

Does physiotherapy help  
manage the DOMS response  
in

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EIMD ?

By

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# What is DOMS and EIMD?

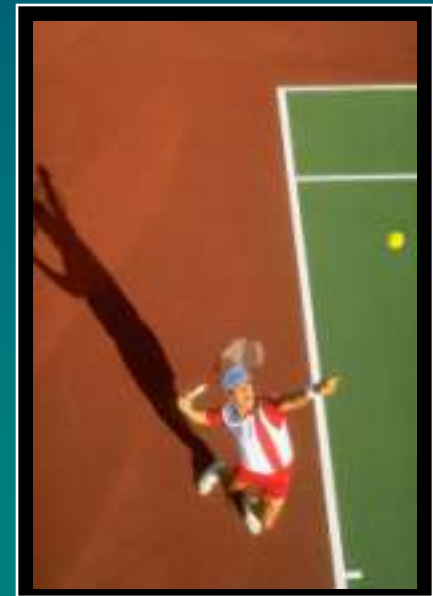
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- Exercised Induced Muscle Damage
  - Eccentric muscle activity
  - Pain, loss of motion, loss of strength, swelling
- Delayed Onset Muscle Soreness
  - Begins 48-72 hours post
  - Lasts 7 to 10 days

# Theories?

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- Lactic acid theory- *accumulation of lactic acid*
- Spasm theory- *pain and spasm cycle*
- Connective tissue damage theory
- Muscle damage theory



# Latest Theory

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- Mechanical factors

- Fewer motor units firing
- Z band streaming
- Rises shown in Creatine Kinase levels

\_\_\_\_\_(Clarkson and Sayers 1999, Franklin et al 1991, Mair et al 1995)

- Calcium Homeostasis

- Elevation in intracellular Ca levels

\_\_\_\_\_ (Clarkson and Sayers 1999, Armstrong 1991)

# Latest Theory cont.

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- Inflammation

- Neutrophil, macrophage and leukocyte infiltration (Smith 1991)
- WBC counts
- Use of anti-inflammatories??



# Effects?

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- Pain

- Swelling and oedema (Smith 1991)
- Inflammatory mediators (Clarkson and Newham 1995)

- Increase in muscle stiffness

- Swelling and oedema (Clarkson and Sayers 1999)
- Ca accumulation (Clarkson and Newham 1995)

- Loss of muscle strength

- Sarcomere over-stretching (Clarkson and Newham 1995)
- Fatigue (Westerbald et al 1993)

# Does physio help?

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- Ultrasound
- Electrical stimulation
- Massage and accupressure
- Repeat bout exercise
- Cryotherapy
- Preventative training

# Ultrasound

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## Varied results

- *Hasson et al (1990)*- effective
- *Plaskett et al (1999)*- ineffective
- *Craig et al (1999)*- ineffective



# Electrical Stimulation

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## Varied Results

- *Denegar et al (1989)*- effective
- *Schmitz et al (1997)*- effective
- *Allen et al (1999)*- ineffective

# Massage and Accupressure

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## May have positive effect

- *Ernst (1998)*- good review article
  - 5 out of 7 studies reviewed- effective
- *Smith et al (1994)*- effective, but timing crucial
- *Charles-Liscombe (1998)*- effective

# Repeat Bout Exercise

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## Varied results

- *Hasson et al (1989)*- concentric effective
- *Smith (1994)*- eccentric ineffective

# Cryotherapy

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## No effect

- *Braun and Clarkson (1989)*- ineffective
- *Paddon-Jones and Quigley (1997)*- ineffective

# Preventative Training

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## Best treatment to date

- *Cleak and Eston (1992)*- effective
- *Friden et al (1983)*- effective
- *Clarkson and Tremblay (1988)*- effective

# Summary

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- No conclusive evidence as to what causes DOMS
- Physiotherapy modalities effective??
- Physiotherapy modalities ineffective??

# Future research

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- Must include:
  - Large sample sizes
  - One modality assessed at one time
  - Ensure no confounders
  - Control groups and placebo

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