Virtual Reality:
Does it decrease pain levels of children during burn therapy?

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Impairments from Burn Injury
- Decreased ROM
- Decreased strength
- Inability to participate in play or school
- Possible contractures
- ADL limitations

Physical Therapy Interventions:
- ROM
- Positioning
- Debridement
- Dressing changes
- Education

Virtual Reality (VR)
VR: patient interacts with a responsive, multi-sensory virtual environment

Reason for need: Medicinal treatments (opioids) do not lower patient’s pain or anxiety to a level which allows for an effective treatment

Examples of current virtual reality technologies: SnowWorld, Spiderworld, ChocolateWorld, Wii, Nintendo

Theory behind VR: distract patient, leaving less cognitive function available for pain perception; “gait control” theory

Interaction level & equipment use varies with each intervention

Involvement vs. Immersion

Why SNOWWorld?3, 4
- Wound care often recreates patient’s original burn experience; thus, a cold, “glacial,” environment “helps” put out the fire.
- Thru goggles, patient virtually slides around an icy canyon, complete with “frigid river and waterfall,” shooting snowballs with their gaze, at snowmen, igloos, robots and penguins.

Evidence Behind VR
- Despite finding no statistical difference, Chan found VR produced less pain & decreased anxious behaviors during and after treatment when compared to no VR.
- Schmidt found immersive VR lead to increase in level of “fun,” was a useful addition to traditionally analgesia (Koenke agreed), & did not diminish with repeated use. VR did not result in significant increase in maximal ROM.
- Dahlquist found brief improvement in pain tolerance & predicted VR could potentially add additional 20 seconds to therapy time.
- Hoffman used functional magnetic resonance imaging (fMRI) to look at brain activity during VR & found pain related activity to be decreased. Compared involvement and immersion in VR and found decreased pain with complete immersion

Interventions Utilized
- Wound care usually involves cleaning the skin and decreasing likelihood of infection by debridement.
- PROM exercises® or AAROM 6.7.8 of involved extremity during VR
- Staple removal with VR compared to video game
- Wound dressing changes1, 7

Benefits of VR
- Reduce reliance & side effects of drugs traditionally used during sessions7
- Allow more aggressive therapy—prevent contractures, decreased skin elasticity, & excessive scarring8
- Speed up recovery
- Decrease pain and anxiety levels
- Results not limited to burn patients2, 4, 5, 6
- As technology increases, as does quality of VR & lead to decreased pain levels
- Two people able to enter into SuperSnowWorld6

Further Research
- VR cost effectiveness
- Double blinded studies
- Studies of VR alone
- Larger sample sizes

Resources

"The fMRI results suggest that virtual reality is not just changing the way patients interpret incoming pain signals; the programs actually reduce the amount of pain-related brain activity.”