



# Virtual reality (VR) for acute pain in outpatient hysteroscopy: a randomised controlled trial

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Randomised controlled trial

## Virtual reality for acute pain in outpatient hysteroscopy: a randomised controlled trial

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# Introduction - VR

A simulated experience that can be similar to or completely different from the real world.

Generates realistic images, sounds and other sensations that simulate a user's physical presence in a virtual environment.

A person using virtual reality equipment is able to look around the artificial world, move around in it, and interact with virtual features or items.





## VR in Medical field

Repeated Use of Immersive Virtual Reality Therapy to Control Pain during Wound Dressing Changes in Pediatric and Adult Burn Patients

[Albertus W. Faber](#), MSc,<sup>1</sup> [David R. Patterson](#), Ph.D., ABPP, ABPH,<sup>2</sup> and [Marco Bremer](#), MSc<sup>3</sup>

**Virtual reality pain control during burn wound debridement in the hydrotank**

[Hunter G Hoffman](#) <sup>1</sup>, [David R Patterson](#), [Eric Seibel](#), [Maryam Soltani](#), [Laura Jewett-Leahy](#), [Sam R Sharar](#)

**Computer-generated virtual reality to control pain and anxiety in pediatric and adult burn patients during wound dressing changes**

[Björn van Twillert](#) <sup>1</sup>, [Marco Bremer](#), [Albertus W Faber](#)

Virtual reality as an analgesic for acute and chronic pain in adults: a systematic review and meta-analysis

[Brian Mallari](#),<sup>1</sup> [Emily K Spaeth](#),<sup>2</sup> [Henry Goh](#),<sup>3</sup> and [Benjamin S Boyd](#)<sup>4</sup>



# Outpatient hysteroscopy

- A lack of consensus on the choice of analgesia for outpatient hysteroscopy.
- Limited research on the role of distraction techniques in the management of pain and anxiety in ambulatory gynaecological procedures
- No published studies on virtual reality as a pain relief modality.



# Outpatient hysteroscopy

- safer and less invasive
- Reduced risks of anaesthesia
- Cost reduction



# Objectives

To evaluate the effectiveness of virtual reality as a distraction technique in the management of acute pain and anxiety during outpatient hysteroscopy.

# Methods

Single centre:

Whipps Cross University Hospital, London,  
UK

Study participants:

40 women of 18-70 years of age who were scheduled to undergo an outpatient hysteroscopy; randomly allocated into 2 parallel groups by a online system based on permuted block

Occasion: Aug - Oct 2018

**Table 1.** Baseline characteristics of participants in standard care and virtual reality

<b>Characteristic</b>	<b>Standard care (n = 20) Mean (SD) or n (%)</b>	<b>Virtual reality (n = 20) Mean (SD) or n (%)</b>
<b>Age (years)</b>	31.3 (5.2)	31.1 (5.4)
<b>Parity, n</b>	2.2 (1.9)	2.4 (1.7)
Nulliparous	4 (20)	4 (20)
Multiparous	16 (80)	16 (80)
<b>Ethnicity</b>		
White	8 (40)	9 (45)
Black	4 (20)	3 (15)
Asian	5 (25)	8 (40)
Mixed	3 (15)	0 (0)
<b>Menopausal status</b>		
Pre-menopausal	7 (35)	7 (35)
Post-menopausal	13 (65)	13 (65)
<b>Prior outpatient hysteroscopy</b>	3 (15)	4 (20)
<b>Hysteroscopy indication</b>		
Heavy menstrual bleeding	5 (25)	6 (30)
Incidental finding	2 (10)	5 (25)
Postmenopausal bleeding	11 (55)	8 (40)
Lost coil thread	2 (10)	0 (0)
Recurrent postcoital bleeding	0 (0)	1 (5)
<b>Pain killers taken before procedure</b>	12 (60)	13 (65)
<b>Pain score anticipated by patient</b>	6.5 (2.0)	7.0 (2.2)
<b>Anxiety score anticipated by the patient</b>	5.6 (3.1)	6.4 (2.9)



## Standard Care

- performed in the office setting by four clinicians of consultant grade and a nurse and a healthcare assistant
- using a 3.2-mm rigid hysteroscope
- using normal saline as distension medium
- vaginoscopic technique unless failure
- Additional procedures such as pipelle biopsies, endometrial biopsies using biopsy forceps, polypectomies if indicated
- Patients were instructed to self-administer analgesics prior to the procedure (either paracetamol or NSAIDs).
- Intracervical local anaesthetic infiltration was administered where necessary in the form of rescue analgesia.

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## Intervention (VR)

- *An 8-min immersive and interactive video content was played during the procedure as a distraction method.*
- *Played on a portable VR headset 'Oculus Go'*



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# Forest of Serenity

<https://www.youtube.com/watch?v=letat93Ar6A>

- commissioned by St Giles Hospice,
- developed by Holosphere and
- narrated by Sir David Attenborough





# Outcome and Measurements

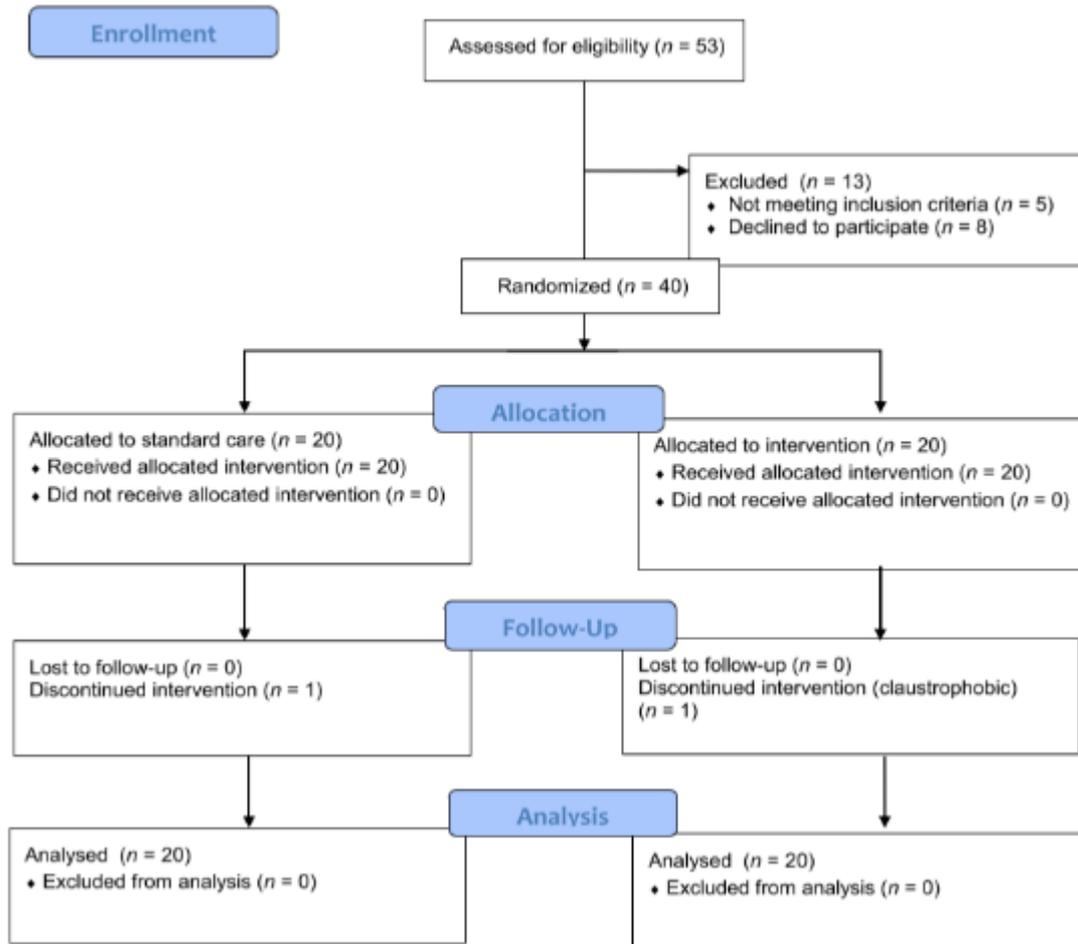
On a 0-10 numeric rating scales

- Average pain
- Worst pain
- Anticipated anxiety
- Experienced anxiety



# Outcome and Measurements

- Semi-structured interviews were conducted within 30 min
  - Questions focusing on patients' experience and any point relevant
  - 16 who received VR; 12 who had standard care
- Questionnaires to nursing staff and clinicians regarding the feasibility





# Results

Worst pain reduction: 28%

Average pain reduction: 38%

Anxiety reduction: 39%

**Table 2.** Comparison of experienced pain and anxiety between standard care and virtual reality intervention in the trial

Group	<i>n</i>	Mean (SD)	95% Confidence interval	<i>P</i> -value	
<b>Worst pain scores</b>					
Standard care	20	7.85 (2.56)	6.65–9.05		
Virtual reality	20	5.65 (2.41)	4.52–6.78		
Difference		2.20	0.61–3.79	0.01	0.008
<b>Average pain scores</b>					
Standard care	20	6 (2.62)	4.78–7.22		
Virtual reality	20	3.7 (2.66)	2.46–4.94		
Difference		2.3	0.61–3.99	0.01	0.009
<b>Anxiety scores</b>					
Standard care	20	5.45 (3.35)	3.88–7.02		
Virtual reality	20	3.3 (2.03)	2.35–4.25		
Difference		2.15	0.38–3.92	0.02	0.019



# Results

- 100% who underwent VR were happy to have the procedure again in an office setting vs 15% who underwent standard care would have liked to have had the procedure under GA
- Gynaecologists reported VR was feasible in 90%; and helpful in 85% of patients
- Assisting nurses reported VR was feasible in 85% and helpful in 85% of patients



## Main findings

- Compared with standard care, the virtual reality pain management intervention had a large effect in reducing pain and anxiety in outpatient hysteroscopy.
- Staff and the majority of the patients found the procedure to be both feasible and acceptable



## Other findings

- Patients reported a sense of relaxation through calming visual imagery, environmental immersion and narrated soothing metaphors about pain control and deflection
- Blocked the sight of doctors and equipment
- Could have a range of videos including educational ones on the procedure
- Most patients found the headset to be comfortable. A minority of patients reported wearing the VR headset to be uncomfortable and claustrophobic.



## Minor findings

- One patient in the intervention arm experienced nausea; however, she managed to keep the headset on till the end, suggesting that the symptoms were not severe.
- Two patients declined to participate in the study as they had used VR for gaming and had experienced nausea.
- One patient had a previous history of claustrophobia and decided to remove the headset when the procedure started as she felt claustrophobic



# Strengths

- Parallel qualitative investigation
- Randomisation and stratification, minimising selection bias
- Numeric rating scale is effective and easy to use
- Qualitative and quantitative results
- The study additionally demonstrated the willingness of patients to participate and identified barriers to recruitment, non-participation, compliance.
- Identified some S/E profile



# Limitations

- Small sample size
- Impossible to blind
- Placebo effect
- Recall bias
- Quantitative results are not well-defined
  - Questionnaires to the clinical staff was shown



Thank you.