

Delivering Connectivity in Healthcare Environments

Uncovering the connectivity gaps
in today's hospitals and
how to close them.



Contents

- 1. Introduction: A time of transformation
- 2. Enhancing the experience with Indoor Connectivity
- 3. Accelerating transformation with Private Networks
- 4. Getting to grips with connectivity – addressing the options
- 5. Why WiFi isn't always the right option
- 6. Managing the future of smarter hospitals

The ongoing digital transformation of healthcare is driving a range of exciting new opportunities.



A time of transformation

The advent of remote consultations, digital health tools and virtual hospital services are revolutionising care delivery and patient interactions. Meanwhile, the building of new state-of-the-art digital hospitals that will benefit patients, visitors and staff is already underway.

Patients are embracing digital to access medical records and services online and via mobile apps, and self-monitoring their conditions with smart devices. When in hospital, they are using their phones to access email, social media and communications services to stay in touch with the outside world and keep family and friends updated on their health.

As we enter the era of the smart hospital, digitalisation is set to revolutionise how hospitals perform at a human, financial and operational level. Creating safer and more streamlined environments that improve patient wellbeing, efficiency and healthcare outcomes.



Connectivity is key

In the digital world, nothing happens without the right networks in place. Hospitals and larger health centres need fast and reliable connectivity, and not just for the digital applications and cloud services that sit at the heart of their transformation. In addition, the corporate and personal mobile devices used every day by staff, patients and visitors are also reliant on site-wide coverage.

The Better Connectivity for Health and Care (BC4HC) programme is among a range of new initiatives aimed at boosting broadband speeds in hospitals. However, a fixed line only approach is rarely enough as demands for speed, mobility and flexibility grow. A new generation of wireless connectivity options is therefore required.



Wireless connectivity options

Hospitals are deploying high bandwidth 4G and 5G Private Networks. These wireless voice and data networks are specifically built for the hospital (and hospital staff and applications). They are fully secure and provide guaranteed, always-on connectivity.

Hospitals are also enhancing mobile coverage and capacity in public areas. Referred to as multi-operator 'indoor connectivity' solutions, these networks bring the signal from the UK's mobile operators into the building – allowing patients, visitors and partners to use their personal phones and connected devices wherever they are inside.

This paper explores the issues driving the growing need for seamless connectivity in hospitals and how these wireless solutions are helping address a range of fundamental challenges.

Enhancing the experience with Indoor Connectivity

Mobile connectivity has become a utility, and there is an expectation that it will simply be there. Often in hospitals it isn't. Thick walls, steel structures and the use of metallised-glass in building design can have a major impact on mobile signals, reducing their strength or blocking them completely. It's a situation that's set to worsen as mobile operators transition their networks to 5G – as 5G signals are even more sensitive to disruption by physical infrastructure.

The issue of poor or non-existent public mobile coverage indoors has significant implications for user communities throughout the hospital.



Universal mobile connectivity is critical for enhancing everyday operations and improving the user experience.

The experience imperative

In today's patient-centric service, experience is second only to health outcomes. For patients, the importance of being able to talk to family and friends, access social and entertainment services on their smart phones, and connect to the health apps and services they rely on cannot be underestimated. Yet poor mobile coverage frequently impacts all this, leading to frustration and feelings of isolation that can seriously undermine wellbeing.

With demand for public WiFi typically outweighing capacity in many hospitals, patients are left with little option but rely on support from nursing staff or to pay to use bedside terminals for communications or entertainment. It's a scenario that disempowers some and excludes others from being able to satisfy their basic needs for emotional support and human interaction.



Patients taking ownership

There is another interesting dimension to this discussion which brings together the consumerisation and health ownership/personal responsibility trends driving healthcare today.

Millions of people now use a wide range of health apps and services, whether on smart wearables or mobile devices. It is increasingly likely that in-patients will want to access these services. They may wish to view their medical records, check medicine names or doses when in consultation with clinicians, or simply input treatment data into their apps. They need a reliable connection to do it all.



Duty of care to staff

Hospitals have a clear duty of care to empower staff to do their work safely. In clinical settings, many healthcare professionals use their mobile devices: to engage with colleagues, use professional medical apps and more. The same is true for facilities managers, catering staff, maintenance teams and others, all of whom need to stay connected while moving around the campus.

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Partnership connections

Reliable connectivity is also a must-have for suppliers and employees working in partnership organisations. On-site food, laundry, retail outlets, pharmaceutical deliveries and external IT support all need to be able to stay connected to stay efficient.

In the retail space, coverage is critical. Not only in ensuring smooth operations, but in driving footfall. A coffee shop where people can't use their mobile devices will get less traffic than those in areas where visitors can. For retailers, the availability of fast connectivity for visitors is central to any commercial decision to lease space. Plus, with the shift towards cashless payments, often via mobile wallets, mobile connectivity becomes even more crucial.

By enhancing the mobile operator signal around the hospital, Indoor Connectivity solutions are the easiest way to eliminate not spots and deliver consistent coverage throughout the entire hospital estate.



Accelerating digital transformation with Private Networks

Today's hospitals need modern data communications infrastructure that can support their smart ambitions.

In their drive to become more efficient and unleash new models of care, hospitals are adopting digital technologies that require resilient, high performance connectivity that's optimised for their specific needs.

The adoption of a secure, ultra-reliable high bandwidth private wireless network that can connect assets, applications and people will accelerate the delivery of truly transformational capabilities.

By putting Private Networks to work, hospitals will be able to realise the potential of automation, robotics, and many other innovative solutions.



Private Networks provide the modern data communication infrastructure hospitals need to embrace digital opportunities and address the complex challenges of serving today's demanding patient populations in the most effective way possible.



Telehealth

Providing the secure high bandwidth connectivity that's needed for smart health applications means clinicians can undertake secure, real-time video medical examinations that reduce consultation times for patients, while delivering efficiencies for doctors.



Rapid and agile point of care delivery

Today's hospitals need to be able to adapt their operations at speed. For example, setting up 'pop up' clinical services around the campus, including hospital car parks, can be an effective way to add additional capacity. A Private Network provides the secure and high-bandwidth connectivity these remote facilities need.



Enhanced clinical communications

When it comes to streamlining clinical communications, Private Networks deliver the seamless voice and data connectivity today's health professionals need when moving around the hospital. That includes on demand access to electronic records and digital images as well as supporting the secure sharing and management of patient records.



New surgical innovations

Low latency connectivity is a vital requirement for enabling applications that use augmented and virtual reality in operating rooms. Today's surgeons are already embracing innovations like robotics, and hospitals will soon be able to boost the capabilities of surgical teams yet further. Whether that's enabling trainees to observe procedures in real-time or using AI insights and feedback to empower surgical teams to perform more precise operations with fewer complications.



Automated asset tracking and monitoring

Hospitals can drive a host of automated monitoring services that will enable them to track assets, such as beds and medical equipment, more effectively and optimise the smooth running of hospital operations.

When it comes to monitoring critical functions such as climate control, pumps and fans, hospitals will also be able to take advantage of IoT-based sensors to finely control facilities and initiate predictive maintenance strategies. Private Networks are perfect for enabling the interconnectivity between systems and devices that automate and streamline operations 24/7 – everything from security and surveillance to site access and facilities management.



Getting to grips with the connectivity challenge – addressing the options

To solve the real-world challenges that get in the way of connecting people, data, and assets, a new generation of wireless connectivity options is making it easier for UK hospitals to address the growing demand for enhanced speed, mobility and flexibility.



Understanding Indoor Connectivity

A distributed antenna system (DAS) is one of the best ways to deliver public indoor connectivity throughout the hospital campus. Here, a network of small radio antennas is used to 'transmit' the signal from the UK's four mobile operators – filling mobile coverage gaps and delivering fast and reliable 4G and 5G connectivity to users. Easy to scale, new antennas can be quickly and simply added to take coverage into new areas, enabling:

- **mobile users to make and receive calls, check messages and get online in all areas of the hospital**
- **critical communications support for a variety of clinical, administrative and facilities management functions**
- **patients to access entertainment and social media apps on their own devices in wards and waiting areas. Thereby helping to enhance the in-patient experience**

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Understanding Private Networks

These purpose-built private 4G and 5G networks deliver tailored high bandwidth voice and data solutions that seamlessly connect people, assets and equipment. Operating on a private, dedicated network gives hospitals the assured data security they need while eliminating the capacity and contention issues that are common to WiFi and public mobile networks.

Key benefits include:

- **Facilitating the provision of technology-enabled models of care, including robotic surgeries and patient monitoring services**
- **Enabling the secure sharing and management of patient records on mobile terminals and devices**
- **Providing wireless control of hospital environments – including ambient temperature, lighting, waste management and emergency access**
- **Enabling asset tracking to improve the management of medical equipment, increase operational efficiencies and minimise re-buy costs as a result of theft and/or loss**





Why WiFi isn't always the right option

WiFi networks offer an alternative connectivity option for patients, visitors and staff, and have often been deployed in hospitals. But they are not always the right option.

Many hospitals offer free 'guest' WiFi access. However, these networks are often overburdened and the resultant slow data speeds create problems for users – particularly when attempting to access TV and movie applications. One issue for visitors and patients, is that WiFi networks typically require users to log in. Many people are uncomfortable providing their personal details due to security concerns. More significantly, it raises questions around inclusivity for anyone other than digital natives: people need to know how to do it.

On a more general point, WiFi networks are prone to interference and contention problems that result in slow speeds and poor experiences. Also, with hospital staff and assets typically very mobile, remaining connected to the network while moving between WiFi 'cells' can be problematic.

There are commercial and operational considerations too: deploying WiFi networks at scale requires extensive cabling and device infrastructure that can be disruptive to install and difficult to maintain. This isn't to say that WiFi networks aren't appropriate for hospital environments, rather that they are not always appropriate for every use case.



Managing the future of smarter hospitals

Modern hospitals can operate effectively with a variety of connectivity networks. However, one size definitely does not fit all.

It is important, therefore, to work with a partner who is able to understand the specific needs of your hospital and map out the right connectivity solution. This may be a public or private network or a combination of both.

As a UK Critical National Infrastructure Provider and a neutral host – an independent provider delivering connectivity from all mobile operators – Cellnex will work with you to precisely tailor solutions to meet the specific needs of your environment.

We begin by understanding your needs, conduct detailed site surveys then deliver a blueprint tailored to your specific building requirements. Our engineering teams will then deploy and commission the solution.

On completion, your network will be fully managed and monitored 24x7x365 to ensure optimal performance.

With expertise in providing flexible commercial models for healthcare providers – some requiring no capital investment – we will create a package that is absolutely right for you and your users. And, as an end-to-end partner, we remove the complexities of dealing with multiple stakeholders by engaging with the mobile operators and third-party suppliers on your behalf.

End-to-end



Survey, design and engineering



Deployment and commissioning



Management of mobile operator connections



Operational monitoring and maintenance



Upgrades and extensions



Get in touch

Cellnex can help you close your coverage gaps, deliver a seamless experience for patients, visitors and staff, and build a solid foundation for today's smart digital hospital apps and services.



Find out more and
book a meeting with our
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Cellnex plays a key role within the telecoms sector enabling connectivity throughout Europe. In the UK, as the country's leading independent telecoms site partner, Cellnex provides critical national infrastructure & services to telecoms operators, emergency services organisations and many other enterprises.

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