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Mixed Reality in resuscitation and acute homecare scenarios

a proof of concept study

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Mixed Reality in resuscitation and acute homecare scenarios: a proof-of-concept study

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Conclusion

- Specialist supervision of junior health care providers was feasible via the HoloLens 2
- Some clinical procedures could potentially be performed with virtual supervision
- Mixed reality has the potential to improve specialist involvement and senior decision making, particularly in out of office hours and in the prehospital setting.
- A feasibility study using HoloLens 2 in a clinical setting is a reasonable next step

Background

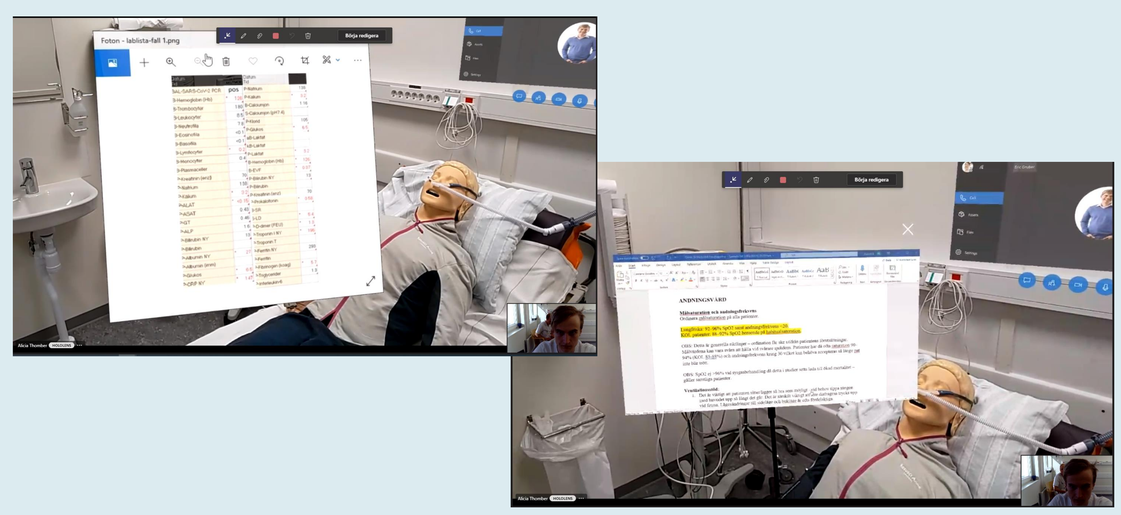
Mixed Reality has recently been introduced to healthcare on a smaller scale. Microsoft HoloLens 2 is a commercially available Mixed Reality device that can communicate via the widely available MS TEAMS. HoloLens 2 has, to our knowledge, not been used in a Swedish healthcare setting. The aim of this study was to test the feasibility of HoloLens 2 in emergency department and acute homecare simulated scenarios.

Method

We tested HL2 in four full scale simulated clinical scenarios on 35 physicians and nurses. Virtual supervision of a junior doctor by a senior physician during the initially treatment and practical procedures (lung ultrasound and high flow nasal cannula setup) in an unstable COVID-19 patient were simulated. Use of a treatment checklist via HoloLens 2 for acute treatment of severe hyponatremia were tested. Virtually supervision of a home-care nurse in neurological examination (acute stroke scenario) and urgent colostomy care via HoloLens 2 were tested in a simulated home environment. A structured interview guide was used for evaluation following each scenario. The study was conducted as a department innovation project.

Case 1: Resuscitation of a COVID-19 infected patient. Supervision by EM specialist via HoloLens. Virtual instructions in HFNO/Oxyflow setup and lung ultrasound were tested.

Case 3 (left). Treatment of colostomy complication with virtual supervision from a stoma specialist nurse. Case 4 (right). Physician performing a virtual neurological exam via a nurse wearing the HoloLens 2.



Diagnostic imaging, lab results and standard operational procedures could be shared and seen in the visual field.

Selected citations from test persons

”Det kändes som att den seniora läkaren var på plats”

”Jag upplevde tekniken som mycket lättanvändbar men känner vikten av att tekniken och handhavandet fungerar väl innan vi testar tekniken på ett verkligt användarfall”

”En stor fördel är att nu kan man både se, dela och verifiera information som annars delges mer analogt – t.ex. blodgaser och testresultat”

”Jag tror inte att det hade varit något problem alls för oss att jobba på ett sådant här sätt”

”I vanliga situationer jobbar man tätt tillsammans som ett team. Detta upplevdes i viss mån brytas upp något när HoloLens introducerades – främst pga att läkaren blev mycket fokuserad på kommunikation i HoloLens”

”Det kanske inte hundraprocentigt kan ersätta att den seniora läkaren skulle varit där fysiskt, men långt bättre än telefon”

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