Validation of Home Telehealth for Assessment of Transfer Mobility: A Study in Patients with Spinal Cord Injury

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Presenter Disclosures

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Participants & Evaluators

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Background

- Home telehealth is the application of telemedicine into the patient’s home
- Most applications utilize ordinary telephone lines
- Another appealing modality is videoconferencing: opportunity to see as well as hear the patient

Background (Contd.)

- Telehealth has potential for:
  - Improving access to care
  - Facilitating frequent monitoring
  - Implementing proactive corrective interventions as needed

Background (Contd.)

- Lack of studies examining:
  - Validity of assessments related to secondary conditions associated with spinal cord injury or disorder (SCI/D):
    - pressure ulcers
    - transfer mobility
    - spasticity

Objectives

- Evaluate the reliability of home telehealth for assessing wheelchair to bed transfer
- Evaluate home telehealth care via:
  - Telephone
  - Videoconferencing
Methods

- 54 participants with a diagnosis of SCI/D
  - at a level of independence for transfers
- 3 research evaluators
  - trained according to assessment guidelines

Methods (Contd.)

- Transfer mobility assessed in each of 3 modalities:
  - Telephone
  - Videoconferencing
  - In-person - “Gold Standard”

Methods (Contd.)

- All assessments conducted at the research site
- Participant setting was designed to simulate a room at home
- Separate room used by evaluators in the telehealth modalities
Methods (Contd.)

- Evaluators (physical therapists trained in assessments) were randomly assigned to a modality for each participant
- Order of modality was randomized

Measures

- Unit of Measure:
  - Participant’s Transfer from Wheelchair to Bed
- Overall assessment:
  - Transfer Performed Safely

Measures (Contd.)

- Participants were instructed to:
  - perform a wheelchair to bed transfer
  - respond to a structured interview
- Evaluators answered questions about their clinical confidence in their assessments

Elements of Transfer

- Wheelchair Position:
  - Manual: 30° to Bed
  - Power: Parallel to Bed
- Brakes:
  - Manual: Brakes Locked
  - Power: Off
Measures (Contd.)

- Elements of Transfer
  - Feet on Ground
  - Knees Anterior to Ankle
  - Head over Toe - Shoulder over Knees

Measures (Contd.)

- Elements of Transfer
  - Transfer Position:
    - Manual: Sacrum on Anterior 50% of Cushion
    - Power: Moved Forward on Cushion

Measures (Contd.)

- Elements of Transfer
  - Elbows Locked
  - Gluteal Clearance
  - Trunk Stable & Upright after Transfer

Measures (Contd.)

- Clinical Confidence: “very” to “not at all”
- Anything that Would Help with Confidence
  - Seeing patient in-person
  - Touching patient
  - More light for seeing
  - Better video quality
  - Better audio quality
  - Better angle or view of patient
Participant Characteristics

N=54  
Mean age: 54.4 years (s.d.) (13.7)

- Gender: 96% male, 4% female
- Ethnicity: 79% white, 6% black, 9% Asian, 0% Other, 4% Decline

Characteristics of Assessed Transfer

- Overall pattern across 9 pairs of columns:
- Rates of correct performance ranged from approximately 50%-90% and were similar overall across each assessment modality

Transfer Mobility Elements: % Performed Correctly by Modality
Proportion Agreement Between Telephone – In Person and Videoconferencing – In Person

Primary Assessment: Performed Safely

Transfer Performed Safely

- Reading horizontally, left to right:
  - 0.65 Telephone – In-person
  - 0.85 Videoconf. – In-person

Proportion Agreement Between Telephone – In Person and Videoconference – In Person

Performed Transfer Safely

- Kappa: Telephone-In Person
  - Slight
  - Fair
  - Moderate
  - Substantial
  - Almost Perfect

Kappa: Videoconf.-In Person

- Reading horizontally, left to right:
  - 0.30 Telephone – In-person
  - 0.70 Videoconference – In-person

Agreement Between Telephone – In Person and Videoconference – In Person

Performed Transfer Safely
Agreement Between Telephone – In Person and Videoconferencing – In Person Elements of Transfer

- Overall pattern across 9 pairs of columns:
- For each of the 9 elements, the proportion agreement with the in-person condition was consistently higher in the videoconference condition than the telephone condition.

Clinical Confidence

- Reading %ages in columns horizontally, right to left:
- 100% in-person condition felt confident with their assessments
- 97% videoconference condition felt confident or very confident
- 50% telephone condition felt confident or very confident
Clinical Confidence

- Reading left to right:
  - 90% telephone modality felt seeing patient in person would help confidence
  - 50% videoconference modality felt seeing patient in person would help confidence

Clinical Confidence (Contd.)

- Reading remaining columns left to right for videoconference modality:
  - 7% more light for seeing patient would help
  - 41% better video quality would help
  - 6% better audio would help
  - 4% better angle or view would help

Summary of Findings

- Videoconferencing assessments were closer to in-person assessments (more reliable) than were telephone assessments of:
  - Transfer from wheelchair to bed overall
  - Elements of transfer from wheelchair to bed
Summary of Findings (Contd.)
- Clinical confidence excellent in videoconference condition
- Clinical confidence substantially lower in the telephone condition

Conclusions
- Videoconferencing is reliable enough to be used to:
  - Increase access to more frequent monitoring of transfer mobility

Conclusions (Contd.)
- Facilitate rehabilitation efforts to proactively prevent serious secondary conditions, especially pressure ulcers
- Ultimately enhance quality of care and quality of life for SCI/D patients

Questions?
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