compatible Bluetooth ® Pre-calibrated sensors</p>
	

6. Body Composition Analyzer

BODY COMPOSITION ANALYSER= Gold Standard





	<p>Futrex's 6050 & 6150- Patented Near-Infrared Technology The Most Accurate and Repeatable Body Composition Analyzer</p> <p>Provides Detailed Analysis- Fat mass (divided into essential fat mass, fat reserve and excess fat mass), Fat-free mass, Muscle protein (metabolically active mass), Absolute water content, Water content divided into intra- and extracellular water, bone portion FFMi (fat-free mass index), BMI (body mass index), BMR (basal metabolic rate "basal metabolic rate"), Problem Zone Analysis "Local Fat and Muscle Analysis"</p> <p>EXCLUSIVE FEATURES</p> <ul style="list-style-type: none">•Gold Standard Accuracy – Equal to hydrostatic testing and DEXA•Measurement via Harmless Light – No AC currents through the body•No Disrobing – No need to remove shoes, socks or pantyhose•Measure Any Time – e.g. before, during or after a meal•Accurate Measurement of Anyone – From ages 5 through 95 <p>Whether whole-body analysis or local problem zone (stomach, legs, hips, etc.): the measurement can be performed at any time - regardless of sports, food and / or fluid intake, cycle, medication or toilet. Even pacemakers and / or defibrillators are no problem</p>
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7. Skin Fold Caliper



SKINFOLD CALLIPER

	<p>Skinfold Calliper- lightweight aluminium calliper. Measurement arms have "floating tips" to assure accurate and reproducible results. 6 cm (2.5 ") scale is large and easy to read. Complete with booklet and tables.</p>
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8. Anthropometry Kit

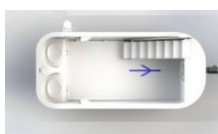
ANTHROPOMETRY KIT	
	<p>Anthropometric Chair - measuring instrument that can be used to measure the dimensions of the human body. Can perform measurements up to 34 dimensions of the human body parts. Measurement Positions: Standing position, Sitting Position, Facial area measurement</p>
	<p>Portable Anthropometry "Complete Set Series" is a modern, practical and effective human body measuring instrument. Material : Stainless Steel</p> <ol style="list-style-type: none">1. Anthropometer<ul style="list-style-type: none">- Anthropometer Bar- Sliding Block- Branches Measurement Curves2. Sliding caliper3. Small Spreading Caliper
	

9. Evaluation- Hand, Back, Leg & Chest Dynamometer

HAND DYNAMOMETER / HAND EVALUATION SET	
	<p>Baseline @ 7-piece hand evaluation sets- Hydraulic hand dynamometer with Five position handle and pinch strength by the mechanical pinch gauge, Stainless steel goniometer, 2-point discriminator with 3rd point, Wartenburg pinwheel, finger circumference gauge, and functional finger motion gauge</p>
BACK LEG CHEST DYNAMOMETER	
	<p>Measure strength of back, leg and chest muscles</p> <ul style="list-style-type: none">• Chain length is adjusted to accommodate for height differences or to vary the point of force application, Comes fully assembled with 5 foot chain• Reads 660 lb/300 kg adult with standard base 18" x 18"

10. Hydrotherapy - Underwater Treadmill

HYDROTHERAPY WITH UNDER WATER TREADMILL



Hydrotherapy system with facility of underwater treadmill for partial weight bearing sports training benefits include improved respiratory status, improved peripheral circulation, improved cardiovascular and metabolic status, increased aerobic endurance, improved function, and psychological benefits.

- ✓ **One-piece design with 50" water depth**
- ✓ **Quiet energy efficient electric motor**
- ✓ **Optimized propeller generated water flow**
- ✓ **Fully adjustable water current with 99 speeds**
- ✓ **Above ground, in-ground, and partially in-ground**

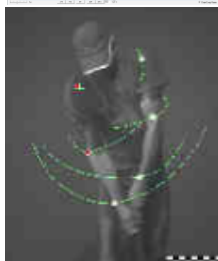
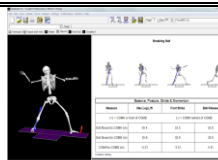
Exclusive **Paddlewheel technology** creates the widest, smoothest, and most powerful river-like water current.

The Triton is an ideal option for any physical therapy or rehab centre:

- 50" (1.27 m) water depth (easy to install)
- Can be installed above or below ground – indoors or outdoors
- Floor load: 355 lbs (161 kg) /sq. ft
- Water depth: 4' 2" (1.27 m)

11. 3D Motion Analysis System

3D- MOTION / GAIT ANALYSIS SYSTEM



EMG



Force Platform



Max PRO - Infra Red Cameras based - Flexibility is the key to MaxPRO.

You have the ability to interface with a wide range of cameras.

Everything from standard camcorders to high speed, high resolution cameras.

FEATURES AND BENEFITS:

- Use up to 32 cameras
- Dynamic Wand calibration
- Creates C3D and ASCII files
- Track up to 255 markers/points
- Marker templates with name, size and color + stick figure defining

Max TRAQ - Video Camera based - All you need are AVI or MPEG files.

MaxTRAQ 3D is Video Based 3D Motion Tracking system Can Synchronise up to 4 cameras.

MaxTRAQ 3D includes tools such as angles, distances, notes, stick figures, traces and scales. Analysis includes distances, angles, centre of mass, etc.

EMG: Trigno™ IM Smallest commercially-available EMG + IMU Sensor

Each Trigno™ IM sensor collects 10 channels: 1 EMG, 3D acceleration, 3D angular velocity, and 3D magnetic field data.

Force Plates: Bertec force plates are well suited for gait, balance, sports, ergonomic, static, and dynamic analysis.

12. Whole Body Cryotherapy

ICE LAB - WHOLE BODY CRYOTHERAPY @ -110 °C



Whole body Cryotherapy @ -110 degree C.

You can remain at -110°C from one to three minutes.

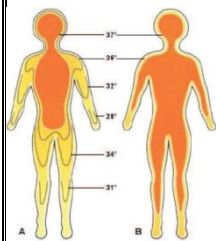
There is more: at -110°C the air volume shrinks by 45% compared with room temperature. This means that **you inhale almost twice the amount of oxygen per breath.**

Medical Indications:

- Disturbed regulation of muscular tone (spastic) with infantile cerebral palsy, multiple sclerosis, muscular strains and hardening
- Blunt traumas of the joint and the musculature
- Psoriasis without and with joint participation
- Atopic dermatitis (neurodermatitis), bronchial asthma
- Signs of muscular fatigue
- Disruptions of equilibrium, disruptions in movement coordination
- Disruptions in central activity levels (central sign of fatigue, burn-out syndrome, sympathicotonic, parasympathicotonic and depressive reaction states, non-organic and pain-conditioned chronic sleep disorders)
- Central psycho-physical deterioration in performance and ability
- Immune reaction disorders, caused by extreme muscular demands, age or stress-dependent functional constraints of the immune system
- Primary hypotonic circulation disorders
- Inflamed and degenerative rheumatic joint diseases (rheumatoid arthritis, Bekhterev's disease)
- Degenerative-rheumatic diseases (osteoarthritis of large and small joints, also before and after endoprosthetic treatment, postoperative edemas)
- Cervical and lumbar vertebral syndrome (discopathies, lumbago, ischia syndrome), also pre- and postoperatively
- Chronic pain states, primary headaches, pain and stress processing defects (fibromyalgia)

Active Components:

- Relieves pain
- Inflammation inhibition, immune-modulation
- Effect on skeletal musculature
- Functional improvements of joints



- Regulation of the central activity level, psycho-physical performance enhancement, improvement of well being
- Economization in the cardiovascular system and energy Budget

ICELAB IN SPORTS

Pain elimination, prevention of development of pain memory and accelerated reduction of inflammation, resulting in:

- Timely elimination of reflexive muscular inactivation
- Prevention of longer pain- and inflammation – induced restriction in mobility of the afflicted joints
- Improvement in local muscular perfusion and with that muscular metabolism
- Improved recruitment of motor units
- Decrease in defects in proprioception
- Prevention of atrophies in the muscle and in the collagenous connective tissue
- Reduction in the risk of subsequent injuries
- Reduction of periods away from training
- Psychological equilibrium and regulation of sleep behaviour

Whole body cold air application at minus 110 ° C was compared with other cooling methods:

- Highest increase in performance
- Sustainable economizing effect on core body temperature
- Reducing skin temperature
- Reduction in heart rate
- Decreasing blood lactate (mmol / l)

INSEP / National Sport Training and Education Centre Paris / France

icelab since 19 years

Zimmer
MedizinSysteme

There is not one icelab out of service due to technical reasons.