Wheelchair Transfer Simulations to Enhance Procedural Skills and Clinical Reasoning

Joanne M. Baird, Ketki D. Raina, Joan C. Rogers, John O’Donnell, Margo B. Holm

OBJECTIVE. We describe an educational intervention that involved simulation scenarios of medically complex patients to teach transfer training and promote clinical reasoning.

METHOD. Scenarios were developed with practitioner input that described (1) a patient who was acutely ill, (2) a critical medical management event that occurred during a bed-to-wheelchair transfer of the patient, and (3) an occupational need. Transfer training, using the scenarios, occurred in a high-technology laboratory with SimMan® and a mock hospital suite. Evaluation was based on student performance and perceptions of simulation effectiveness.

RESULTS. On average, students completed 66%–88% of the transfer items correctly. Student performance suggested that the simulation scenarios were more difficult than practitioners rated them. Students rated the simulation scenarios as effective teaching tools.

CONCLUSION. Scenario use in simulations for transfer training makes a positive curricular contribution to teaching procedural skills and clinical reasoning simultaneously.


Manually moving patients from bed to wheelchair requires procedural skills and clinical reasoning skills to manage the move and any consequences of the move (Nelson, Fragala, & Menzel, 2003). This is especially true in an acute care setting, in which successful completion of wheelchair transfers involves several factors: the hands-on, step-by-step skill of the transfer; vigilance for any signs or symptoms indicating a change in the patient’s medical status; and management of medical equipment. Transferring a patient can be a high-risk activity because of the potential for harm to the patient as well as to the health care professional (Waters, Nelson, Hughes, & Menzel, 2009). However, there is currently no consistent method to teach and assess patient transfer skills, including the underlying clinical reasoning that may require a timely response specific to a patient’s medical complexities (Resnick & Sanchez, 2009).

Simulation is especially suited to teaching patient handling skills because it has multiple advantages over other educational methods. These advantages include preservation of patient safety, the ability to replicate standardized clinical situations, and an authentic environment that reflects the complexities of patient situations (Issenberg, McGaghie, Petrusa, Lee Gordon, & Scalese, 2005; O’Donnell et al., 2011). Because of these advantages, simulation provides a promising approach to facilitate students’ ability to transfer knowledge and skills to the clinic with greater ease (Christensen, Heffernan, & Barach, 2001). However, the challenges associated with the development and inclusion of simulation in a curriculum have rarely been considered (Motola, Devine, Chung, Sullivan, & Issenberg, 2013).
Moreover, applying simulation to transferring patients who are acutely ill or medically complex has not been specifically addressed.

In our occupational therapy curriculum, we used Cognitive Learning Theory as the theoretical basis for integrating simulation into course requirements (Bandura & Locke, 2003). Cognitive Learning Theory’s premise that function occurs as an interaction among the environment, cognition, and behavior echoes simulation’s approach to learning in which the learner is always dynamically interacting with an authentic environment. The cognitive and behavioral foundation for learning can be monitored through the development of self-efficacy. Bandura (1986, 1997) believed that learning occurs through enactive and vicarious means, which, in simulation, means that learning can be categorized as active participation (enactive learning by doing the activity) and active observation (vicarious learning by observing a peer do the activity). Thus, simulation provides a unique opportunity for experiential learning that promotes hands-on skills for students (Motola et al., 2013).

In this article, we describe the process of developing the simulation scenarios that we created to teach dependent transfer skills and clinical reasoning. Specifically, we describe in turn (1) the development of the scenarios, (2) transfer training using the scenarios in the curriculum, (3) the methodology used to assess student performance during the simulation scenarios, and (4) the students’ perceptions of the effectiveness of simulation training.

Development

The impetus for scenario development came from both students and fieldwork educators. Although existing course content contained hands-on peer practice of patient transfers in a classroom laboratory, students requested more intensive practice in completing dependent patient transfers. Likewise, our fieldwork educators expressed a need for curriculum content that addressed practice, hands-on management of acutely ill and medically complex patients, and use of associated medical equipment. This request was common to fieldwork educators working in hospitals, transitional care, skilled nursing, and inpatient rehabilitation settings and was communicated on the American Occupational Therapy Association Fieldwork Performance Evaluation form. Cognitive Learning Theory was selected as the theoretical model because of the emphasis on both participation and observation. Faculty selected simulators (SimMan®; Laerdal Medical Corporation, Wappingers Falls, NY) as the method for teaching students dependent transfer skills. In contrast to human simulated patients, simulators allowed us to attach lines, tubes, and drains and manipulate physiological functions, and students could do no harm to them.

To capture real-life clinical events, 10 occupational therapists employed in regional acute care settings were asked to nominate medical conditions and critical events they faced when transferring medically complex patients. Because each therapist was employed in a setting with various specialty units, a variety of critical events were proposed (Table 1). Patients’ medical status frequently requires managing a line, drain, or tube; managing respiratory equipment; managing a decline in medical stability; or maintaining patient safety. To promote spontaneous problem solving and enhance students’ clinical reasoning skills for responding to critical events that occur while transferring a patient, the critical events for each scenario were different, and each critical event was based on real medical challenges in acute care settings that required a skilled response.

Every scenario included a dependent bed-to-wheelchair transfer of a simulator (patient). This type of transfer was chosen because it mimics getting a patient ready to participate in activities of daily living or transport to the rehabilitation gym. Although the transfer classification was fully dependent, the simulator weight (29.5–34 kg, or 65–75 lb) was judged by the instructors to simulate a one-person maximum assistance transfer, which is often used by rehabilitation professionals.

Each scenario had an accompanying patient medical history (vignette) that was presented in a standardized format to the students before the encounter with the patient. For example, for the postoperative scenario the vignette read, “Mr. Smith had an accident at a construction site and has suffered internal trauma. He now has a Jackson-Pratt abdominal drain. You are going to transfer him out of bed and into a wheelchair so that he can change into clean hospital clothing before his family visits.”

Five faculty members and three doctoral candidates associated with the department reviewed the scenarios to determine their overall ecological (real-life) and content validity. All reviewers had experience in direct patient care and exposure to intervention in the acute care environment but were not involved in scenario development. Content validity was rated on the degree to which each scenario assessed (1) patient and therapist safety, (2) equipment and technology management, and (3) medical complexity. All ratings used a scale ranging from 1 (lowest) to 10 (highest). Ratings for the eight scenarios (Table 2) were averaged to yield an overall scenario rating mean. Score equivalency in the overall rating of the scenarios was sought because of the scenarios’ use in course grading. The orthopedic trauma scenario was eliminated because of its low overall rating. Therefore, the simulation scenarios selected for application...
11 Patient is moved supine to sit safely. Done with elevation of the head of the bed, or safe manual handling.

10 Placement of drain on gown is correct. Drain is pinned below the level of insertion to allow for gravity-assisted drainage.

9 Drain and tubing are slack or loose. Drain and tubing are kept slack or loose (are not pulled or do not become taut).

8 Drainage clip is moved to gown. Drainage clip or safety pin is moved to gown before transferring patient.

7 Drain is unclipped from bed linens. Drain is unclipped from bed linens before any patient movement.

6 Clear directions are given regarding patient’s role in transfer. Participant explained to patient that he or she would be assisted to sit on edge of bed and then assisted into a W/C in preparation for activity.

5 Leg rests and armrests are removed or swung out of the way. Armrest and leg rest between simulator and W/C seat are removed.

4 W/C brakes are locked and W/C stability is checked before beginning transfer.

3 W/C is positioned as close to the bed as possible. Side of W/C is next to electric bed with no significant gap.

2 Vital signs are recorded at start of session. Blood pressure, heart rate, respiratory rate, and oxygen saturation are completely and accurately recorded on student’s lab sheet.

1 Proper infection control procedures are followed (hands are washed). Observed washing hands on video or auditory evidence of water running.

**Table 1. Performance Assessment Criteria and Evidence**

<table>
<thead>
<tr>
<th>No.</th>
<th>Yes</th>
<th>No</th>
<th>Assessment Criteria</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td>Proper infection control procedures are followed (hands are washed).</td>
<td>Observed washing hands on video or auditory evidence of water running.</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td>Vital signs are recorded at start of session.</td>
<td>Blood pressure, heart rate, respiratory rate, and oxygen saturation are completely and accurately recorded on student’s lab sheet.</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>W/C is positioned as close to the bed as possible.</td>
<td>Side of W/C is next to electric bed with no significant gap.</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td>W/C brakes are locked and W/C stability is checked before beginning transfer.</td>
<td>Locking of brakes is observed on video; W/C remains in place when pushed or pulled.</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td>Leg rests and armrests are removed or swung out of the way.</td>
<td>Armrest and leg rest between simulator and W/C seat are removed.</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td>Clear directions are given regarding patient’s role in transfer.</td>
<td>Participant explained to patient that he or she would be assisted to sit on edge of bed and then assisted into a W/C in preparation for activity.</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td>Drain is unclipped from bed linens.</td>
<td>Drain is unclipped from bed linens before any patient movement.</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td>Drainage clip is moved to gown.</td>
<td>Drainage clip or safety pin is moved to gown before transferring patient.</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td>Drain and tubing are slack or loose.</td>
<td>Drain and tubing are kept slack or loose (are not pulled or do not become taut).</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td>Placement of drain on gown is correct.</td>
<td>Drain is pinned below the level of insertion to allow for gravity-assisted drainage.</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td>Patient is moved supine to sit safely.</td>
<td>Done with elevation of the head of the bed, or safe manual handling techniques. Participant hand placement could not be around the neck.</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td>Bed height is adjusted to allow the patient’s feet to touch the floor.</td>
<td>Both feet must touch the floor and the entire foot, including heel, must touch the floor.</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td>Upright posture of the patient is supported by using proper hand placement that prevents a loss of balance on the edge of the bed.</td>
<td>Hand placement near scapula and below cervical spine. Hand placement could not be around the neck. Patient could not evidence a loss of sitting balance.</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td>Patient is scooted to edge of bed with buttocks remaining on mattress.</td>
<td>Hips moved contralaterally in a controlled manner. Patient’s arms must remain at rest in a normal position and could not get caught on the bed or sheets. Patient must stay on edge of bed and could not slide off edge of mattress.</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td>Movement from bed to W/C is smooth and controlled, with no jarring or sudden movements.</td>
<td>Movements must be coordinated and controlled. Transfer could not be paused midway.</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
<td>Proper body mechanics are used during transfer (back straight, knees bent, head erect).</td>
<td>Proper body mechanics observed on video (back straight, knees bent, head erect). The patient must have weight shifted and could not be lifted or supported in a standing position.</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td></td>
<td>Leg rests and armrests are replaced to original position.</td>
<td>Armrests at side of wheelchair. Leg rests observed locked with footplate fully down and patient’s feet on them; armrest secure in wheelchair frame.</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td>Vital signs are recorded at end of session.</td>
<td>Blood pressure, heart rate, respiratory rate, and oxygen saturation are completely and accurately filled in on student’s lab sheet.</td>
</tr>
</tbody>
</table>

**Note.** Regular text indicates procedural transfer criteria and evidence. Italics indicate critical events and reflect criteria and evidence of students’ appropriate clinical reasoning in response to the critical event. W/C = wheelchair.

in the curriculum were perceived to be of comparable complexity, with experts’ overall mean ratings ranging from 7.60 to 8.63 (see Table 2, left side).

**Transfer Training**

In our curriculum, wheelchair transfer procedures were taught using a video–practice–assessment sequence, in which students first watched instructional videos of proper transfer techniques, then practiced transfers with peer partners in a classroom laboratory, followed by a performance assessment consisting of a peer transfer in the classroom laboratory. The practice simulation experience at the Peter M. Winter Institute for Simulation, Education, and Research (WISER) Center, a high-technology mock acute care environment, was added 1 wk after the classroom assessment. The WISER Center consists of multiple identical single-patient rooms that mimic an acute care setting in which medically complex patients would receive care. Rooms included monitors reflecting programmed vital signs and full-size simulators (e.g., SimMan), with lines, drains, and tubes indicative of the medical condition of the patient described in the relevant patient scenario.

Students in our entry-level and advanced professional master’s programs ($N = 108$) participated in the transfer training module. Approximately 1 wk before engaging in the practice simulation, students were grouped in threes. Each group was given scenario vignettes (three of the seven available) that provided basic information about the patients they might encounter at the WISER Center.
Each vignette outlined the patient’s medical condition, the reason for the bed-to-wheelchair transfer, and the occupational activity that was to occur once the patient was seated. Instructors also used the WISER Center’s digital recording system to record clips that showed students the patient rooms and SimMan and demonstrated equipment use and medical procedures they might encounter. Students did not know the specific critical events they would encounter in the practice simulation until the event actually occurred in the context of their transfers. Because students practiced in groups, each student had the opportunity to learn by being a participant (doing a transfer) and by being an observer (observing a peer).

After students completed their practice simulation at the WISER Center, a pause-to-reflect method of debriefing was used (Pollock, 2012). Verbal feedback was provided by one of the instructors to each student and each small group immediately after the session. Written individual feedback was subsequently given to each student using the applicable scenario checklists (see Table 1, Assessment Criteria column). Students also had the opportunity to review the digital recording that was made of their group’s simulation experience. The most common errors and their remediation were discussed as part of classroom instruction.

Performance Assessment

Approximately 2 wk after the practice simulation session, student groups returned to the center for performance assessment. The procedures used to prepare for, and engage in, the practice simulation session were repeated for performance assessment except that the scenarios and accompanying vignettes were different.

To facilitate performance assessment, criterion-referenced checklists for each scenario, with criteria and evidence, were used (see Table 1). The criteria common to all scenarios addressed basic infection control, equipment management (wheelchair and electric bed), patient management (noting and recording vital signs before and after transfer), and the transfer process (body mechanics and safety, preparing patient for the move). Because each scenario had a different medical challenge, and hence critical patient management event, the critical event criteria were unique for each scenario. Thus, each scenario had a slightly different checklist (see Table 1 and Figure 1). Each checklist item was operationally defined with observable actions. For grading performance, each criterion was regarded as equally important, and all criteria were summed to yield an overall score. Because each checklist item was graded as met or not met, the checklists provided a portrait of each student’s strengths and weaknesses in managing the transfer in the context of occupation and a medical event consistent with patients in acute care settings.

The four graders for the performance assessment were occupational therapists trained to interpret checklist criteria by Joanne M. Baird and Ketki D. Raina. Digital recordings were made of all sessions, and graders watched them together but scored the checklists separately; inconsistencies were discussed until consensus was achieved. Interrater reliability of ≥90% was achieved and monitored through random audits by Raina. Checklist raw scores were converted to percentages of criteria met, and mean scores, standard deviations, and minimum and maximum scores were used to compare student performance in each scenario. Student checklist scores were averaged to determine the level of difficulty of each scenario, based on student performance. The cardiac scenario was the most challenging for students (mean $[M] = 66\%$), and the intravenous (IV) scenario presented the least difficulty ($M = 88\%$; see Table 2).

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Experts’ Ratings of Degree of Difficulty</th>
<th>Students’ Performance Indicating Degree of Difficulty (%) of 18 criteria passed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ecological Validity</td>
<td>Safety</td>
</tr>
<tr>
<td>Postoperative</td>
<td>9.25</td>
<td>9.29</td>
</tr>
<tr>
<td>Cardiac</td>
<td>9.00</td>
<td>9.63</td>
</tr>
<tr>
<td>Pulmonary</td>
<td>9.38</td>
<td>9.50</td>
</tr>
<tr>
<td>Chronic medical</td>
<td>9.50</td>
<td>9.63</td>
</tr>
<tr>
<td>Respiratory</td>
<td>9.38</td>
<td>9.38</td>
</tr>
<tr>
<td>Urinary</td>
<td>9.25</td>
<td>9.75</td>
</tr>
<tr>
<td>IV management</td>
<td>9.25</td>
<td>9.75</td>
</tr>
<tr>
<td>Orthopedic</td>
<td>7.88</td>
<td>7.88</td>
</tr>
</tbody>
</table>

Note. IV = intravenous; M = mean; SD = standard deviation.

*Orthopedic scenario was not used because of low ecological validity and scenario mean, so students did not rate it.
**Postoperative Scenario**

**Objective:** Maintain integrity of Jackson-Pratt drain

1. Drain is unclipped from bed linens before any patient movement.
2. Drainage clip or safety pin is moved to gown while transferring patient.
3. Drain and tubing are kept slack or loose (are not pulled or do not become taut).
4. Drain is pinned below the level of insertion to allow for gravity-assisted drainage.

**Cardiac Scenario**

**Objective:** Recognition and management of bradycardia episode

1. Notes that vital signs are not stabilizing.
2. Nurse is called.
3. The change in patient condition is calmly and accurately reported over the call system.
4. The patient is reassured that the nurse is being called.

**Pulmonary Scenario**

**Objective:** Transition from wall oxygen to portable oxygen tank

1. Portable oxygen tank is placed next to wheelchair or in holder in preparation for transfer.
2. The disconnection and reconnection of oxygen is explained without jargon before the transition.
3. Portable oxygen tank liters per minute are adjusted to match wall oxygen liters per minute.
4. Patient’s oxygen access is disrupted for less than 60 s.

**Chronic Medical Scenario**

**Objective:** Recognition and management of postural hypotension

1. Head of patient is elevated slowly.
2. Vital signs are observed as head of patient is elevated.
3. Elevation is stopped until vital signs become stable again.
4. Monitors are visually scanned for vital signs as the patient is brought to full upright position.

**Respiratory Scenario**

**Objective:** Management of humidified airway with tracheostomy

1. Water is distributed back into reservoir or onto washcloth before patient movement.
2. No water is allowed to enter the airway through the tracheostomy.
3. Oxygenated airway patency is maintained during transfer (tubing does not become dislodged).
4. Oxygenated airway tubing is kept slack or loose (is not pulled taut).

**Urinary Scenario**

**Objective:** Management of urinary catheter bag

1. Catheter bag is unhooked from bed frame and moved to transfer side of bed.
2. Catheter bag and tubing are kept slack or loose (are not pulled or do not become taut).
3. Catheter bag is immediately positioned under wheelchair after patient transfer is complete.
4. Tubing is checked to ensure full drainage into catheter bag (tubing is not kinked or twisted).

**IV Scenario**

**Objective:** Management of antecubital IV

1. Only the IV pump is unplugged (hands are walked backward from the IV pump to the plug).
2. IV line is protected by moving the pole around the bed in a controlled manner before transfer.
3. The IV pole and pump are out of the way and do not present a physical barrier during the transfer.
4. IV site integrity is maintained (the IV line remains intact and is not dislodged or disconnected).

**Orthopedic Scenario**

**Objective:** Maintenance of non-weight-bearing precautions

1. Sling is positioned correctly before the transfer (strap is not twisted, elbow into the sling, wrist and hand supported).
2. Upper extremity stays sling protected during transfer (no hand placement in or around left axilla).
3. Upper extremity remains immobilized with no weight bearing or external pressure.
4. Sling is positioned correctly after the transfer (strap is not twisted, elbow into the sling, wrist and hand supported).

Figure 1. Scenario critical event objectives and operational criteria.

*Note: IV = intravenous.*
Students' Perceptions of Effectiveness of Simulation Training

Students rated the effectiveness of simulation training and the scenarios on a scale ranging from 1 to 10 (1 = very uncertain that the experience was effective; 10 = very certain that the experience was effective). Students were surveyed before beginning simulation training, after the simulation practice sessions, and after the simulation performance assessment. A comparison of mean scores and minimum and maximum scores determined whether the scenarios were perceived as effective for clinical preparation to transfer medically complex patients in an acute care setting. These ratings were used to determine students’ perceptions of scenario effectiveness over time. Data indicated that student perceptions of the effectiveness of the simulation scenarios were highest immediately before (M = 8.81, standard deviation [SD] = 1.38) and after (M = 8.01, SD = 2.07) the initial simulation exposure and decreased after the second simulation exposure (M = 7.98, SD = 2.15).

Discussion

Typically, occupational therapy curricula expose students to a classroom-based peer transfer before clinical practice with actual patients. In response to feedback from fieldwork students and practitioners that more content was needed on transferring medically complex and fragile patients, we built on the classroom training in dependent transfers by designing an educational intervention that consisted of students executing a dependent transfer of a patient (SimMan) in a simulated acute care setting, the WISER Center, with actual medical equipment, vital signs screens, lines, and drains in place. The transfer was embedded in a clinical scenario that described the patient’s medical condition and the occupational activity that the student would initiate after the transfer. During the transfer, students anticipated that a critical event common to patients who are acutely ill would occur, but the nature of that event was unknown. Thus, students were exposed not only to a more realistic dependent transfer but also to critical events that required timely clinical reasoning. More important, students experienced the consequences of their actions. For example, students who forgot to lower the bed and poorly executed a transfer were faced with a patient fall; students who attended to changes in vital signs indicative of postural hypotension and thus slowed postural changes of the simulator were relieved to observe a resumption of medical stability in the patient.

With input from regional therapists, eight clinical scenarios were developed to support the intervention. One, the orthopedic trauma scenario, was subsequently eliminated because of low ratings of ecological and content validity. The expert practitioners judged the seven remaining scenarios to be of comparable difficulty. Therefore, we expected that student performance on the various scenarios would be equivalent. However, this was not the case. Students’ performance was stronger in scenarios requiring them to manipulate equipment (management of an IV) and weaker in scenarios requiring timely clinical reasoning based on changing patient conditions (management of bradycardia). This finding indicated that our curriculum needed to place greater emphasis on signs and symptoms of medical instability as well as the clinical reasoning necessary for the correct and timely responses needed. Although students were allowed 10 min to complete each scenario, this finding also suggests that scenarios that focus on critical events involving medical instability should include documentation of the time needed for the student to implement the correct response. In contrast, equipment manipulation usually allows for a more flexible timeline, which may have allowed the students to demonstrate their clinical reasoning in a less stressful context.

Students' ratings indicated that the scenarios and simulation experience were effective in preparing them to transfer medically complex patients in an acute care environment. Informal student feedback about experiences at the WISER Center supported these ratings. When students were asked about their WISER experiences in relation to classroom-based learning, one student commented,

Some things just cannot be taught in the classroom. It takes repeated exposure in a clinical setting to begin to develop confidence. . . . The [WISER Center] was a great introduction so that I didn’t feel like I was going in[to my clinical fieldwork] blind.

Another student commented,

When I went to the [WISER Center], I hated it. It was stressful, and I thought the clinic wouldn’t be anything like that. Looking back, I almost think the scenarios should be more complicated—like real patients are. It really helped me [during my fieldwork] because I knew how important it was to watch vital signs carefully before you begin any type of treatment.

Additional feedback about the benefits of the simulation focused on increased skill in management of common equipment (IV poles, various lines and drains) and a quicker recognition of instability using vital signs (pulse, respiration, oxygen saturation, blood pressure).

When designing educational interventions, complex simulations are not often considered for the training of transfer skills (Resnick & Sanchez, 2009). However, the use of simulation scenarios with embedded critical events
was effective for teaching and assessing dependent transfer skills and clinical reasoning in occupational therapy students. This training occurred in a realistic context and without risking injury to medically complex patients. Many occupational therapy curricula have access to a SimMan or similar simulator, and the critical event scenarios can be used without a mock hospital suite. Students reported that their learning experience was broader than just transfer training. Thus, the educational intervention was successful for teaching students about the importance of monitoring vital signs, managing equipment, and adjusting to the acute care environment, all while implementing the mechanics of a dependent transfer.

Limitations

Although the scenarios were effective as a means for teaching transfer skills to students in a simulated setting, they did have limitations. Medically complex patients often have multiple comorbidities, and these scenarios only included one medical condition, not multiple conditions. Although this allowed the student to address one condition for ease of learning, in a clinical environment it may not be possible to address only one condition at a time in patients with multiple comorbidities. Some common clinical conditions, such as weight-bearing precautions, range-of-motion limitations, and neurological involvement, were not represented in the seven scenarios used.

Future Research

Suggestions for future study include further developing scenarios that combine conditions as students move through training. For example, patients often have IV lines and additional equipment, such as oxygen. A combination scenario using both the IV and respiratory criteria would challenge students to manage symptoms associated with multiple conditions. Combining conditions and including management of a change in medical status would also provide learning benefits and promote advanced reasoning.

Further analysis of the components of the performance assessments is needed. The critical event criteria captured the students’ responses to an unexpected event and were thus reflective of students’ reasoning. Hence, further analysis of these criteria could provide insight into the learning mechanisms associated with these events that can be difficult to teach in a traditional classroom setting.

Implications for Occupational Therapy Education

The rapid pace of clinical care makes education of occupational therapy students a challenge, and curricula are increasingly using simulation (Bethea, Castillo, & Harvison, 2014). We offer the following considerations for simulation use in an occupational therapy curriculum:

- Human patient simulation challenges students to develop clinical reasoning and procedural skill components of practice simultaneously. The use of full-body simulators was effective in teaching students dependent bed-to-wheelchair transfers. The use of scenarios with critical events prepared students for unexpected contingencies.
- Although the scenarios had learning benefits, they also had teaching benefits. Using the same performance criteria for the transfers as in the classroom provided a consistent format for assessment and guided instruction. For example, if multiple students evidenced difficulty with a specific skill set, such as one aspect of equipment management, those skills could be retaught, either in the classroom or by digital video review.
- Simulation can be effectively included in existing course designs and need not be burdensome. Addressing multiple skills (hands-on procedural skills and clinical reasoning skills) simultaneously and including different settings (classroom, simulated acute care environment) provides intensive practice that may translate to other areas of proficiency and can thus save curricular resources.

Conclusion

The use of a simulator, a mock hospital suite, and clinical scenarios with embedded critical events was effective for teaching dependent transfers, handling skills, and clinical reasoning. Digital videos of each students’ transfers also allowed students the opportunity to review their transfers with the goal of improving their performance and reasoning.

References


