Creating a Safe Environment for Providers During Horizontal Patient Transfer.
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Conflict of Interest

• No conflict of interest exists for any of the authors of this presentation
Background

• Healthcare workers have a much higher incidence of musculoskeletal injury related to the rest of the general workforce.¹
  – General worker population- 30.5 per 10,000
  – Nursing- 166.3 per 10,000
  – EMS- 187.4 per 10,000

• The purpose of this study was to identify biomechanical flaws in the horizontal transfer of a patient.

Purpose

• Not much literature exists for the best practice for performing this movement.
• The purpose of this study was to identify biomechanical flaws in the horizontal transfer of a patient.
• The main objective of this study is to understand factors contributing to musculoskeletal injury using motion capture technology.
Methods

• A non-experimental observational research design
• Convenience sample of nursing students \((n=11)\) and EMS professionals \((n=4)\).

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The Movement

- Participants performed a horizontal transfer of a 75 kg simulated patient.
  - Moments and angles of the ankles, knees, hips, and waist
  - The rotations of the pelvis and trunk
Results

• Three specific biomechanical risk factors were identified:
  – Asymmetrical lifting technique,
  – Valgus knee during the lift, and
  – Moments in all three planes of the waist
Asymmetric lifting technique

- Average resultant moments

Resultant Moment Knees pull

Resultant Moment Knees push
Valgus Knee

• Every lift had Valgus Knee
• Knee Position changes:
  • Head of Femur relocated within acetabulum
  • Moment on the pelvis is shifted
  • In theory, altered distribution of force on the lumbar spine.

Moments about the waist

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Discussion

- Asymmetrical lifting technique creates an uneven loading of the joints of the lower extremities, pelvis, and lumbar spine
- Valgus knee increases risk of injury in knees, hips, and lower back
- Moments about the waist are uneven, meaning an uneven loading on the lumbar spine, increasing risk of injury
Conclusion

• Some limitations include the lack of correlation between lifting techniques and the lumbar spine, no procedures were in place to correct the improper lifting, and no generalizability could be determined due lack of scope.

• By confirming these faults in the horizontal transfer, it allows for further improvement in technique.

• Future studies will attempt to determine the effects of the valgus knee on the lumbar spine and to contrast even-loading lifting vs. one leg lifting.