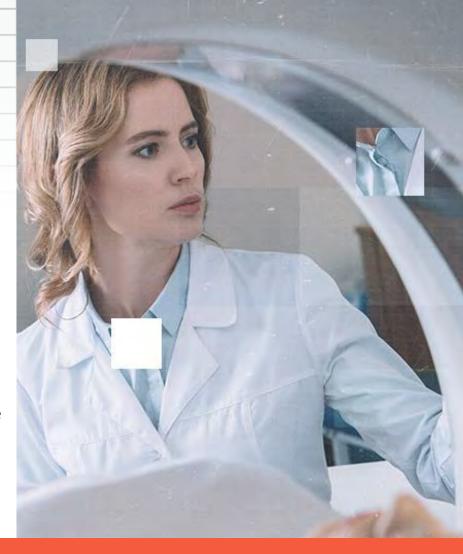
KEY LEARNINGS - ISAVE

ISAVE in NHS

- * Realism works: VR environments elicit authentic anxiety responses, preparing patients effectively.
- * Impact stories: Patients who previously cancelled multiple MRI scans felt able to attend after using iSAVE.
- * Clinician feedback: Radiographers and pediatric specialists saw opportunities for integration into referrals, play therapy, and community use.
- * Accessibility matters: Patients and clinicians stressed the need for inclusivity for all, including age, disability, neurodivergence and setting. Digital Healthcare has the ability to transform the industry, but also risks excluding certain groups of patients due to issues around digital literacy, etc.
- * Access: Pressure on staff limiting bandwidth for pilots and integration.



It offers a realistic and engaging experience that helps patients feel more prepared and less anxious before their MRI examination. The tool is easy to use, reliable has been a valuable support in my clinical practice.

Stéphanie Podgorski, Psychologue, Hôpital de la Citadelle

ELE STRESS

Police Absence & Mental Health

• In 2023, UK police officers took 774,000 mental health-related absence days, costing an estimated £116M annually (£150 per lost shift).

NHS Staff Turnover & Mental Health Costs

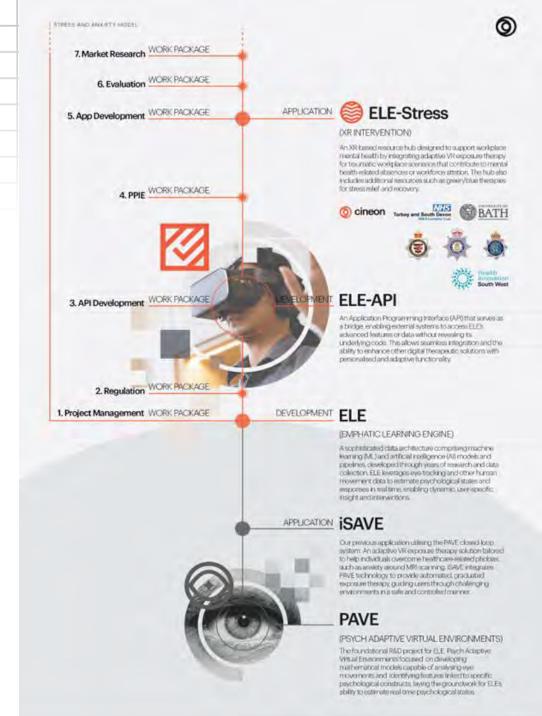
- 11.7% turnover in NHS England means 140,000 staff leave annually, with each nurse replacement costing ~£4,500.
- 7M+ working days lost in 2022 due to stress, depression, or anxiety, worsening staff shortages and patient care.

Excessive Support Waiting Times

IAPT services have 15+ month wait times in some regions. Even in best cases, 1 in 4 patients wait over 90 days, delaying treatment and worsening conditions.

Stigma & Accessibility Barriers

Emergency workers often avoid seeking help due to job security concerns and stigma. Uptake of employer-provided counselling is low due to scheduling issues and perceived ineffectiveness.



MEASURING OUTCOMES

How are we measuring success?

Planned Trials:

• NHS staff and Police service evaluations through University of Bath and Torbay & South Devon NHS Trust (Return to Practice Scheme).

Key Metrics for Efficacy:

- Al model accuracy in detecting changes in anxiety and stress
- Improvement in self-reported well-being
- Qualitative feedback on usability and engagement

METRIC MORE PSYCHOLOGICAL ESTIMATE STRESS WORKLOAD Tom Arthur¹ ; GJ Melendez-Torres : David Harris ; Sophie Robinson ; Mark Wilson 1 (2); Sam Vine 1 (2)

Post Project

Longitudinal tracking would look at the impact on workforce retention in terms of a decrease in absenteeism and attrition rates.

A clinical evaluation of the tool would determine its efficacy in reducing anxiety and stress. Further funding (NIHR) would allow us to undertake this clinical evaluation and achieve IIa medical device classification.

Evaluation Strategy

Health Innovation Network South West are assisting us in creating and delivering our evaluation strategy for measuring success and ensuring regulatory compliance post project.

Extended Reality Interventions for Health and Procedural Anxiety: Panoramic Meta-Analysis Based on Overviews of Reviews



EXPOSURE SCENARIOS - EM



Exposure Therapy Content



Aggression or belittling from patients or their relatives

- Feel threatened
- Doing the best to help, what more could be done
- Play out possible scenarios what if they have a knife?
- Hypervigilant plan escape and withdraw when possible
- Defensive to protect oneself
- Support from colleagues



Witnessing pain and suffering of others, not always under own care

- Desperate to help, but not able to - conflict between personal values and protocol
- Responsibility do something, can't let them down
- Feel sadness, guilt, empathy
- Take control, reprioritise, work harder, gather info
- Keep thinking about it after



Decisions and judgments are ignored or questioned

- Question why they didn't trust decision - self-doubt
- Lowers confidence and self-worth
- Feel undermined, insecure and dejected
- Prove them wrong
- Disengage or dismiss can't make them listen

EXPOSURE SCENARIOS - POLICE



Exposure Therapy Content



Overwhelming and highpressure work environment

- Unrealistic expectations
- Pressure & hostility from others. Feel out of control
- Lower self-confidence & selfworth - feel like a failure
- Frustrating and unfair
- Work harder and faster to keep on top, but doesn't solve core problems



Secondary trauma from calls with vulnerable and distressed victims

- Desperate to help, but can't always stay on the line
- Want to make it better, but not always clear how helpless
- Responsibility worry about letting the victims down
- Question abilities and dwell
- Double-check decisions/info



Decisions and judgments are ignored or questioned

- Question why it wasn't good enough
- Doubt own judgment and value of work
- Feel undermined
- Vent to colleagues
- Conflict between decisions on risk vs resource - tension
- Influence future decisions

SUPPORT WE NEED

- *NHS / Social Care Pilot Partners: To integrate iSAVE into diagnostic pathways and co-develop ELE-Stress in real-world frontline contexts.
- *Evidence Building: Clinical evaluations, service data, and impact measurement to accelerate adoption.
- *Navigation Support: Guidance on NHS procurement, regulatory pathways, and scaling across Trusts.
- *Funding & Collaboration: To refine, scale, and expand ELE's applications in healthcare and occupational wellbeing.

Why this matters

For patients: Reduced anxiety, improved access, better outcomes.

For clinicians: Less sedation, improved workflow, more reliable scans.

For the NHS: Cost savings, improved throughput, community-based prevention.

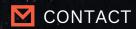
For the workforce: Scalable, stigma-free support for stress and burnout.







THANK YOU



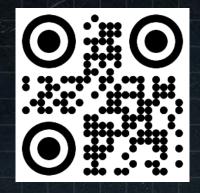
Tel: 01392 444111

Email: info@cineon.ai



Science Park, 6 Babbage Way, Exeter EX5 2FN





www.cineon.ai





Introducing the Team





20 YEARS

Building immersive experiences

7
World's firsts

from live-streaming to medical experiences

15+ awards

Including 5G & HR innovation awards







In November 2019, Mativision received the **Digital Catapult Platinum Award** which celebrates the eight companies, chosen among more than 250, judged to best demonstrate the diversity and richness of the UK's tech ecosystem.







Introducing the Team Global Customer Base













Augmented Reality

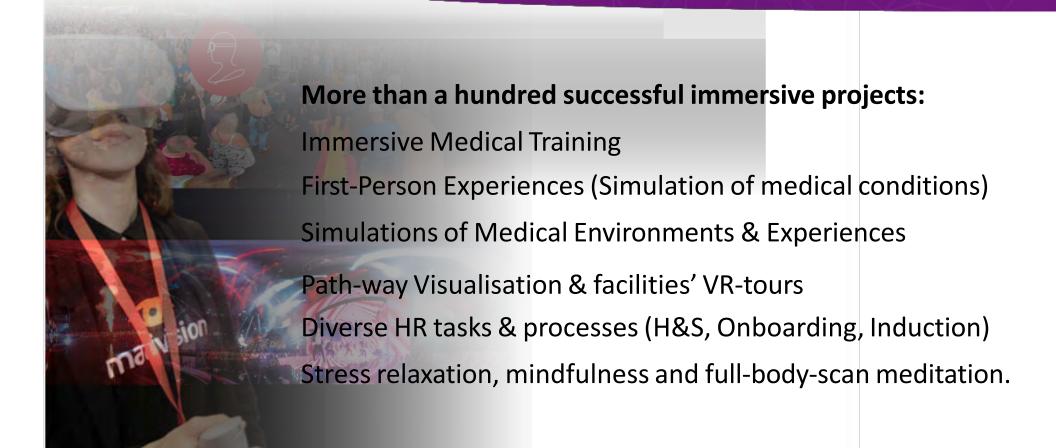


Mixed Reality











The Problem we are trying Tosolve: STRESS IN PATENTS



Key fact:

Stress in Patients affects not only their mental state but also the effectiveness of treatment.

"Stress has a profound impact on how your body's systems function" *Lorenzo Cohen, Ph.D.*

"Chronic stress can help cancer grow and spread," **Anil K. Sood, M.D.**, professor of Gynecologic Oncology and Reproductive Medicine at MD Anderson Cancer Centre- Univ. of Texas.



The Solution: **ESCAPEVR**



(R)TM



ESCAPEVR ®TM is

Mativision's turn-key VR-based solution for stress relief, relaxation and mindfulness in diverse healthcare settings.



The Solution: Who is it for?





ESCAPEVR^{®™} can be used in a wide range of healthcare settings:

Chemotherapy Infusion Wards can offer their patients a means to escape to relaxing and non-stressful environment during infusions,

Pre-Op & Pre-Test. Healthcare facilities can help patients reduce their stress and anxiety while waiting to undergo testing or operations,

Healthcare Staff can considerably reduce their stress during short breaks, by virtually escaping to relaxing environments.



The Solution: Description of parts





ESCAPEVR ^{®™} is a **turn-key VR** solution including:

- one or more specially selected VR Headsets pre-loaded with the ESCAPEVR®™ application,
- A library of curated high-quality relaxing 360-video content, produced on-purpose by Mativision,
- A number of VR Fun & Relaxing Games for distraction,
- A purpose-produced Immersive Full Body-Scan Meditation Module,
- Additional immersive tours of selected destinations (option).



The Solution: Howit is used





The user, while seated, wears a comfortable **VR Headset** which isolates them from their surroundings and immerses them in the virtual environment of their choice.

Through the VR Headset and the **ESCAPEVR** ^{®™} application, the user «escapes» to a relaxing, calm natural setting.

The environments are carefully selected and are presented through high-quality 360-degree videos which create an experience surrounding the user.

The user can look around simply by turning their head, as they would do, naturally, if they where physically in the actual location they are immersed in.



The Solution: User Friendliness



A simple and friendly menu structure helps the user navigate the immersive content, make selections and enjoy the experiences and games.





Key Learnings So Far: Field Tested and Proven



Statistics following two years of Escape VR used in a number of large hospitals in UK, Europe & USA



Key Learnings So Far: Field Tested and Proven



the experience to

others



Were more

relaxed

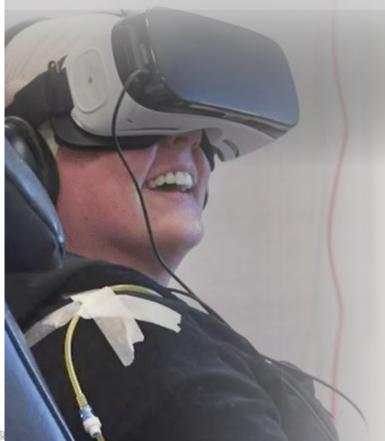
positive

Experience



Key Learnings So Far: Field Tested and Proven





The average reduction of anxiety in patients when using VR during chemotherapy treatment is

65%



Key learnings So Far: Field Tested and Proven (most recent – Q2Q3 2024)



Trial run over three weeks within Ambulatory Clinic and Pre-Theatre setting CORK UNIVERSITY MATERNITY HOSPITAL, Wilton, Cork, Ireland

ASSESSMENT QUESTION	Not at all	Slightly	Somewhat	wiestly	Constantly	Did not answer
Did you feel distressed?	57%. (15)	11.5%. (3)	11.5 % (3)	11.5% (3)	3.8% (1)	3.8% (1)
Did you feel pain?	7.7% (2)	42.3% (11)	34.6% (9)	15.4% (4)	0% (0)	0% (0)
Did you feel in control?	3,8% (1)	11.5% (3)	11.5% (3)	19.2% (5)	42.3% (11)	11.5% (3)
Did you feel embarrassed?	61.5% (16)	23% (6)	7.7% (2)	3.8%(1)	0% (0)	3.8% (1)
Did you feel anxious?	50% (13)	25.9% (7)	11.5% (3)	7.7% (2)	3.8% (1)	0% (0)
Did you feel faint?	26.9% (7)	7.7% (2)	3.8%(1)	0% (0)	0% (0)	53.8% (14)

			Neither good		
ASSESSMENT QUESTION	Verygood	Good	nor poor	Very poor	Don't know
Overall, how was your experience of VR?	73% (19)	26.9% (7)	0% (0)	0% (0)	0% (0)
ASSESSMENT QUESTION	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I would choose this way of having a procedure if I were in the same situation again.	69.2% (18)	23% (6)	3.8% (1)	3.8% (1)	0% (0)









The product is available for rental in bundles of 3, 5, 10 or more VR Headset units.

Customers receive an all-inclusive, turn-key solution which includes everything and is ready to go.

For all bundles, there is an all-inclusive monthly rental cost with a minimum committed period of 3, 6 or 12 months.

The monthly cost per unit becomes more favourable with bundles of more units (5, 10 or more) and longer rental periods (6 or 12 months).



Market Traction: EscapeVR Users





Greece several locations

Use EscapeVR at the core of a twoyear-long, nationwide campaign involving several large hospitals in Greece, supporting women during their chemotherapy treatments



Essex/U K

Use multiple

EscapeVR units to provide relaxation, stress relief and immersive mindfulness to Chemotherapy patients



Chicago/US A

Use multiple

EscapeVR units to provide relaxation, stress relief and immersive mindfulness to patients across their 11 medical facilities



Baltimore/US

A

Use multiple

EscapeVR units to provide relaxation, to patients in the Chemotherapy Infusion centre and evaluate the merits of VR in mental health and wellbeing of patients and staff



Market Traction: Customer Testimonials



"The EscapeVR is a wonderful way to help relieve the anxieties of treatment or procedures, whether you are transported to a sunny beach or playing one of the games, our patients really love it."

Jo Dean, Hospital Director at Spire Healthcare Group plc.

"We've just begun our EscapeVR efforts, but the setup was easy and early feedback is positive from our nurses that this reduces stress."

Kali Arduini, Director, Innovation at Northwestern Medicine, Chicago, USA.

'We introduced the Mativision VR headsets with EscapeVR software to our chemotherapy unit to provide escapism for our patients receiving cancer treatment. The feedback has been vastly positive, particularly among the patients who use scalp cooling – with the headsets providing a much-needed distraction during the cooling process.'

Katherine Coy, Chemotherapy Lead Nurse, at Spire Hartswood Hospital, Spire Healthcare Group plc, UK.



The Support Weneed:





Introduction to potential customers (hospitals, institutions, Healthcare organisations)

Support to properly promote and advertise the product

Investment support to acquire the necessary equipment and infrastructure to enable the launch of a nation-wide rental service.

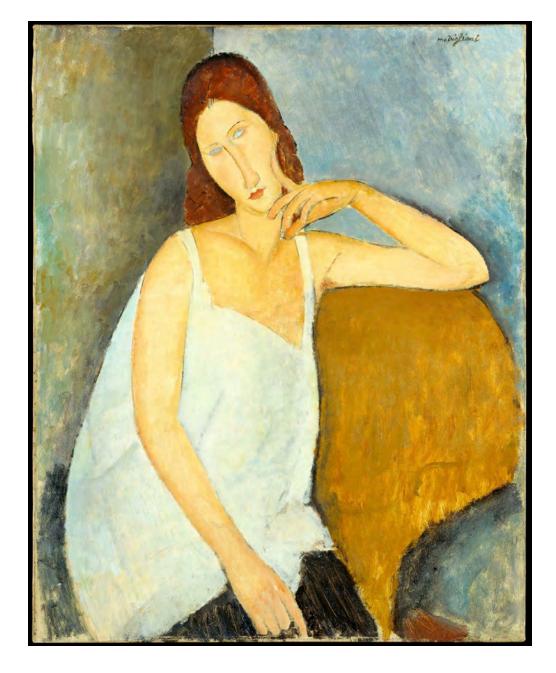
Support to enable further development and adaptation of the product to specific settings (Children, Mental health, Rehabilitation)





Transforming global mental health through scalable immersive therapies









Depression and anxiety: global problem

600,000,000+

More than half a billion people suffer from depression¹ & anxiety²

\$97bn

Total estimated direct expenditure on depression and anxiety treatment by healthcare systems globally

£1.05bn

The NHS spends over £1bn a year on talking therapies, with depression being by far the largest cost



Global problem:

561,000+km

The queue of people suffering from depression and anxiety would wrap around the world 14 times.

\$2.5tn

If you provided everyone with depression or anxiety talking therapies the total cost would exceed \$2tn a year.



The solution: Tend VR-MBCT A breakthrough VR-based MBCT course



Mindfulness Based Cognitive Therapy (MBCT) is an extremely effective, well proven therapy. It has no side effects, and can be given alongside other treatments.

However, MBCT is currently only available as an unscalable talking therapy.

Advances in VR technology have allowed us to create a breakthrough immersive adaptation of MBCT that is entirely scalable and can be delivered anywhere, any time, at vastly reduced cost.

First results n=12



Further results:



















UKRI/Mind feasibility study results:

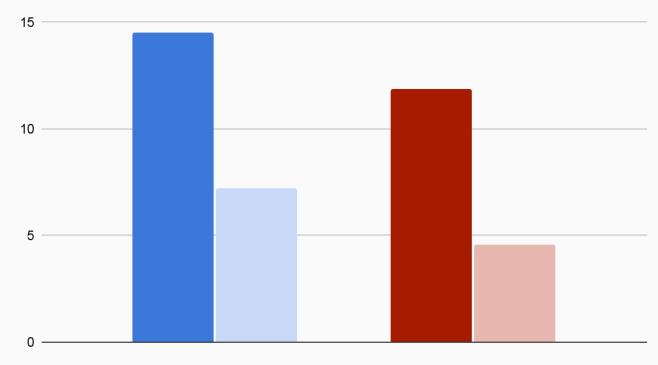
Large reduction in Depression (PHQ-9) from 14.00 to 7.7, with a reduction of -6.3 points

Large reduction in anxiety (GAD-7) from 12.02 to 5.74, with a reduction of -6.28

87% completion rate 87% of participants completed more than 4 sessions with an average 7.8/8 sessions completed

86% would recommend to friends and family

Mind/UKRI PHQ-9 and GAD-7 pre and post



Participant voices

- "I have ADHD and I've always wanted to be mindful, to be able to meditate but nothing I've ever tried has worked. **Tend** is different, Tend worked for me. It had a calming effect that took me out of my day to day life to see something, be somewhere else, without having to use imaginary visualisation techniques."
- "I've got hope. I've got hope that I'll be able to deal with certain things… you've got to be really kind to yourself, have compassion. It's taught me that if you are kind to yourself, take things slowly, who knows what might happen." Participant in CIRCE study.
- "It did help, definitely. I'm definitely trying to be nicer to myself, stop the critical self talk that I do all the time. One of my friends said 'you're so different, you're more open' I feel like I've got myself back a little bit." Participant in UCL/Retreat study
- "It brought back my belief in myself and my capabilities. I now feel that I can control my reactions better and it brought back my belief that my brain can do amazing things if I let it go it can improve my personal wellbeing" NIHR participant
- "I thought it was amazing. It really is the future of mental health for general anxiety and depression. I wish I'd had these tools when I was younger" Participant in UCL/Retreat study

How Tend works:

Tend is delivered either in community settings, such as at local Mind sites, or as a loaned headset from NHS Talking Therapies services. Users complete the course over 8-10 weeks before offboarding.



Headsets are held at shared sites, like Mind, or loaned to service users by NHS providers.



Users complete the course over a period of 8-10 weeks either at home or using shared headsets



Clinicians regularly check in with patients and then conduct final measures



The headset is then immediately ready for use by the next patient, radically reducing costs

Tend VR

2 to 5 times cheaper

Tend is two to five times cheaper than existing talking therapies. Tend's shared headset model is offered to trusts at £250 per patient for an 8 week course delivered at Mind or other third sector partners.

No waiting time

Patients that are not seen quickly are harder to treat It's vital that patients that are seeking help are seen by clinicians and offered treatment quickly.

>52% Reduction in PHQ-9 and GAD-7

Tend has averaged greater than 50% reduction in both GAD-7 and PHQ-9 Many patients with depression and anxiety are carers or even double carers with jobs, so giving them the option to fit treatment into their lives in a flexible way is vital

Tend VR-MBCT service

UK wide service

11 sites live

20+ sites going live soon across the country in London, Essex, Manchester, Harrogate, Wales and more

Live in our first NHS Talking Therapies Service

Starting pilots in another three trusts

Talking to partners in Scotland and Northern Ireland





TEND

Transforming the treatment of depression and anxiety for 600m people across the globe



In partnership with University College London and The Retreat York

Q&A













Realising the Promise of XR in Mental Health: Evidence, Implementation and **Implications for Health Inequalities**

Sam Vine, Tom Arthur & G.J. Melendez-Torres.





Virtual reality for treating agoraphobia and agoraphobic avoidance [GID-MT595]

Draft scope

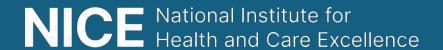
Medical technologies evaluation programme

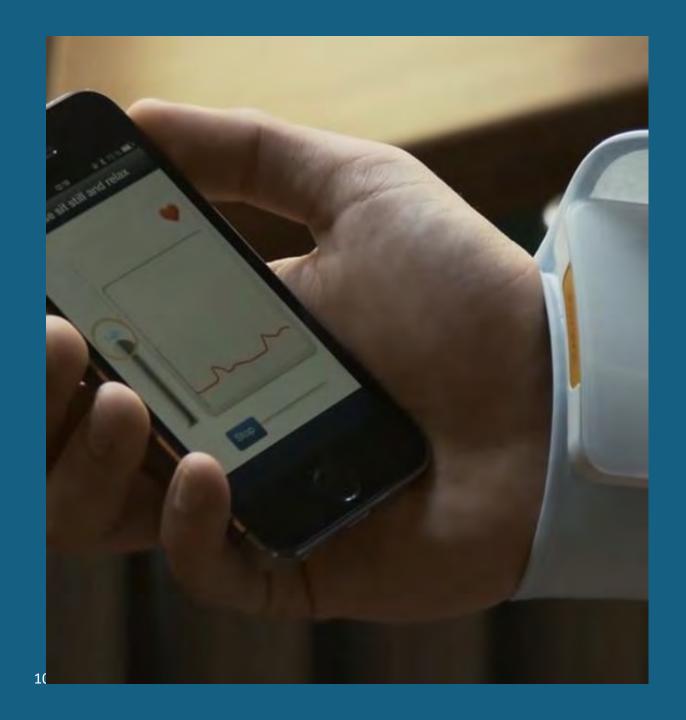
NICE National Institute for Health and Care Excellence



Early value assessment for Medtech

Actively drawing in medical devices, diagnostics and digital products that address national unmet needs. Providing quicker assessments of early value to identify the most promising technologies, conditional on further evidence generation.





Exeter Immersive

Research and capability in immersive technologies and techniques.

Health and Wellbeing



Creative, heritage and tourism



Training and Education









Talk in 3 short sections

- Evidence (for effectiveness)
- Equity
- Implementation

Procedure anxiety and phobia as a case study.







Evidence

Is VR effective?









Extended reality interventions for health and procedural

anxiety: An overview of reviews

Tom Arthur¹, Sophie Robinson¹, David Harris¹, Mark Wilson¹, Samuel Vine¹, GJ
Melendez-Torres¹

JOURNAL OF MEDICAL INTERNET RESEARCH

Arthur et al

Review



Extended Reality Interventions for Health and Procedural Anxiety: Panoramic Meta-Analysis Based on Overviews of Reviews

Tom Arthur, PhD; GJ Melendez-Torres, DPhil; David Harris, PhD; Sophie Robinson, MA; Mark Wilson, PhD; Sam Vine, PhD

Faculty of Health and Life Sciences, University of Exeter, Exeter, United Kingdom

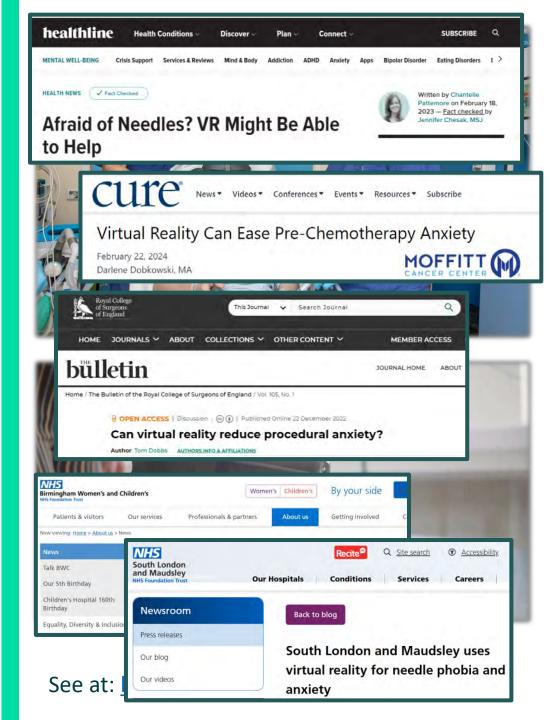


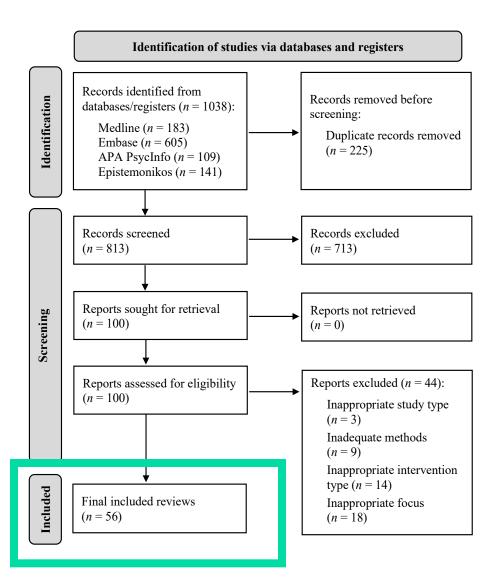
Background

- Health and procedural anxieties are a major barrier to uptake of medical services
- These impact on timely diagnosis and treatment (and are inequitably distributed)
- Virtual exposure is a promising method for addressing patient anxiety, though evidence is fragmented and inconsistent

RQ1: what is the quantity and quality of evidence for interventions' effectiveness?

RQ2: what are the mechanisms by which interventions can impact on health equity?





PRISMA flow chart of retrieved, screened and included articles

'Overview of Reviews'

We analysed research evidence that:

- 1. Is a Systematic Review
- 2. Focuses on 1+ XR interventions
- 3. Studies patient-directed outcomes for health and/or procedural anxiety

Searches undertaken in MEDLINE, Embase, Epistemonikos, and APA PsycINFO

Quality appraisals of methodologies performed using the AMSTAR-2 tool

Synthesis of review- and trial-level data and extracted summary information (study objectives and their headline findings)





	Distraction-based Intervention methods	Education- and Exposure-based methods	Combination of Intervention methods	
Acute medical operations and surgery	Paediatric groups: XR reduces anxiety 39.65.76 Adults: null effects 70 Quality assessments: appraised reviews were critically low in quality	Paediatric groups: XR reduces anxiety. 62.76.81 mixed evidence 39 Adults: inconclusive evidence 35 some positive effects 70 Combined groups: XR reduces anxiety. 41 Quality assessments: appraised reviews were critically low in quality	Paediatric groups: XR reduces anxiety 40,42,52 Adults: Combined groups: mixed evidence 22, positive effects 33 Quality assessments: appraised reviews were low/critically low in quality	Conclusions: XR. generally found to reduce patient anxiety, though evidence is lacking in quality and weaker in adults
Cancer treatment and rehabilitation	Paediatric groups: XR reduces anxiety 65,74,80 inconclusive data 63 Adults: null effects 59 Quality assessments: appraised reviews varied in quality	Adults: XR reduces anxiety. Quality assessments: appraised review was critically low in quality	Combined groups: null effects ⁶⁸ • Quality assessments: appraised review was low in quality	Conclusions: Mixed evidence for reducing patient anxiety
Dental procedures	Paediatric groups: XR generally reduces anxiety ^{57,65,67,78} ◆ Adults: lack of evidence ⁷⁸⁰ Quality assessments: appraised reviews were low/critically low in quality	Adults: XR reduces anxiety?" Quality assessments: appraised review was critically low in quality	Paediatric groups: XR reduces anxiety ³⁵ Combined groups: XR reduces anxiety ^{75,79} Quality assessments: appraised reviews were low/critically low in quality	Conclusions: XR generally found to reduce anxiety, methods differ between child and adult studies
Imaging procedures	No identified review evidence [©]	No identified review evidence ^O	Combined groups: positive but inconclusive evidence ⁵³	Conclusions: Conclusive data is lacking
Needle- related procedures	Paediatric groups: XR generally reduces anxiety ^{57,65,66,71-74} , inconclusive data ⁶⁰ Quality assessments: appraised reviews were low/critically low in quality	No identified review evidence [○]	Combined groups: XR reduces anxiety, but not significantly more than control methods Definition assessments: appraised review was low in quality	Conclusions; XR generally reduces anxiety in children, but evidence is poor in quality and lacking in adults
Wound care procedures	Paediatric groups: XR reduces anxiety ⁶⁰ Adulls: null effects ⁸³ Combined groups: XR generally reduces anxiety ⁵⁷ , null effects ⁷⁵ Quality assessments: appraised reviews were low/critically low in quality	No identified review evidence [◇]	Combined groups: XR reduces anxiety ^{37,38} Quality assessments: appraised reviews were critically low in quality	Conclusions: Mixed, generally positive supporting evidence but this is lacking in quality
	Conclusions: XR generally reduces paediatric anxiety, but evidence is poor quality and lacking in adults	Conclusions: There are emerging positive effects, though evidence is generally of poor quality	Conclusions: Mixed findings, likely reflective of different contexts and a lack of quality evidence	

Summary of Findings Table

'Overview of Reviews'

- Most reviews focus on managing procedural anxieties (e.g. relating to needle insertion, surgery, dental, or imaging operations)
 - ... OR they focused on more **general health anxieties** (e.g., relating to maternity, chronic treatment/rehab processes)
- Interventions used distraction, exposure,
 education, and rehab-based methods, and various
 XR equipment and protocols

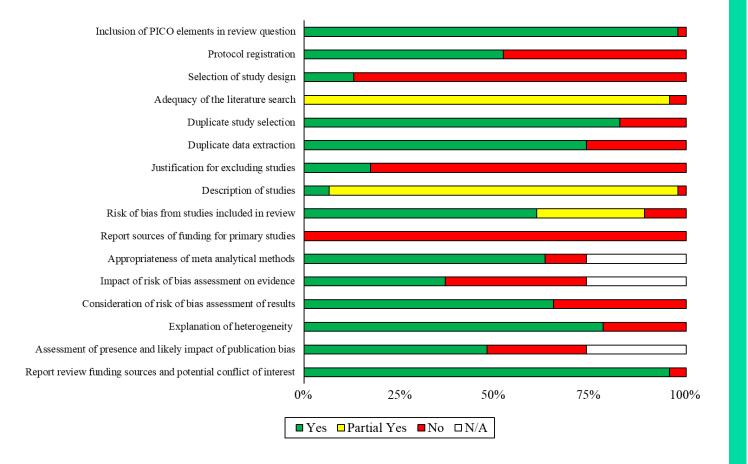








What is the quantity and quality of evidence for XR interventions' effectiveness?



- Only 2 reviews were appraised as 'moderate' quality, while the remaining were deemed to be of 'low' (n = 15) or 'critically low' (n = 29) quality.
- Panoramic meta-analyses support the generalised effectiveness across wideranging use cases and trials

However...

- 1. Trials are often low quality
- 2. The quality of reviews is poor
- 3. Enthusiasm for XR is not matched by data/evidence



Equity









What are the mechanisms by which interventions can impact on health equity?

	/ T Y / 100	Assessment (
Pathway characteristic	Focal technology	Target situation
Availability: system factors	Capacity to deliver XR interventions	Capacity to provide effective services
Accessibility: group factors	Design and extriences of digital tools	Barriers and burdens that affect uptake
Acceptability: individual factors	Possible adverse effects and/or poor adherence	preferences and needs of care

Taken from the *Tanahashi* (1978) framework

Innovate UK



What are the mechanisms by which interventions can impact on health equity?

Pathway characteristic	Focal technology	Target situation
Availability: system factors	Capacity to deliver XR interventions	Capacity to provide effective services
Accessibility: group factors	Design and experiences of digital tools	Barriers and challenges that affect uptake
Acceptability: individual factors	Possible adverse effects and/or poor adherence	Personal preferences and needs of care

Income. staffing, policy factors, transport/mobility issues, chronic conditions or disabilities, socioeconomic barriers, language proficiency, cultural beliefs

Overstretched health services and varying demands/resources faced by service providers?

Characteristics that limit or prevent certain communities from accessing health services?

Contextual/individual factors that affect how compliant and satisfied a patient is with care?

What are the mechanisms by which interventions can impact on health equity?

	The second secon	
Pathway characteristic	Focal technology	Target situation
Availability: system factors	Capacity to deliver XR interventions	Capacity to provide effective services
Accessibility: group factors	Design and experiences of digital tools	Barriers and challenges that affect uptake
Acceptability: individual factors	Possible adverse effects and/or poor adherence	Personal preferences and needs of care





Cybersickness, discomfort, inappropriate hardware/content, added time or resource demands

The ability to invest in, staff, and/or maintain XR technology in practice? Factors that influence the uptake of XR applications across diverse users and communities?

Potential for unpleasant user experiences or unsuitable XR programmes/applications?

Journal of the American Medical Informatics Association, 2025, 32(5), 945–957 https://doi.org/10.1093/jamia/ocaf047 Advance access publication 20 March 2025 Review



Review

Equity implications of extended reality technologies for health and procedural anxiety: a systematic review and implementation-focused framework

Tom Arthur , PhD^{1,*}, Sophie Robinson, MA,¹ Samuel Vine, PhD,¹ Lauren Asare, MPH,¹ G.J. Melendez-Torres, DPhil¹

Pathways to equity and inequity



Double Jeopardy / Single Impact Model



Accelerating inequity

XR can **activate** inequity in the same domain(s) as the target situation.

Incrementing inequity

XR could generate **additional** pathways to inequity in the target situation

Matching inequity with *equity*

XR could **address** inequity-generating mechanisms in the target situation

Pathways to equity and inequity



Double Jeopardy / Single Impact Model



Accelerating inequity

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Pathways to equity and inequity



Double Jeopardy / Single Impact Model



Accelerating inequity

XR can **activate** inequity in the same domain(s) as the target situation.

Incrementing inequity

XR could generate **additional** pathways to inequity in the target situation

Matching inequity with **equity**

XR could **address** inequity-generating mechanisms in the target situation

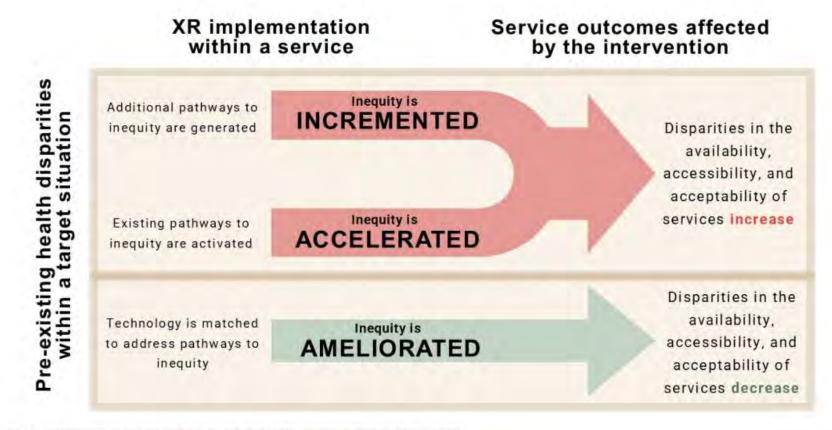


Figure 2. Schematic overview of the double jeopardy, common impact framework.



Practical considerations

Implementation



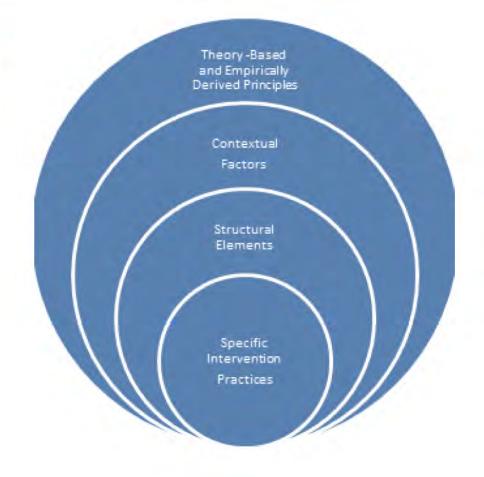


Delivery Components

These are the '**key ingredients**' that are likely to contribute to the effectiveness of a healthcare intervention.

- Some components will be part of the intervention's specific content/format, while others will relate to how it is broadly implemented in healthcare services.
- By identifying what these components are (and how they are linked with different outcomes and/or variables), you can map out precisely what an effective intervention looks like in your field.





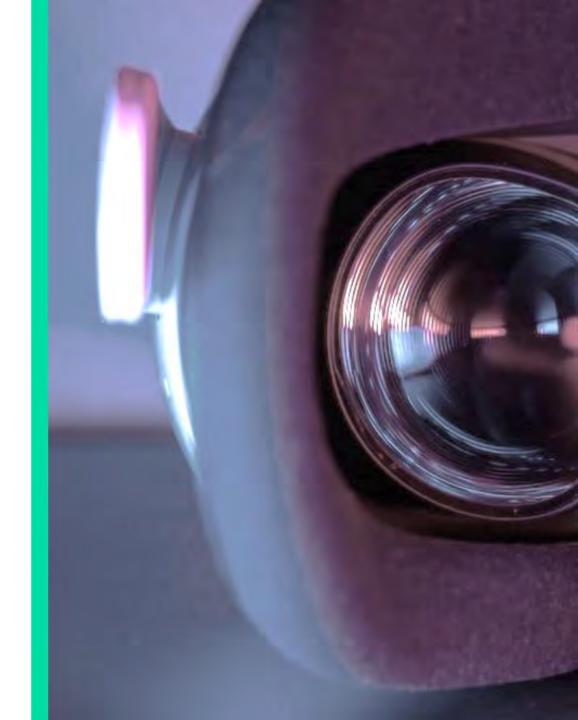
Blase & Fixsen (2013) *US Department of Health and Human Services.*



Intervention Component Analysis (ICA)

Based on the aforementioned evidence, we have focused on the following delivery components:

- 1. Pre-intervention checks
- 2. Accompanying material
- 3. Post-intervention support





1. Pre-intervention checks

Before XR-based technologies are used, it is important to establish how they are set up in terms of:

- Practical support (e.g. for IT systems)
- Digital inclusion and accessibility
- Patient Orientation
- User expectations

Therefore, there is a need to optimise the precise form, timing and instructions associated with an XR intervention, in order to maximise any positive effects.



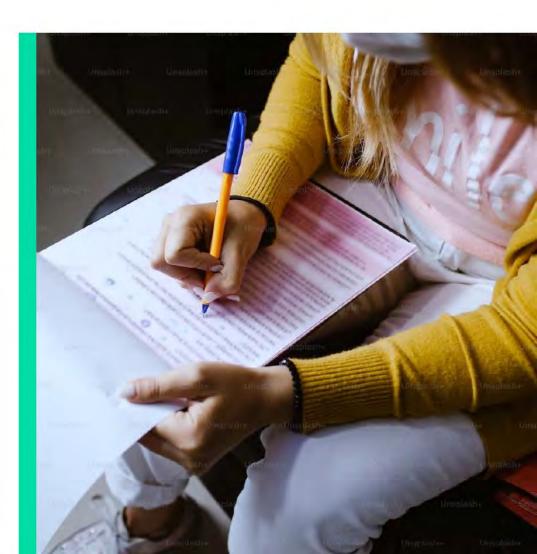


2. Accompanying material

Considerations should be made about the provision of various supporting information, such as:

- Relevant user instructions
- Recommendations for using XR
- Appropriate technical support
- Needs assessments?
- Appraisal and monitoring practices?
- Opportunities to ask questions?

The next page outlines key analogues that support VR in radiotherapy settings



Examples of Accompanying Material that have been used in previous intervention studies

Ashmore 2019	A preparation book was developed to support the [VR] app. allowed for closer interaction between the child, health play specialists, radiographers, and parents and to provide a choice of resource for the patient contained photos highlighting the same parts of the MRI journey as the app, maintaining consistency of persons acting as radiographers and parents
Gao 2022	The VR experience was also supported by explanatory material this content includes personalized and psychological care for the patient, explaining the importance of positioning during radiotherapy procedures
Jimenez 2017	The VR intervention featured an educational programme consisted of an introduction to the VR system/education session and information about the technical components of radiotherapy (e.g., concepts of immobilisation, simulation, and planning/treatment details pertinent to the breast cancer patients)
Sule-Suso 2015	At the end of the exercise, patients filled in a needs assessment questionnaire comprised of eight items, seven of which were statements relating to tumour visualisation/radiotherapy, while the eighth invited any other comments or observations



Future work should seek to optimise the exact design and content of these delivery components.

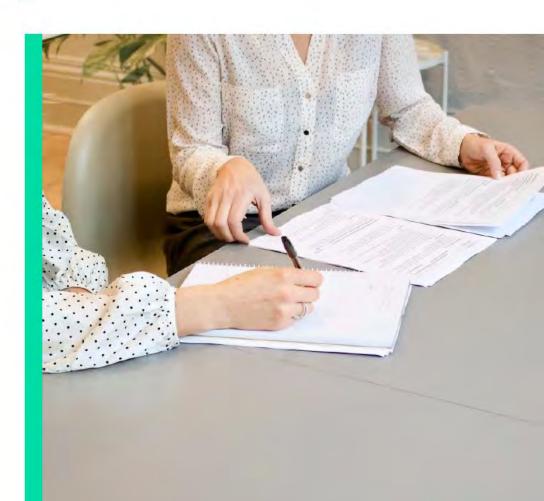


3. Post-intervention support

There is a lack of information in relation to the processes that occur upon completion of XR-based interventions. Considerations must be made to sufficiently:

- Address user questions and concerns
- Share relevant expertise

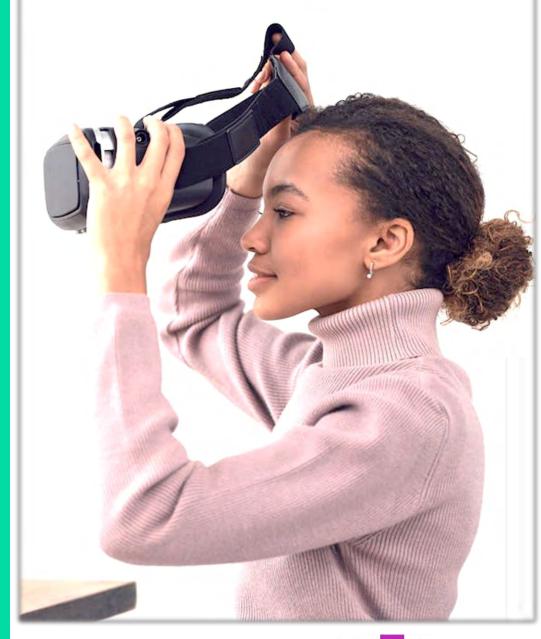
As such, there is a further **need to optimise the precise form, personnel, timing, and instructions** associated with these future XR programmes.





Conclusions

- There is a growing consensus that XR can be used to reduce patient anxiety across wide-ranging clinical contexts.
- Positive outcomes have been shown for both procedural and more general health anxieties, especially in children.
- **BUT** empirical support has not reached maturity and is currently lacking in detail, quality, and consistency.
- **ALSO** there are practical considerations distinct from the XR that need attention.
- *Most importantly* there is potential to worsen health inequalities, without due caution in XR design and implementation.















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Q & A











Thank you for attending!









