

Teaching the assessment of pressure ulcers/injuries virtually



Author

Patricia B Hotaling
and Joyce M Black

Background: Psychomotor skills are hands-on skills taught with the learner; giving feedback on the skill being taught. With the introduction of COVID-19 and social distancing, schools had to make several changes to continue to instruct students. To comply with social distancing, teaching psychomotor skills was transformed. The authors developed a virtual education activity to teach assessment of pressure injuries. **Method:** The authors developed a narrated module of content based on seven principles of wound assessment: pressure injury staging, anatomical location, assessment and documentation, accurate measurement, tissue types, clinical evaluation over time, and infection. These were taught using conversation style recordings between the authors. Within the slides were feedback on student performance and critical thinking explanations. **Results:** The results of the student evaluation survey showed significant learning occurred, with significance of $P < 0.00001$ for three domains and $P < 0.01$ for one domain. **Conclusion:** This level of success allows for great potential for other psychomotor skills to be taught virtually also.

COVID-19 required significant changes to nursing education delivery to ensure student and faculty safety. While didactic education did have to make several changes, clinical education was spun on its head. To meet the need for classroom material, a narrated slide lecture was developed with a post-test on pressure injury prevention after a hip fracture was used at the authors' facility and posted online at www.npiap.org for ongoing use. Teaching psychomotor skills virtually, however, remained a dilemma at the midwestern University. How do you teach and evaluate studies on psychomotor skill when students are quarantined at home? Wound assessment was a prime example of the problem with trying to teach the skill and from afar.

The authors created a guided narrated PowerPoint where the student would be

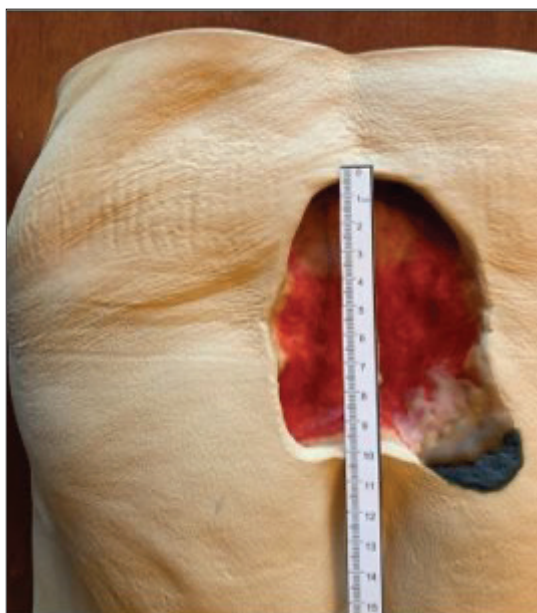
instructed on pressure ulcer assessment and the critical thinking that is used to determine if the wound is worsening or improving. This pilot study examined the students' accuracy of wound assessment and asked students how the virtual activity compared to prior experiences in the laboratory with other psychomotor skills.

Method

The authors developed a narrated PowerPoint slide deck which educated them on wound care practices and added evidence-based rationale about wound care. The authors recorded the slides while sitting next to each other to ensure it seemed more like live teaching rather than a recorded lecture. To vary the content, one would narrate the slide and the other faculty would add clarification or ask further questions. For example, one

Patricia B Hotaling is Clinical Assistant Professor, College of Nursing, University of Nebraska Medical Center, Omaha, US;
Joyce M. Black is Florence Neidfelt Professor of Nursing, College of Nursing, University of Nebraska Medical Center, Omaha, US

Figure 1. Correct methods to measure sacral pressure ulcer length.



material, as well as continued practice and allowed for proper leveling of material into understandable topics.

The authors introduced each topic and explained the importance and clinical relevance. The students were then asked to answer a question or complete an assessment of the wound picture on the slide over the portion of material presented. The following slide would display the correct answer and the authors would discuss why the correct answer was correct. Following each photograph, a list of potential interventions for the wound was presented. The students were asked to identify the correct care plan for the patient's specific wound. The following slide was a dialogue about each intervention and included striking out the inappropriate interventions; the authors discussed rationale for why it was or was not appropriate for this wound. The next slide ended with the final appropriate care plan for the patient's wound. As the module progressed, the students needed to demonstrate previous understanding of the skills.

Wound 1 was a stage 1 pressure injury and included content publicly available from the National Pressure Injury Advisory Panel (NPIAP). To allow for building on previously learned material, every wound assessment for the module included a staging component. Wound 2 was a pressure injury on the buttocks, and the students needed to identify the correct anatomical location and stage the wound. From there through to the rest of the module, the students needed to correctly identify the anatomical location of the wound. Wound 3 focused on assessing the wound using correct medical terminology and every wound thereafter required that level of assessment.

As this was done virtually, the subjective data gleaned during an examination was provided, such as pain, surrounding tissue, odour and drainage assessment. The authors used plain, non-medical language to provide additional opportunities for students to practice translating non-medical language into assessment terms, using the correct corresponding wound care term.

Wound 4 was the actual psychomotor skill of wound measurement. The authors used a wound manikin (Seymour Butts II Wound Care Model from VATA; Canby, Oregon) and took photos of different ways a wound could be assessed, which included common mistakes [Figure 1]. These photos were used to create

The old dressing had a large amount of yellow, white, and maroon drainage.
The skin around the wound is boggy to palpation.
The wound and drainage smell like bowel movement.
The patient reports pain 8/10.

This image is 19 cm tall by 21 cm long

Figure 2. Information provided to the student that they could not glean from a photograph.

presenter gave instructions on what to do and how to do things and the other provided critical information and feedback, established patient's history and critical thinking help.

Pressure injury was used as the exemplar for this activity. There were seven domains identified for pressure injury assessment and evaluation. The seven domains were:

- 1) Assigning the correct Pressure Injury stage
- 2) Accurately labeling the anatomical location
- 3) Assessing and documenting a wound status
- 4) Accurately measuring the surface dimensions and depth of the wound
- 5) Identifying tissue types
- 6) Evaluating change in the wound over time
- 7) Recognising signs of infection.

The order presented was specifically used as it allowed for building on previously learned

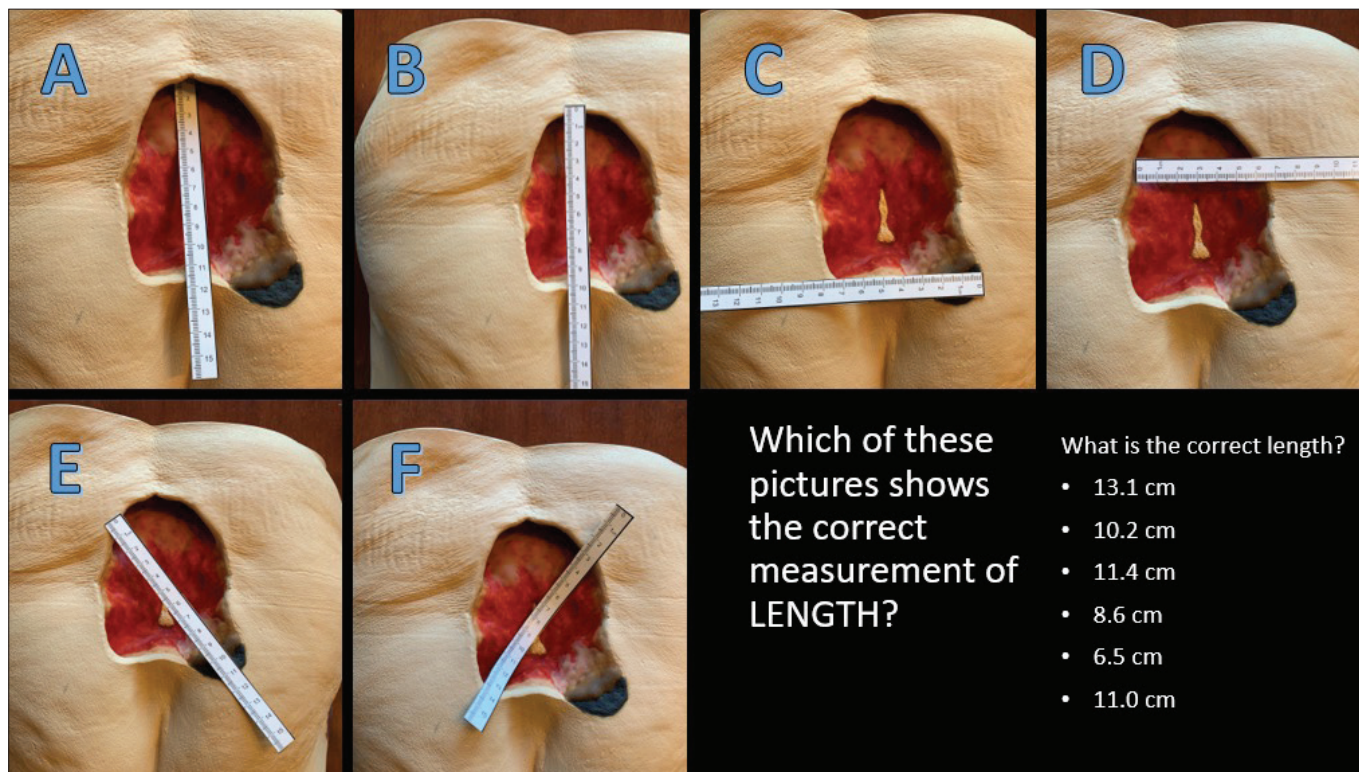


Figure 3. Incorrect methods to measure wounds.

a collage specific to the type of measurement being done and included 1 correct way and 4–6 incorrect ways to measure [Figure 2].

The students were then asked to correctly identify the measurement of length and width, and the correct technique to measure depth, as depth is a multi-step process. All photos were shown with a ruler and the students were asked to correctly identify the right measurement technique. After all of the measurements were obtained, feedback slides presented the correct way to measure and the correct measurement. There was also feedback if the student did not pick the correct measurement and what was wrong about the technique to obtain that measurement. For example, the length of the ulcer was 11.3 cm, if the student selected 8.5 cm in length then the feedback provided was: “If you chose 8.5 cm, you correctly measured width, but we are currently measuring length which is from head to toe, not horizontally.” This gave the opportunity for the student to have immediate feedback on what was done, as well as be shown the correct way without being next to the student. This feedback would facilitate understanding and be the substitute for direct feedback when done in the laboratory or clinical setting.

Wound 5 focused on tissue types and being able to correctly identify granulation tissue, epithelial tissue, tendon, bone, slough and eschar. The students were then shown a picture

with significant slough and granulation and asked for how to assess the wound bed. Again, they received feedback after they had completed the assessment [Figure 3].

Students were provided with a wound documentation tool to record their findings [Figure 4]. The correct responses were provided but could be omitted if faculty preferred to have this portion submitted as a gradable activity. The wound shown in Figure 2 is fully described in Figure 5.

Wound 6 simulated wound deterioration over 4 days of time. The students were asked to measure and evaluate the wound, and then given feedback. In this module, the students had to measure the wound. There were instructions on how to make the ruler visible on PowerPoint and how to best measure the wound with shapes to ensure accuracy. On the slides needing wound measurements, the authors included the dimensions of the photo to account for screen size differences. The second photo of Wound 6 was a clinical deterioration. The students repeated a full assessment of the wound and included clinical progression as a synthesis level of thought. As this wound had become more unstable, the authors completed an SBAR report and instructions on how to convey this wound and its status to a provider over the phone.

Wound 7 was a fully necrotic wound with significant erythema and other signs of infection. The students were asked to assess the wound

Figure 4. Wound documentation form; the red oval could be copied by the student for documentation on the form.

Pressure Injury Assessment Form							
Wound Location: 							
Wound Dimension: Length _____ x Width _____ x Depth _____							
Characteristics	Stage 1	Stage 2	Stage 3	Stage 4	Unstageable	DTPI	
Stage	Stage 1	Stage 2	Stage 3	Stage 4	Unstageable	DTPI	
Condition of Wound Bed	Open	Closed	Resolved/Healed				
Tissue in Wound Bed	Epithelium	Granulation	Slough	Eschar			
Periwound Tissue	Red	Pale	Purple	Intact	Open	Blistered	Macerated
Drainage	None	Scant	Small	Moderate	Copious		
Drainage Type (and color if appropriate)	Serous	Serosanguinous	Sanguineous	Purulent			
Odor	No odor	Malodor					
Pain	No	Yes (Severity)	Pain Scale Used:	Unable to be determined			

Figure 5. Full documentation of the wound used in Figure 2.

Pressure Injury Assessment Form - ANSWERS							
Wound Location: Sacroccocygeal							
Wound Dimension: Length 16 cm x Width 14.5 cm x Depth UTD (because of the slough)							
Characteristics	Stage 1	Stage 2	Stage 3	Stage 4	Unstageable	DTPI	
Stage	Stage 1	Stage 2	Stage 3	Stage 4	Unstageable	DTPI	
Condition of Wound Bed	Open	Closed	Resolved/Healed	Tunneling at 7 o'clock	Undermining		
Tissue in Wound Bed	Epithelium	Granulation 25%	Slough 75%	Eschar			
Periwound Tissue	Red	Pale	Purple	Intact	Open	Blistered	Macerated
Drainage	None	Scant	Small	Moderate	Copious		
Drainage Type (and color if appropriate)	Serous	Serosanguinous	Sanguineous	Purulent; yellow, white			
Odor	No odor	Malodor					
Pain	No	Yes (Severity) 8/10	Pain Scale Used: Numerical	Unable to be determined			

without measurements, as the photo was not conducive to measurements and to determine the care plan for this wound at present. The authors verbalised that this wound was discovered in the Emergency Department and how the conversation between the nurse and doctor may not be as formal due to the close working quarters. The authors ended the presentation with a photo showing this same wound, which was fully healed.

There project required 103 slides, narrated over 2 hours and 45 minutes. The material was preserved and is available free of charge at www.npiap.org.

Results

Upon completion of the module, 16 students were asked to evaluate the experience. The evaluation was based on a knowledge, skills and attitudes survey (van Schalkwyk and D'Amato, 2015), and used a 5-point Likert scale. Students were asked to assess their prior knowledge of wound assessment

after they completed the modules, to have a more accurate assessment rather than a self-assessment that may have reflected assumptions of what they thought they knew about wounds. The survey asked for prior and post knowledge, as well as comparison to other psychomotor skills done in the lab setting. Anecdotal feedback was also collected.

Students' two-tailed T-test was used to compare the differences in the scores before and after the module. Students completing the module scored their learning much higher than prior to the modules [Table 1]. The final questions asked of the students was to compare this module presentation to a hands-on skills lab. Results were positive and shown in Table 2.

The authors asked students to describe how consistently their measurement matched the true dimensions of the wound, which was set as within 0.1 cm. Thirteen of the 16 responses (81.25%) said 'consistently', 3/16

Table 1. Analysis of student survey results.

Question	Pre-module score	Post-module score	Difference	Statistical significance
My knowledge of wound assessment was adequate	2.5625	4.625	2.0625	$P < 0.00001$ T = 6.982922
I felt comfortable assessing the LENGTH of a wound	2.875	4.4375	1.5625	$P < 0.00001$ T = 7.678689
I felt comfortable assessing the WIDTH of a wound	2.9735	4.5	1.5625	$P < 0.00001$ T = 8.591792
I felt comfortable assessing the DEPTH of a wound	2.75	4.1875	1.4375	$P < 0.00101$ T = 4.070106

Table 2. Comparison of module to hands-on skills lab.

Question	Average score
I believe this module taught me wound measurement as well as a "hands-on" skills lab would have.	4.1250
I believe I met the objectives of this module.	4.5725

(18.75%) said 'inconsistently', while 0/16 said 'not consistently'. This information assisted the authors in evaluating how well the programme worked to test ability to measure dimensions of a 2-dimensional photograph.

There was also a place for anecdotal feedback from the students. Neither of the authors had done a dually recorded narrated slideshow before and were unsure how it would be received. In addition to having no negative comments one student said: "The teaching with two instructors broke up the material and allowed me to think through the process. Much appreciated." The full list of comments is included in [Table 3](#).

Conclusion

The COVID-19 pandemic required many changes in how teaching occurred. This quality improvement project by faculty showed that presenting psychomotor skills virtually is possible and students could learn outside of a laboratory or skills centre. While not the traditional way of teaching these skills, this module appeared to meet the objectives

of the skills lab, provide immediate feedback, both positive and constructive, and provide the critical thinking that is necessary when developing an individualised plan of care. The authors enjoyed developing the module and, based on the feedback from the students, they enjoyed this type of experience. There is also great potential for this type of module to work with other psychomotor skills. **WINT**

References

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Table 3. Anecdotal feedback.

Very good module. I would maybe not put the answers out until a later date. It would encourage better learning/accuracy for measurements.

I think this was a good module and allowed us to learn new wound management and have a hands-on activity as well.

I thought this module had lots of good information. I also liked how there were lots of application questions.

The teaching with two instructors broke up the material and allowed me to think through the process. Much appreciated.

I was usually off by 0.25 to 0.5cm but that may have been due to computer setup. Measurements were usually fairly close though. I really enjoyed and appreciated this module. I thought it was well put together and quite informative. In lecture, we had a brief introduction to wounds, and I feel like this module really helped solidify and expand on what we learned in lecture and allowed me to apply skills. Thank you!!

It was very informative.

To be honest, I really want to see wound #7 after surgery. Overall, I really enjoyed the lecture. I just really feel I need some hands-on activity for staging wounds on an actual patient. This was hard to accomplish on the laptop.

Although the material was good, the PowerPoint voice cut out at times and was difficult to understand (I am assuming this was a technology issue).

I had trouble using the ruler provided on PowerPoint. It took some practice, and I am still not 100% confident in measuring dimensions on the computer. However, this module was extremely helpful, and I benefited greatly from this.

This was very in-depth and useful for understanding wound assessment and care. The multiple case studies were particularly useful in highlighting real scenarios and getting the instructor's assessment of a wound in their own words. I certainly need more practice with wound assessment, measurement, and documentation, but I learned a lot from this module and feel I am on my way.

I think both presenters did a thorough dive into the material and presented it in a clean and clear way that was easy to follow and understand.

This was a great module because it was very informative and engaging. I learned a lot of new techniques.