

ENHANCING PERCEPTION OF PAIN USING VIRTUAL REALITY: A FEASIBILITY STUDY

See all
CHDR posters:



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Introduction

Virtual Reality (VR) can be used to modulate a person's pain perception. This might be used as challenge model with a focus on pain experience in early drug development. Here, we aim to enhance the perception of pain by means of VR during an electrical stimulation task.

Methods

24 healthy male participants were included in a parallel study of two visits. The perception of pain was quantified by the Pain Detection Threshold (PDT), Tolerance Threshold (PTT), and subjective scores related to pain experience.

Prior to each VR assessment, participants were primed by interacting with the VR environment. All endpoints were recorded for three conditions:

- No VR simulation (grey)
- Neutral VR simulation (blue)
- Wound VR simulation (pink)

During visit 1, participants started with the neutral VR simulation. During visit 2, neutral VR was the second VR assessment. The other three VR assessments included the virtual wound increasing in intensity. (Figure 1)

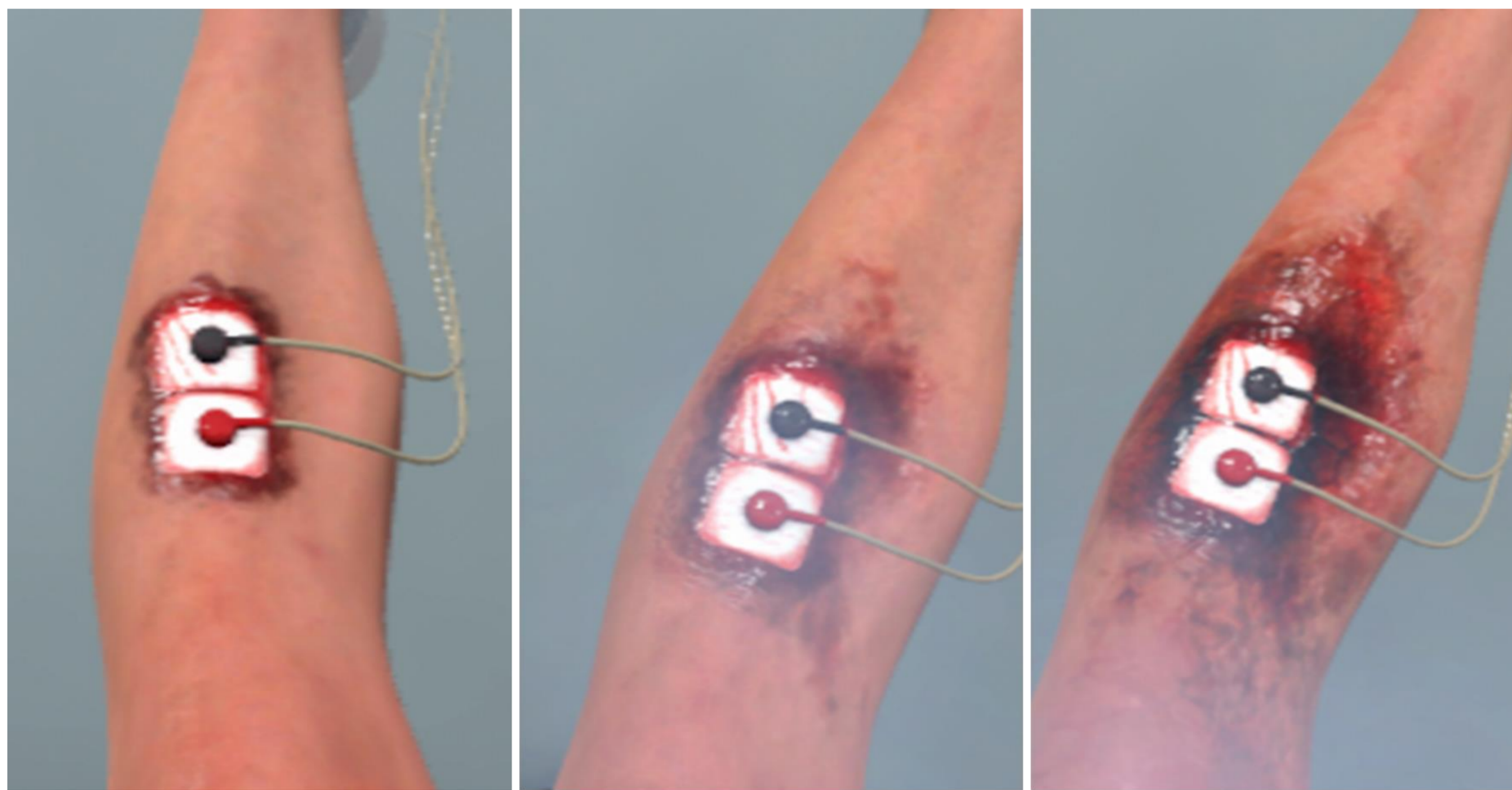


Figure 1: The virtual wound simulation

Results

Compared to the neutral simulation, the VR wound condition:

- Decreased the PDT [mA]: -18.4% (-26.9% ; -9.0%)
- Did not affect the PTT [mA]: -3.2% (-8.0% ; 1.8%)
- Increased VAS pain intensity: 4.5p (1.8 ; 7.2)
- Increased VAS pain unpleasantness: 5.9p (2.1 ; 9.8)

Conclusions

- The PDT, but not PTT, was lowered by perceived tissue damage through VR
- VR enhanced the overall pain experience
- VR-induced changes in pain perception have the potential of being a biomarker of affective processing of pain, which can be used in early drug development in healthy volunteers

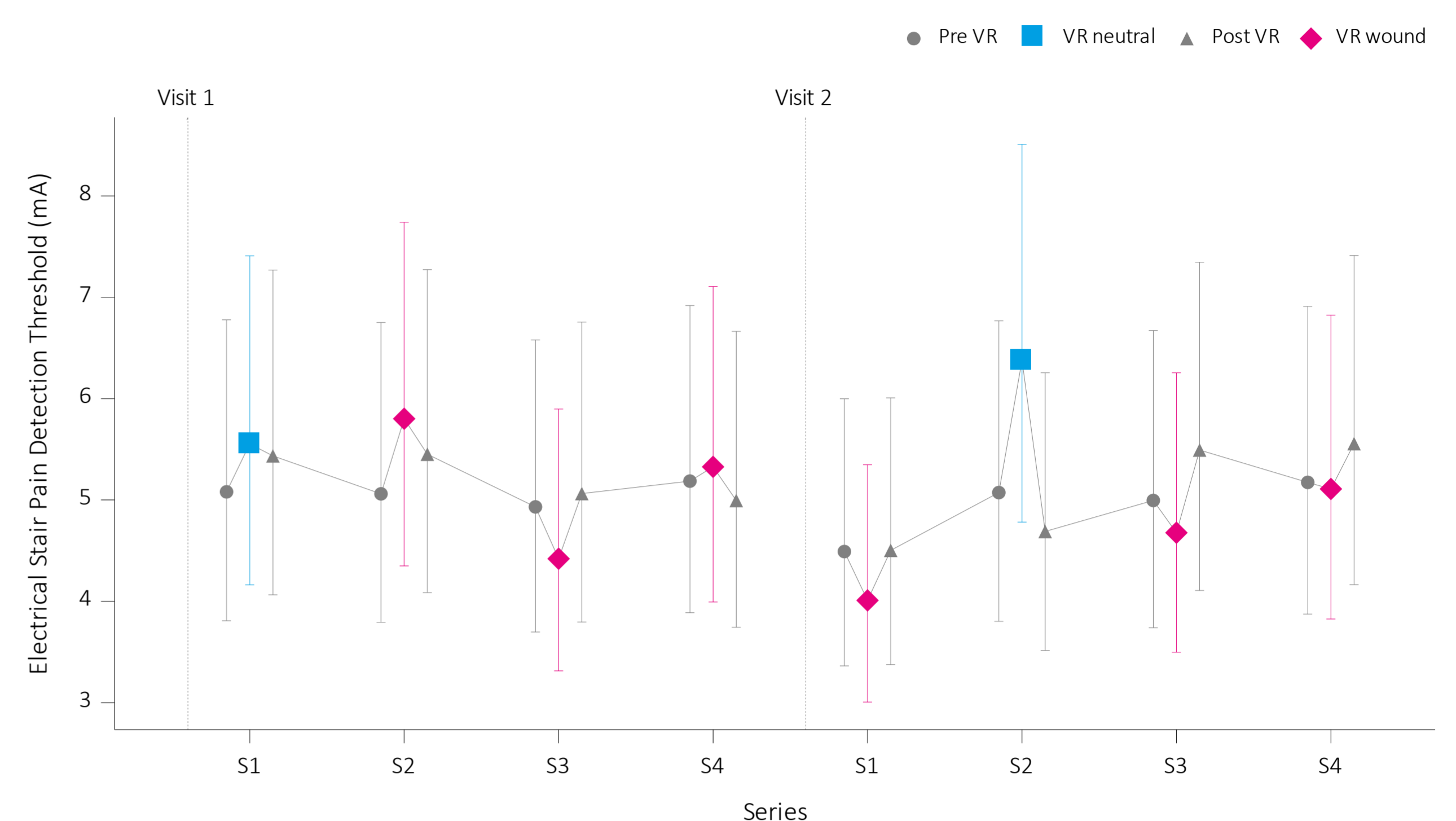


Figure 2: Effect of both VR simulations on PDT

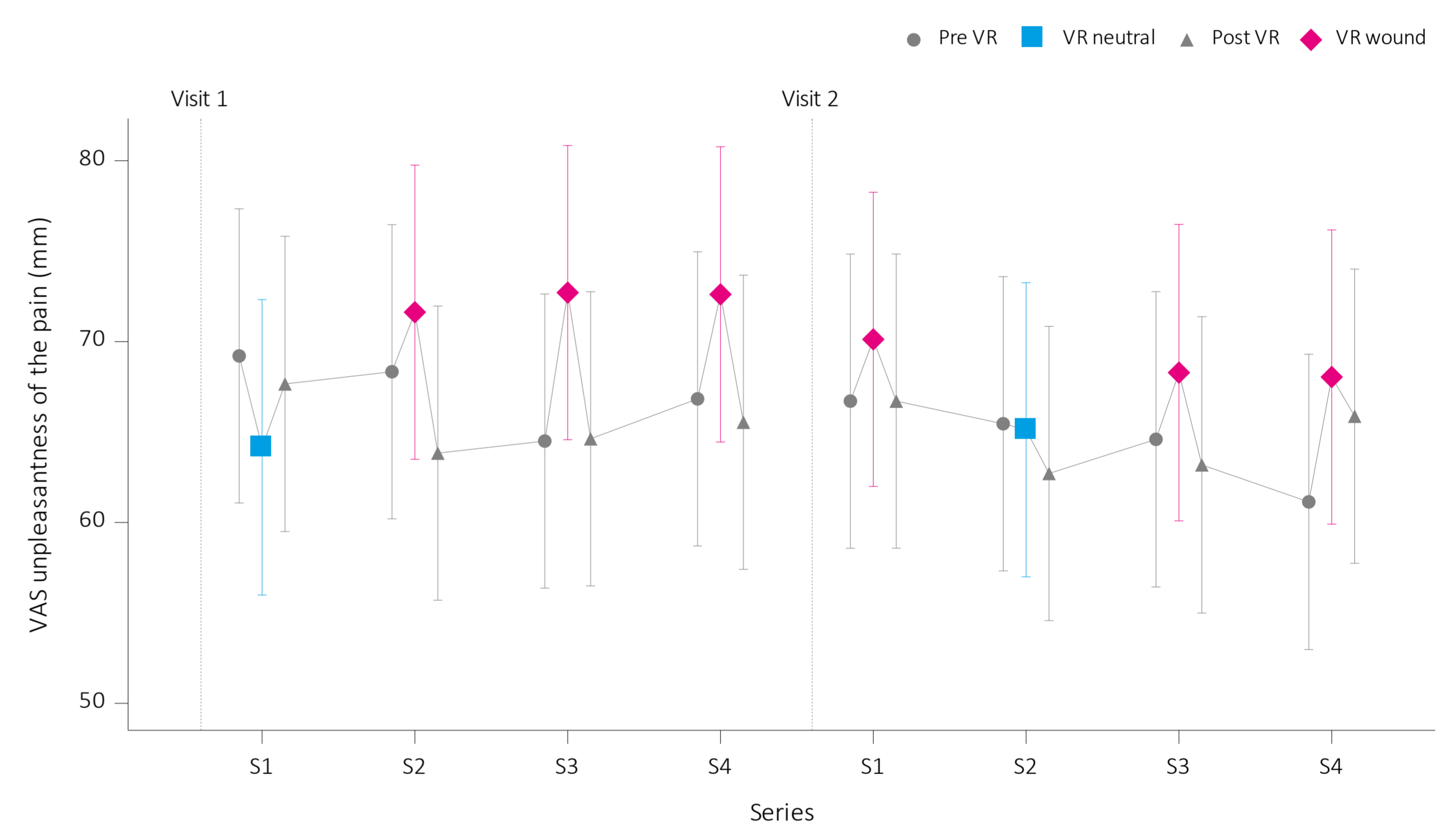


Figure 3: Effect of both VR simulations on VAS pain unpleasantness

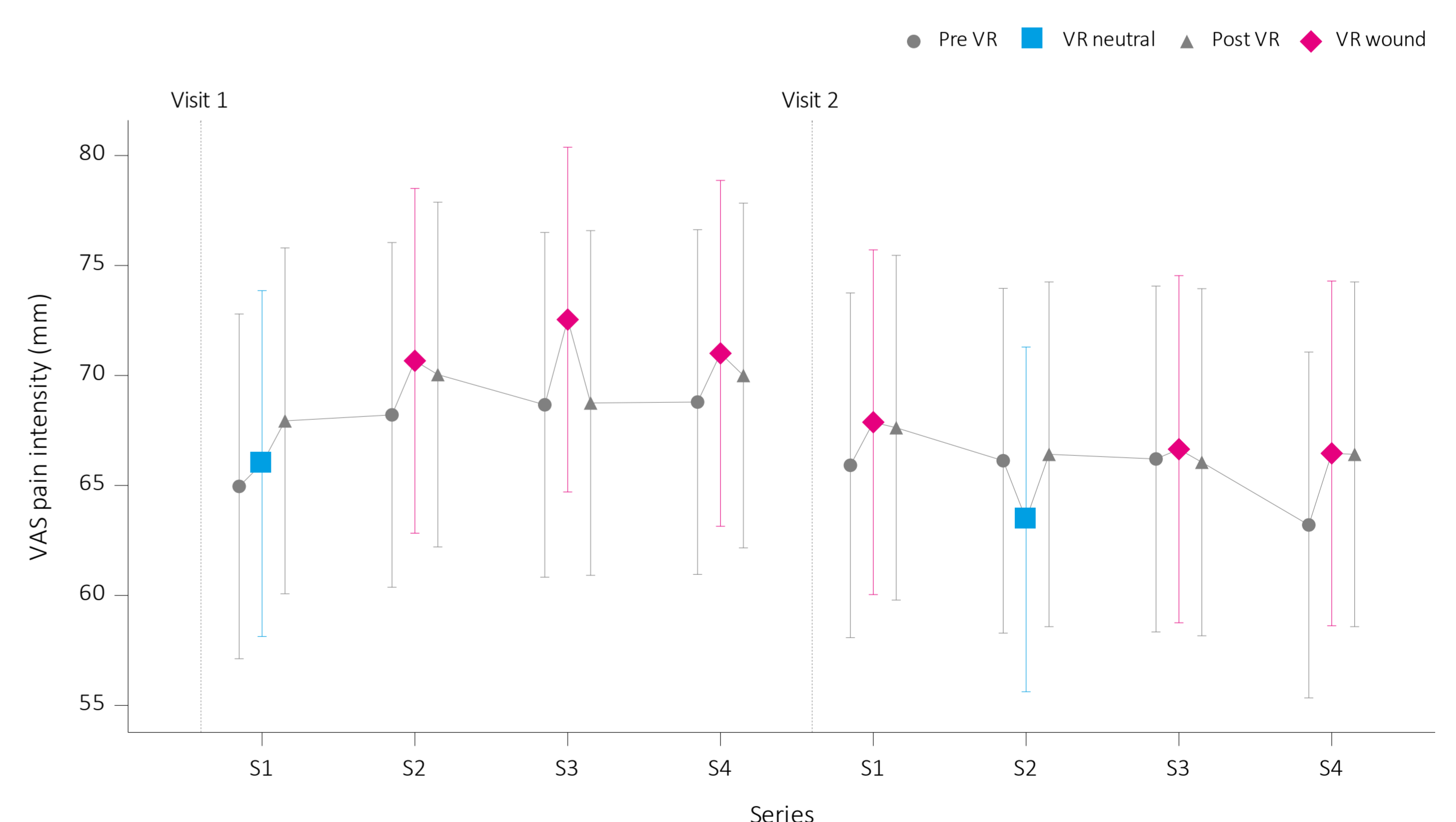


Figure 4: Effect of both VR simulations on VAS pain intensity