

The Impact of Virtual Reality on Chronic Pain



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BACKGROUND AND SIGNIFICANCE

Numerous clinical studies have shown that Virtual Reality (VR) can effectively decrease high levels of acute pain during treatments for burns, wounds and other procedures.¹ To date there has been only one study on the impact of VR on chronic pain.² This poster presents the basic findings of two studies done at the Pain Consultants of East Tennessee, Knoxville, using VR to relieve chronic nonmalignant pain (CNP).

TWO STUDIES OF VIRTUAL REALITY FOR CHRONIC PAIN



Subjects with CNP pain conditions were recruited and offered VR therapy. Subjects rated their pain 0-10 before, during and after the session. Data was also gathered on any potential impact of the VR experience on dizziness, headache or nausea.



STUDY 1 – Single Treatment Session (one five-minute treatment session): (N=30) Subjects with a variety of CNP conditions.

STUDY 2 – Multiple Treatment Sessions (three 20-minute sessions): (N=7) Subjects with neuropathic CNP pain conditions. (This study is currently ongoing)



VR THERAPY APPLICATION: COOL!

The VR program used in these studies is called COOL! (DeepStream VR Inc., 2014). COOL! is a fun, interactive journey through a fully immersive 360° VR journey through a fantasy landscape populated with flames and playful otters. Patients can interact with COOL! using the buttons on a mouse to toss magic orbs and fish to play with the otters. The VR display used in this study was an Oculus Rift DK-2.

COOL! is Copyright 2014 DeepStream VR, all rights reserved.

Patients reported pain reductions of 60-75% during the VR treatment, and 30-50% immediately after.

RESULTS

STUDY 1 (Table 1)

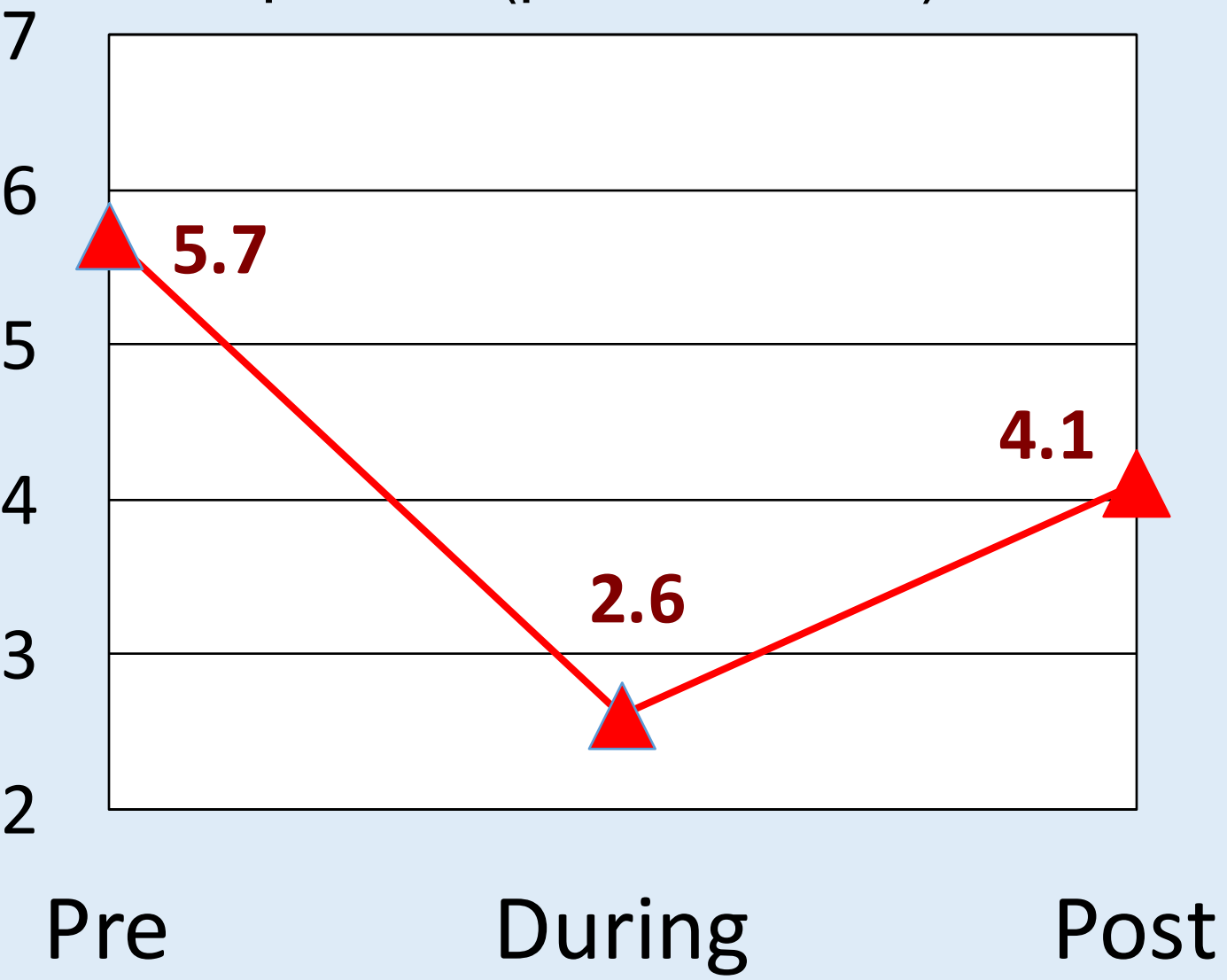
Nine subjects reported 100% pain relief; three subjects reported no pre-post pain relief. Pain scores decreased an average of 33% pre-post session ($p<.001$) and decreased 60% pre-during session ($p<.001$). No subjects reported any dizziness, headache or nausea.

STUDY 2 (Table 2)

Pain scores decreased an average of 57% pre-post session ($p<.001$) and decreased 75% pre-during session ($p<.001$). No subjects reported any dizziness, headache or nausea.

LASTING EFFECT: A majority of subjects reported that the analgesic effect of the VR experience persisted beyond the end of the treatment session. Patients reported that the relief persisted from 2 to 48 hours.

Table 1. Group Mean Pain Ratings, 5-Minute VR Session
 $p<.001$ (paired t-tests)

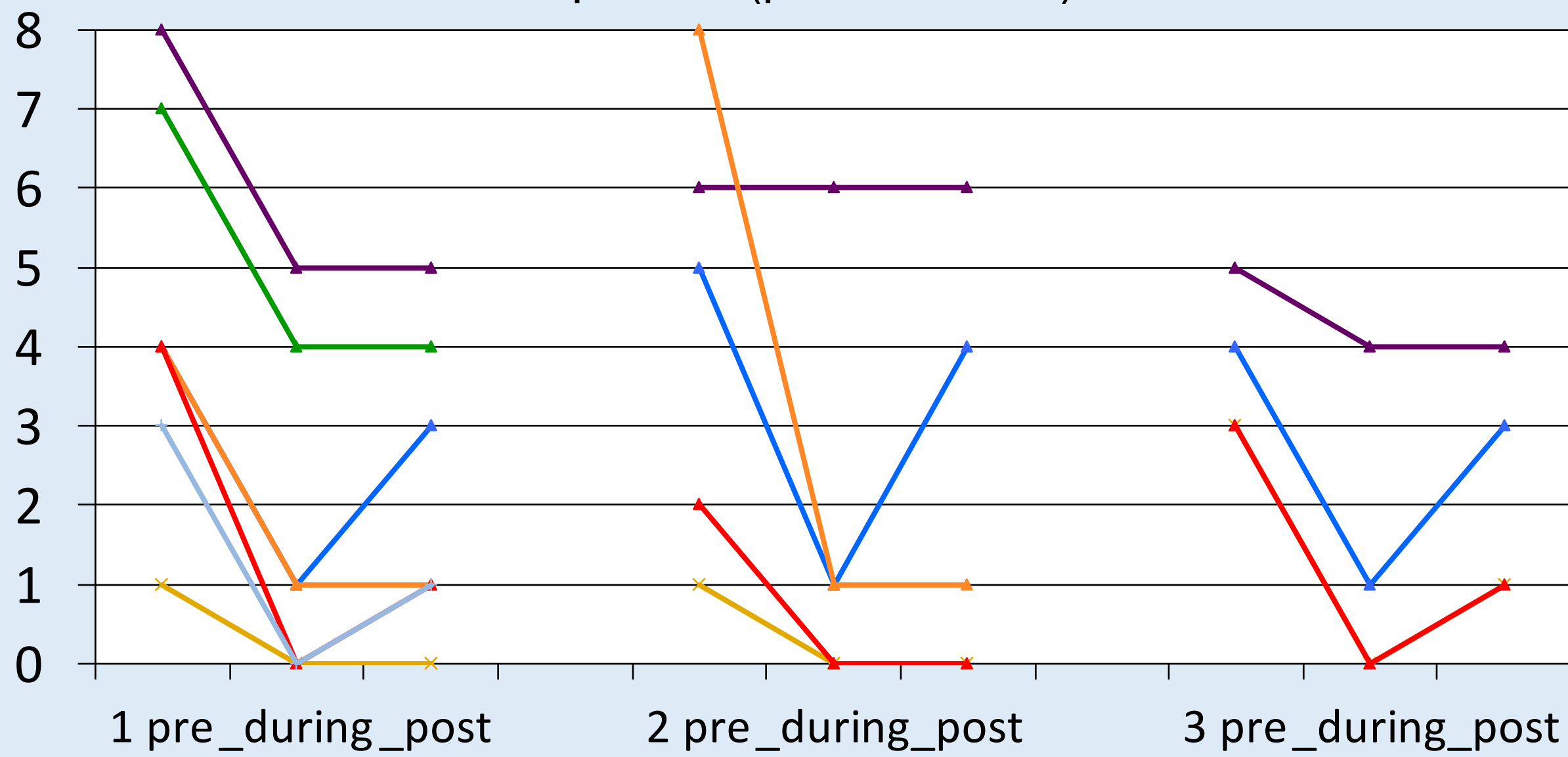


CONCLUSION

These studies showed Virtual Reality can provide clinically significant pain relief for CNP patients. Patients reported dramatic pain reductions of 60-75% during the VR treatment, and 30-50% immediately after the treatment. This effect can last up to 48 hours after treatment. No adverse health effects were reported.

This study supports wider use and further study of VR pain control therapy as an adjunct or potential replacement to traditional pain therapy. These findings are especially significant and timely in light of the strong clinical shift away from opioid drug therapies.

Table 2. Pain Ratings, Three 20-Minute VR Sessions
 $p<.001$ (paired t-tests)



REFERENCES

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- Wiederhold, B. K., Gao, K., Sulea, C., & Wiederhold, M. D. 2014. Virtual Reality as a Distraction Technique in Chronic Pain Patients. Cyberpsychology, Behavior and Social Networking, 17(6), 346-352.