

INFORMED CONSENT – POST SURGICAL

SPECIAL CONSIDERATIONS – NOT INTENDED FOR TREATMENT

IS INFORMED CONSENT FOR THE USE OF BLOOD FLOW RESTRICTION (BFR) IN COMBINATION WITH YOUR REHABILITATION PRESCRIPTION NECESSARY?

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INTRODUCTION

The Blood Flow Restriction technique (full occlusion of venous and partial occlusion of arterial blood flow by itself or combined with low-intensity resistance training) is designed to enhance muscle strength, size, and endurance by using well-documented physiological responses secondary to oxygen depletion with lactic acid accumulation. These are like those that occur with high intensity, progressive resistive exercises (PREs) using heavy weights to exhaustion. BFR has been employed since it was first developed in Japan in the early 1970s. It is now becoming increasingly popular due to many recent research studies demonstrating its value.

It has been shown that BFR can achieve similar results to extreme PREs without overloading healing tissues and causing joint cartilage damage. Clinical studies have demonstrated that it can be safely introduced early, into the rehabilitation protocol, regardless of the surgery performed, if both the practitioner and patient understand its benefits and limitations. It should be appreciated that the physiologic benefits achieved by performing BFR on the unaffected extremities will still benefit the affected limb and that by merely walking with the straps in place, BFR benefits are possible.

There are also benefits in reducing atrophy to the non-injured limbs when injury prevents normal movement such as walking after a knee injury.

Like any exercise prescription, BFR exercises should be different for each individual depending on the expected recovery, patient age, and goals. The number of repetitions, amount of weight, extremity position, time per BFR session, and sessions per day or week, need to be carefully outlined by the physical therapist or trainer. They should also apply PRE principles into the BFR work-out; these principles have guided surgery and injury recovery for over one hundred years.

Blood Flow Restriction enhancement of medically prescribed recovery or rehabilitation protocols is new. Much research still needs to be accomplished. BFR is presently NOT considered “community standard,” and the need for a detailed discussion, and voluntarily signed informed consent, should be carefully considered by any healthcare practitioner employing BFR.

INDICATIONS

It has been demonstrated that BFR techniques can be safely used to enhance the recovery of most patients. Any injury or surgery where it can be anticipated that there will be a loss of muscle strength, endurance, or girth is a candidate for BFR.

Using BFR techniques early, on an injured or repaired extremity, should be carefully outlined, modified, and introduced, to avoid increasing swelling and the chances of thrombophlebitis or pulmonary embolus.

The average incidence of these complications after surgery or injury depends on several factors but ranges from 5% to 11% for deep vein thrombophlebitis, and .01% to .06% for pulmonary embolus. Present clinical studies have not shown an increase in either diagnosis when BFR is used.

Regardless, in the post-operative or injury environment, it would seem prudent to consider recommending an 82 mg Aspirin per day, unless the patient is, or will be given another anticoagulant by their physician. Consider that the possibility of any DVT or PE event during the use of BFR, may likely be considered the result of blood flow restriction.

CONTRAINDICATIONS

ABSOLUTE

- Existing thrombophlebitis in the affected extremity **
- Existing infection in the affected extremity **
- Active cancer
- On medication known to increase clotting risks
- Peripheral vascular compromise
- Sick cell trait or disease

- History of pulmonary embolus
- History of DVT in the affected limb
- Family history of inherited blood abnormality (Factor V)
- Elevated D-dimer blood test and + Doppler
- Positive Doppler exam for DVT
- Congestive heart failure
- Significant liver or kidney disease
- Post-partum recovery

*RELATIVE

- Obesity, BMI > 30 **
- Diabetes
- Smoker (only as co-morbidity)
- Paralysis or paresis **
- Immobile for greater than 7 days
- Swelling > than 3 cm. vs. normal limb **
- Tenderness over deep venous system **
- Major abdominal or pelvic surgery 4 weeks prior to
 - starting BFR (highest risk is 2 to 10 days post-op)
- Crohn's disease or Ulcerative Colitis
- Age > 65 yrs.
- Birth control pills
- Family history with multiple family members
 - having pulmonary emboli
- Severe varicose veins
- Fractured long bone or pelvis

**Use an anticoagulant such as Aspirin, low dose Heparin, etc.*

***May use BFR on unaffected upper or lower extremities, or opposite extremity.*

ASSESSING THE RISK OF DVT OR PULMONARY EMBOLUS

Clinicians have traditionally used published guidelines to help them decide the relative risk of a patient developing deep vein thrombophlebitis or a pulmonary embolus.

One of the more popular programs is the Wells Criteria, Risk Stratification Score (x) and is recommended by the American Medical Association. A numerical score is assigned to each positive answer, and

the total of all answers is then used to place the patient in a low risk (5%); Medium risk (6% to 17%); or High risk (18% to 53%) group.

This approach is constructive and necessary when trying to determine if a patient should be placed on dangerous anticoagulants for extended periods. Many anticoagulants carry a known risk of serious complications related to bleeding, and the use of them should be well documented in the medical record.

Fortunately, there are several safe and effective modalities that have proven to reduce the incidence of DVTs or PEs. Compression hose and lower extremity pneumatic pumps are now available in the ambulatory setting and are inexpensive.

Also, the use of 82 mg. of ASA per day is equally effective to the more dangerous anticoagulants in the postoperative setting.

The need to calculate relative risks for postoperative or post-injury patients under-going BFR therapy is obviated by the routine use of Aspirin, compression hose, and/or pneumatic pumps. Which, if not all, of these modalities, are prescribed by the healthcare clinician, should be based on the relative risks, as outlined above, as well as how close to the surgery or injury the BFR is started.

Additional Resources

You may want to consider using additional risk assessment forms such as those found on the following link
<https://www.venousdisease.com/capri-dvt-risk-assessment.pdf>

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