

BIODEX

Elite Sport Financial Justification



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BIODEX System 4 & BIODEX Balance System SD

Professional Football Club **saved £15,000,000** on transfers

Saving in cost of new players

Over the last 15 years, a Premiership Football Club has saved over £15,000,000 on transfers using their Biodex Isokinetic and Balance System equipment as part of their pre-signing medical. This was achieved through:

- + Renegotiation of the transfer fees with the selling club after finding a “problem” on isokinetic testing during a medical. This is often not detailed in the accompanying medical records of the player. This may allow the signing club to renegotiate the length and terms of the contract with the player
- + As part of the signing on medical process, isokinetic data played a major part in the decision not to sign certain players as the risk of a poor playing return far outweighed the ability of the player to improve the squad.

Return to play

In addition to the testing capability of the equipment, it can be utilised as a rehabilitation platform in various modes of exercise. By returning a player back to play safely and quicker, with isokinetics and proprioceptive training as part of the complete rehabilitation process, the initial cost of the equipment soon becomes a money saver.

| | Player A | Player B | £ Saved |
|--------------|----------|----------|-----------------|
| Weekly Wage | £50,000 | £10,000 | - |
| No. of Weeks | 4 | 0 | £200,000 |
| No. of Weeks | 1 | 6 | £110,000 |
| No. of Weeks | 4 | 6 | £260,000 |

Scenarios are over 2 years

No. of weeks is the number of weeks that a player is returned to play earlier

Prevention of injury

The concept of pre-season and in-season screening using the Biodex System 4 and Biodex Balance SD is an important consideration of injury prevention in the sporting environment. This baseline data provides an excellent opportunity for assessing each individual whilst in a healthy state – particularly should they suffer a related injury post testing. It also provides similar baseline information on current musculo-skeletal concerns for each member of the squad which may influence their ability to train or play. Prevention of injury, through early identification of deficits and subsequent strengthening and rehabilitation **enables the club to save out of play costs associated with an injured player.**

IPRS Mediquipe are the **sole distributors for Biodex** customers in UK & Ireland. Over 24 years’ experience, augments our Biodex approved clinical training and equipment servicing.



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BIODEX System 4 - Isokinetic Dynamometer

Biodex System 4

Over 30 years of Biodex experience in muscle testing equipment, the System 4 rehabilitation dynamometer is both dependable and versatile in design and function. It allows the clinician to evaluate power, strength, endurance, and range of motion of all major joints and muscles, alongside highly detailed objective data results in numerous other parameters. To support these various statistics, graphic reports sit alongside, which is a useful parameter for both clinician and patient in planning and understanding the prospective rehabilitation protocol.

Dynamic and static muscle loading environments give unlimited combinations of technique and applications...

Isokinetics is an exercise modality that operates at a fixed speed with a variable resistance, so it accommodates the individual throughout the full range of joint motion. If required by the clinician, maximum dynamic loading is possible throughout which contrasts with the more utilised isotonic exercise, which works at a variable speed with a fixed resistance. Impact-free acceleration eliminates joint trauma during the achievement of high speeds that correlate to function with the ability to choose between maximum speeds of 500°/sec (concentric) and 300°/sec (eccentric) down to a minimum speed of 15°/sec in both modalities

Within this there are many modes of contraction available to the clinician...

Continuous Passive Motion (CPM) is often used immediately after injury or post-surgery, with the most common sites being the shoulder, knee, and ankle joint. The advantages of this early, safe mobilisation are that it has an analgesic effect, allows an increase in early and late ranges of movement (ROM), and prevents the complications of immobilisation such as peri-articular adhesions, contractures, and circulatory stasis without any detrimental effect on wound healing. Longer periods of time can be split into bouts of treatment, so a 1-hour session can be split into 3 x 20 mins to allow the patient to mobilise from the static position and/or partake in other aspects of their injury specific rehabilitation programme. Single CPM units are joint specific and cost approximately 3k-4k each. **The isokinetic unit can provide passive motion for all major upper and lower joints avoiding the need for a medical department to purchase individual units.**

Active assisted and **submaximal** workloads can be used in the early stages of rehabilitation. Acute pain from the injury site may limit the amount of torque the patient can generate when exercising. As an isokinetic unit has both a passive and active assisted mode, submaximal exercise can begin in the first few days before progressing to fully active modes.

Isometric mode Isokinetic units can also be used for isometric muscle testing and rehabilitation. This form of exercise is performed at a speed of 0°/second with no joint movement. Any observable movement of the muscle belly occurs as the muscle fibre contracts and shortens. Isometric muscle contraction sits in the midpoint of both tables shown below in terms of soft tissue and joint tension. This enables the therapist to incorporate isometric work at an early stage of rehabilitation, when safety is essential to prevent further injury, yet can still be utilised in the later stages, when maximum isometric loading can provide a moderate stress on supporting joint structures. However, if used with too great an intensity at an early stage for muscular activation then it is important to recognise the possibility of unwanted joint irritation.

Isotonic mode for inertia-free concentric or eccentric muscular contractions with the bonus of graphic and numerical data feedback specific to each repetition.

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BIODEX System 4 - Isokinetic Dynamometer continued...

Comparison of soft tissue tension
developing capacities of various
muscular contractions

HIGHEST

Eccentric Isokinetics
Eccentric isotonic
Isometrics
Concentric Isokinetics
Concentric isotonic

LOWEST

Comparison of joint tension
developing capacities of various
muscular contractions

HIGHEST

Eccentric Isotonics
Eccentric isokinetics
Isometrics
Concentric isotonic
Concentric Isokinetics

LOWEST

Source: Davies 1992

Reactive eccentric mode for initial submaximal neuromuscular re-education through to maximal control in the later phases of rehabilitation. Physical and computer software range of motion limits always ensure patient safety whatever the desired mode of contraction.



Proprioception Injury which involves trauma to a joint will not only damage soft tissue structures but the balance mechanoreceptors which are responsible for proprioception. In rehabilitation terms, muscle activation and joint movement is necessary to provide stimulation to these balance receptors post injury. Isokinetic units, using passive and active assisted modes particularly, can provide this stimulation with the added advantage of using joint positioning drills, with or without visual feedback at definitive ranges of motion in various phases of joint loading.

Patient specific protocols using the link facility which allows all modes of contraction to be incorporated into the one rehabilitation protocol. This ensures muscle strengthening; proprioceptive and kinaesthesia training can be included in one session if desired

Compare each patient's graphic and data report to normative databases supplied or developed based on your clinical experiences.

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Biodex Balance System SD

Static and dynamic balance testing and balance training for athletes...

The Biodex Balance System is ideal for pre-season baseline, injury pre-disposition or return to activity.

The Biodex Balance System SD serves as a valuable balance analysis and balance training device to enhance kinaesthetic abilities that may provide some degree of compensation for impaired proprioceptive reflex mechanisms following injury. Using the unique device, clinicians can assess neuromuscular control by quantifying the ability to maintain dynamic bilateral and unilateral postural stability on a static or unstable surface.

Help players safely return to play with Biodex Balance and Assessment for Concussion Management...

Combined Assessment - Biodex Balance Assessment adds the objective, neuro-physical component for the management of concussion. The benefit is that clinicians can quantify the elements of balance – before and after an injury occurs. Detailed summary and progress reports track recovery and provide the medical team with quantitative data to help with the return-to-play decision.

Biodex Balance Technology - Biodex Balance Assessment is either conducted using the versatile Balance System SD or portable BioSway. The Biodex Balance System SD is a sophisticated measuring and training device for static and dynamic balance testing and training. The BioSway is a portable balance device with a static-only platform. The mCTSIB can be performed on either Biodex Balance device, designed to systematically test the sensory selection process by compromising available somatosensory, visual, and vestibular senses while measuring an athlete's ability to minimise postural sway.

The Sway Index is an objective quantification of postural sway and is measured during the mCTSIB. The test provides a generalised assessment of how well an athlete can integrate various senses with respect to balance, and compensate when one or more of those senses are compromised. A higher Sway Index indicates a reduction in the athlete's ability to remain steady during the test.

In addition to performing the CTSIB test the NEW version of the Balance System SD and BioSway software now includes the option of conducting a modified version of the Balance Error Scoring System (BESS) test of postural stability, popular for concussion management. Both systems now feature the ability to create custom sensory integration balance testing which allows for modification of existing or the creation of entirely new protocols with both the CTSIB and BESS tests.



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