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SPECIAL REPORT

The evolution of nurse call systems

In association with

STATIC SYSTEMS GROUP

Evolution

London Calling

Fundamental requirements for nurse call systems have not changed since the early 1960s

Resilient

Design Matters

Nurse call systems should be designed to be resilient, fault-tolerant and easy to maintain

Technology

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Opportunities to integrate systems such as VoIP telephony, door access, bed status, fire alarm and medical gas alarms

The evolution of nurse call systems

Imagine you are in a hospital bed and you want a glass of water, or are in pain and want to speak to a doctor or nurse about your medication. Today, as you would have done 50 years ago, you will undoubtedly use a nurse call system so you can summon staff to your bedside when you need to.
While the systems themselves have barely changed since the war, the technology behind them is unrecognisable from those first 'bell and buzzer' devices.

Those early electrical systems featured a bulky handset with a button for patients to press if they wanted assistance. This sounded a buzzer to alert staff.
This was no doubt adequate for Nightingale wards and larger hospital bays, where staff had a good view of patients, but as the clinical environment evolved, and wards were divided into smaller bed bays, so came the need for a change of direction.
By the 1980s bell and buzzer systems had been replaced with microprocessor-based technology, which was not reliant on relays and had the benefit of having no moving parts, offering greater reliability at a reduced cost.
This evolution was much better for patients, too. With a system of overdoor lights, staff would not only know when a patient was in need of assistance, but could follow the light to the individual bed bay.
But the third and probably most revolutionary development came with the arrival of Internet Protocol (IP) systems, which have enabled, not only improvements to the underlying technology of nurse call systems, but also their integration into modern internet-based technologies.
Speaking to BBH this week, Phil Wade, sales director at nurse call supplier, Static Systems Group (SSG), said: "Although the fundamental requirements for nurse call systems have not changed since the early 1960s, it is an environment that has had huge change thrust upon it from a variety of sources including government initiatives, new technologies and changing medical practises.
"In the 1960s nurse call was based upon electro-mechanical relays that were bulky, expensive and prone to failure. However, along came the thyristor, in essence a 'static switch', which changed nurse call radically and became the main component of the new electronic systems being developed.
"Some other key developments that quickly followed included the introduction of additional facilities where, for instance, radio sound was controlled from the patient hand unit to supplement the simple 'pear push' button. This was the forerunner to many future additional facilities controlled from the bedside."
What used to be simple nurse call handsets can now do a variety of other things, including room and bed lighting, control of TV or radio, and also window blinds and heating. Importantly, these computerised systems can also keep a log of activity, providing an audit trail of the nurse call facility and response times for quality control purposes.
Increasingly, systems are also required to link in with a hospital's telephone, building management and fire systems.
Today, the manufacture of nurse call solutions is governed by Health Technical Memorandum 08-03, a Department of Health guidance document. Guidance is also given in a document drawn up by Space for Health entitled Bedhead Services: Technical Design Manual.
It states: "The ability for patients to summon nursing assistance at the bed space or nursing location, and for clinical staff to communicate remotely with the patient and with each other, is an essential lifesafety component of bedhead services.
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easy to maintain. It should be possible for the system to log all of the calls/events to provide detailed history reports when required."

With most modern systems, calls are initiated by the patient operating a push-button on a handset at their bedside or by pulling a cord in dayrooms or washrooms. Once activated, a reassurance lamp should illuminate steadily within sight of the patient to tell them their call has been logged. As well as a lamp on the handset and bedhead, a lamp outside and above the door of the ward, cubicle or room should also illuminate.

Simultaneously a lamp or liquid crystal display (LCD) should light up at the main communications desk, often the central nursing station, and in other areas where staff are frequently located, such as utility rooms and offices.

All bedside and central workstation lights should remain activated until the member of staff arrives at the patient's bedside to answer the call. They can then reset the alarm from the bedhead, or call for further assistance using an emergency call function.

Accompanying audible alarms are often used. A switch on the main communications panel can reduce this volume at night or on high-dependency wards.

Another major development has been the introduction, in recent years, of wireless technology. Enabling nurses to carry a small handset that will alert them to patient alarm calls without having to return to a central nursing station is having a major effect on staff efficiency and costs.

So too are manufacturers having to consider issues like infection control, producing handsets that are easy to clean and impregnated with bug-busting materials.

Wade said: "In the early days great emphasis was given to the technical attributes of equipment, with only secondary importance given to the design of front plates and enclosures – hence some of the rather bulky patient handsets of the 1970's! But that changed in the mid-1980s with the introduction of waterproof hand units. Now handsets could be easily wiped and cleaned between users.

"Today it is expected that equipment provided at the bedhead is designed with this in mind and it is usual to incorporate anti-microbial technology to assist in this. Anti-microbials and the inclusion of such additives are, in their own right, a highly specialist area. Now, manufacturers, who by background are experts in mechanical and electronic systems, have had to embrace and understand a whole new set of skills to equip them to ensure products are fit for purpose in this respect."

Suppliers have responded to market demands and now there is a huge range of products to choose from, many ▶

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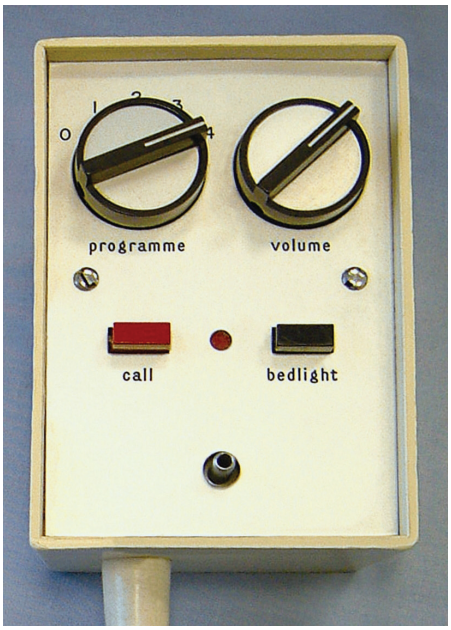

providing the NHS with ways to improve ward efficiency and cut costs.
Wade said: "For example nurse presence systems, which in the early days of nurse call were operated by switches located by the ward door, can now be fully automated. They can even identify nurses by name. Link such options with two-way speech and it can be reasoned that some real efficiencies can be realised by being able to quickly and easily locate and communicate with staff members. Such options fit well with current NHS initiatives and drives for improving patient care."
John Pohill, national sales manager at supplier, Courtney-Thorne, added: "Nurse Call Systems have come a long way from the lamp-based hard-wired wall boards of the past. The future is the integration of the nurse call system with other technologies. IP communication is fast becoming the platform for system integration so modern nurse call systems should be able to utilise IP without relying upon it totally.
"The right technology for the right job, rather than technology for technology sake is the principle that Courtney-Thorne has adhered to in its 20-plus years developing nurse call systems. Wireless communication between the bedhead call point and display panels offers clean, easy installation, scalability and low-cost maintenance. Touch-screen operation of display panels improves ease of use and infection control, and IP communication between control panels and integrated systems offers the greatest flexibility.
"The delivery of nurse call information to smart devices such as mobile phones and tablets will also be widespread over the next 10 years, an area Courtney-Thorne has pioneered in conjunction with Samsung Electronics Research Institute.
From a practical point of view, it is more common for new nurse call systems to be added when healthcare buildings are developed. SSG was recently commissioned to provide a nurse call, staff attack and bedhead trunking solution for the new Emergency Care Centre at Foresterhill in Aberdeen. The bedhead services for the 10-storey, 365-bed new-build facility were assembled offsite.
But, looking towards the future, the NHS is unlikely to see new build projects on anywhere near the same scale of the past decade and is more likely to be looking to improve the estate it has already got. So how does this affect the adoption of new nurse call technologies?
Wade says: "With the recent slowdown in new hospital building we are seeing a significant increase in the supply of new nurse call systems for ward refurbishments and upgrades. The latest nurse call systems are designed to be easily integrated with existing wiring, which although sometimes over 15 years old, was usually installed to a very high standard in robust metal conduits. As long as the wiring is in good condition, then specially developed interface modules can be used to connect legacy wiring to new equipment."
This was evident during work SSG carried out at North Tyneside Hospital in North Shields. Here, the containment could be reused and a new system was installed around it.
Aid Call also produces next-generation wireless systems, which are a popular choice for working hospitals. The company's national sales manager, Chris Donnelly, said: "Fitting systems can be disruptive, time consuming and expensive. If you have to decamp an ►

◀ entire ward in order to fit a hard-wired system, the cost could well be prohibited. This has led to creation of wireless systems such as our Nurse Call system. With this, you can install equipment while a patient is in bed with minimum disruption. There is no need to install cables to any of the call points and wireless systems also have lower installation and operating costs and are quicker and easier to install, are easily changed and can be expanded."

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Having seen so much change over the past 50 years, nurse call systems are likely to continue to evolve over the next decade, driven by new technology, modern construction techniques and changing market demand.

Wade says: "The use of such IT-based technology and structured wired solutions opens up a number of opportunities to integrate systems such as VoIP telephony, door access, bed status, fire alarm and medical gas alarms.

"As an example, with the growth in two-way speech nurse call as the move towards single-bed wards gains pace, IP technology now enables the call system to be easily linked to other systems on site. A good example of this being voice over internet protocol (VoIP) telephony. Touchdown nurse bases and the management of calls can be more effectively realised by the introduction of wireless VoIP handsets, thus providing in essence mobile nurse bases. Our 'culture' helps here with acceptance of such systems as we all grow more and more accustomed to use of similar technology in everyday life."

Donnelly adds: "With the continued spread of mobile data, and the undoubted developments in over-air transfer throughout healthcare establishments, we will be in a position with our equipment to improve staff efficiency, providing accurate and timely information to them wherever they are, which will include call and staff locations, patient records and their call history on a host of devices that they will be familiar with in their daily lives."

But both suppliers and healthcare managers will need to be prepared to make changes in order to keep pace with these changes.

"A key impact, given the wide choice of facilities now available, is to recognise the need for much greater involvement from nursing management teams in the procurement process," says Wade.

"Suppliers must not simply 'up-sell' advanced technology for the sake of it – after all technology can do virtually anything we want! Applying that

technology sensibly and appropriately is now the issue. Consideration must be given to nursing management protocol, hospital design, and patient 'type' in developing future solutions.

"One of the clearest changes has been the need for teamwork and an acceptance of the valuable role that nursing and support teams can have in helping the advance of patient care in these contexts. For manufacturers, such changes demand from them not just the ability to sell clever technology for technology's sake, but to engage in the process of finding out what each hospital team needs and the best way of delivering a tailored and effective solution. Manufacturers are seeing their role in today's healthcare environment as 'service providers' rather than 'product producers' and their role is to consider each application and provide expert guidance and solutions to each need.

"As with all other aspects of life and business, success is achieved by the need to keep moving forward, after all no one stumbles on a good idea sitting down. The next half-century is guaranteed to be as challenging and stimulating as the last."

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