

Sleep Medicine, 11<sup>th</sup> August 2015

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Stichting Opleidingen Musculoskeletale Therapie



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# Nocturnal leg cramps

**Diagnosing, therapy and associations  
with other sleep related movement  
disorders.**

# Outline



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- Muscle cramps in general
- Grouping of cramps
- Diagnosing
- Other **sleep related movement disorders**
- Therapy
- Conclusion
- References

# Muscle cramps

in general



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Involuntary, painful, visible contractions

Uncontrolled repetitive firing of motor unit action potentials

due to

hyperexcitability of intramuscular terminal motor axons by  
activation in the spinal cord

# Cramps

in general



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Pharmacologic treatments have a moderate interest because of the potential of toxicity (quinine sulfate)

or

Moderate / inconsistent effectiveness

# Cramps

in general



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Rule in or out the motor unit diseases (neuropathy, radiculopathy, plexopathy, neuromyotonia, and a cramp fasciculation syndrome which can precede ALS)

# Cramps

grouping



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- Exercise-associated cramps
- Cramps secondary to disease
- Iatrogenic cramps
- Rest cramps: pregnancy-related cramps and nocturnal leg cramps



# Cramps

Grouping



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- Cramps secondary to disease

Renal failure, liver diseases, vascular insufficiency

Only associations no causal relationship



# Cramps

## Grouping



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- Iatrogenic cramps

Cramps induced or associated by medication use: diuretics, steroids, lithium, morphine and statins are most known.

Haemodialysis!

# Cramps

## Grouping



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- Rest cramps: pregnancy-related cramps and nocturnal leg cramps



Why am I Cramping?  
Reasons For Cramping in Early Pregnancy

# Diagnosing

Nocturnal leg cramps



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- High prevalent (0.70%) disorder
- Painful
- Sleep disruption
- Decreased quality of life
- At night or at rest
- Muscle hardening

# Diagnosing

Nocturnal leg cramps



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- Criteria by patient history and not evidence based
- Confusing with Restless Legs Syndrome and/or Periodic Limb Movement Disorder
- Mostly not recognized by clinicians

# Diagnosing

Nocturnal leg cramps



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- Restless Leg Syndrome
- Periodic Limb Movement Disorder

# Others

## Restless Leg Syndrome



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Uncomfortable and unpleasant sensations in the legs associated with an urge to move; relief of symptoms by moving the legs; sensations in feet or arms and always during rest; appearance in the evening or at night.

# Others

PLMD



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Idiopathic PLMD symptoms are repetitive jerking movements of the leg for a period of approximately 20-30 seconds during sleep or wakefulness and complaints during wakefulness is more intense than during sleep.

# Diagnosing

Nocturnal leg cramps



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- Systematic comprehensive review
- Study aims:
  - To define characteristics for diagnosing NLC
  - Differentiation from RLS and PLMD



# Diagnosing

Nocturnal leg cramps



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- Inclusion
  - Electronically search
  - Prior 25 years
- Exclusion
  - Non-English abstracts

# Diagnosing

Nocturnal leg cramps



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Describing diagnostic terms or classification criteria during night or sleep in the randomized clinical trials and observational studies

Delphi study to examine relevance of the revealed characteristics

# Diagnosing

Nocturnal leg cramps



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No diagnostic studies found

Systematic and narrative reviews

Extracted randomized trials and observational studies

# Diagnosing

Nocturnal leg cramps



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- Ten criteria were identified which were used for differentiating NLC from RLS and PLMD
- Decision tree

# Therapy

Nocturnal leg cramps



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## Pharmacological:

Many side-effects

Medication benefits are limited

Inconsistent evidence

# Therapy

Nocturnal leg cramps



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- Quinine
- Hydro-quinine
- Less coffee
- Pyramid under the bed
- Natrium – Kalium – Vitamine B/E
- Legs higher during the night
- Stretching

# Therapy

Nocturnal leg cramps



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Will a pre-sleep stretching regimen be effective in preventing NLC?

# Method

## Randomized trial

n=80 (40-40)

Inclusion criteria:

age > 55

frequency at least 1 week

Exclusion criteria:

medication use

co morbidity



# Method

## Stretching protocol

Triceps surae

Hamstrings

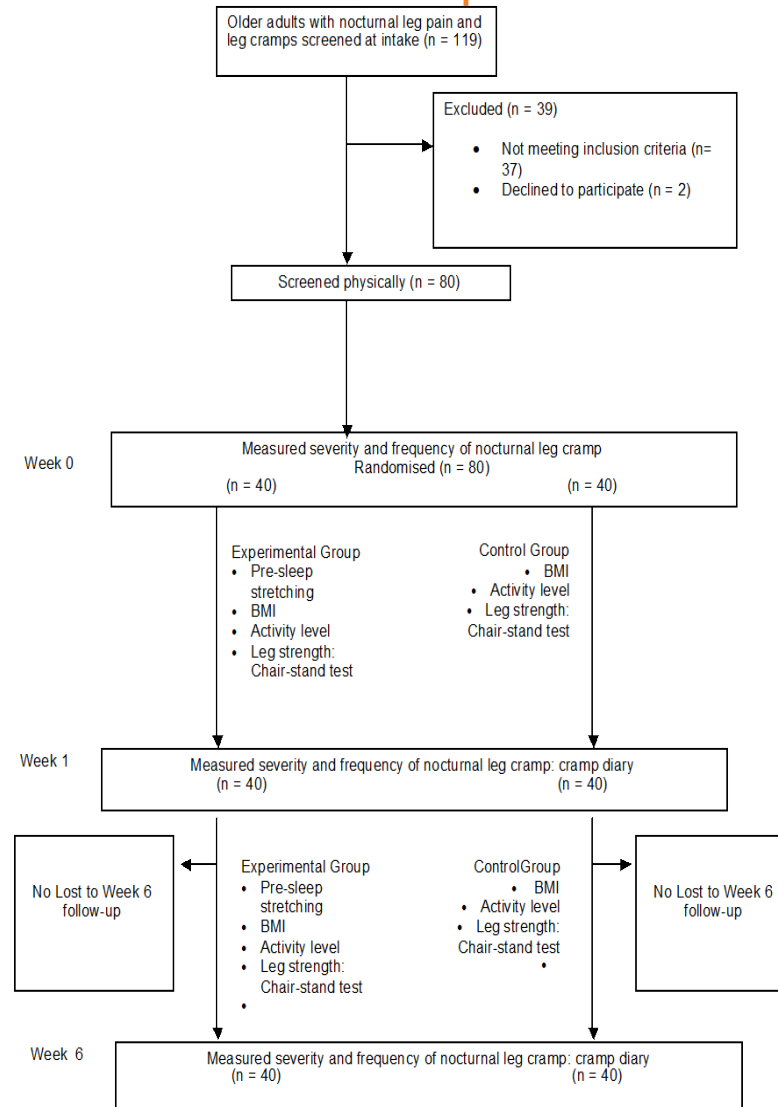
Both

Each stretch 10 seconds with 10 seconds interval and perform three times

# Method



# Method



# Method

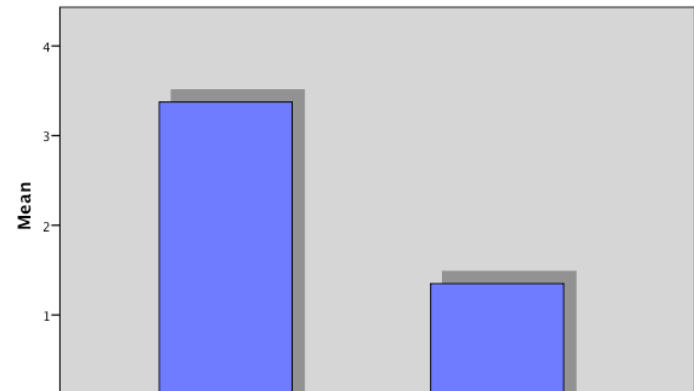
- Outcome measures
  - Frequency
  - Intensity of pain (severity)

# Results

Outcome	Groups				Difference within groups		Difference between groups
	Week 0		Week 6		Week 6 minus Week 0		Week 6 minus Week 0
	Exp (n = 40)	Con (n = 40)	Exp (n = 40)	Con (n = 40)	Exp	Con	Exp minus Con
Cramp frequency ( <i>0 to 10</i> cramps/night), mean (SD)	3.4 (1.5)	3.2 (1.9)	1.4 (1.4)	2.4 (1.7)	-2.0 (1.3)	-0.8 (1.3)	-1.2 (-0.6 to -1.8)
Cramp severity ( <i>0 to 10</i> ), mean (SD)	7.2 (1.4)	7.4 (1.3)	5.9 (1.4)	7.5 (1.3)	-1.3 (1.1)	0.0 (0.9)	-1.3 (-0.9 to 1.7)

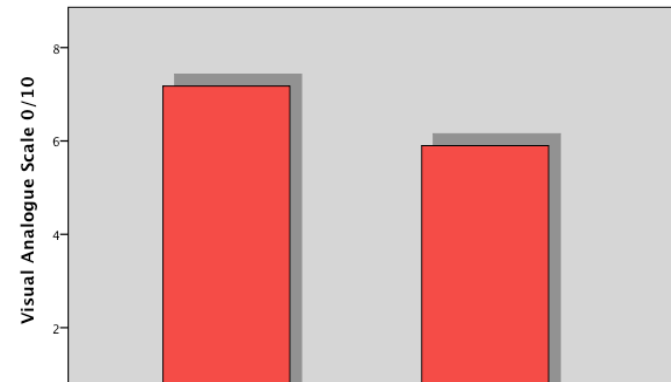
# Results

## Frequency



# Results

## Intensity of pain



# Results



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## Take away message

Recognizing NLC

Rule out serious pathology

Differentiating NLC from RLS and PLMD

Physiotherapy consult might be useful

Stretching is effective, safe and without side effects



# Results



## Take away message

Most important: no disruption of sleep!

# References

- Hallegraeff JM, et al. J Physiother 2014;60: 174-5.
- Drouet A. et al. Rev Prat 2013;63: 619-23.
- Hallegraeff JM, et al. J Physiother. 2013;59(4):279.
- Hallegraeff JM et al. J Physiother. 2012; 58: 17–22.
- Garrison SR, et al. Cochrane Database Syst Rev. 2012;9:CD009402.
- Blyton F, et al. J Foot Ankle Res. 2012;5:7.
- Merlino G, Gigli GL. Neurol Sci 2011;33: 491–513
- Monderer RS et al. Curr Neurol Neurosci 2010;10: 53–59.
- El-Tawil S, et al. Cochrane Database Syst Rev. 2010;12:CD005044
- Coppin RJ, et al. Br J Gen Pract. 2005;55:186–191.
- Naylor JR, et al. Age Ageing. 1994;23(5):418–420.
- Sontag SJ, et al. Med Hypotheses. 1988;25(1):35–41.
- Joekes MA. J. R. Soc. Of Med. 1982; (75).