

# Washington, D.C. Pediatric Center Consults on Heart Disease with Immersive Video



Children's National Medical Center uses Cisco TelePresence to collaborate with the Uganda Heart Institute

## Executive Summary



### CHILDREN'S NATIONAL MEDICAL CENTER

- **Customer Name:** Children's National Medical Center
- **Industry:** Pediatric Care
- **Location:** Washington, DC
- **Number of Patients:** 300,000 annually

### CHALLENGE

- Provide urgent pediatric care to children in developing countries
- Connect medical teams internationally in real time
- Increase access to education for surgical teams and nurses

### SOLUTION

- Used integrated immersive video to discuss medical cases
- Created large training rooms to accommodate medical staff
- Displayed recorded medical images over video

### RESULTS

- Consulted on several types of pediatric heart disease
- Conferred on individual cases
- Enhanced medical education and training for doctors and nurses

## Challenge

Dr. Craig Sable is the director of echocardiography and telemedicine at Children's National Medical Health System in Washington, D.C. For more than 13 years, Dr. Sable has participated in medical missions to Uganda, where his team has helped to provide medical and technical education to physicians, nurses, and other health care professionals taking care of children and young adults with heart disease.

These medical interactions are one of many ways that medical teams from Children's National engage with global partners. The medical center is the only exclusive provider of pediatric care in the Washington metropolitan area and the only freestanding children's hospital near Philadelphia, Pittsburgh, Norfolk, and Atlanta.

### *Pediatric Care in Africa*

With the critical goals of treating children with potentially fatal diseases and training doctors to perform live-saving surgeries, Dr. Sable and his team places a priority on medical interactions with Africa. Dr. Sable and his team have traveled to Uganda several times a year to combat congenital heart disease, a birth defect affecting one percent of all children, which often requires open heart surgery, and rheumatic heart disease, an acquired, preventable heart problem that progresses to severe heart valve damage if left untreated.

"One percent of the world's children are born with a congenital heart defect, but most have their defects repaired at a young age and reach a high life expectancy," says Dr. Sable. "In Uganda, we see hundreds of children who have not been repaired, and the older they get, the more complex they are to treat."

The urgency of congenital heart disease is an issue across the developing world, and many of the affected children in those areas are left behind. Lamentably, in Uganda, along with much of Africa, congenital heart disease is often left untreated. And outside of medical team visits to the city of Kampala (where the Uganda Heart Institute [UHI] is located), Ugandan teams have limited access to the knowledge transfer, specific supplies, and supporting materials needed to facilitate effective treatment. As a result, the doctors and surgeons at UHI are forced to concentrate on only the most critical patients.

In the United States and throughout developed nations, rheumatic heart disease is nearly nonexistent. The disease is acquired secondary to a bacterial strep infection of the throat or skin, and is usually treated with penicillin. This management thereby prevents rheumatic fever and rheumatic heart disease from occurring. Collaborative research and education are the keys to increasing efforts to prevent rheumatic heart disease.

UHI is working to change possibilities for families in Kampala. But while the institute's team delivers high-quality care on a daily basis, it achieves more through its collaboration with Children's National. In Uganda, there is always a need to do more.

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**Dr. Peter Lwabi**, Cardiologist and Deputy Director, Uganda Heart Institute

“Year over year we see an increasing complexity of cases,” says Dr. Peter Lwabi, cardiologist and deputy director at UHI. “We have to make life-saving decisions frequently; the absence of real-time, live feedback in discussing cases, answering questions, and sharing perspectives is very unfavorable.”

## *Turning to Telemedicine*

The partnership between Children's National and UHI has helped to set the institute apart as a center of excellence in the region and in sub-Saharan Africa. Throughout the country, UHI is a sought-after site for families facing life-or-death issues when it comes to heart disease; however, many of these families can't travel to Kampala, and if they do, there is a backlog of cases.

“Based on this population, there are about 5,000 to 6,000 children in Uganda that could potentially have open-heart surgery for congenital heart disease if the resources were there,” says Dr. Sable. “Having the majority of these children repaired during medical missions is not a sustainable solution.”

The vast majority of these children would have normal lives if they were granted access to the care they need. Sadly, many of these children will die prematurely without receiving the necessary treatment they need. Telemedicine, however, can be a game changer.

In addition to children with congenital heart disease, more than 100,000 children, and most likely 12 to 13 million in Africa, are currently living with rheumatic heart disease. At least five percent of these children are in need of surgery, and the rest can be treated with penicillin, which prevents the need for heart surgery, if they can be identified. In this way, telemedicine can have a huge impact on reducing the burden of rheumatic heart disease.

Since its partnership with Children's National began, UHI has hoped to increase its medical collaborations. In between medical missions, cardiologists collaborate primarily over email; however, due to the time difference, responses and collaboration can be delayed for many hours.

“It's been our government's wish that we increase our offerings, but developing the services we provide further can be challenging, especially in this very crucial area,” says Dr. Tom Mwambu, chief heart surgeon at UHI. “The more we collaborated with Children's Medical and realized what we could achieve, the more we started to think about technical support and innovation.”

## **Solution**

To strengthen their partnership, in 2013 Children's National and UHI decided to invest in telemedicine and integrate video with the knowledge transfer process. The goal was to provide surgeons in Kampala with real-time, live feedback and increase the impact of those surgeons day to day.

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“Less than 10 percent of people in Uganda have access to UHI or will be able to travel to the Institute at all,” says Dr. Lwabi. “To us, that means that a lot of children will remain undetected. We decided to explore telemedicine to establish our partnership more firmly, process information more quickly, and improve the coverage and quality of our services in rural areas.”

In addition to more frequent interaction, the promise of a telemedicine room at UHI offered great hope that the Children’s National and Ugandan surgical teams can give joint lectures to residents and students, and discuss approaches to difficult cases.

Due to its longstanding relationship with Cisco, Children’s National engaged the technology provider to use a Cisco TelePresence® solution, a high-definition, lifelike video system designed to link two physically separated rooms, so they resemble a single conference room, regardless of location. Because the medical center already had an established telemedicine program and was leveraging Cisco technology, the question for Cisco and the two teams became how to extend the technology across the world to Kampala.

In 2012, Cisco donated desktop units along with additional services to support UHI’s goal of improving telemedicine. The equipment promised to help UHI improve its information and communications facilities, aligning the institute with the latest technological developments and allowing it to consult on complicated procedures.

“Historically, we’ve faced a formidable challenge when it comes to open-heart surgery,” say Dr. Mwambu. “Telemedicine offered a way to extend this type of procedure into our theater, so we can improve our interactions.”

Telepresence also offered the ability for Children’s National and UHI to focus on more detailed collaboration: for example, the ability for Ugandan surgeons to share an echocardiogram of a child’s heart and discuss it with Children’s National staff in Washington D.C. Other anticipated benefits include second opinions, assistance with time-sensitive cases and surgeries, and consultation with the cardiac catheterization lab.

To facilitate the donated equipment and other types of modern telemedicine, a long-distance education room was built in UHI with ample seating for surgeons, doctors, and residents.

Children’s National and UHI collaborated with Cisco to work through the technical and financial considerations surrounding the deployment of the Cisco TelePresence solution. In February 2014, the telemedicine room at UHI opened its connection with Children’s National to widespread gratitude. On-going technical support for the room is led by Enock Kibalizi (an information and communications technology [ICT] technician for UHI).

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## Results

Using Cisco TelePresence solutions has allowed the partnership between Children's National and UHI to soar. In addition to attending to urgent needs when it comes to collaborating on cases, investing in telemedicine has cut down on costs, collecting data and receiving feedback on that data is now streamlined and instantaneous.

“Immersive video is much smoother and much more seamless than talking on the phone,” says Dr. Sable. “The ability for us to connect and share information is powerful. We can easily display and discuss recorded images of the heart, which cannot be done with any other modality.”

With the two theater screens at UHI, doctors can view the presenter and review recorded images at the same time, creating a harmonious, single-room feeling. The importance of this interaction lies not only in case work, but the ability to hold conferences where both teams look for ways to improve the program.

“Discussing our cases gives us valuable input, which helps us to make better decisions and improve on the quality of care,” say Dr. Lwabi. “There’s no great distance dividing us anymore, and we’ve only improved each day on how we present and transfer knowledge.”

So far, Children's National and UHI have completed lectures for medical residents and students in both pediatric cardiology and general pediatrics. The teams have discussed topics related to the diagnosis and treatment of congenital heart disease and acquired heart disease; one of the most recent lectures covered rheumatic heart disease.

“From our perspective here in the U.S., rheumatic heart disease is a diagnosis that a doctor practicing in our area may rarely or never see,” says Dr. Christopher Jordan, a fellow in the division of cardiology at Children's National. “Quite a bit of the data that’s published, and what we use frequently, comes from UHI, which makes this an incredible opportunity for us.”

Since the two hospitals have been collaborating, the teams have worked on almost 500 children that have experienced some kind of intervention, either surgery or catheterization. Many would not be alive without the care that they received at UHI, which is a result of the institute’s expertise and interaction with Children's National.

“It might seem simple, but the picture and sound make a very big difference,” says Dr. Mwambu. “The recorded images are so clear, clearer than any other resource we’ve used, and that detail gives us an enhanced sense of reliability and confidence in what we do.”

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**Dr. Craig Sable**, Director of Echocardiography and Telemedicine, Children's National Medical Center

## *The Impact of Care*

With the use of telepresence, Dr. Mwambu and Dr. Lwabi are able to keep nurses at UHI involved in critical care, instead of sending staff abroad for training. The ability to teletrain in this environment, where their work is taking place, adds an additional level of education to application and a realistic approach to teaching medicine.

“It's not easy to remove 10 nurses from a station, and that absence impacts the level of care we are able to provide,” says Dr. Lwabi. “Telemedicine allows us to train from our premises. It's a great advantage, and it's helped to ensure continuous care.”

One example of telemedicine's impact on critical care happened earlier this year during an echocardiogram in the operating room. On that day, UHI was operating on three children with Tetralogy of Fallot (TOF), which is a rare, complex heart defect that occurs in about 5 of every 10,000 children. This condition manifests as a hole in the heart with obstructed blood flow to the lungs.

“A young girl with this condition in Uganda, Victoria, came to UHI, where Dr. Mwambu and a heart surgeon from Children's National went to work,” says Dr. Sable. “She had almost no oxygen going into her body. Thanks to telemedicine, we were able to consult on Victoria and give her a brighter future.”

Over the past six months, telemedicine has strengthened the collaboration between Children's National and UHI as well as improved the care the two hospitals can deliver to a large number of patients. The addition of telepresence has proven to be a critical aid in helping to improve healthcare for children in Uganda.

## **Next Steps**

In the future Children's National will continue to increase the number of collaborators participating in telemedicine, including organizations in Cleveland, Indianapolis, London, and other cities around the world. Now that this facility is a success, both the medical center and UHI hope to expand their audience.

Children's National also plans to establish weekly meetings with UHI to discuss cases and expand the reach of telemedicine to more universities in the mid-Atlantic and across Uganda. The goal is to achieve more progress when it comes to infectious and cardiovascular diseases. By fast-tracking the development of its partnership, the medical center and UHI can expand the reach of education, and make even better use of telepresence.

“We want doctors from anywhere in the world to be able to connect to UHI and consult,” says Kibalizi.

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## Product List

### VIDEO

- Cisco TelePresence

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**Dr. Peter Lwabi**, Cardiologist and Deputy Director, Uganda Heart Institute

From a research perspective, Children’s National is focusing on expanding its nursing curriculum. Nursing education is a key goal of the medical center, because these professionals are on the front lines aiding sick children.

“We’re working to put together a multi-institutional nursing-education curriculum with some of our partners,” says Dr. Sable. “Our expectation is to connect nurses from several different institutions over telepresence, including those at UHI and in rural areas of Uganda.”

Telemedicine and Cisco TelePresence solutions are helping national and international organizations provide better care to children with preventable disease. It is Children’s National’s hope that this progress will continue well into the future.

“The coming of telemedicine is a blessing,” says Dr. Mwambu. “Likewise, Dr. Lwabi continues, we are very happy with Cisco’s generosity and getting this equipment to us. It’s something that in our imagination we never thought possible.”

## For More Information

For more information about Cisco TelePresence products, go to: <http://www.cisco.com/go/telepresence>