Virtual teaching

learn anytime anywhere

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ZOLL Foundation

INSPIRE Innovation Grant

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GNPI Projektförderung

ESPNIC Medtronic Research Grant

Datanexus / Austrian Federal Ministry for Innovation and Technology

No conflict of interest



Simulation-based medical education

educational intervention, where situations similar to real clinical cases are reproduced for use in the training of healthcare providers and students

Costco

Vienna Pediatric Simulation and Innovation Center

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Interprofessional student training

> Front Pediatr. 2021 Aug 30;9:700226. doi: 10.3389/fped.2021.700226. eCollection 2021.

Impact of a Multifactorial Educational Training on the Management of Preterm Infants in the Central-Eastern European Region

Philipp Steinbauer ¹, Katrin Klebermass-Schrehof ¹, Francesco Cardona ¹, Katharina Bibl ¹, Tobias Werther ¹, Monika Olischar ¹, Georg Schmölzer ², ³, Angelika Berger ¹, Michael Wagner ¹





162 participants from 15 CEE countries





219

trainings / year



participants / year

Neo-SIM Ambulanz-SIM CCP BLS KiChir + HNO + Radio + KiPsych **CCP NLS Geburtshilfe** LISA Training Skills Training: IO, NVK, Drains, Airway, Defi, BLS, NLS, ZVK, SK, PVK **Tertial Simulation** Wahlfach Interprofessionelle Simulation







Reduced training opportunities

Reduced bedside teaching



Multicenter Study > Pediatr Crit Care Med. 2021 Jun 1;22(6):e333-e338. doi: 10.1097/PCC.00000000000002649.

Readiness for and Response to Coronavirus Disease 2019 Among Pediatric Healthcare Providers: The Role of Simulation for Pandemics and Other Disasters

Michael Wagner ¹, Christina Jaki ², Ruth M Löllgen ³, Lukas Mileder ⁴, Fabian Eibensteiner ⁵, Valentin Ritschl ⁶, Philipp Steinbauer ¹, Maximilian Gottstein ⁷, Kamal Abulebda ⁸, Aaron Caihoun ⁹, Isabel T Gross ¹⁰















Telesimulation as a modality for neonatal resuscitation training

Lukas P. Mileder^{a,b}, Michael Bereiter^b and Thomas Wegscheider^{b,c}

- Telesimulation is feasible for neonatal resuscitation training
- Participants received simulation manikin and ventilation equipment + weblink for one-hour telesimulation session
- Positive learning effect
- Potential technical issues, training logistics were discussed as challenging

MEDICAL EDUCATION ONLINE 2021, VOL. 26, 1892017 https://doi.org/10.1080/10872981.2021.1892017





Randomized Controlled Trial > Neonatology, 2020;117(2):159-766. doi: 10.1159/000504853. Epub 2020 Jan 6.

Comparison of Two Telemedicine Delivery Modes for Neonatal Resuscitation Support: A Simulation-Based Randomized Trial

Isabel T Gross ¹, Travis Whitfill ², ³, Brooke Redmond ⁴, Katherine Couturier ³, Ambika Bhatnagar ², Meliasa Joseph ³, Daniel Joseph ³, Jessica Ray ³, Michael Wagner ⁵, Marc Auerbach ², ³

	Group		p value
	teleleader $(n = 10)$	$\begin{array}{l} \text{teleconsultant} \\ (n=11) \end{array}$	
Median checklist % (JQR)	68 (66-09)	58 (42-63)	0.016
1. Warm	5 (50)	1 (9)	0.038
2. Dey/stimulate	9 (90)	6 (557	0.072
3. Bulb suction to clear airway	.9 (90)	4 (36)	0.011
4. Initial assessment - anscultate heart/lungs	3 (30)	5 (46)	0.466
5. Initial assessment - palpate pulses	1(10)	3 (27)	0.314
6. Apply pulse aximetry to right hand	7 (70)	2 (18)	0.017
7. BVM with infant hag/mask	10 (100)	II (100)	1.000
8. Oxygen at 21%	7 (70)	2 (18)	0.017
9. PPV for 30 a	10(100)	11 (190)	1.000
10. Reassess after 30 s of PPV	11(100)	6 (60)	6.020
11. Verbalize correct tube size (3 or 3.5)	10(100)	H (73)	0.074
12. Verbalize correct blade size (0 or 1)	10 (100)	10(91)	0.329
13. Verbaline correct insertion depth (9-12)	7 (70)	4 (36)	0.123
14. Reamens after intubation - auscultate heart/lungs	7 (70)	# (73)	0.890
15. Reamens after intubation - palpate pulses	0 (0)	3 (27)	0.074
16. Increase oxygen	6 (60)	4 (40)	0.049
17. Initiate chest compressions (30 s after intubation)	8 (90)	5 (46)	0.104
18. Chest compressions in 3/1 ratio with ventilation	9 (90)	7 (64)	0.157
19. Administer Ept 0.1-0.3 mL/kg of 1:10,000 solution	3 (30)	7 (64)	0.123

Data are presented as n (%) unless otherwise indicated. The teleleader group was superior to the teleconsultant group in six subdomains, as indicated in bold.









How to plunge into virtual LISA? How to best experience your workshop For computer users Intelling Bart poor web internet Make some you don't have any other dution and that Back page and Brisings as prior surgering you can join the workshop in a quist room for the last asperance as recommend frough (from a For an optimal workshop experience make sure in have time to attend the whole workshop express vides and microphone before the workshop wat and blank the Participate from a computer with a stable interior are almost for a protocold from will publish pro of the lot workshop Bart the Vice For Better Interaction we would ack your sequelarly within discussion. In period gerting, click or a desired when we first something This is going to be an interestive workshap, or procee wik spections and let as size learn from your Watch the Water 1111 - Sector Sector

LISA Workshop Vienna -The virtual experience





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late Visit: BC NICU Part Two 21

Site Visit: 158 NIMO

Primary Care of a Protometab

10.00



Immersive Experience







User receives VR glasses 2 weeks in advance



User opens the plattform in VR



User selects VR 360* Video



Enjoying the full immersive experience



On-site NICU visit



Simulation Training



Real LISA experience with audio / subtitles

















Virtual Reality



Virtual Reality



Augmented Reality



Experiencing a complete virtual rebuilt environment while blinding out the real environment

Digital holograms additive to the real environment



- Stand-alone vs. high-end headset
- Functionality vs. quality
- Price
- 360° videos vs. interaction













Original

Digital twin









Virtual Reality Plattform IMED

Collaboration with SomaReality

Attach mobile VR glasses

Flexible, cost-efficient, location-independent

Multi-User

alone, with colleagues or an additional instructor

Modular training (in progress) Create your own patient and scenario

Cognitive Load adaption (in progress)

Optimization of learning process through adaptive training











Virtual Bedside Teaching and Remote Training





recorded from a first-person perspective with real-time streaming





> Arch Dis Child Fetal Neonatal Ed. 2021 Aug 19;fetalneonatal-2021-321806. doi: 10.1136/archdischild-2021-321806. Online ahead of print.

Video-based reflection on neonatal interventions during COVID-19 using eye-tracking glasses: an observational study

Michael Wagner ¹, Maria C den Boer ², Sophie Jansen ², Peter Groepel ⁵, Remco Visser ², Ruben S G M Witlox ², Vincent Bekker ², Enrico Lopriore ², Angelika Berger ⁴, Arjan B Te Pas ²





- 12 recordings, 9 reflections, 88 observers
- Intubation, MIST/LISA, lines
- Point-of-view videorecording is feasible and shows an educational benefit





The use of point-of-view recordings...

- ... is feasible for our NICU*
- ...was an educational benefit for me*
- ...helps with (virtual bedside) education during COVID-19*
- ...was done within a safe learning environment*
- The first-person perspective was an addition to the educational experience*
- I was distracted by the first-person perspective during the audit*
- Using the first-person perspective would be beneficial for reviewing other procedures too*



Category	Feedback	
Experience	Observers mentioned "a lot of different variations in technique for placing lines."	
Equipment, medication and timing	To think about "sedation balance" and "comfort of the baby", meaning the sequence of sedation, removal of CPAP, mask/t-piece application ventilation, and the "use different catheters (for MIST)" as well as the necessity to "take more time to give MIST".	
Environment and Awareness	To change "the position of the baby or the monitor for a better visual" and think about "the position of material in the room". To acknowledge to "think about the blade you use"	
Sterility	Observers noticed "violations in the sterile technique". In terms of central-line insertion, one observer mentioned that it is important to "check sterility, also for those around" and to think about "how to improve sterility and increase awareness about sterility".	
Point-of-view recording	Point-of-view recording was especially "worthwhile for learning umbilical catheterization and the crucial steps of the sterile technique" It helped to see the "procedure through the eyes of the neonatologist" and "how others operate".	
Technique	Some observers claimed that the videolaryngoscope blade 1 "can be a problem because the light of the blade reflects on the tongue". It was further mentioned that the videolaryngoscope blade should be placed on the right side of the patient to avoid "left-handed insertion of the laryngoscope".	
Education and Training	e-tracking technology is "good to learn" and "very nice to refresh" fucational aspects. To acknowledge the "differences in performing e procedure" brings attention to changes such as "start the ocedure with the left hand and not with the right hand, otherwise ou have to change an extra time."	
Technical issues	In some recordings it was "difficult to see the head of the patient"	













Augmented Neonatal Care





















Eye-tracking knowledge combined with AR for guiding attention during training











© Mojo Vision

Remote high-fidelity simulation training



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Crisis Resource Management (CRM)

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Pro/Cons

+ location-independent
+ once prepared, less
resources necessary
+ more participants than
usually possible

Technical issues
Non-verbal communication difficult
Psychological safety



Tips for Conducting Telesimulation-Based Medical Education

Anita Thomas¹, Rebekah Burns², Elizabeth Sanseau³, Marc Auerbach⁴ DOI: 10.7759/cureus.12479

- Identify learning objectives
- Use supplemental audio and visual material to inrease realism
- Pilot testing of telesimulation
- Prepare your learners (pre-brief)
- Consider limitations
- Allow for "time outs"
- Engage (quiet) participants
- Establish team roles and communication strategies
- Share additional learning resources afterwards
- Collect feedback







immersive experiences will transform the way we work, learn & teach.







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