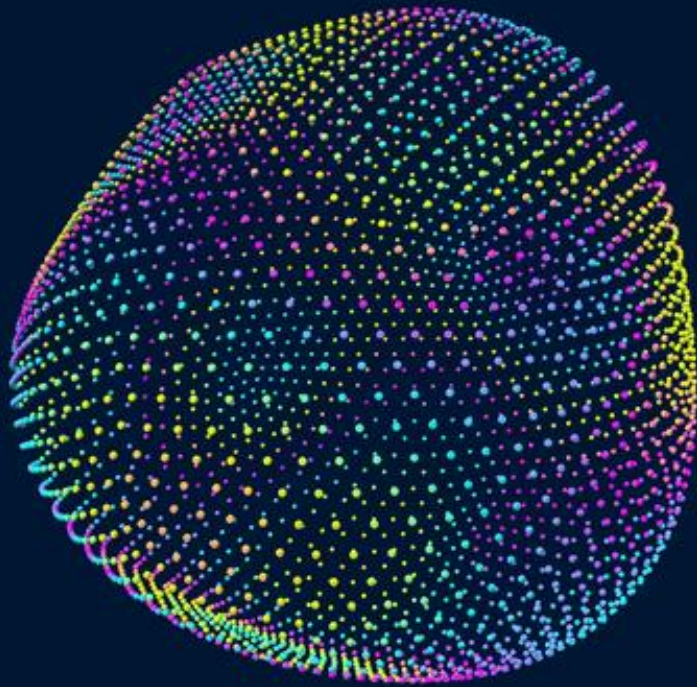


2020

#Commsverse



Commsverse

Leveraging Virtual Reality to Reduce and Eliminate Pain

Session #373


Robert Buren
Peter Carson



Bringing the Community & Industry together – Thank you to Everyone!



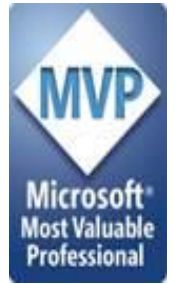
Agenda

- 
- Introductions - Background
 - OOTB External Sharing
 - Teams Provisioning and Sharing
 - Azure AD B2B
 - Portals for External Users
 - Summary and Closing

Peter Carson



- President, Extranet User Manager
- Office Apps and Services Microsoft MVP
- peter.carson@extranetusermanager.com
- blog.petercarson.ca
- www.extranetusermanager.com
- Twitter @carsonpeter
- President Toronto SharePoint User Group



Robert Buren

- **Robert Buren, M.A.**
 - Management Consulting, Dot-Com startups, Microsoft Canada
 - Co-Founded SecTor (Security Education Conference – Toronto)
- **In 2008, paraplegic from a mountain biking accident**
 - Within five years he become the first Canadian with paraplegia to complete the Ironman triathlon (226km).
- **2020, trying to solve is neuropathic pain, leveraging VR**
 - Sharing the learnings with others to see what's possible
 - The science and my experience so far indicates promise
- **Learn more about Robert at his blog: www.RockTheChair.com**



My Pain Story



- **October 5, 2008, T11 complete paraplegia**
- **Today, Neuropathic Pain continues to be my biggest challenge**
- **Known as “Suicide Pain”, it feels as though my body is on fire**
- **More than 60% of individuals with an SCI suffer from this pain**
- **No traditional pain remedies work dependably**
 - Acupuncture, hypnosis, Reiki, Osteopathy, Massage, Medication, Diet, Exercise
 - Cannabis (oils, vaporizer, tincture, edibles, concentrates), Alcohol
 - Medications (Gabapentin, Nortriptyline, Lyrica, T3, Arthrotec, Celebrex, Codeine, Butrans....)
 - The side effects are often worse than the pain.

Not Just Me... Chronic Pain is at Epidemic Proportions

USA: 20.4% or 50 million American Adults have chronic pain

- *Over-dependence led to opioids crisis*
- *Chronic pain leads to other health issues, including anxiety and depression*
- *USA Chronic Pain costs at least \$560 billion a year in medical expenses, lost productivity, disability programs. (Oct 21, 2018, [The Washington Post](#))*

Canada

- *An estimated 20% of Canadians live with chronic pain costing \$56 to \$60 billion in costs to individuals and the economy in Canada - [link](#)*

Around the World

- *Chronic pain treatment market is expected to reach \$105.9 billion by 2024 - [link](#)*

“If the number of deaths caused by flu exceeds 7.7%, it is considered an epidemic”

My 'What If' Moment

- My Pain Isn't Real (mechanically speaking)
- I knew that amputees suffering from Phantom Limb pain can find relief using Mirror Box Therapy.
- Without a working leg to reflect, might 3D video in VR trick my brain into thinking that I could still control my lower body, so it would no longer need to send pain signals?
- I put a post on Facebook asking if any friends had knowledge of VR and the response was fantastic, I bought a 3D camera, and we started experimenting.

Research Shows Promise

- Going back to 2007 research has shown the potential for VR (visual illusion) to help reduce pain.

Review Virtual reality for the treatment of neuropathic pain in people with spinal cord injuries: A systematic review

Philip D.



© 2018 American Psychological Association
0090-5550/19/\$12.00

Rehabilitation Psychology

2019, Vol. 64, No. 1, 13–24
<http://dx.doi.org/10.1037/rep0000246>

Effects of Virtual Walking on Spinal Cord Injury-Related Neuropathic Pain: A Randomized, Controlled Trial

Elizabeth J. Richardson, Emily C. McKinley, A. K. M. Fazlur Rahman, Phillip Klebine, David T. Redden, and J. Scott Richards
University of Alabama at Birmingham

Virtual reality improves embodiment and neuropathic pain caused by spinal cord injury

OPEN

Polina Peng, PhD
Kerlie Pflaum, PhD
Roberta Renchi, PhD
Marco Solà, MD
Abdul Wahab Al-Khadiji, MD
Xavier Jordan, MD
Ammar Karamalla, MD
Oliv Blasco, MD, PhD

ABSTRACT
Objective: To investigate changes in body ownership and chronic neuropathic pain in patients with spinal cord injury (SCI) using multisensory own body illusions and virtual reality (VR).
Methods: Twenty patients with SCI with paraplegia and 20 healthy control participants (HC) participated in 2 factorial, randomized, repeated-measures design studies. In the virtual leg illusion (VLI), we applied asynchronous or synchronous visuotactile stimulation to the participant's back (either immediately above the lesion level or at the shoulder) and to the virtual legs as seen on a VR head-mounted display. We tested the effect of the VLI on the sense of leg ownership (questionnaire) and on perceived neuropathic pain (visual analogue scale pain rating). We compared illusory leg ownership with illusory global body ownership (induced in the full body illusion [FBI]), by applying asynchronous or synchronous visuotactile stimulation to the participant's back and the back of a virtual body as seen on a head-mounted display.

Results: Our data show that patients with SCI are less sensitive to multisensory stimulations inducing illusory leg ownership (as compared to HC) and that leg ownership decreased with time since SCI. In contrast, we found no differences between groups in global body ownership as tested in the FBI. VLI and FBI were both associated with mild analgesia that was only during the VLI specific for asynchronous visuotactile stimulation and the lower back position.

Conclusions: The present findings show that VR exposure using multisensory stimulation differentially affected leg vs body ownership, and is associated with mild analgesia with potential for SCI neurorehabilitation protocols. *Neurology*® 2019;93:1894–1903

Pain Medicine 2018; 19: 151–159
doi: 10.1093/pm/pnx109

OXFORD

ACUTE & PERIOPERATIVE PAIN SECTION

Special Article

Innovative Techniques for the Treatment of Pain: Immersion, Distraction, or Isolation?

Chapter 2

Neuroplasticity and Virtual Reality

Katharine L. Cheung, Eugene Tunik, Sergei V. Adamovich, and Lara A. Boyd



Pain 130 (2007) 294–298

PAIN

www.elsevier.com/locate/pain

Clinical note

Using visual illusion to reduce at-level neuropathic pain in paraplegia

G. Lorimer Moseley *

Department of Physiology, Anatomy and Genetics and fMRIB Centre, University of Oxford, Le Gros Clark Building, South Parks Road, Oxford OX1 3QX, United Kingdom

Received 21 September 2006; received in revised form 4 January 2007; accepted 10 January 2007

What is VRx?

- **VRx is intended to refer to the growing field of Virtual, Augmented and Mixed Reality Tech that allows a user to go beyond or extend their immediate reality.**
- **It can also represent a Virtual Rx (Prescription)**
- **With regards to this plan, VRx is considered an assortment of content and potentially exercises that may help to reduce or eliminate pain.**



Tech Stats

Smart Phones

- **3.2 billion people in the world own a smartphone in 2019 – [link](#)**
 - *Smart phones with a headset (starting at \$10, allows users to view 3D video)*

Virtual Reality

- *Worldwide, VR market volume is expected to reach 98.4 million sales by 2023, generating an installed base of 168 million units with a worldwide population penetration of 2%. Growth is forecast across all regions and countries. [link](#)*
- *The global virtual reality market size was valued at USD 7.3 billion in 2018 and is projected to reach USD 120.5 billion by 2026, exhibiting a CAGR of 42.2% during the forecast period - [link](#)*

Sharing the Learning






- www.VRxBTherapy.org
- VIDEOS

The following videos are experimental attempts to show first-person movement of a man's lower body so that an individual suffering from neuropathic pain can mimic those movements in the hopes that doing so will decrease the pain.

They can be viewed in VR mode using YouTube with a headset to allow a 3D experience.

Show 10 entries

Search:

Description	Rating	Target	Setting
 <p>Lower Body Movements One of the most important videos, this is a guided therapy moving toes, feet, knees and legs. Best done while sitting up in bed, this 10 minutes of therapy is tiring (if you're really focusing on trying to mimic the movements), but effective.</p>	*****		indoor
 <p>Leg Press Against Window Jim pushes away from the window leaning back in a chair. In addition to isolating the push movement, this video has the bonus view of Manhattan, NYC.</p>	****		inside looking out
 <p>Steep Incline on Varied Surface In this video, Jim starts walking around 1:25 into the video. It's a great up-close view of climbing a steep surface with a varied surface. Focus on each push up, remembering the effort that involved. At the end of the video, Jim turns 180 to look down at the incline. When wearing the VR Goggles, be careful not to lose your balance if you're sitting in your wheelchair.</p>	****		outside
 <p>Night Walk in the Snow Jim takes the dogs for a long walk at night in the snow. No talking. Can be watched at slower speeds (select on YouTube app).</p>	****		outside night walk
 <p>Walking Up Stairs Outside Another great video of walking up an incline and stairs. The 3D experience is extra vivid with the foliage moving in the breeze and cars passing by along the top of the path. When doing this therapy, with each step, Rob will plant and roll his hand on his leg to mimic the foot walking.</p>	****		outside

HISTORY

The Back Story

For those curious about the back story to how Rob got to where he is today, you can read below a summary of the last 10+ years.

In October of 2008, Robert suffered a catastrophic spinal cord injury in a mountain biking accident, resulting in complete paraplegia. Seven weeks after his accident, while in hospital recovering, he began to feel a tingling and slight burning pain in his toes. Excited that this might be a return to feeling, Rob was informed that it was most likely the onset of neuropathic pain. Conducting a quick online search, the first few results explained the phenomenon of neuropathic pain, and also indicated that this pain is often referred to as 'suicide pain'.

Essentially, because the spinal cord is damaged and he no longer uses his lower body, his brain assumes something is terribly wrong and generates pain signals to warn him of the problem. Each day Rob typically wakes up with at least a tingling sensation in his feet, but by mid-day this tingling will often turn into a burning sensation and progresses all the way to his mid-section and can often reach a level of 10/10.

In 2004, prior to meeting with a Dr. specializing in neuroplasticity, Robert summarized his attempts to solve the Neuropathic pain. Below the summary has been pasted, and updated to present day:

1. Medications at varying dosages and combinations. Gabapentin, Nortriptyline, Lyrica
2. Side effects were terrible, and I eventually stopped them all together.
3. Tried again in 2019 with the same results
4. Massage and Chiropractor
5. Chiropractic adjustments fire up the nerve pain,
6. Massage and head scratch can lessen it somewhat
7. Continue to do this every two weeks so that I can stay active with triathlon training
8. Acupuncture
9. Generally seemed to make my nerve pain worse. Stopped this treatment after my lung was punctured with a needle in 2011.
10. Hypnosis

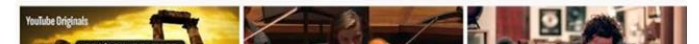
BLOG

My Quest Experiences



YouTubeVR (and normal) content

In addition to all of the www.neuroplasticityVR.org videos, I enjoyed checking these out.



How VR is helping me

RED: Distraction through action

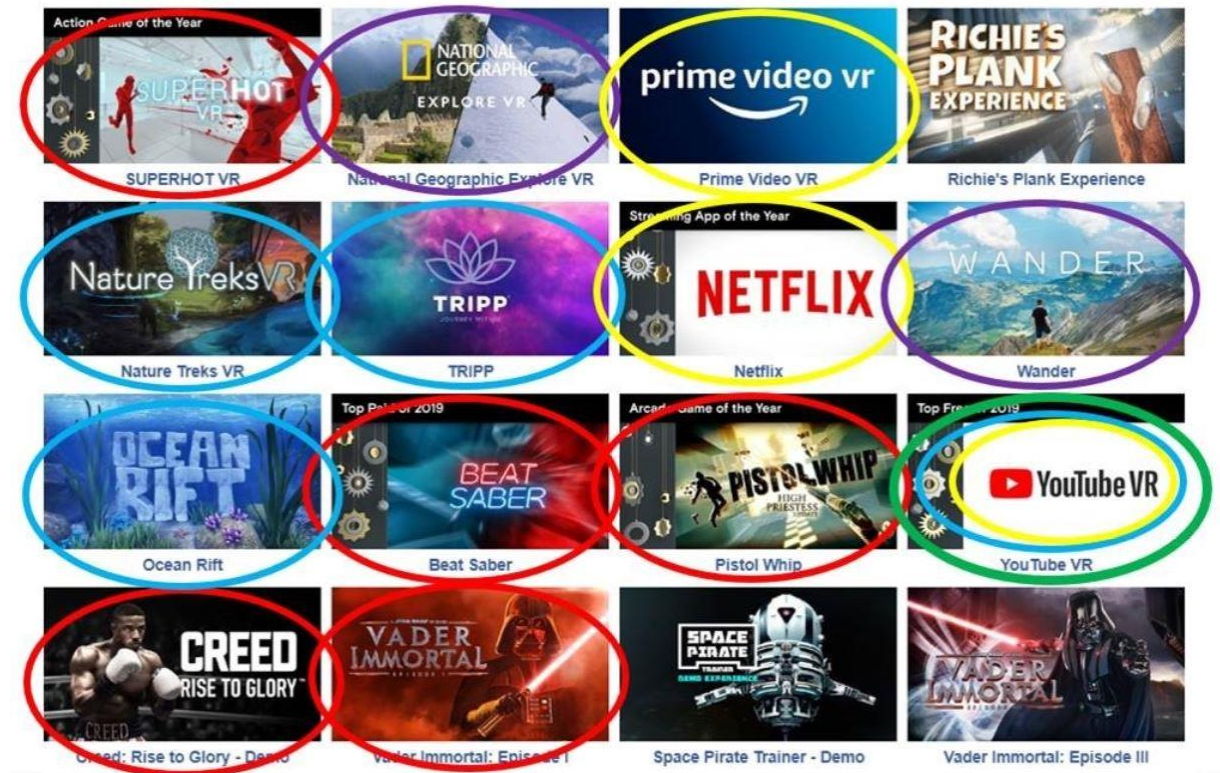
PURPLE: Distraction through VR.

YELLOW: Distraction through a story.

BLUE: Meditative and calming.

GREEN: Therapy, Distraction, Meditative
(depends on the content and what interests you)

My Quest Experiences



The Vision for VRxTherapy

Create a VR Destination / APP for all key pieces related to reducing pain.

- 1. 3D Content Creation – diverse body types doing different movements for those in need**
 - Insta360 EVO camera partnership – on loan to others, physio clinics, pre-amputees, etc.
- 2. Content Exploration**
 - Filter and browse content by category
 - Rating and commenting
- 3. Beyond the Website: Cloud Program to upload, search and deliver 3D videos**
- 4. Developing a Database/Engine to offer content, apps, links to videos, research, etc.**
 - 3D videos – Therapy that we're designing
 - Quest apps – Games, VR experience, Stories (content), Meditation
 - Link to TED talks, PDFs, YouTube videos, etc.
 - Tool might provide translation so that content can be consumed globally



3D Videos/Therapy

Distraction: Games

**Distraction:
Meditation**

YouTube VR

**Distraction: VR
Experiences**

**Movies:
Netflix - Prime**

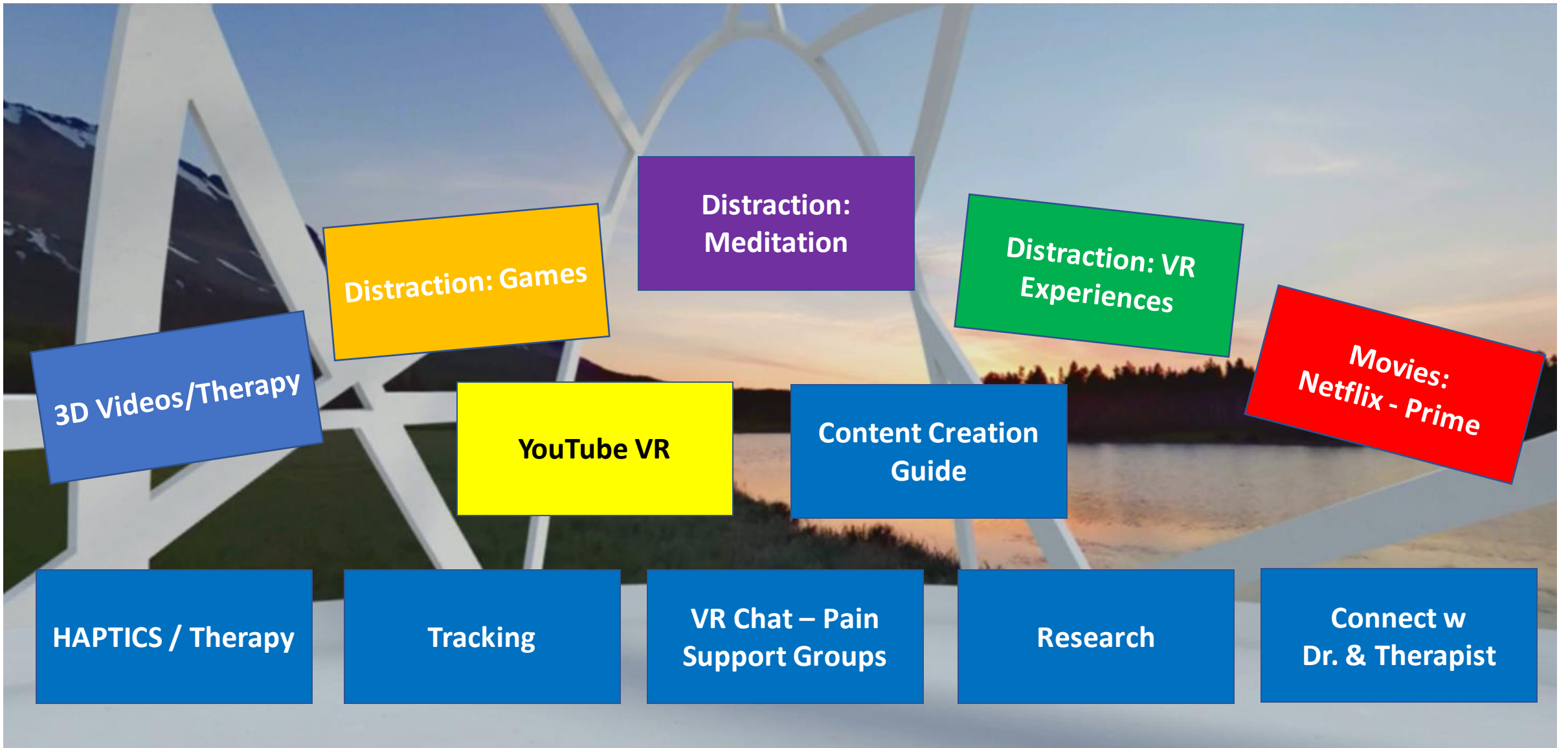
The Vision Extended

1. Integrating Haptics with the Quest

2. Going beyond in phase 2...

- Tracking the user's time, pain levels, correlations of data over time, etc.
- Looking at and including other modalities like Sound Therapy, Light Therapy (migraines)
- VR Groups – could be support groups
- Bringing in Dr.'s and therapists to provide professional guidance
- Diet apps related to general health and pain reduction

3. Idea: Building out a standalone VR device or packing up the suite of Pain related VR content for the Oculus Quest



3D Videos/Therapy

Distraction: Games

Distraction: Meditation

Distraction: VR Experiences

Movies: Netflix - Prime

YouTube VR

Content Creation Guide

HAPTICS / Therapy

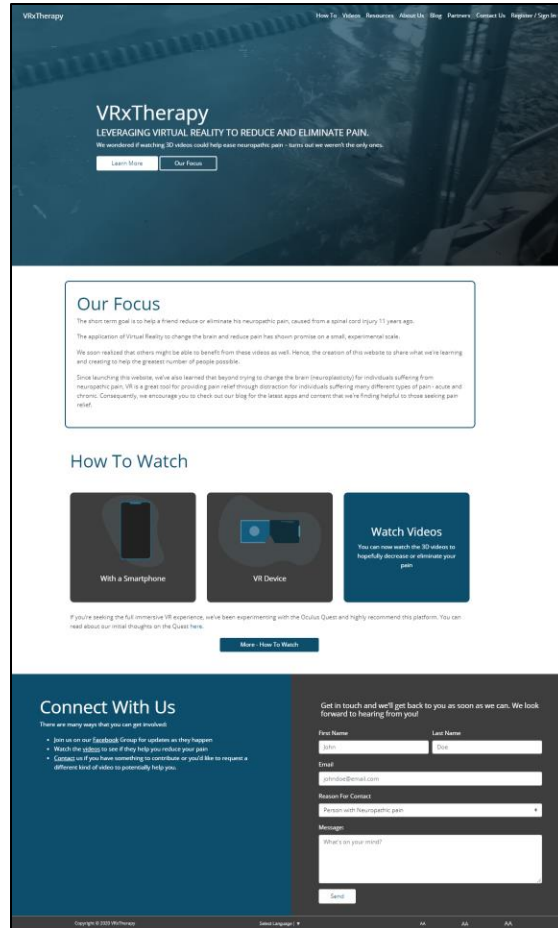
Tracking

VR Chat – Pain Support Groups

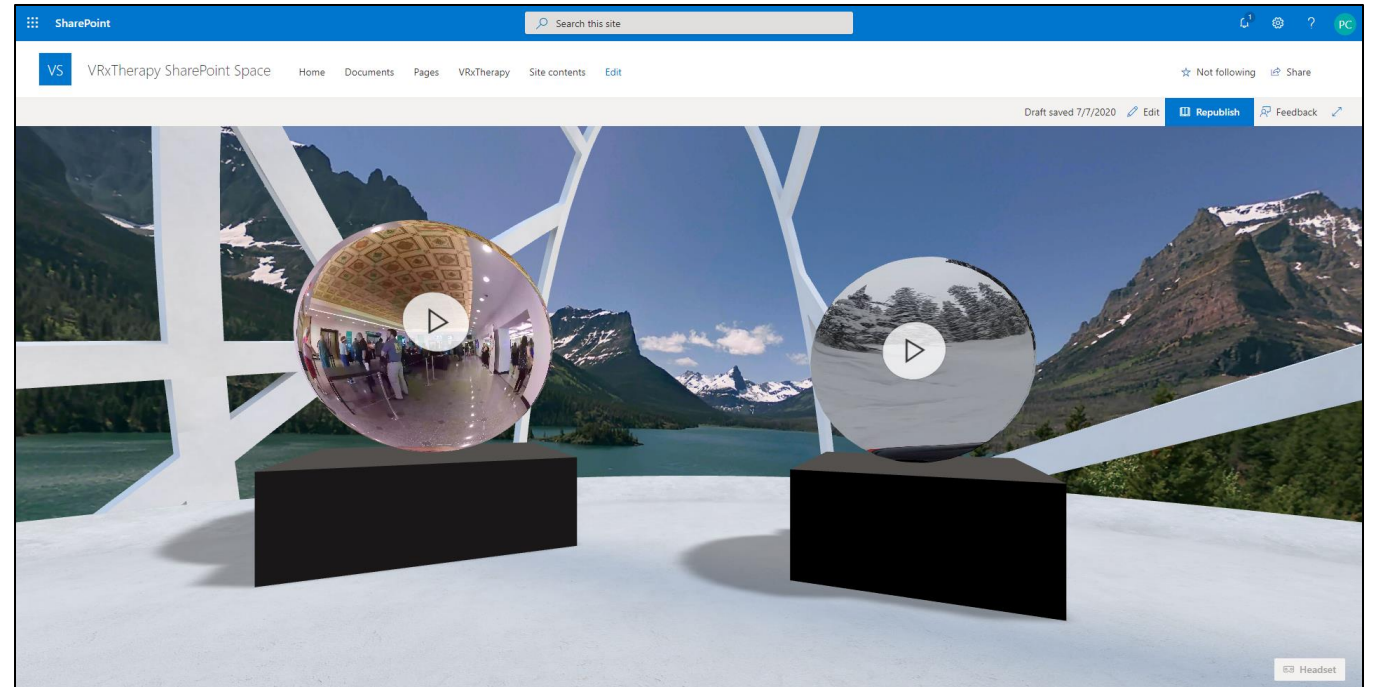
Research

Connect w Dr. & Therapist

VRxTherapy.org and SharePoint Spaces



www.vrxtherapy.org



<https://vrxtherapy.sharepoint.com/>

VRxTherapy

LEVERAGING VIRTUAL REALITY TO REDUCE AND ELIMINATE PAIN.

We wondered if watching 3D videos could help ease neuropathic pain – turns out we weren't the only ones.

[Learn More](#)

[Our Focus](#)

3D VR Videos

The following videos are experimental attempts to show first-person movement of a man's lower-body (and one upper-body video) so that an individual suffering from neuropathic pain or phantom limb pain can mimic those movements in the hopes that doing so will decrease their pain. The ratings on the videos represent how helpful Rob has found these videos.

For therapeutic benefits, they should be viewed in the YouTube App in VR mode on a smart phone or a VR device, to allow a 180 degree 3D experience.

Filter

Sort By Rating

Sort By Date Added

Lower Body Movements

One of the most important videos, this is a guided therapy moving toes, feet, knees and legs. Best done while sitting up in bed, this 10 minutes of therapy is tiring (if you're really focusing on trying to mimic the movements), but effective.



Indoor

Leg Press Against Window

Jim pushes away from the window leaning back in a chair. In addition to isolating the push movement, this video has the bonus view of Manhattan, NYC.



Indoor

Hand Movements

Experimental 180 degree 3D video to potentially help people with upper body neuropathic or phantom limb pain.



Indoor

Steep Incline on Varied Surface

Night Walk in the Snow

Walking Up Stairs Outside

Resources

Below are some of the videos, research abstracts and books that have informed our thinking and experiments.

[Sharepoint Spaces](#)[Videos](#)[Research](#)[Books](#)

Sharepoint Spaces

SharePoint Spaces is the exciting new preview program from Microsoft that introduces mixed reality to the workplace. It is fully immersive and works on any device.

Interested in trying out SharePoint Spaces? Just register and sign in to our website. Through our Extranet User Manager product you will be automatically added to a private group in EUM, which also adds you to the appropriate group in SharePoint Spaces to access it. Follow the link and try it out today!

[Sign In/Register to View Site →](#)

VRxTherapy

Get Started Here

Enter your email to login or register.

Remember My Login

Continue



What is your main interest?

Managing my pain


Caregiver

Healthcare Provider

Interested in VR


1 — 2 — 3
Interests Personal Info Summary

Enter your profile info

Email *
ptest6@eum.co 

First Name *
Peter

Last Name *
Test 6

Country
Canada 

Newsletter
 I would like to receive the e-Newsletter

[Next](#)

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Summary

Interests	Edit
My main interest is	VR

Personal Info	Edit
First Name	Peter
Last Name	Test 6
Email	ptest6@eum.co
Country	Canada
I would like to receive the newsletter	Yes

What to Expect Next:

You will be redirected to Microsoft to sign in via one of the three methods below:

 Office 365	If you used an Office 365 email address or a Microsoft account, and you're not already signed in, you'll sign in at Microsoft with your password for that account
 Google Federation	If you used a gmail.com email address, and you're not already signed in, you'll sign in at Google with your Gmail password
 One-time passcode	If your email address is neither of the above, you'll be sent a temporary code to your registered email address to sign in with

Looks good, sign me up!



pctest4@eum.co

Sign in

We'll send a code to pctest4@eum.co to sign you in.

[Send code](#)



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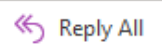


Your Envision IT account verification code - Message (HTML)

File **Message** Help Tell me what you want to do

Delete Archive Delete Respond Show Move Tags Editing Speech Zoom Reply with Meeting Poll FindTime Dynamics 365 Insights

Your Envision IT account verification code

 Envision IT (via Microsoft) <account-security-noreply@accountprotection.mi>
To  ptest4@eum.co

  Reply  Reply All  Forward 

Tue 2020-07-07 8:32 AM

Envision IT

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To access **Envision IT**'s apps and resources, please use the code below for account verification. The code will only work for 30 minutes.

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If you didn't request a code, you can ignore this email.



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Enter code

We just sent a code to ptest4@eum.co

23931603

Sign in

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Hang tight while we give you access to Envision IT.

. . . .

VRxTherapy

LEVERAGING VIRTUAL REALITY TO REDUCE AND ELIMINATE PAIN.

We wondered if watching 3D videos could help ease neuropathic pain – turns out we weren't the only ones.

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[Our Focus](#)

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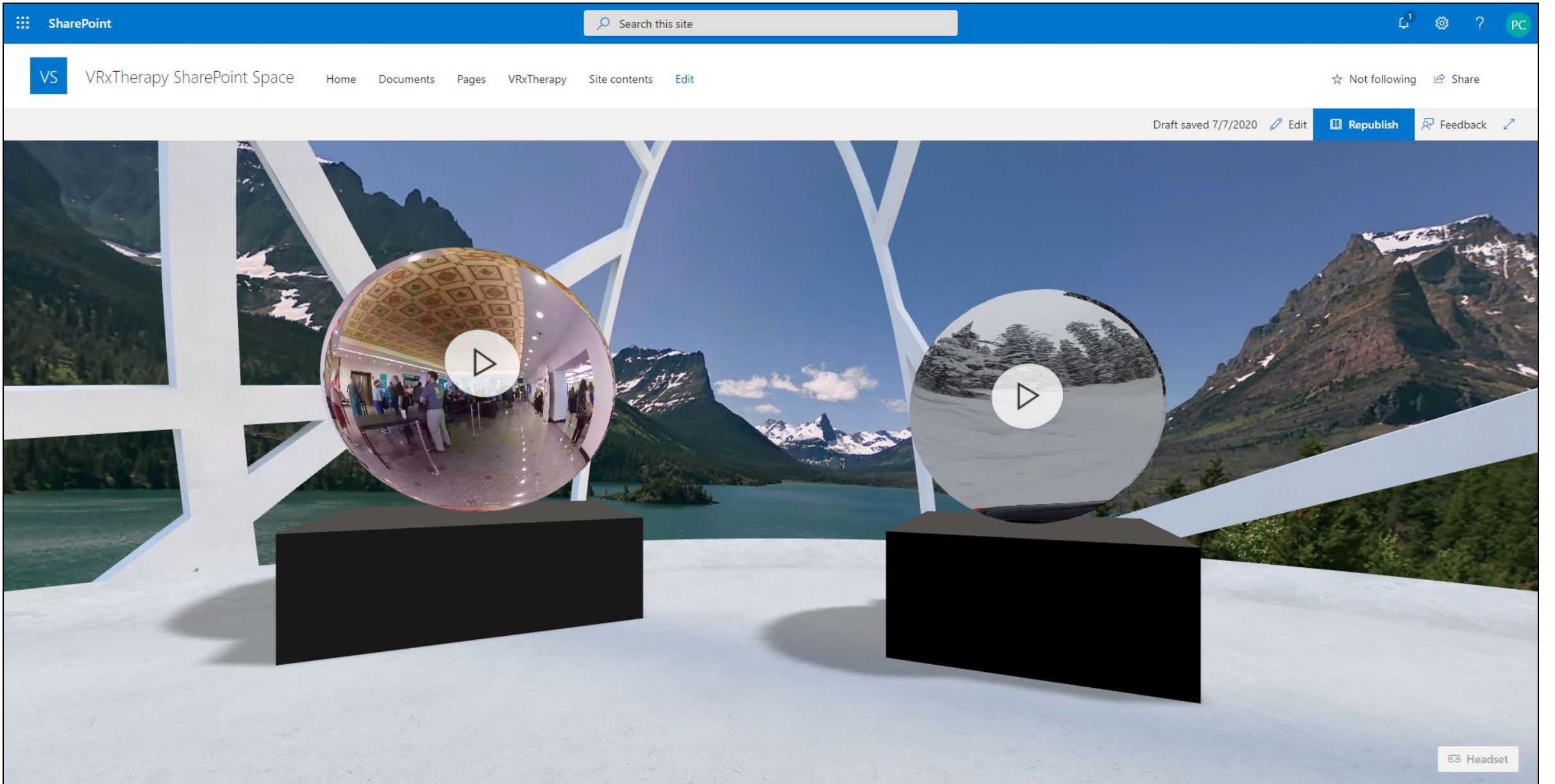
[Sharepoint Spaces](#)[Videos](#)[Research](#)[Books](#)

Sharepoint Spaces

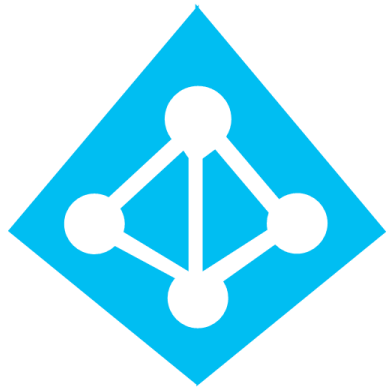
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[Go To Site →](#)



Azure AD B2B and Microsoft 365



- Azure Active Directory Business to Business
- External users can access Microsoft 365 and any other system exposed through AAD
- Completely free for external users in Teams and SharePoint Online
- Invite as many external users as you'd like

[Microsoft Azure AD B2B Articles](#)

Extranet User Manager – <http://eum.co>

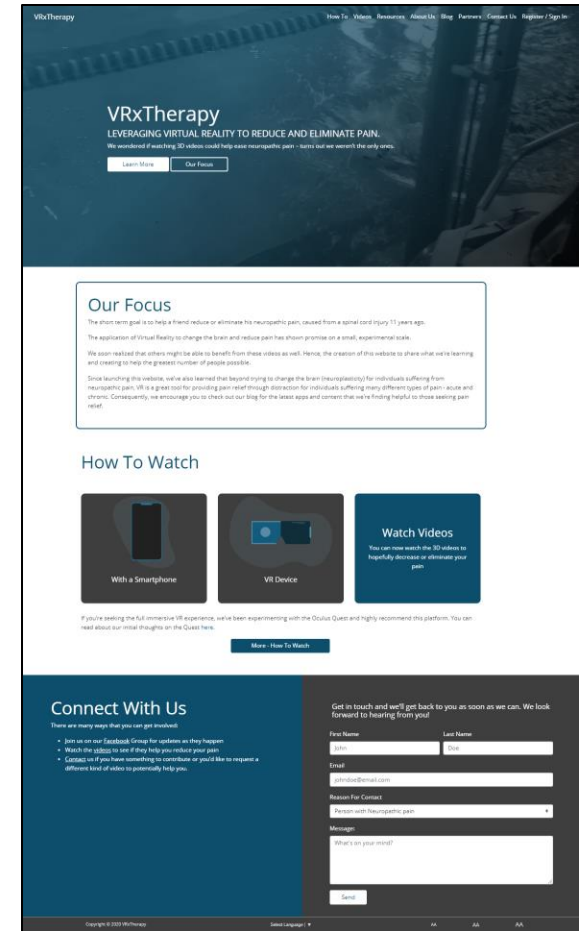
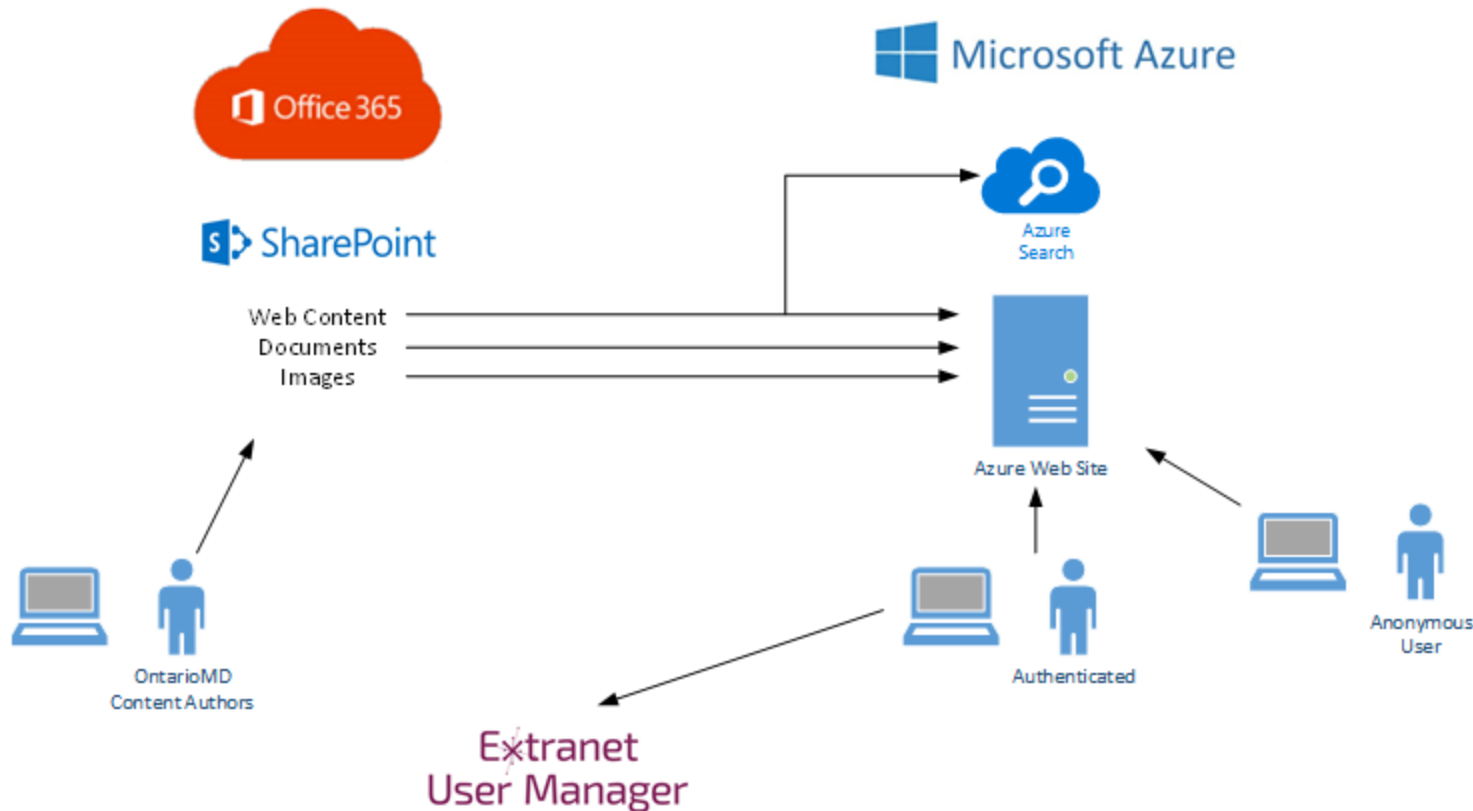
End User Features

- Fully brandable and customizable
- Mobile friendly adaptive design
- Register / Sign In
- Private and public registration links
- Manage your profile
- My apps / sites
- SPFx web parts for SharePoint and Teams

Admin Features

- Delegation to business owners
- Search, add, edit, and import users and groups
- Approval workflows
- System configuration
 - General settings
 - Federation Clients
 - Email templates
 - Office 365
 - Azure AD B2B
- Power Apps and Logic Apps connector
- Power BI dashboards
- Hosted in Azure or on premises

VRxTherapy and Extranet Publisher



www.vrxtherapy.org

Summary and Wrap-Up

- **Rob has noticed a change in intensity of neuropathic pain**
 - It can be part of the solution, both through distraction and therapeutic
- **Please visit www.VRxTherapy.org, and sign up for the newsletter**
 - Lots of resources and more coming
- **Facebook page at www.facebook.com/VRxTherapy**
- **SharePoint Spaces is still in preview and evolving, but come try it out if you have a VR headset**
 - Oculus Quest is ideal
- **Share what we're doing on Facebook, Twitter, LinkedIn**
- **More on Extranet User Manager at <http://eum.co>**



All Presentations

- **Monday July 6, 11pm BST / 6pm EDT
#160 Teams and Office 365 External
Users – Unstructured and Structured**
- **Tuesday July 7, 8pm BST / 3pm EDT
245 Teams, Office 365 Groups and
Modern Sites Provisioning and
Governance**
- **Tuesday July 7, midnight BST / 7pm
EDT
#373 - Leveraging Virtual Reality to
Reduce and Eliminate Pain**
- **Wednesday July 8, 12pm BST / 7am EDT
#318 - Teams and Office 365 External
Users - Unstructured and Structured**
- **Wednesday July 8, 4pm BST / 11am EDT
337 Teams, Office 365 Groups and
Modern Sites Provisioning and
Governance**



Join the Post-Presentation Break Out

<https://gotteams.fans/brk373>