Occupational low back load assessment using a video analysis method

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Background (1)

- Dose-response relation for LBP is lacking
- Cheap and easy applicable methods are needed

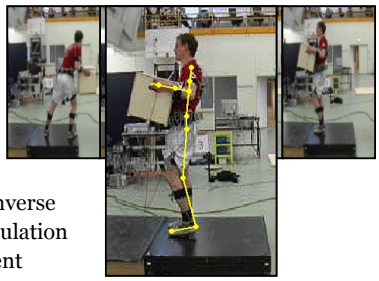
Background (2)

Current video methods:
- Only sagittal plane movements
- No segment dynamics
- Crude categorization

Aim:
Develop and validate a low back load video analysis method for lifting
(based on Xu et al., 2010)

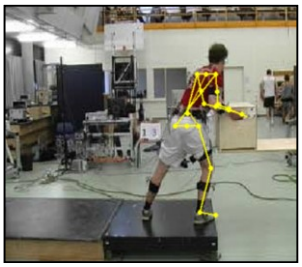
Methods (1) – Video Method

- 4 key frames
- Fit of stick-figure
- Top-down inverse dynamics calculation of L5S1 moment



Methods (2) – Video Method

Model allows for:
- Axial rotation
- Translation
- Scaling
- Semi-3D movements



Methods (3) – Lab. Experiment

- 12 different lifting conditions
  - Horizontal load distance
  - Vertical load distance
  - Symmetric/Asymmetric
- Comparison L5S1 peak and mean moment:

video method **vs** gold standard inverse dynamics LSM (Kingma et al., 1996)

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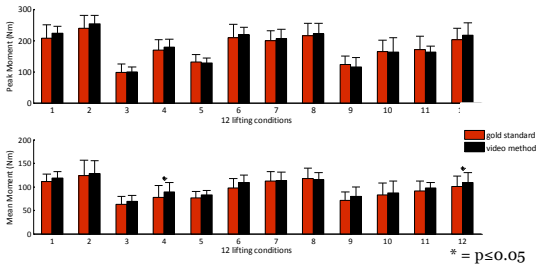
Results (1)



* = p≤0.05

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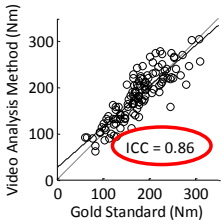
Results (2)

	Peak Moment (Nm)
Non-absolute errors	3.62 ± 5.86
Absolute errors	18.27 ± 3.87



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Discussion

- Video method is useful for low back load assessment
  - Minor systematic errors
  - High correlation
- Substantial random errors
- Improvements:
  - Trunk modeling
  - Interpolation

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Main message:
We developed a valid video analysis method
for assessment of low back load during occupational lifting.

Thank you!

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