Feasibility Study Assessing a Novel AI Fall Detection System

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Introduction

- Falls cause injury and increased mortality in the elderly and disabled

- Cost $50 billion annually in U.S.

- EVA (emergency video alerts) is an automated video monitoring system that detects falls and high fall-risk positions

How it Works

- Video captured and analyzed in real-time
- Tracks patient movement and positioning frame-by-frame
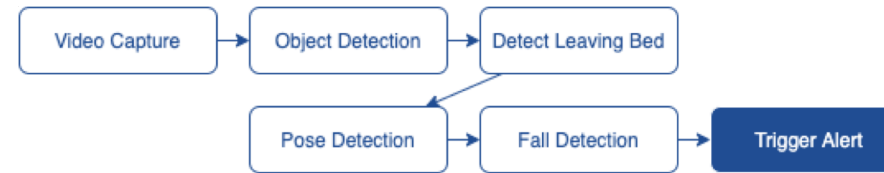- No footage stored to maintain patient privacy

Figure 1. Information flow through EVA technology

Methods

EVA analyzed "fall" vs "no-fall" scenarios performed by 16 participants:
- Sit up in bed
    - Sit up in bed with RA in frame
- Stand up off bed
- Stand up and walk out of room
- Stand up and sit on the floor
- Fall out of bed
    - Fall out of bed with RA in frame
- Stand up and fall down

Figures 2-3. Examples of object detection

Preliminary Results

Fall Detection
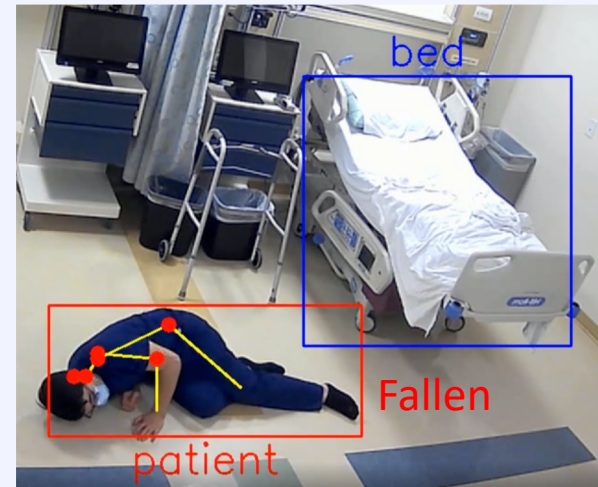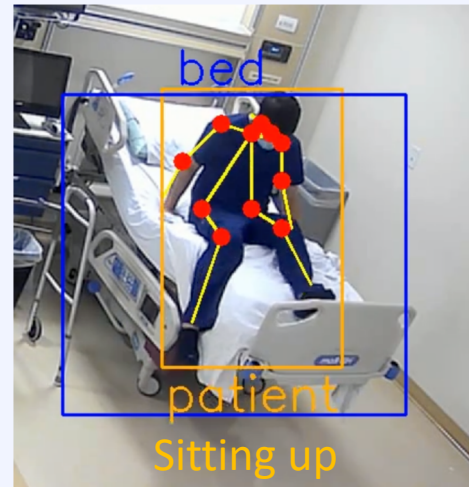**Sensitivity**: 81.3%
Specificity: 94.7%

Conclusion

- Further data analysis and development will help improve sensitivity and specificity and determine EVA's position recognition capabilities

- Real-time and accurate fall prediction and detection alerts may help clinicians prevent falls

- Future studies will evaluate clinical utility and generalizability of EVA in multiple environments

- Further research will include:
    - pressure ulcer prevention
    - seizure monitoring