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## It's a Bird, It's a Plane, It's a Superhero Seal: The Use of a Therapeutic Robotic Seal to Facilitate Rehabilitation in the Pediatric ICU

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# It's a bird, it's a plane, it's a superhero seal: The use of a therapeutic robotic seal to facilitate rehabilitation in the pediatric ICU

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## Introduction

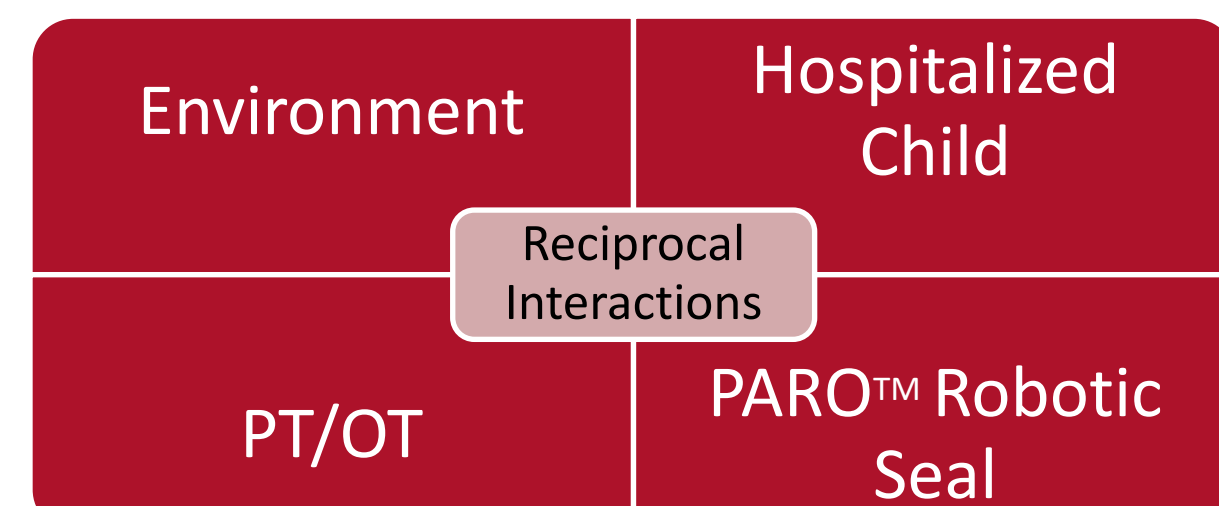
- Animal assisted interventions (AAIs) use animals therapeutically to promote health and well-being.<sup>1,2</sup>
- AAIs can positively impact critically ill patients but are used sparingly in the ICU.<sup>3</sup>
- Robot animals may be as effective as live animals with greater flexibility and reduced infection risk.<sup>4-7</sup>

## Purpose

To determine the feasibility, acceptability, and therapeutic effect of a therapeutic robotic animal, PARO™, during rehabilitation sessions in the pediatric ICU (PICU).

## Conceptual Framework

An adapted version of the P.A.C.E Model (practitioner, animal, client, and environment)



## Methods

**Design:** Single-arm, pre/posttest exploratory study

**Sample:** 19 PICU patients

**Setting:** Single PICU at Nebraska Medicine

**Interventionist:** PT and/or OT

**Targeted rehabilitation skills**



**Measures:**

Feasibility:

- Consent rate, Number & length of therapy sessions
- Therapy Session Activities (Activity Performance Form)

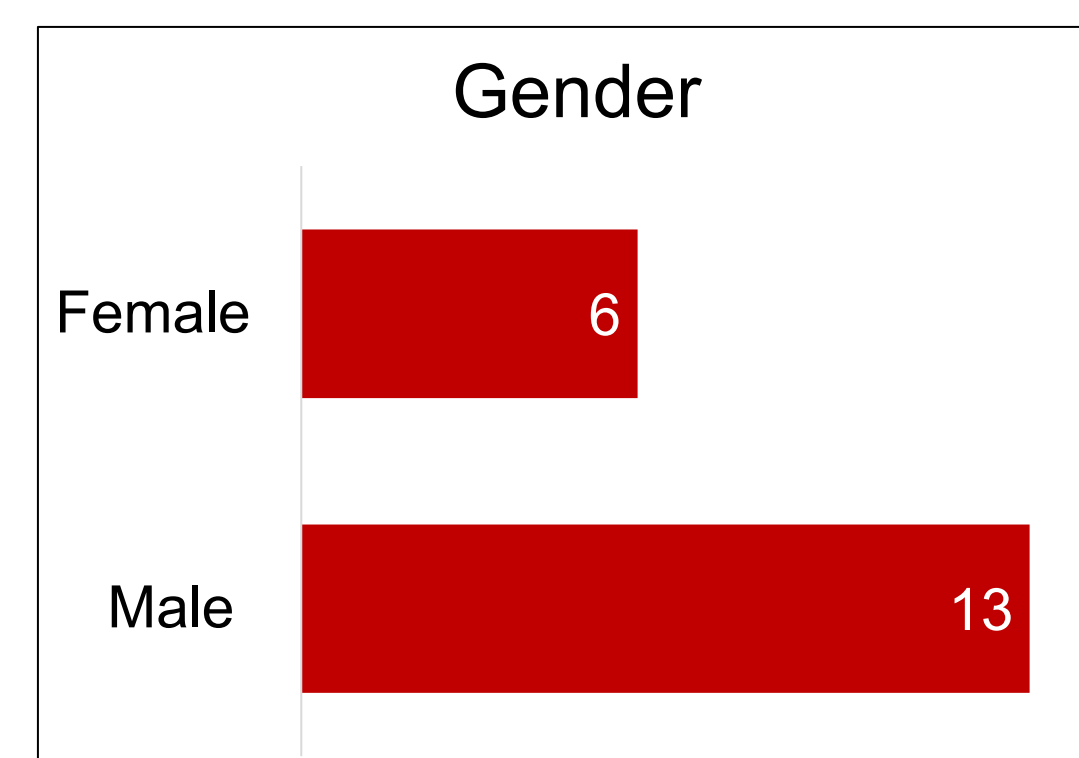
Therapeutic effect:

- Pre/post Session Variables
  1. Vital signs
  2. Pain (Wong-Baker FACES Pain Rating Scale)
  3. Anxiety (Children's Anxiety Meter-State (CAM-S))

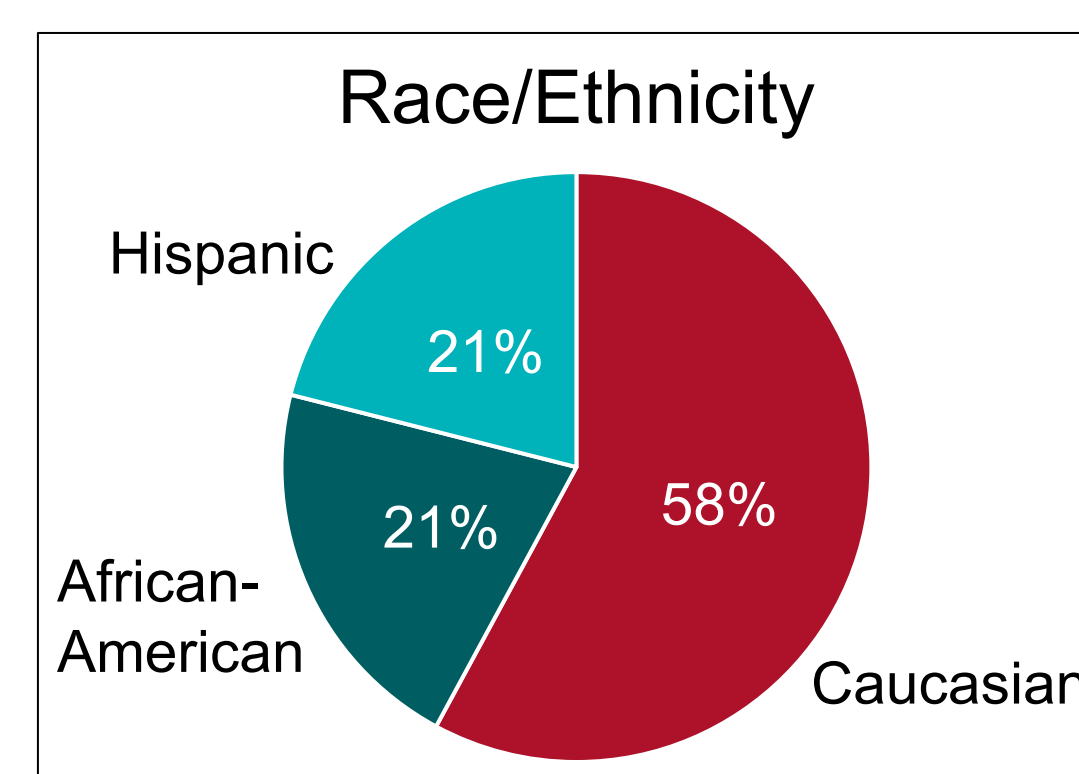
Intervention Acceptability

- Post Study Interview

## Results



Age Range  
**5-17**  
Years



**47**

Total individual therapy sessions completed by participants.

**2.5**

Mean number of sessions per subject (SD=1.6)

**35.8**

Mean length of sessions (SD=9.7)



- Significant decrease in anxiety score after first therapy session ( $p < 0.05$ ).
- No other statistically significant changes.
- Overall downtrend in pain and heart rate before and after sessions.

## Post Study Interviews

Question	Subject Responses
What did you like most about the seal?	<ul style="list-style-type: none"> <li>• It was different and made therapy entertaining</li> <li>• It made me feel calm</li> <li>• I got to play with it</li> </ul>
What activity did you like doing most with the seal?	<ul style="list-style-type: none"> <li>• Fishing</li> <li>• Touching and petting it</li> <li>• Getting it to interact with me</li> </ul>
Was the seal fun?	<ul style="list-style-type: none"> <li>• Yes, because it was something I could play with and distract me</li> <li>• Yes, it made time in therapy fun</li> </ul>

## Conclusions

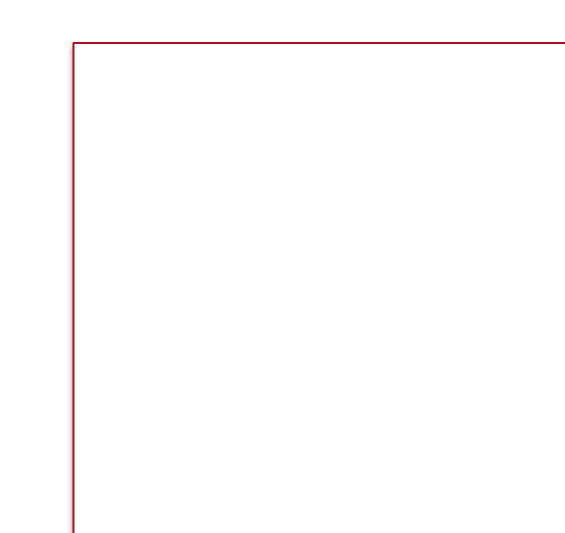
- AAI using a robot animal is feasible, acceptable, and was received positively by participants.
- This novel intervention has great potential to positively impact critically ill patients and transform critical care rehabilitation.
- More research is needed to understand the specific psychophysiological responses associated with improved outcomes.

### Future Directions

- This study provided preliminary findings for an ongoing clinical trial at a large tertiary children's medical center.
- Additional behavioral measures related to patient motivation and guardian satisfaction have been added.



## References



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