

# Utilizing Augmented Reality to Improve Patient Outcomes with Negative Pressure Wound Therapy (NPWT)

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## Introduction:

Augmented Reality (AR) is a burgeoning digital technology which is finding some use in healthcare. The benefits of AR (such as hand-free imaging and remote viewing [Figure 1]) makes this a tool particularly suited for wound care. To date, there have been few instances where this technology was leveraged in a way that could potentially improve patient outcomes in wound care. This study showcases a use of AR in order to improve the outcome of patients undergoing treatment with negative pressure wound therapy (NPWT).

## Methods:

A case-control study of 27 patients within one rural Louisiana hospital was performed, identifying a retrospective control (n=15) and comparing to similar cases (n=12) where AR was employed to augment treatment outcomes.

## Use of Augmented Reality:

In the study group, augmented reality was utilized during nights and/or weekends to address any complications that arose with the wound care therapy. When complications were identified by the bedside nurse, they would don the augmented reality headset and the wound care personnel could audibly guide the bedside nurse through assessment of the dressing and provide visual cues in order to facilitate troubleshooting (Figure 2).

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Figure 1. Closeup of the Augmented Reality device (HoloLens 2, Microsoft); Shows integrated cameras and the display.

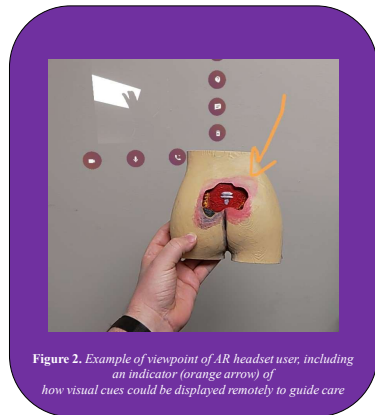


Figure 2. Example of viewpoint of AR headset user, including an indicator (orange arrow) of how visual cues could be displayed remotely to guide care

## Results:

Univariate data analysis was performed and found that the treatment group had decreased frequency of unintended surgical revisions ( $P=0.002$ ), fewer interruptions in therapy time ( $P=0.01$ ), and fewer readmissions related to wound infection ( $P=0.004$ ) (Figure 3).

Correlational testing was performed, showing strong correlation between the number of dressings performed and the amount of complications that arose (0.71) as well as between premature dressing removals and numbers of readmissions related to infection (0.74).

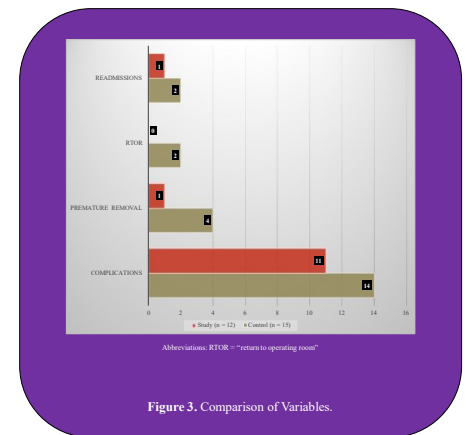


Figure 3. Comparison of Variables.

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## Conclusions:

The findings herein suggest that AR implementation can positively influence patient outcomes when combined with NPWT, mainly via addressing barriers to a successful therapy course. These results warrant further study in order to replicate findings. Future research could be performed to assess if AR use could be beneficial with other advanced wound care modalities, potentially addressing barriers to their successful implementation.