

Visual Patient Avatar

- More Than Just a Nice Picture on the Screen

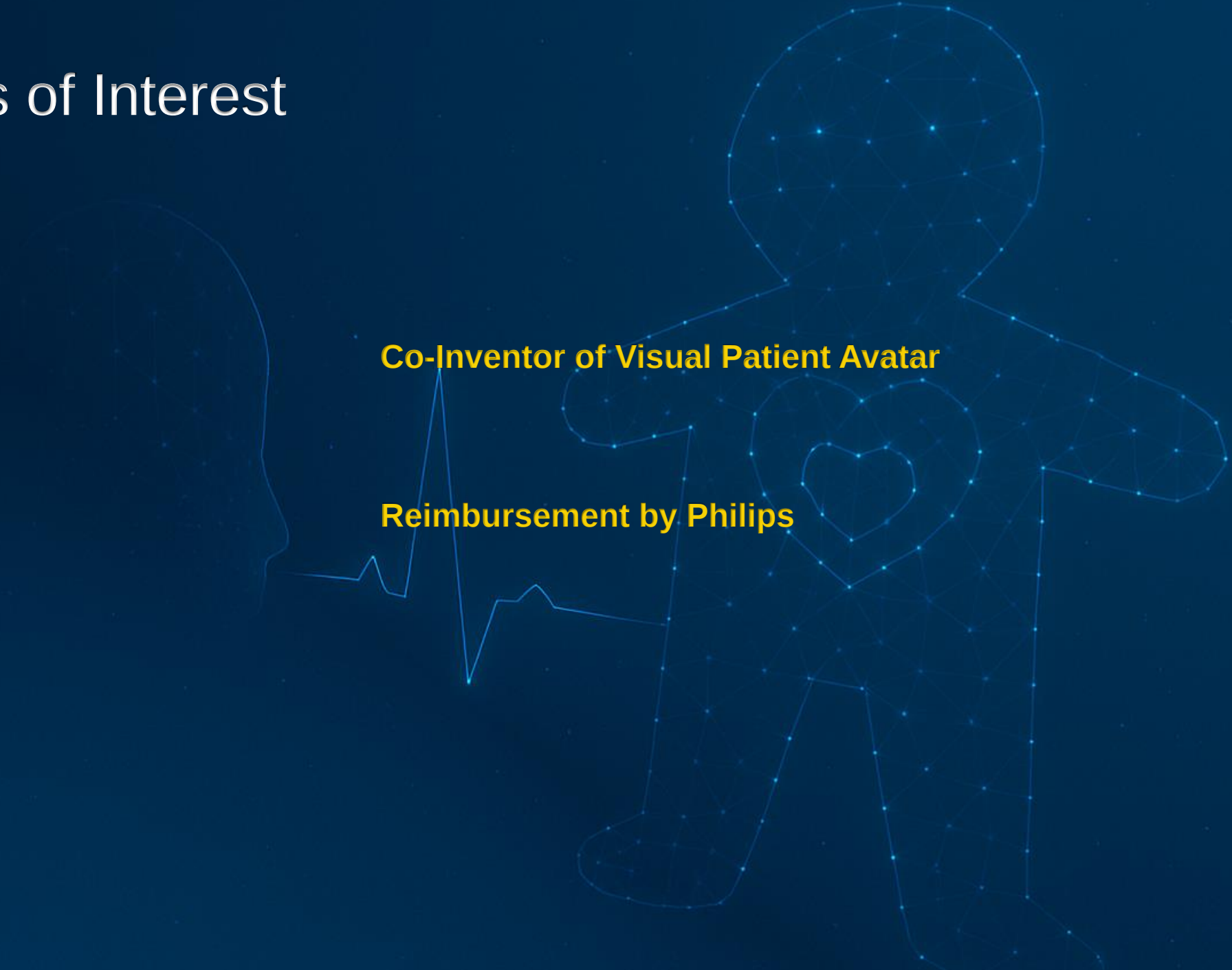
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Institute of Anaesthesiology and Perioperative Medicine
University Hospital Zurich, Zurich, Switzerland

31st Congress ČSARIM Prague – October 10 2025



Conflicts of Interest



Co-Inventor of Visual Patient Avatar

Reimbursement by Philips

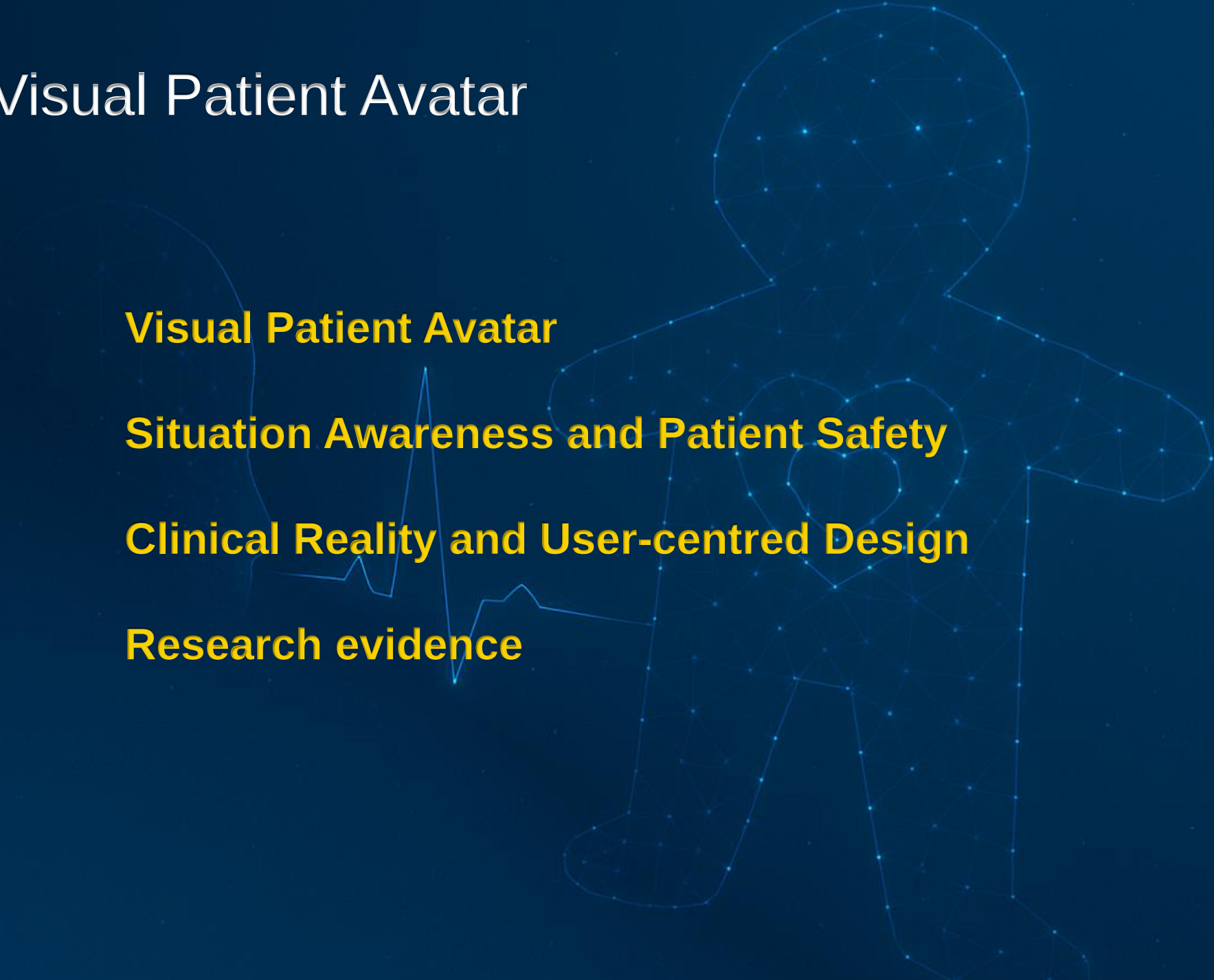
Agenda Visual Patient Avatar

Visual Patient Avatar

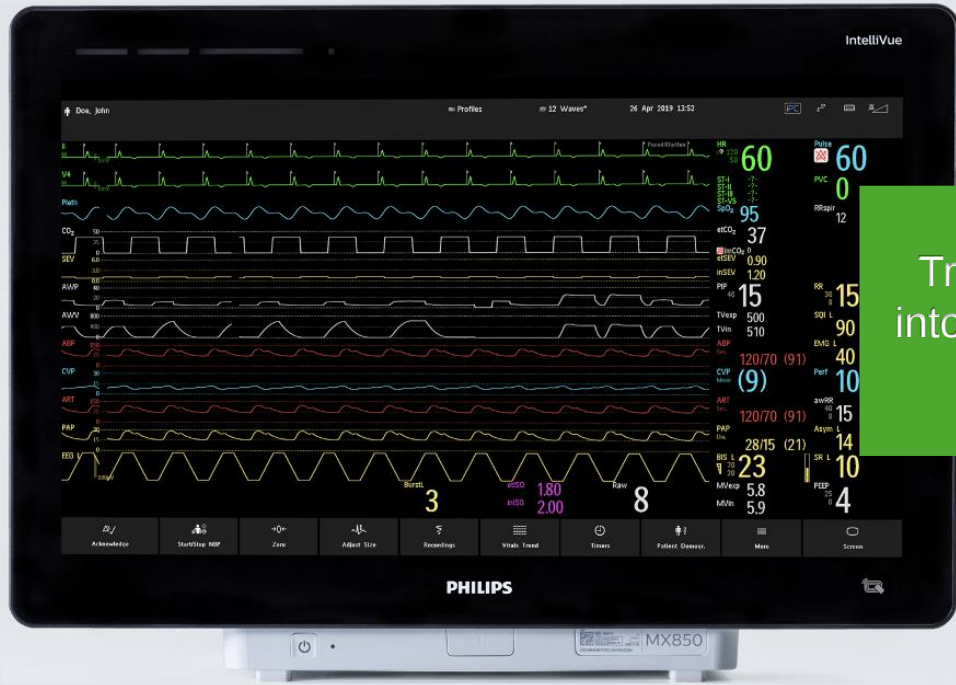
Situation Awareness and Patient Safety

Clinical Reality and User-centred Design

Research evidence



Visual Patient Avatar



Translates numerical data
into a graphical model of the
patient

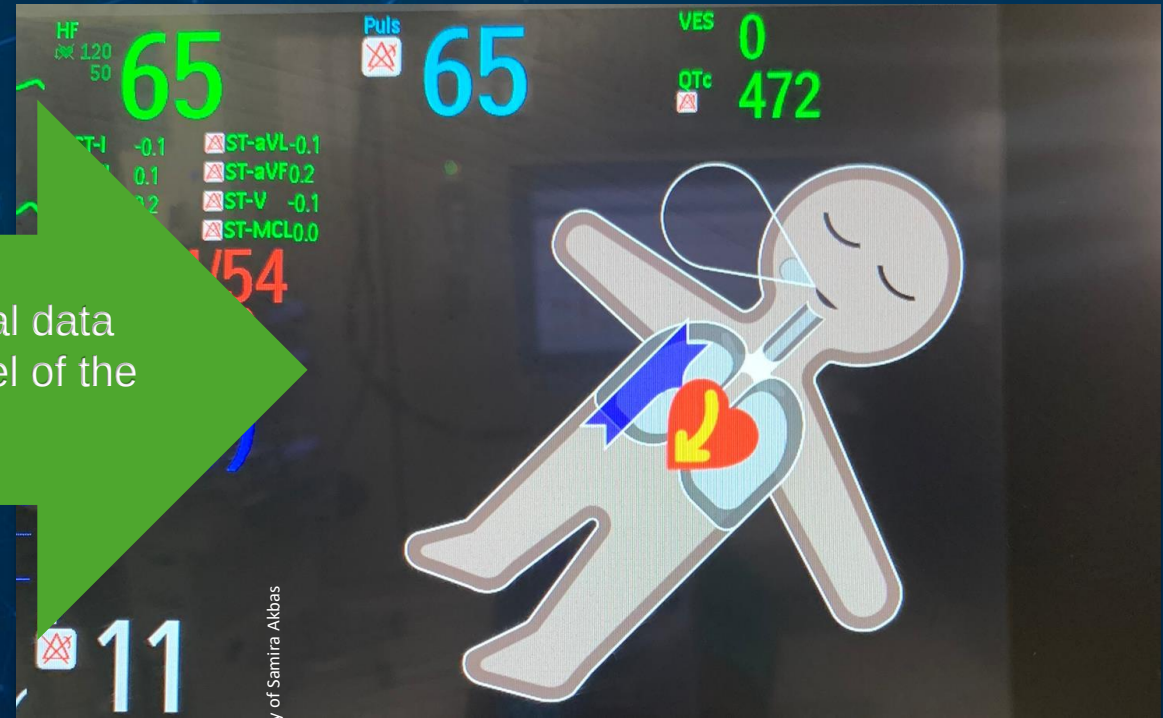
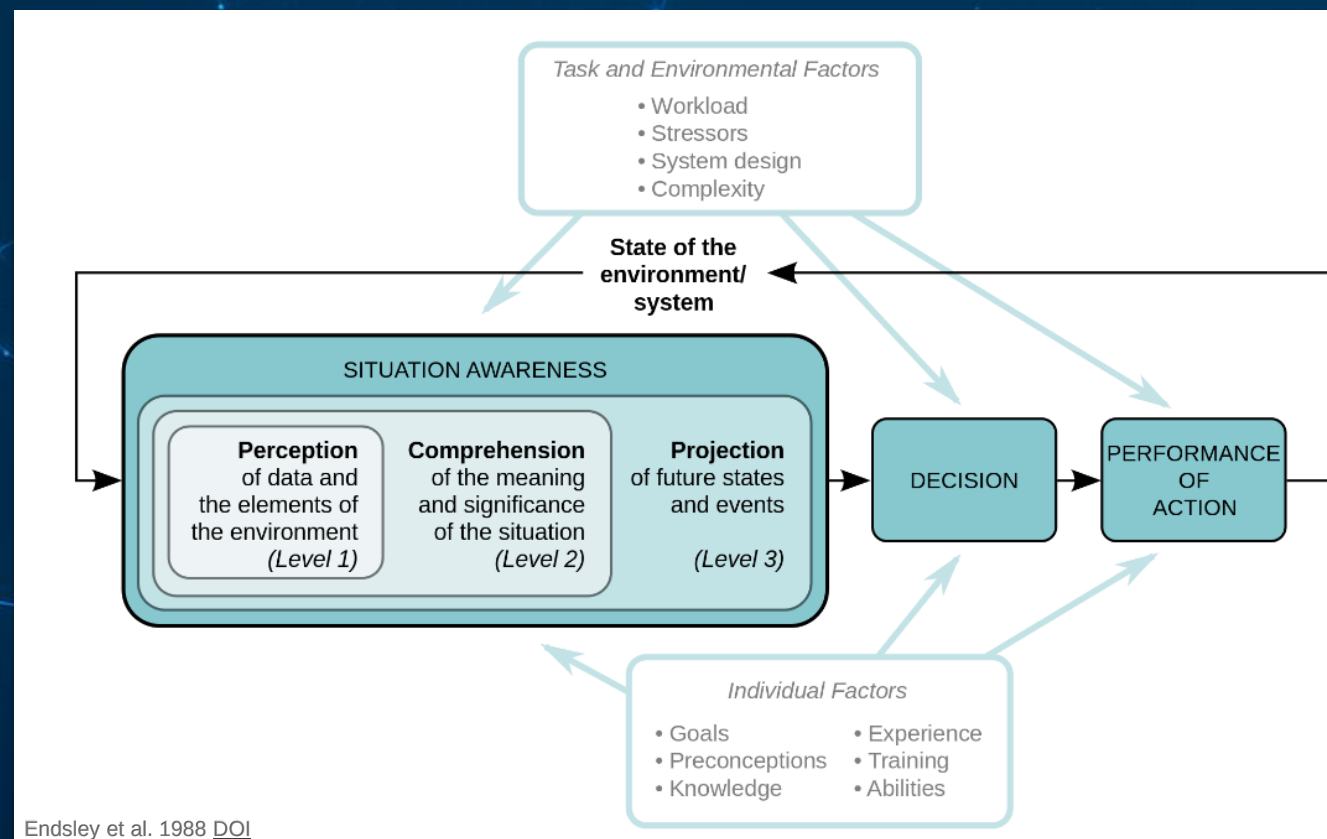


Image courtesy of Samira Akbas

Situation Awareness and Patient Safety

Situation Awareness means being aware of what is happening around you and understanding what that information means to you now and in the near future.

Endsley et al. 1988 [DOI](#) Schulz et al., Anesthesiology 2013 [DOI](#)



Endsley et al. 1988 [DOI](#)

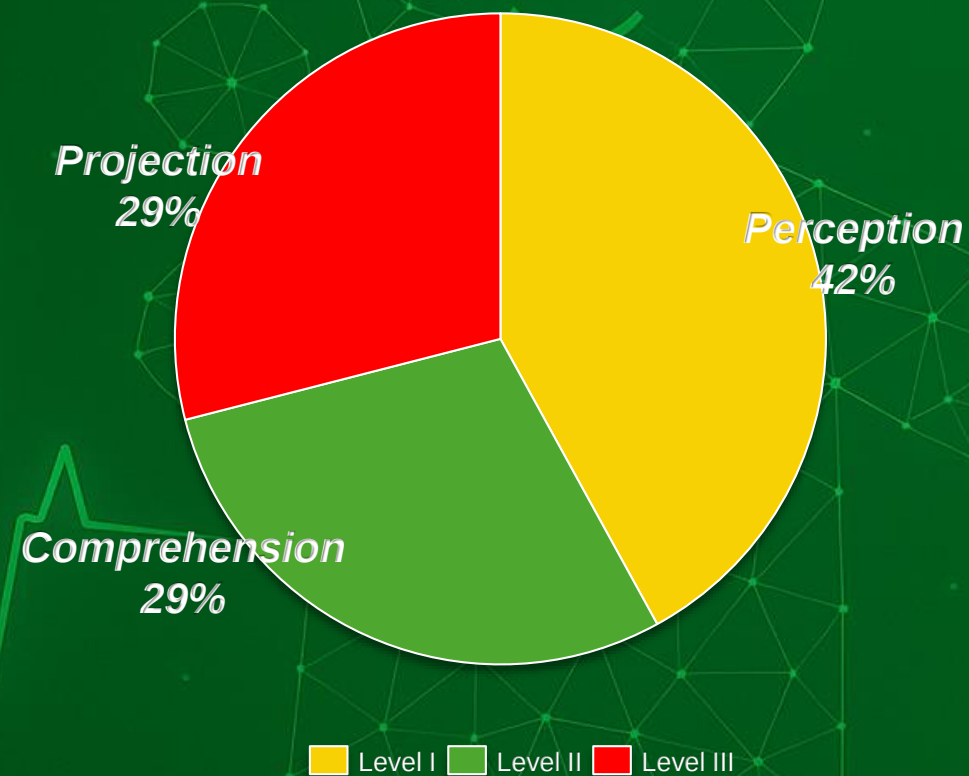
Situation Awareness and Patient Safety

Situation awareness failures cause 88% of aviation accidents.

Endsley et al. 1995 [DOI](#), FAA 2023 [LINK](#)

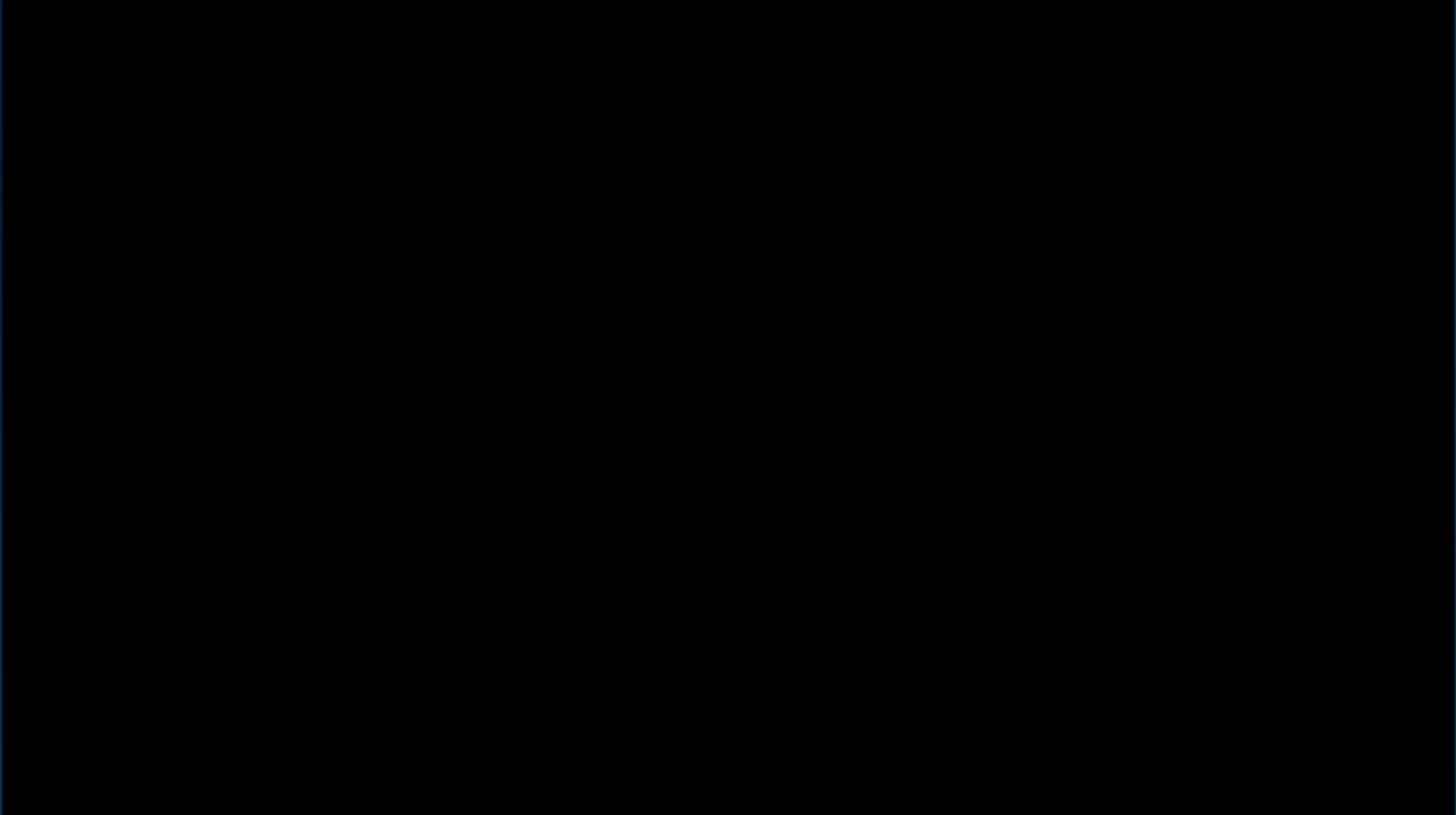
Situation awareness failures cause 80% of anesthesia and intensive care incidents.

Schulz et. al. BMCA 2016 [DOI](#),
Schulz et. al Anesthesiology 2017 [DOI](#)



Schulz et. al. Anesthesiology 2017 [DOI](#)

Clinical Reality



Clinical Reality

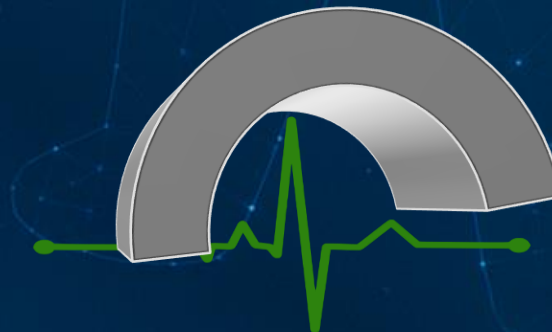
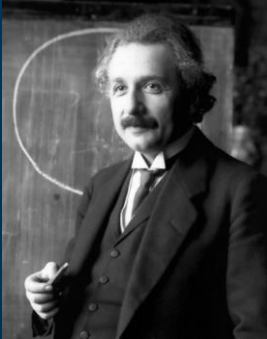
Information Overload

- Many data streams
- Complex and dynamic
- Growing number of parameters

More data $\neq$ more information

Interplay of System Factors

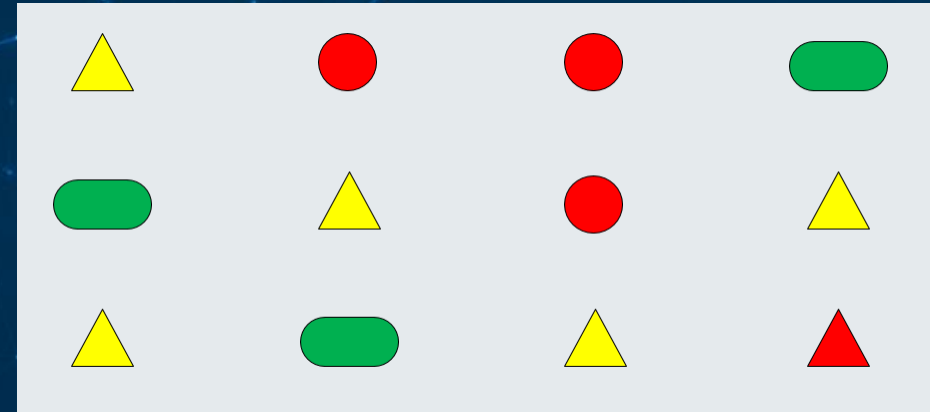
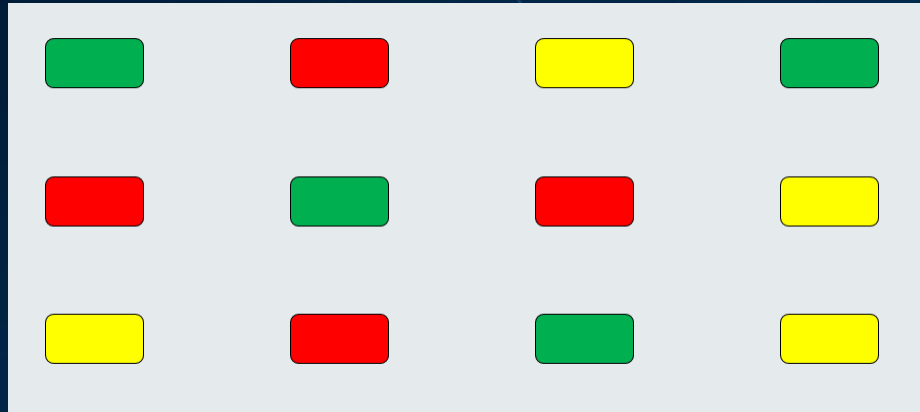
- Workload, fatigue, distractions, and other stressors



Humans can only remember 7 +/- 2 numbers in short term memory

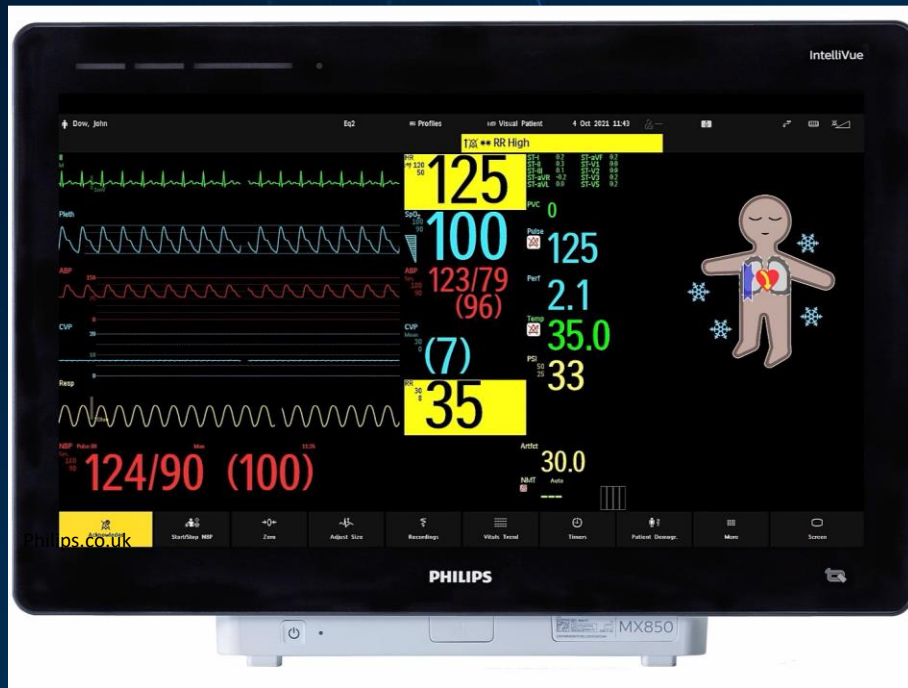
Miller et al. 1956 [LINK](#)

Read the colors



YELLOW	RED	GREEN	YELLOW
RED	GREEN	RED	RED
YELLOW	RED	GREEN	RED

Improve Situation Awareness



User-centred interface design

Passing on **relevant** information to users as **quickly** as possible with as **little cognitive effort** as possible.

Visual Patient Avatar History

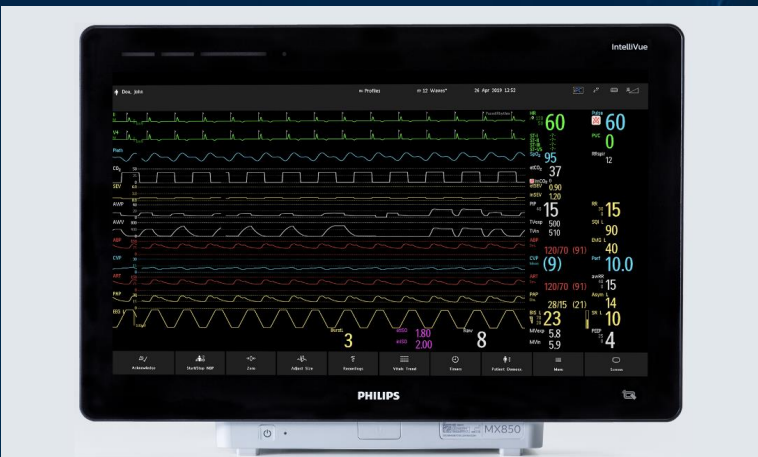


2000

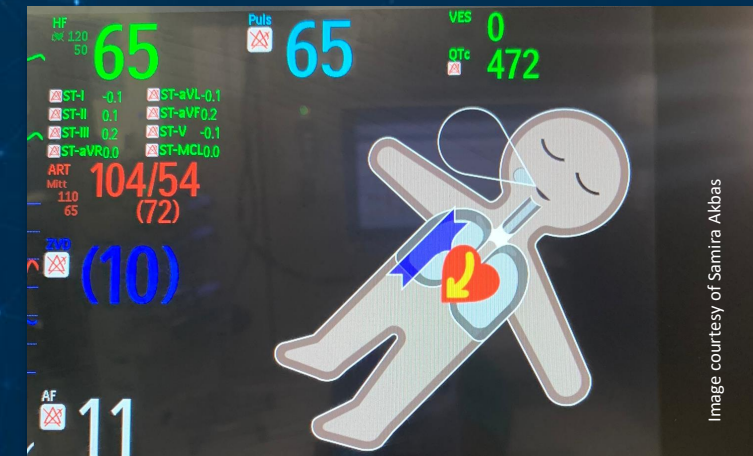
Revolutionized
aviation industry
in < 20 years



2025



improves patient
monitoring

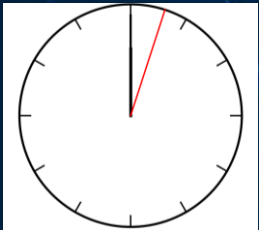


Research Evidence: Visual Patient Avatar

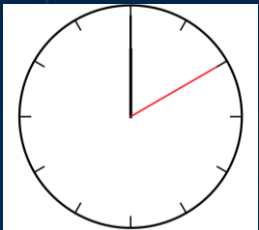
- Better vital sign perception
- Reduced workload
- Enhanced diagnostic confidence
- Improved team communication

Visit visualpatient.org

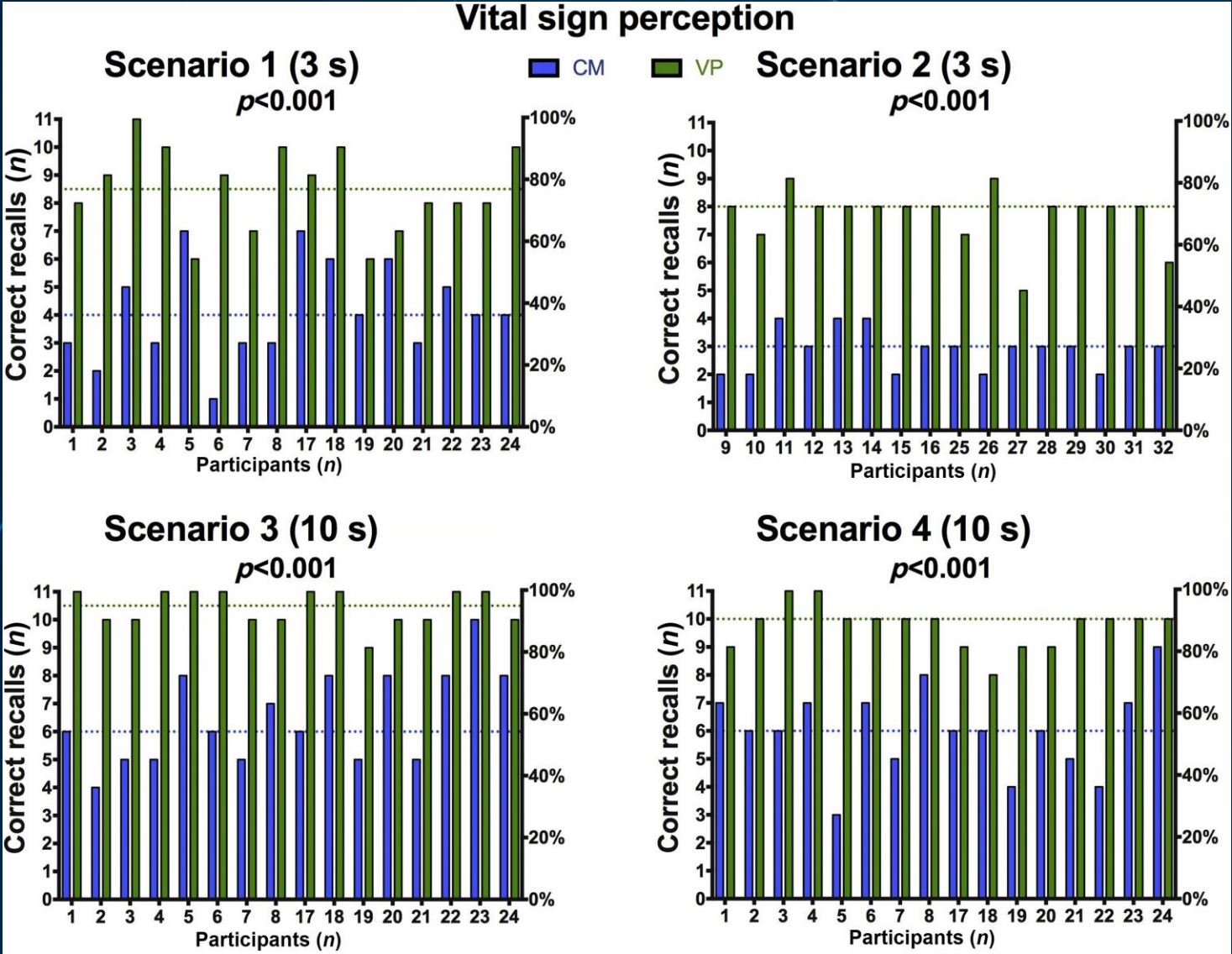
Better Vital sign perception



3 sec



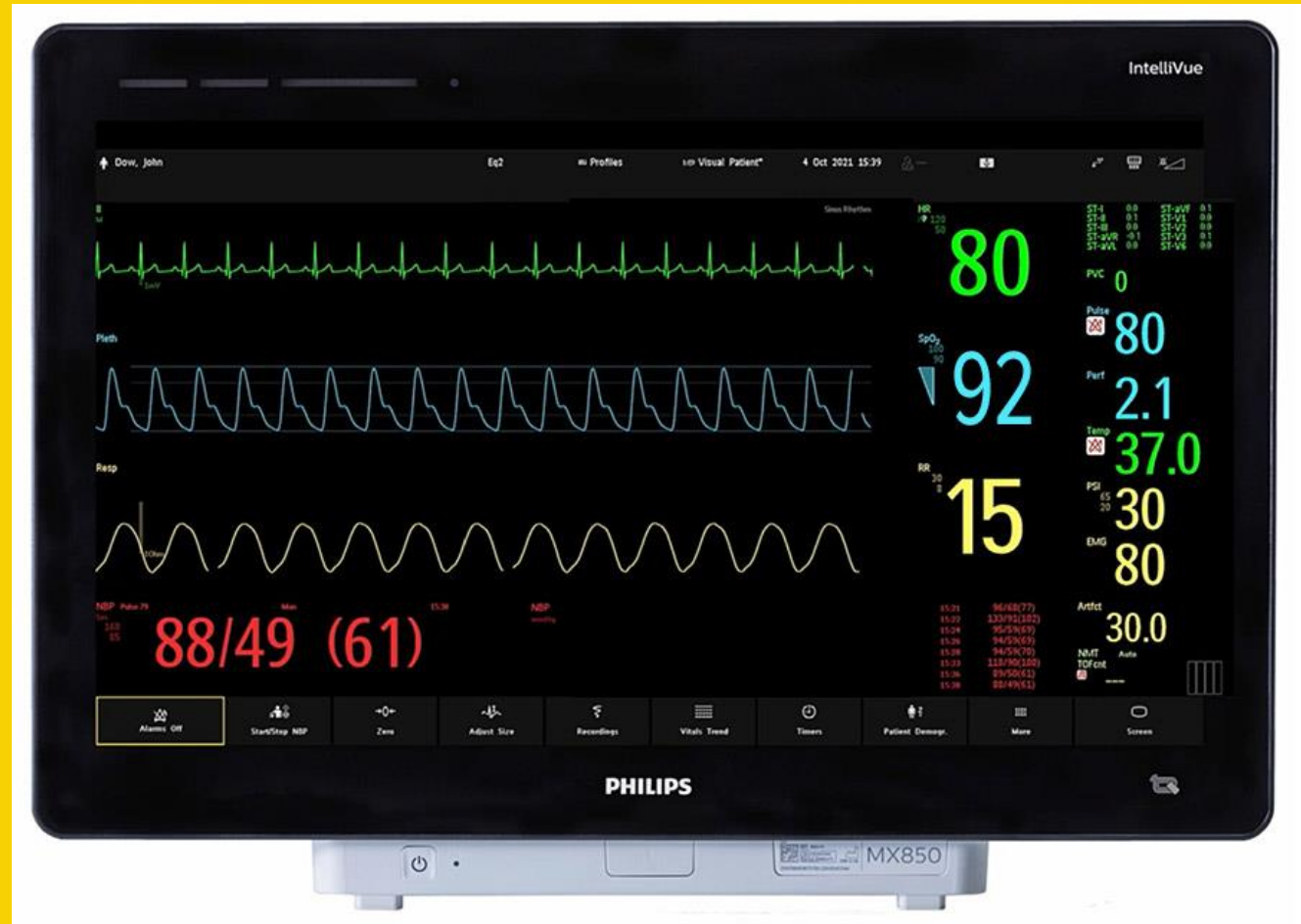
10 sec



Live Demo

00:00.00

Desaturation = SpO2 < 90%



Live Demo

00:00.00

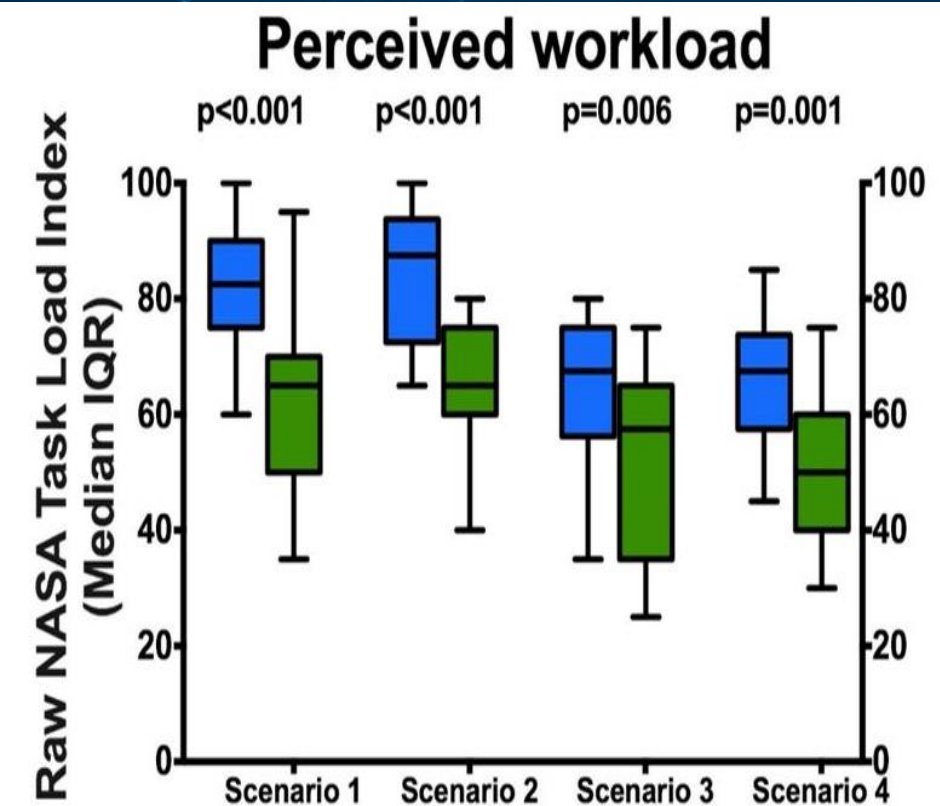
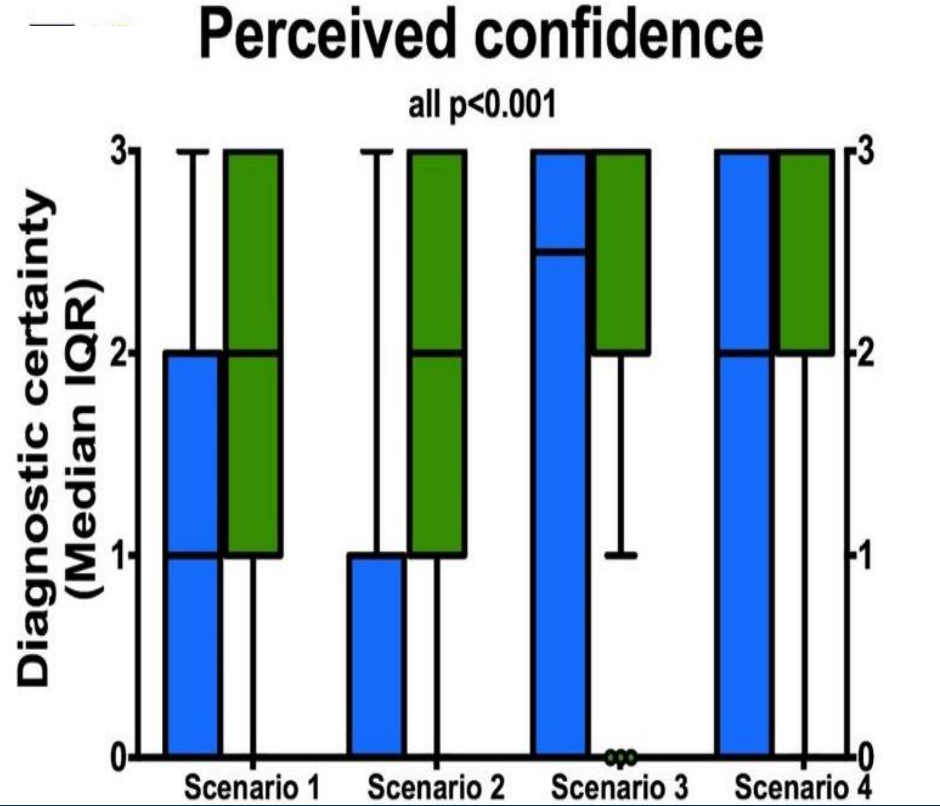
Desaturation = SpO₂ < 90%

Which of the following is not a cause of desaturation?

Desaturation is caused by:



Reduced Workload and Enhanced Diagnostic Confidence



Tscholl et al. BJA 2018 DOI

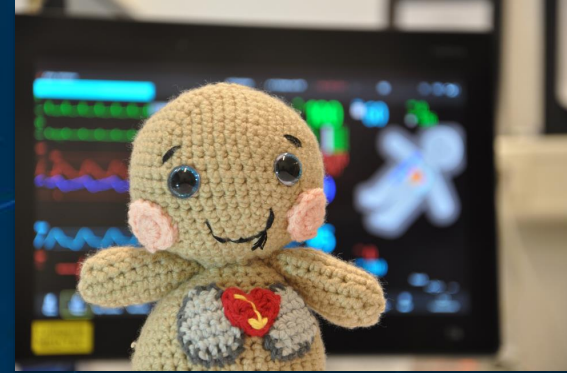
Improved team communication

**78% higher chance to correctly
communicate the emergency**
(HR 1.78; 95% CI 1.13–2.81; P = 0.012)

Roche et al. BJA. 2021. [DOI](#)

Visual Patient Avatar Real-Life Implementation

- University Hospital Zurich, **Switzerland** (Newsweek Global Hospital Ranking 2024 #10)
- University Hospital Heidelberg, **Germany** (Newsweek #15)
- Vienna General Hospital, **Austria** (Newsweek #27)
- Oslo Universitetssykehus, **Norway** (Newsweek # 29)
- New York Presbyterian Hospital, **USA** (Newsweek #55).



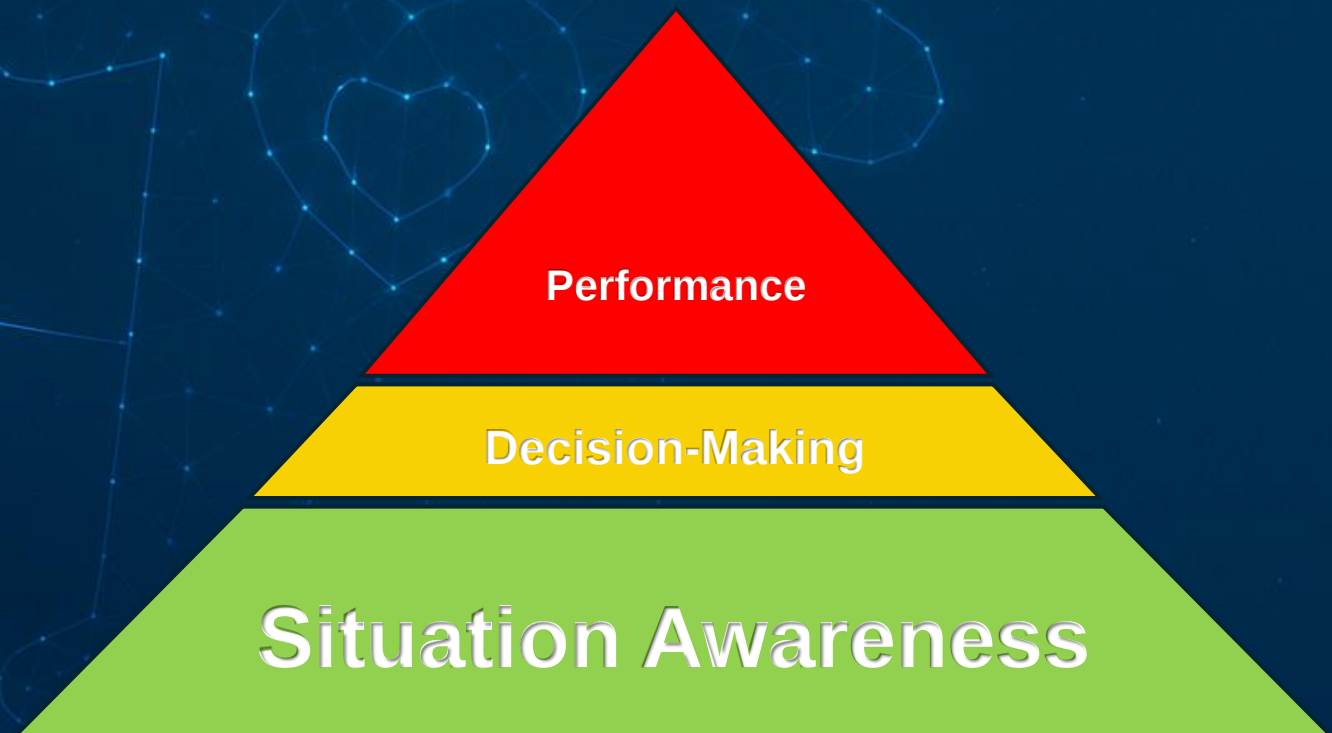
Visual Patient Avatar Real-Life Implementation

New York-Presbyterian Weill Cornell Medical Center, NY, USA

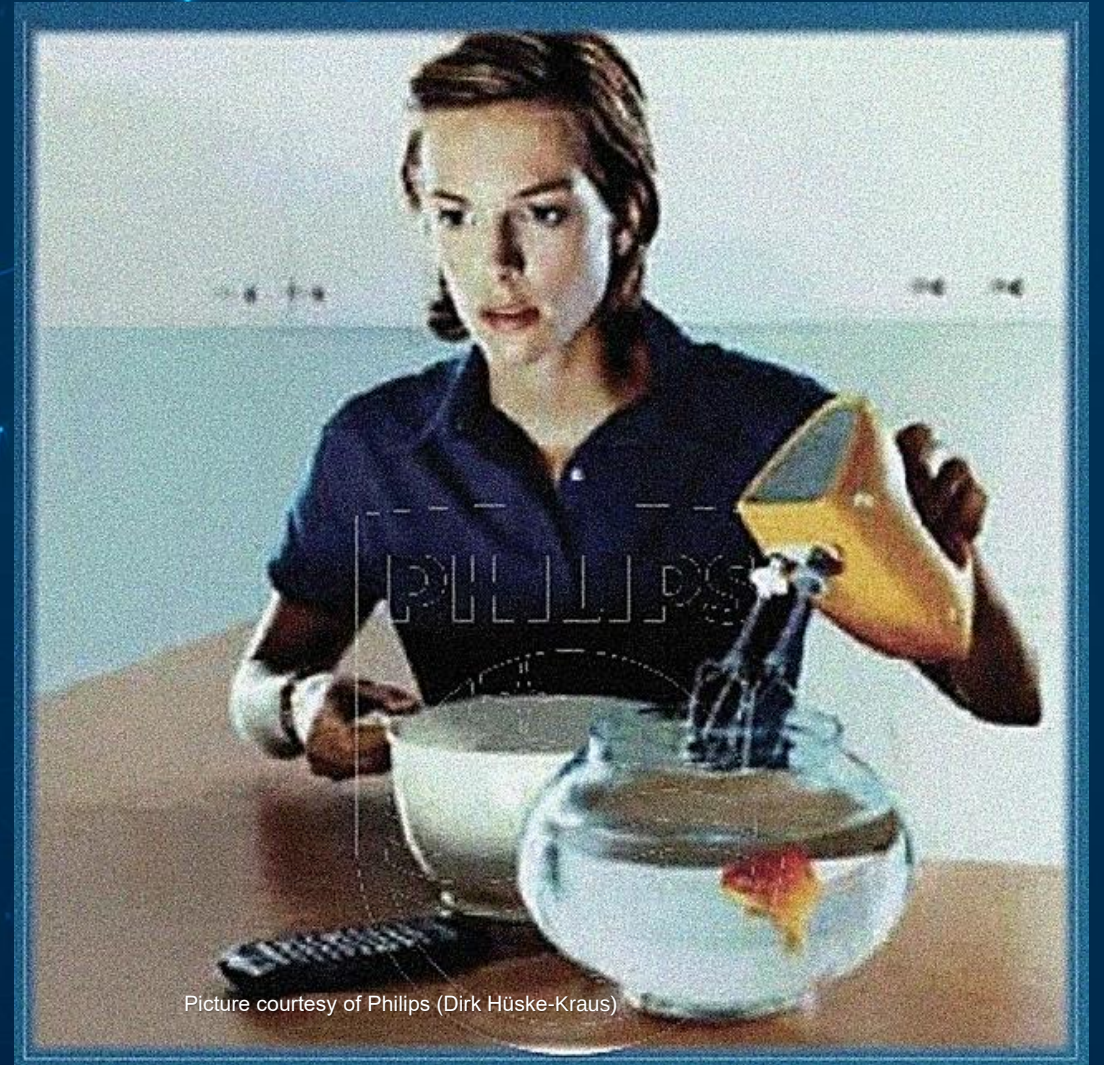


Take home message Visual Patient Avatar

- User-initiated development of **situation awareness tool**
- Translates numerical data into an **intuitive patient avatar**
- Better vital sign **perception**
- Reduced **workload**
- Enhanced diagnostic **confidence**
- Improved team **communication**

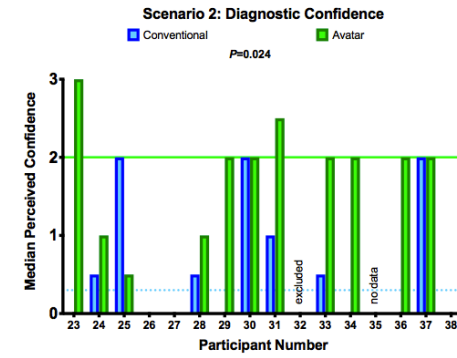
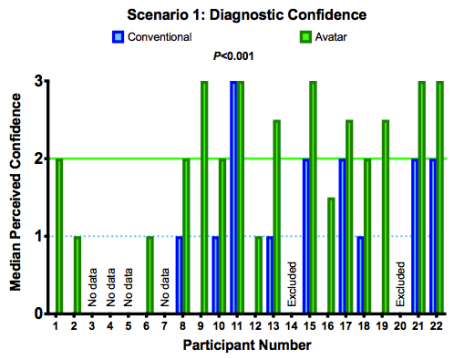
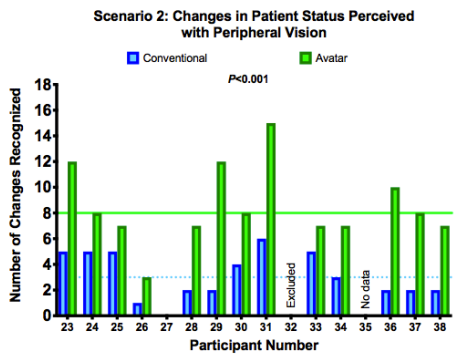
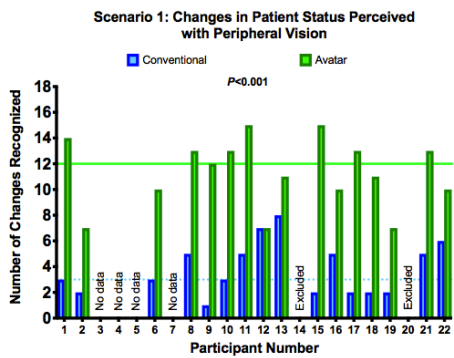
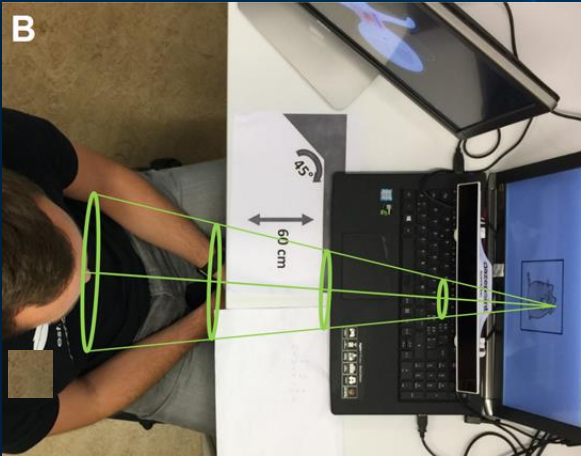
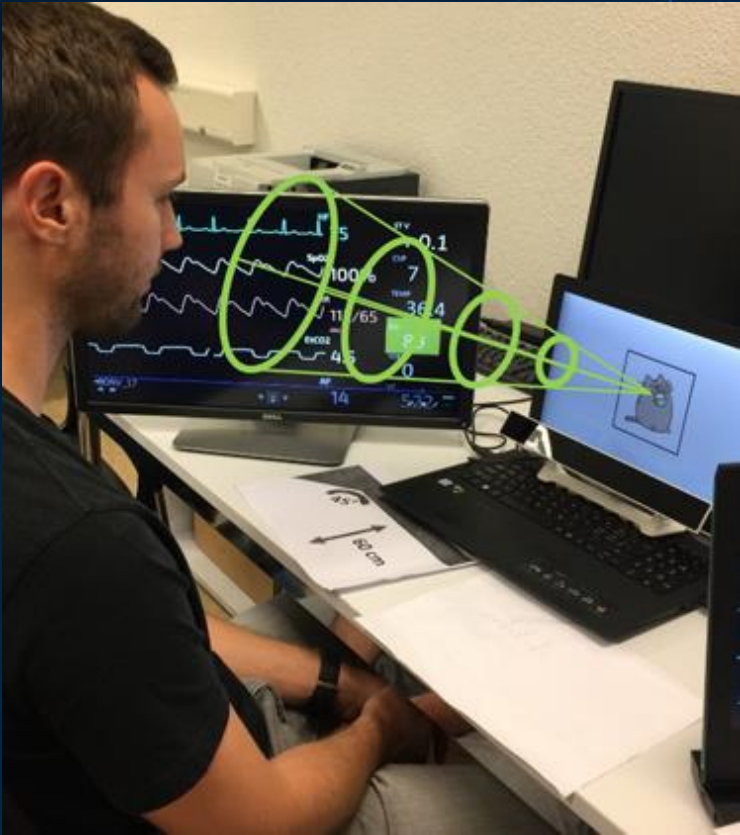


Thank you very much for your attention 🙏



Picture courtesy of Philips (Dirk Hüske-Kraus)

Situation Awareness Evidence: Peripheral Vision



Pfarr et al. JMIR 2019 DOI

50° 5' 11" N, 14° 24' 43" O

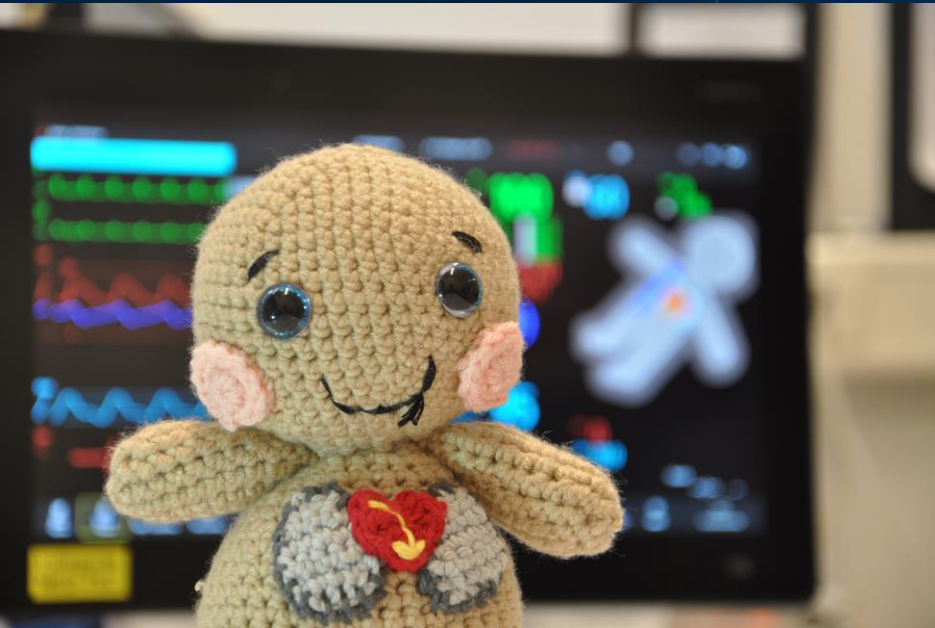
Real-life feedback: Positive user perceptions and areas for improvement

- **Three user feedback studies:**

Lunkiewicz et al. Children. 2022.

Hunn et al. Bioengineering. 2024

Radavicute et al. Nature Sci Rep. 2024



- **Quick overview & rapid problem identification:** Helps providers identify issues faster.

- **Increases confidence & reduces perceived workload:** Reduces decision-making uncertainty.

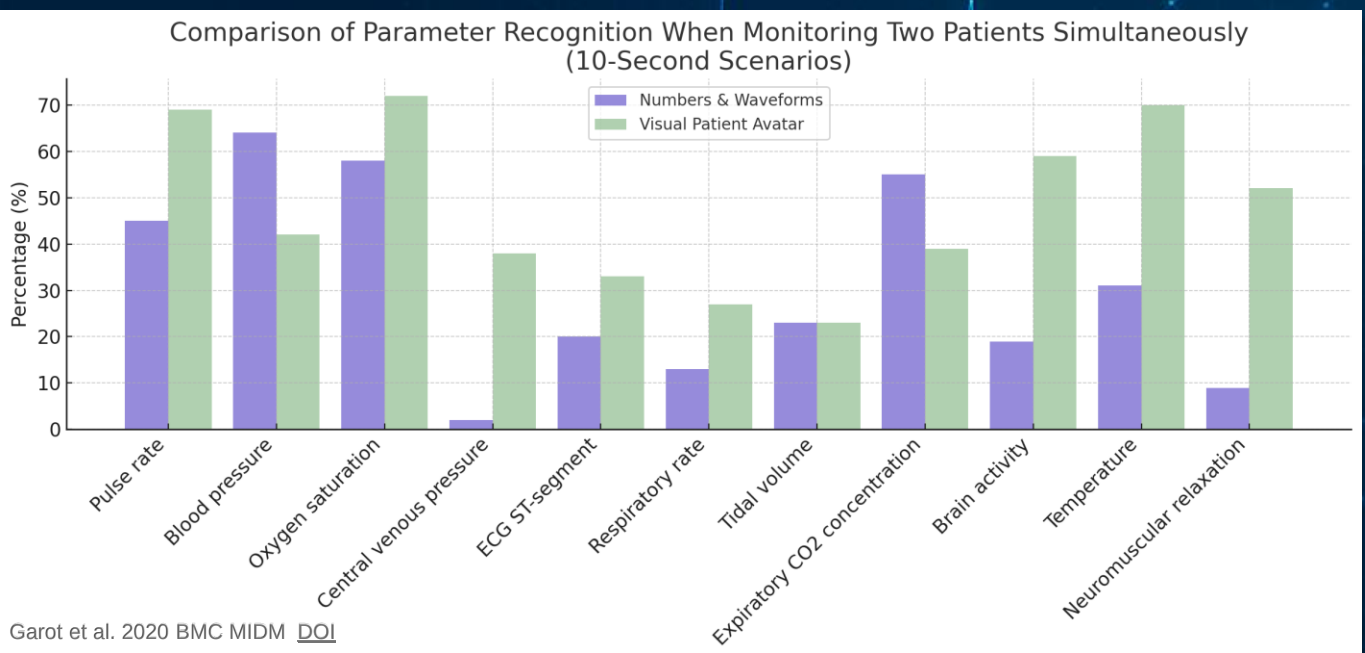
- **Positive reception in pediatric anesthesia:**

- Children & parents respond positively to the avatar.
- Helps comfort children during anesthesia induction.

- **Areas for Improvement:**

- More options to customize visualization thresholds

Multiple Patient Monitoring: Better Vital sign perception



Garot et al. 2020 BMC MIDM DOI

