Effects of Warm Tub Immersion Versus Cold Tub Immersion to Relieve Delayed Onset Muscle Soreness in Division 2 Collegiate Baseball Players

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### Review of Literature

**Delayed Onset Muscle Soreness (DOMS)**
- Microtrauma
- Pain caused by a buildup of lactic acid, local ischemia, muscle tightness, connective tissue damage, and muscle inflammation.
- 24-48 hours post exercise.
- Affects athletic performance.
- Compensatory mechanisms

**Cold Water Immersion**
- Analgesic
- Constricts Blood Vessels
- Decreases Metabolism

**Hot Water Immersion**
- Analgesic
- Promotes blood flow
- Muscle Relaxation
- Tissue Elasticity

### Findings

**Cold water immersion therapy** is more effective than contrast immersion therapy. Therapy time less than 10 minutes is ineffective with cold water immersion. Cold water immersion decreased perception of fatigue in athletes. Very few studies compare hot water to cold water in its effectiveness.

- One study shows athletes who received warm water therapy recovered a day faster than those who received cold water therapy.

### Purpose and Significance

**Purpose:** to bring clarity to what the best method of practice may be for the athlete in comparing cold water immersion vs. hot water immersion for the treatment of delayed onset muscle soreness.

**Significance:** provide an alternate method in treating DOMS and bring clarity to current conflicting research.

### Hypothesis

Cold water immersion will create a better benefit in reducing DOMs.

### Methods

- Letters to coaches.
- Email Baseball players.
- Recruit volunteers
- Meet with volunteers
- Randomly assign to 3 groups

### Groups

- Cold water immersion - 45 degrees fahrenheit.
- Warm water immersion - 96 degrees fahrenheit.
- Control group.

### Measures

- Vertical jump height
- Peak torque of quadriceps and hamstrings.
- Self reported muscle soreness.

### Findings and Limitations

- Limitations: Lack of blinding.
- Variability in athletes workouts.
- Instrument errors when testing.
- Learning curve.

**Findings:** There were no significant findings between the groups for any measures.