

# Alder Hey Children's Hospital Pioneers Remote Clinical Care with Microsoft HoloLens 2 and Dynamics 365 Remote Assist

Alder Hey Children's NHS Foundation Trust cares for over 330,000 children, young people and their families every year. One of Europe's biggest and busiest children's hospitals, it also provides cardiac care and treatment for up to 8 million patients in the North West region of the UK.

## The Challenge

Alder Hey Children's Hospital wanted to use immersive and mixed reality technology to reduce the amount of physical contact between hospital staff, patients and visitors. Looking for a solution that would deliver immediate benefits, the hospital would also have the potential to support future developments in medical treatment. The initial use cases it had in mind included remote patient care, virtual ward rounds and staff training.

In the first instance, clinicians in the operating theatre wanted the ability to consult medical experts who were located elsewhere. This would reduce the number of people in the theatre and lower the risk of spreading infections – including COVID-19 and MRSA. It would also allow the clinician to consult other experts more quickly – which could lead to a better outcome for the patient.

The team at Alder Hey also wanted to conduct virtual ward rounds, with just one clinician making the rounds and others joining remotely. This would make ward rounds more efficient and reduce the number of people physically present at the bedside. As well as keeping contact to a minimum, this would provide a more personalised experience for the patient and their relatives. It could also reduce the strain on PPE equipment, as well as the associated cost, with fewer clinicians at the bedside.

Another issue that Alder Hey wanted to address was staff training. The hospital needed a way to enable medical trainees to observe a procedure without having to be in the room. Given the limited space in a room, this also increased the number of people that could observe live, plus improved the ability to record procedures for on-demand viewing afterwards.

Alder Hey therefore needed a way to communicate and share images as well as real life scenarios with other practitioners through video and audio in real time 24/7, regardless of the participants' location.



## Quick Overview

Alder Hey Children's NHS Foundation Trust wanted to enable clinicians to collaborate and communicate remotely in real time. It was looking for a way to minimise contact in the operating theatre and allow practitioners to consult fellow medical experts during surgery, regardless of their location. Insight worked with top surgeons and cardiologists at the hospital to implement Microsoft HoloLens 2 and Microsoft Dynamics 365 Remote Assist, a mixed reality solution that enables hands-free communication as well as sharing of images and live video.

"I was in the operating theatre performing a complex repair on a little heart, no bigger than the size of a strawberry. By using the HoloLens, we were able to transmit live the view of the heart to other colleagues, as well as reviewing the echocardiogram at the same time."

**Rafael Guerrero**, Director, Heart Unit,  
Clinical Director of Innovation and Chief of  
Congenital Cardiac Surgery

## The Solution

The Insight team worked directly with Rafael Guerrero, Clinical Director of Innovation and Chief of Congenital Cardiac Surgery at Alder Hey Children's Hospital, to implement a mixed reality solution combining HoloLens 2 and Dynamics 365 Remote Assist. The proof of concept involved Mr. Guerrero and Paediatric Cardiology Consultant, Dr Phuoc Duong. Insight advised Mr. Guerrero and Dr Duong on the features and functionality of the HoloLens 2 device, combined with the remote assist software. They worked with Alder Hey's IT team to guide them through device and application considerations, the licensing process, setting up user accounts and assigning roles, and connecting securely to Alder Hey's network. The Insight team effectively provided 'hand-holding' for Alder Hey, through the out of box experience and onto their first remote assist calls with HoloLens 2.

Further sessions followed to ensure evaluation was running smoothly and to answer the questions that naturally arose as the Alder Hey team continued exploring the technology.

By enabling clinicians to communicate hands-free and share information in real time, the HoloLens 2 and Dynamics 365 Remote Assist solution has huge potential for transforming medical processes. A simple but very effective use case is for ward rounds. Clinical assessment in the cardiac ward requires the presence of several specialists, so there are usually several people on the round. Wearing a HoloLens 2 device running the remote assist software, means just one clinician can perform the round. Other specialists can join in using Microsoft Teams, seeing exactly what the clinician sees, whilst also having 2-way audio/video communication and being able to share other visual content. While one specialist is making the round, other tasks – such as updating patient records – can be redistributed among the team, saving time.

HoloLens 2 with Dynamics 365 Remote Assist has great potential to reduce the number of clinicians needed in the operating theatre too. For example, prior to HoloLens 2, if Mr. Guerrero wanted to consult fellow clinicians during a procedure, they would need to put on gowns and PPE, enter the operating theatre, review the imaging and have the discussion face to face. The HoloLens 2 headset, which can be worn with PPE equipment (including a visor), allows Mr. Guerrero to share high quality images with colleagues and communicate with them while continuing to operate on the patient.

Mr. Guerrero reported that when wearing the HoloLens 2 himself, he is able to share images and make calls, completely hands-free. As well as potentially reducing the number of clinicians in the room – especially important with COVID-positive patients – this could reduce pressure on PPE stock.



HoloLens 2 can enable medical experts to provide advice remotely by sharing images. On one occasion, Dr Duong was able to guide a colleague working in the Cath Lab by sharing images using HoloLens 2 and Dynamics 365 Remote Assist. In this situation, a surgeon needed to place a tiny stent inside a blood vessel of a small child, while a colleague used x-ray imagery to ensure it was in the correct position before he expanded it. Describing the procedure, Dr Duong said, "I was able to drive the model from my laptop and say, 'actually from this angle, from this view is where you can best see the structure', so that my colleague could tell the radiographer where to place the camera." In this way Dr Duong took pressure off his colleague, who needed to use both hands for what he was doing. As it can often take quite some time just to get the x-ray camera in position, working with the HoloLens 2 solution helps gain back valuable life-saving moments.

HoloLens 2 has the potential to help with education and training by enabling a clinician to film a medical procedure. For example, if a surgeon was performing an unusual operation, they might want to share this with colleagues. The fixed camera in the operating theatre doesn't provide a perfect solution – as the surgeon often physically blocks the camera's view of the operation. The HoloLens 2 provides a way to record and share delicate operations, without having more people in the operating theatre than absolutely necessary.

The use cases so far show how transformative the communication and image sharing capabilities of HoloLens 2 and Dynamics 365 Remote Assist can be for modern medicine, but there's little doubt that that it offers even more exciting possibilities for the future. It could be used for collaboration between medical professionals working in different hospitals, and even in different countries. It opens up new possibilities for education, both for clinicians and for patients – helping the latter to understand complex surgical procedures and the way medicines work.

There is also the possibility of using its full 3D image projection capabilities to give an enhanced view of the patient. According to Mr. Guerrero, "HoloLens 2 and mixed reality may, in the future, enable me to have a patient's scans in front of me while I'm doing the operation. If I can use technology to obtain that information, to see those images in front of me, that helps me tremendously and improves the outcome for my patient."

## The Benefits

HoloLens 2 and Dynamics 365 Remote Assist reduces the number of staff needed in the operating theatre, lowering the risk of infection, preventing disruption. It can also reduce the number of people present during ward rounds and make the process more efficient for both patients and staff.

The solution allows clinicians to consult colleagues without waiting for them to be available in person – vital for time-critical operations. It will even make it possible for medical professionals to turn to experts from other hospitals within the UK and around the world.

HoloLens 2 and Dynamics 365 Remote Assist permits medical experts to communicate completely hands free, enabling them to consult colleagues while continuing to perform delicate and time sensitive operations.



"Being able to remotely respond at 2 a.m. leads to reduced response times, greater efficiency, and the ability to make rapid decisions not just based on what's heard, but what's seen also."

**Phuoc Duong**, Paediatric Cardiology Consultant

## The Results Highlights



Clinicians can now consult with each other remotely while continuing to operate, saving valuable time and ultimately saving lives.



The number of staff needing to be in contact with patients and each other has been reduced – lessening the risk of cross infection.



Fewer specialists are needed on ward rounds now, making them more efficient, and giving a better experience for patients and their relatives.



Surgical operations can be recorded for educational use, with a clear view of the patient and procedure, enhancing the learning experience for junior medical professionals.