

The VIPA Study – Investigating Virtual Immersive Experiences in the Management of Chronic Pain

Edify Fireside Chat

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ORBITAL | MEDIA



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NHS Foundation Trust

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@VRMedicsNorwich

Agenda For Today's Talk

- 1. The Burden of Chronic Pain**
- 2. Virtual Reality for Pain**
- 3. The VIPA Methodology**
- 4. Our Preliminary Results**
- 5. The Participant Experience**





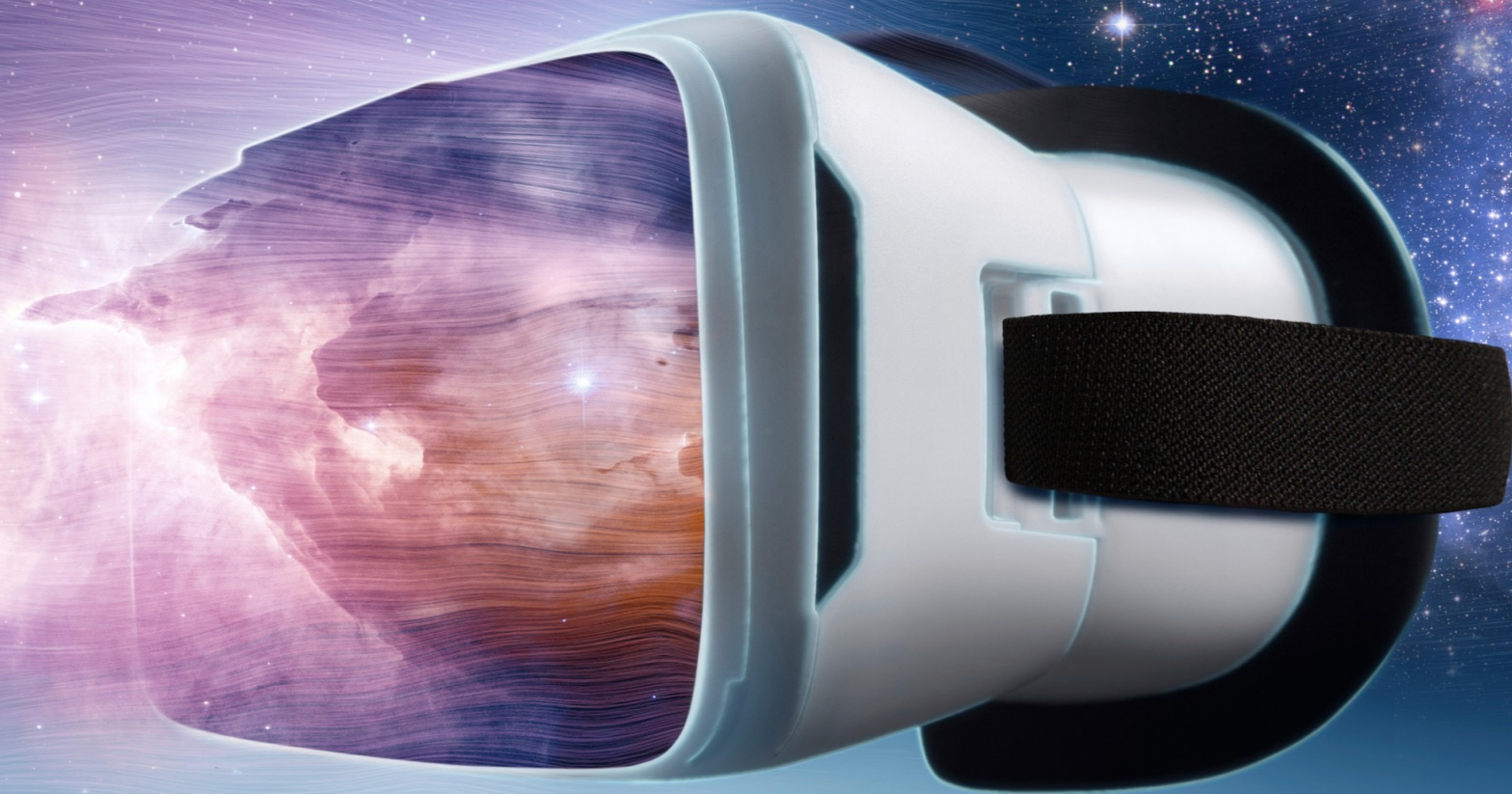
The Burden of Chronic Pain

Just under 23 million suffer with chronic pain
(Fayaz et al, 2016)

Non-pharmacological options recommended
although variable accessibility
(NICE, 2020 & EULAR, 2017)

High numbers of opioids prescribed
(COPERS trial, 2018)

What is Virtual Reality? (VR)



Why might it be useful for pain?

Accessible treatments at home

Unique possibilities through immersion

'Hijack' the brain through feelings of presence



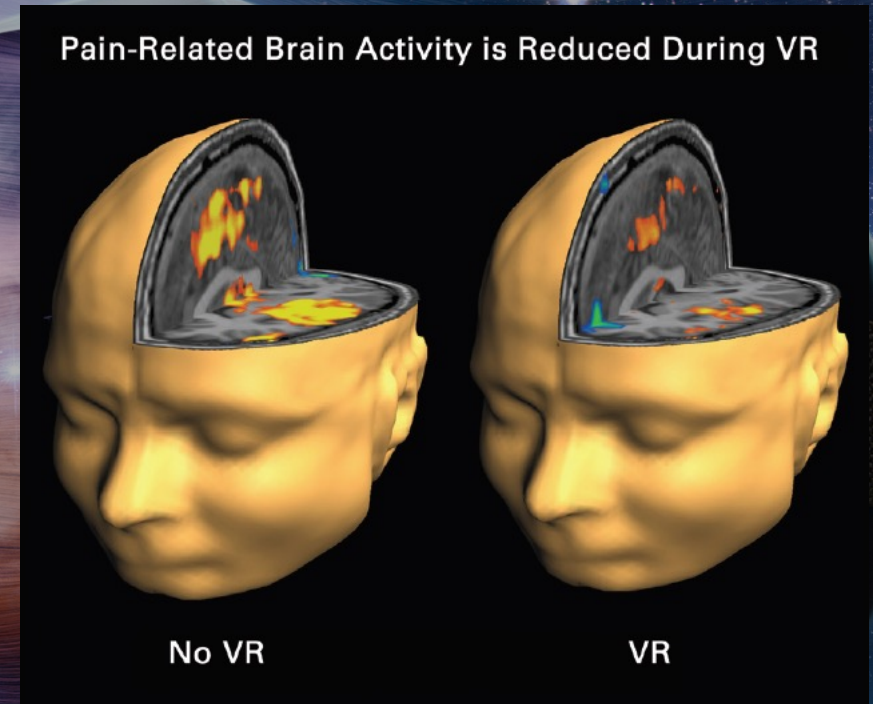
Evidence in Acute Pain



Spiegel et al (2019): n=120

Greater reduction in pain with VR compared to a 2D video ($p < 0.04$)

Significant results persisted at 72-hours ($p = 0.04$)



Hoffman et al (2004): n=8

Reduction in pain-related brain activity during VR ($p < 0.002$)

Evidence in Chronic Pain

- A Different Entity – The Biopsychosocial Model
- Multiple Chronic Pain Conditions – Different Phenotypes & Mechanisms
- Only small pilot studies with heterogenous groups reported

Jones et al (2016)

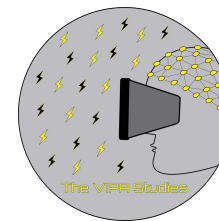


Reduction in pain from pre to post VR session by 33%
($p < 0.002$)

Heterogenous groups, small sample size ($n=30$)



The VIPA Study



Industry-Academic collaboration over the last 2 years: Co-development

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UEA
University of East Anglia



Fusion of different expertise:
Pain expertise, Computer Sciences,
Neurosciences, Game Design, Psychology

Multiple sources of competitive funding

EiRA

ActionArthritis

British Society for Rheumatology



The Experiments



Acceptability and Influence on Pain



~ 30 Participants with
Fibromyalgia/Post-TKR
Chronic Pain



OP Clinics at NNUH
& Addenbrookes

1. Four VR Systems
2. Two VR Environments
3. Four VR Cognitive Tasks
4. A Brain-Computer Interface



Data Collection – Experiment 1



1. Four VR Systems



Gear VR



Oculus Go



Oculus Quest



Oculus Rift S

McGill Pain Questionnaire (Short Form)

	0	1	2	3	4	5	6	7	8	9	10
1. Pain intensity	0	0	0	0	0	0	0	0	0	0	0
2. Pain frequency	0	0	0	0	0	0	0	0	0	0	0
3. Pain duration	0	0	0	0	0	0	0	0	0	0	0
4. Pain interference	0	0	0	0	0	0	0	0	0	0	0
5. Pain relief	0	0	0	0	0	0	0	0	0	0	0
6. Pain tolerance	0	0	0	0	0	0	0	0	0	0	0
7. Pain awareness	0	0	0	0	0	0	0	0	0	0	0
8. Pain control	0	0	0	0	0	0	0	0	0	0	0
9. Pain impact	0	0	0	0	0	0	0	0	0	0	0
10. Pain management	0	0	0	0	0	0	0	0	0	0	0
11. Pain coping	0	0	0	0	0	0	0	0	0	0	0
12. Pain adaptation	0	0	0	0	0	0	0	0	0	0	0
13. Pain acceptance	0	0	0	0	0	0	0	0	0	0	0
14. Pain tolerance	0	0	0	0	0	0	0	0	0	0	0
15. Pain control	0	0	0	0	0	0	0	0	0	0	0
16. Pain impact	0	0	0	0	0	0	0	0	0	0	0
17. Pain management	0	0	0	0	0	0	0	0	0	0	0
18. Pain coping	0	0	0	0	0	0	0	0	0	0	0
19. Pain adaptation	0	0	0	0	0	0	0	0	0	0	0
20. Pain acceptance	0	0	0	0	0	0	0	0	0	0	0

Pain VAS (written, before/after)

Written Pain Visual Analogue Scale

Please mark a vertical line on the scale below to show how bad your pain is at the moment. The left end of the line means no pain at all, the right end of the line means the worst pain possible.

No pain _____ Worst possible pain

Subjective Experience Questionnaire (after each and at the end)

This headset was the most comfortable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This headset was the easiest to use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was the most immersed in the VR activity when using this headset	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Data Collection – Experiment 2



2. Two VR Environments



V
S



Oculus Rift S



64ch Active
Electrode
EEG



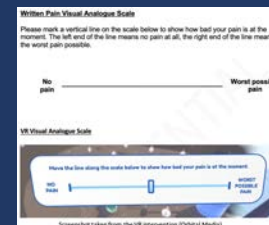
McGill Pain
Questionnaire
(Short Form)

The McGill Pain Questionnaire (Short Form)

Indicate the extent to which you have experienced each of the following words or phrases in each of the preceding 24 hours (0 = none at all, 3 = worst imaginable)

	None at all	Mild	Moderate	Very severe
1. Aching	0	1	2	3
2. Burning	0	1	2	3
3. Stinging	0	1	2	3
4. Hot	0	1	2	3
5. Cold	0	1	2	3
6. Tingling	0	1	2	3
7. Itching	0	1	2	3
8. Prickling	0	1	2	3
9. Sharp	0	1	2	3
10. Dull	0	1	2	3
11. Stabbing	0	1	2	3
12. Cramping	0	1	2	3
13. Throbbing	0	1	2	3
14. Stinging	0	1	2	3
15. Burning	0	1	2	3
16. Hot	0	1	2	3
17. Cold	0	1	2	3
18. Tingling	0	1	2	3
19. Itching	0	1	2	3
20. Prickling	0	1	2	3
21. Sharp	0	1	2	3
22. Dull	0	1	2	3
23. Stabbing	0	1	2	3
24. Cramping	0	1	2	3

Pain VAS
(written
and VR)



Subjective
Experience
Questionnaire
(between and
after)

Subjective Experience Survey – After Experiencing Both Environments

This questionnaire is intended to understand your experience of each of the VR environments/weather conditions. Please read each question carefully, compare your experiences of each type of VR environment, and answer as honestly as possible.

1. For each environment, please indicate whether there was an effect on your pain:

Environment	Yes It increased my pain	Yes It decreased my pain	No It did not affect my pain
Green Environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Snowy Environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Data Collection – Experiment 3



3. Four VR Cognitive Tasks



**Boat Game:
Rail Shooter task**



**Farming Game:
Management/Multi-task**



**Sequence Game:
Memory-based task**



**Vine Matching:
Match-3 task**

Oculus
Rift S



64ch Active
Electrode
EEG



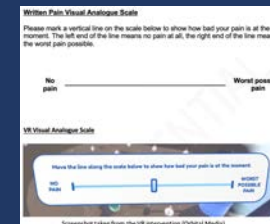
McGill Pain
Questionnaire
(Short Form)

The McGill Pain Questionnaire (Short Form)

Number the tick in the box for the descriptor that best describes the nature of the feeling you are experiencing. Tick only one box for each descriptor.

	None	Mild	Severe	Very Severe
1. Aching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Burning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Stinging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Hot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Freezing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Itching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Tingling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Numbness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Heavy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Tired	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Weak	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Dizziness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Faintness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Lightheadedness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Headache	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Drowsiness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Irritability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Nervousness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Frustration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Annoyance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Impatience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Sadness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Loneliness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Helplessness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Fear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Shock	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Stupor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Total inability to concentrate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Total inability to think	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Total inability to remember	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Total inability to feel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Total inability to move	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Total inability to speak	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. Total inability to hear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. Total inability to see	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Total inability to taste	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. Total inability to smell	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. Total inability to feel touch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. Total inability to feel temperature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. Total inability to feel pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. Total inability to feel anything	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Pain VAS
(written
and VR)



Subjective
Experience
Questionnaire
(between and
after)

Subjective Experience Survey – After Experimenting All VR Activities

This questionnaire is intended to understand your experience of each of the four VR activities. You will be asked specific questions on each of the VR activities. Please read each question carefully, reflect carefully on your experience of the VR activity being asked about, and answer as honestly as possible.

5. Finally, we will be asking you generic questions which are relevant to all of the activities.

Please rate your level of agreement with each of the following statements on the 5-point scale provided:

	1 (Strongly Disagree)	2 (Disagree)	3 (Neutral)	4 (Disagree)	5 (Strongly Agree)
Overall, using VR was enjoyable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall, the VR was engaging	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall, the VR was informative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall, the visual quality of the VR was satisfactory	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Data Collection – Experiment 4



4. A Brain-Computer Interface

Boat Game:
Rail Shooter
task



Oculus
Rift S



64ch Active
Electrode
EEG



McGill Pain
Questionnaire
(Short Form)

The McGill Pain Questionnaire (Short Form)

Directions: Put a tick in the box for each descriptor that best describes your level of pain at each of the following times. You should tick at least one box in each row.

	None	Mild	Severe	Very Severe
1. Aching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Burning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Stinging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Itching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Tingles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Prickling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Stabbing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Sharp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Dull	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Stinging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Hot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Cold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Tingling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Crawling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Itching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Burning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Stinging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Sharp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Dull	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Stinging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Hot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Cold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Tingling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Crawling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Itching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Burning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Stinging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Sharp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Dull	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Stinging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Hot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Cold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Tingling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. Crawling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. Itching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Burning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. Stinging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. Sharp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. Dull	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. Stinging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. Hot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42. Cold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43. Tingling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44. Crawling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45. Itching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
46. Burning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. Stinging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48. Sharp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
49. Dull	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50. Stinging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51. Hot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
52. Cold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
53. Tingling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
54. Crawling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55. Itching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
56. Burning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
57. Stinging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
58. Sharp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
59. Dull	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
60. Stinging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
61. Hot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
62. Cold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
63. Tingling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
64. Crawling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
65. Itching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
66. Burning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
67. Stinging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
68. Sharp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
69. Dull	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
70. Stinging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
71. Hot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
72. Cold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
73. Tingling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
74. Crawling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
75. Itching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
76. Burning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
77. Stinging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
78. Sharp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
79. Dull	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
80. Stinging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
81. Hot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
82. Cold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
83. Tingling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
84. Crawling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
85. Itching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
86. Burning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
87. Stinging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
88. Sharp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
89. Dull	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
90. Stinging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
91. Hot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
92. Cold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
93. Tingling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
94. Crawling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
95. Itching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
96. Burning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
97. Stinging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
98. Sharp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
99. Dull	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
100. Stinging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
101. Hot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
102. Cold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
103. Tingling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
104. Crawling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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227. Stinging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
228. Sharp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
229. Dull	<input type="checkbox"/>	<input type="checkbox"/>		





Preliminary Results

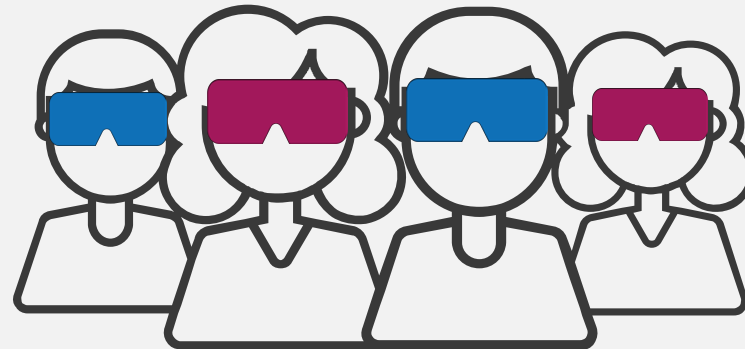


Experiment 1 (n=13)

Acceptability



▲ High levels of agreement with 15 acceptability statements



Perceptions

▲ 100% agree they would be open to regular VR use at home for pain treatment



Pain



▼ 48.2% reduction in McGill Pain Questionnaire Scores*

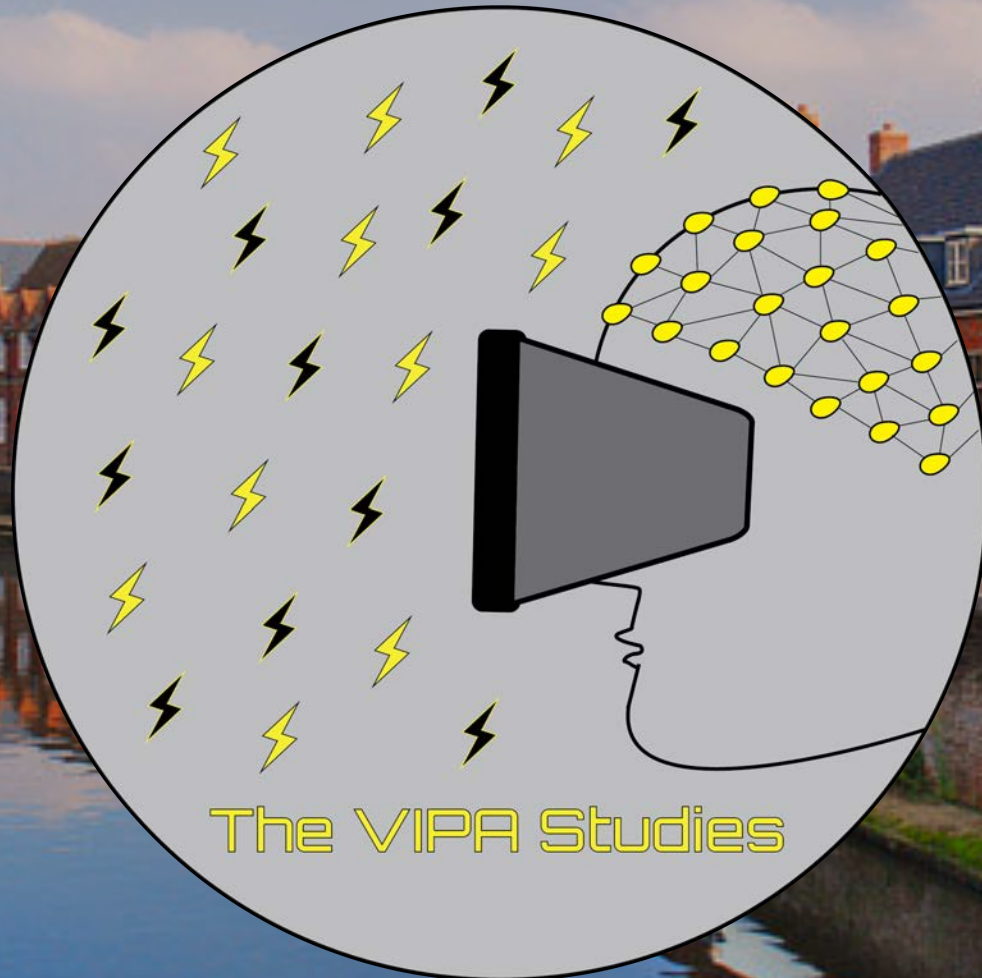
*Statistically Significant
(Wilcoxon Signed Rank, $p < 0.05$)

In Summary

- 1. Chronic pain is a both prevalent and difficult to treat**
- 2. Our early results are encouraging in Fibromyalgia Syndrome**
- 3. Further pain and neurophysiological data will offer further insights**
- 4. Feasibility results need confirming in larger studies**
- 5. The future is bright! Therapeutic VR has enormous potential**

Thank you!

Any Questions?



NHS
Norfolk and Norwich
University Hospitals
NHS Foundation Trust

Addenbrooke's **NHS**
NHS Trust

UEA
University of East Anglia

ORBITAL | MEDIA

 @VRMedicsNorwich

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