



5G makes tele-surgery fit for the future



A 4G symbol next to the signal strength bar on a smartphone assures fast data transmission. 5G, the next generation of technology, is waiting in the wings and could herald a new era for tele-surgery, according to Dr Michael Kranzfelder. First, however, a few obstacles must be overcome.

Report: Wolfgang Behrends

4G has data transfer speeds of up to 100 Mbit/s. 5G will increase this to 10Gbit/s, i.e. a hundredfold, explained Michael Kranzfelder, Senior Physician of the Clinic and Policlinic for Surgery at the Rechts der Isar Hospital, Technical University of Munich. Speaking at this year's Congress of the German Society of Surgery in Berlin, he explained: 'It will open up many new areas of application for which the previous mobile data transmission standard was simply not fast enough.' This is important for the development of virtual and augmented reality as much as for autonomous driving, the use of professional drones and robots as well as for tele-surgery.

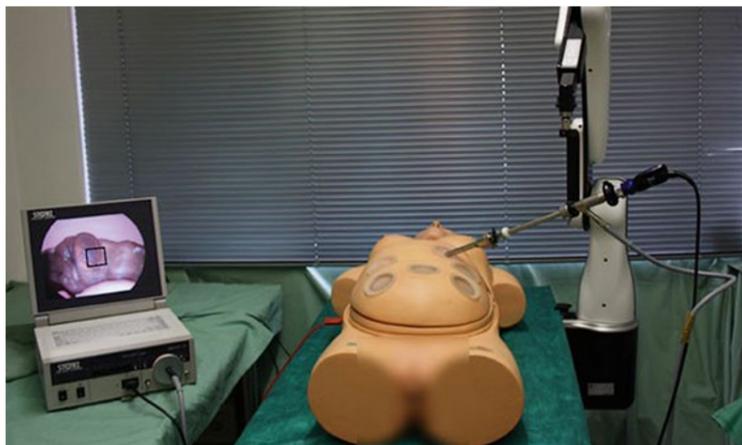
Although 4G should be sufficient for real-time transmission of high-resolution video images (such as HDTV) under ideal conditions, in reality, the data transfer speed is often lower or limited by latency. The latter phenomenon has been a particular problem for the use of mobile data connections in surgery because each delay represents a risk to the patient. The 5G standard, due to be introduced in 2019/2020, promises a reduction of latency by a factor of 10, to around one millisecond – bringing use in the operating theatre within tangible reach.

'For the first time, the speed and laten-

cy of 5G are now meeting the requirements of tele-presence and even tele-surgery,' Kranzfelder explains. In contrast to passive tele-consultation, the surgeon can actively intervene in the treatment. 'One example is remote control of a camera guide arm which moves the laparoscope during minimally-invasive interventions.' This needs real-time transfer not only for remote control but also for the video signal, so that the surgeon is immediately aware of the effects of his actions without delay and can react at once. The model would also be suitable for the substantial improvement of surgical care in remote locations as specialists from anywhere could be involved in almost all locations worldwide.

The fast mobile data standard also opens up new opportunities for process optimisation in the operating theatre: '5G could facilitate intelligent, real-time tracking of people and objects – the so-called track & trace,' says Kranzfelder. The evaluation of such data can lead to improvements of the operative workflow, helping to avoid for example unnecessary work and moves in the operating theatre.

Right: Second generation camera control system SoloAssist (AKTORmed, Barbing, Germany). Centre: OP-Phantom ELITE (CLA Coburg, Germany). Left: Visualisation unit Gastropack (K. Storz, Tuttlingen, Germany)



The surgeon also sees the potential of this technology for training: Real-time overlay of helpful markers during an intervention could focus the surgeon's attention towards important structures.

To test the opportunities and limita-

tions of the new technology, researchers at the Technical University of Munich have equipped a test operating-theatre with prototypes of 5G-capable access points and terminals. Using this set-up, they checked whether control commands can be transmitted to robots and processed fast and reliably, and whether endoscopic image data can be viewed without delay.

Kranzfelder believes that results obtained so far are encouraging: '5G is a trend-setting technology which will play an important role in surgery. However, whether or not it will make the wireless operating theatre a reality remains to be seen.'

Also not yet clear is whether vulnerability to failure during large-scale use is likely to increase. The objective should therefore be to become actively involved in shaping the standardisation process to ensure that the data standard meets the requirements of surgery upon its introduction to the market. 'This is a very critical area of application,' Kranzfelder emphasises. 'It is likely to be regarded with the same critical eye as autonomous driving is at the moment,' emphasises the expert.

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PD Dr. Michael Kranzfelder is a specialist for general surgery at the Rechts der Isar Hospital, Technical University of Munich in Germany. There, he is part of the research group for minimally-invasive therapeutic interventions (MITI). His research focuses on the implementation of intelligent, cooperative OR systems, sensor-based real-time workflow analysis and prediction, radio-frequency identification (RFID) and navigated diagnostics in ultrasound and endoscopy.

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Japanese and German surgeons seek answers

Smiles solidify a surgical team

Surgeons are growing older and the lack of junior surgeons is widespread – a situation acknowledged by most experts at the annual congress of the German Society of Surgery (DGCH) in Berlin, who debated whether the need is greater to increase specialists or, on the other hand, generalists. Both sides produced convincing arguments, but a third group took an entirely different tack.

In the session 'Generalists vs. Specialists', surgeons from Germany and Tokyo, Nagoya and Kumamoto, explored why medical students appeared to shun their fields.

'High risk, comparably low pay

A gruelling work load, fractious atmosphere and high personal risk can discourage junior physicians from surgical training.

and 60 or more weekly hours – are the difficulties surgeons have to deal with,' Professor Hideo Baba pointed out. 'Surgery is one of the reasons why kar shi, death by overworking, continues to be a major issue in Japan,' the Head of Gastrointestinal Surgery at Kumamoto University explained. In the end this is a lose-lose situation, he added: 'Overworked surgeons make more mistakes – a

fact that negatively affects students as well as the reputation of the hospitals.'

Surgeon shortages are a big problem, Professor Yasuhiro Kodera agrees. 'The number of certified surgeons, be it general or specialised surgery, is a direct quality indicator for a hospital,' the Head of Surgery at Nagoya University pointed out. As a rule of thumb, the higher the num-

ber of surgeons, the lower patient mortality. In this situation the fact that fewer and fewer medical students opt for a career in surgery, a trend in Japan as well as in Germany, is cause for concern.

Enthusied in theory, disappointed in practice

'Strangely enough, many junior students do want to become surgeons,' said Benedikt Braun from Saarland University Hospital in Homburg, Germany. However, the first year as physicians is often a reality check: hardly any team spirit, poor work-life balance and little appreciation. No wonder young surgeons, when reduced to nameless instrument holders, re-evaluate their career options. Above all, female medical students are turned off by a gruff atmosphere.

although initially 50 percent of students would consider working as surgeons, after their first practical experiences only seven percent still do so. 'The discipline per se is well positioned and attractive but the working conditions are abominable,' Braun confirmed. Moreover, this assistant physician pointed out that few hospitals have a strategy to attract and retain young surgeons. He is optimistic that 'as soon as this changes, the problem can be solved'.

Dr Joachim Jähne observed a different problem: imbalance to the detriment of general surgery. 'There's a strong trend towards specialisation,' said the Medical Director of the Department of General and Visceral Surgery at Diakovere Henriettenstift in Hanover. 'This specialisation is more attractive for young doctors – often better work hours and you are not involved in stressful clinic routine anymore,' he explained.

While this development is characteristic for industrialised countries such as Germany or Japan, these countries also need physicians who are more broadly trained and experienced, be it in trauma surgery or to provide healthcare in rural areas.



As the fictional Dr Tokimeki, Professor Ohki helps his young colleagues, for example, to use new stent techniques.

'Therefore we have to make the discipline as such more attractive for junior physicians,' Jähne advises.

'I will smile at each and every one'

Better working hours, higher salaries – these are not necessarily the prime drivers for young surgeons, according to Professor Dr Takao Ohki. 'The most important issue is job satisfaction,' he believes. As Head of Visceral Surgery at Jikei University School of Medicine in Tokyo, he squarely puts



Illuminating medical care

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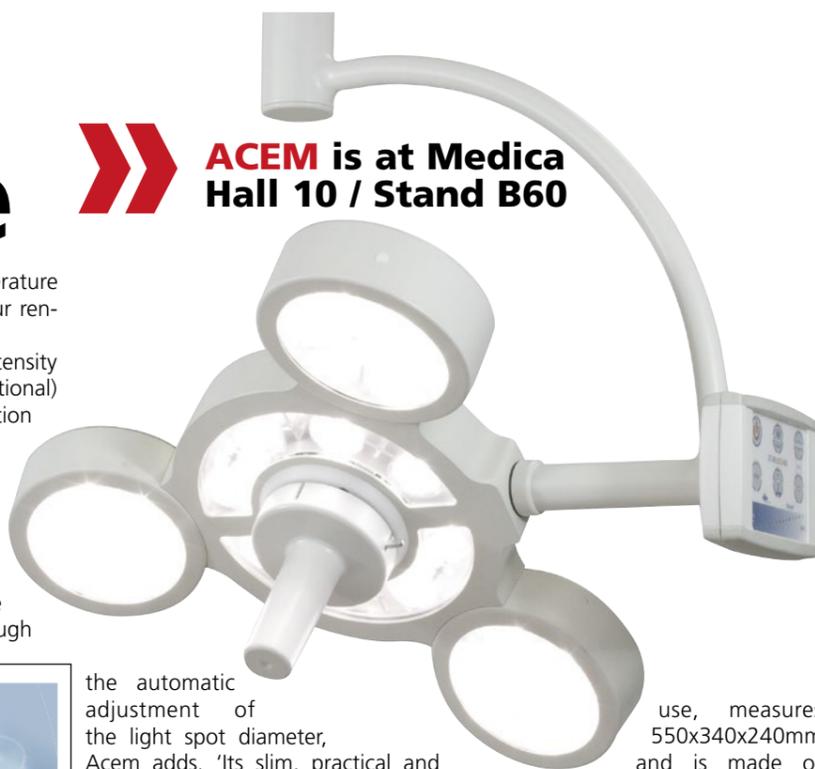
of light with a colour temperature (CCT) of 4.500 °K and a colour rendering index (CRI) of 95.

'The lamp also has a light intensity of 130,000 lux (160,000 optional) with a low energy consumption of 69W.

The life cycle of its LEDs is about 50.000 hours.'

The three reflectors produce a well-blended and intense cone of light focusable through

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the automatic adjustment of the light spot diameter, Acem adds. 'Its slim, practical and compact design makes it perfect for several uses. The lamp is ergonomic, easy to move and to position and suitable for the laminar flows of the operating room.

'The ENDO function (light for endoscopy) gives the possibility to use the lamp for minimal-invasive surgery, too. The easy -to-clean shape and material, as well as its removable, sterilisable and easy-to-grip handle assure an excellent cleanliness.'

The ABPS, Acem's rechargeable battery powered system for trolley

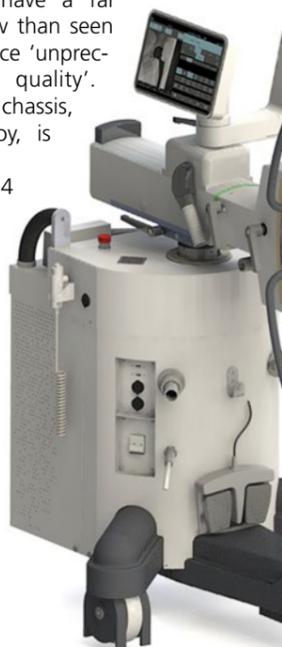
use, measures 550x340x240mm and is made of protective resistant plastic. The control panel manages fundamental parameters, such as residual charge, type of power supply, recharge status and electrical power supply presence, etc.

The unit is recharged by an automatic charger and requires no specific maintenance, the manufacturer adds. 'The autonomy may vary depending on the battery model, which can be from 12 Ah to 28 Ah with maximum charging time of about 8 hours.'

Seeking

Cyberbloc, the large C-arm range manufactured by Primax International, results from the firm's 30-year track record in medical imaging. Today, along with the C-arm range, the firm produces mobile radiography machines, remote controlled RF tables, conventional and digital radiography and urology equipment, and X-ray generators. Primax reports that the easy-to-position C-arms, with special wheels layout to ease approach to the operating table, have a far larger field of view than seen before, and produce 'unprecedented image quality'. Additionally, the chassis, of aluminium alloy, is lightweight.

Other aspects: 4 kW fixed anode or 5 kW rotating anode single tank generator; enhanced orbital rotation and C-arm depth; triple field I.I. (9 or 12 inches) 625 lines or 1024x1024 CCD camera, and an orientable touch-screen operator console.



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department.'

The fact that Professor Ohki is serious about being a role model for his young colleagues has already been acknowledged in the media. In the Manga series 'Dr Tokimeki', he – smilingly of course – helps young surgeons with rare or risky procedures (see: https://www.drsgate.com/company/c00042/ohki_index.php).

The times they are a-changin'

The self-perception of surgeons continues to be shaped by the times when surgery icons such as Ferdinand Sauerbruch were revered as demigods, Professor Dr Hans-Rudolf Raab,

Medical Director of the Surgery Department at Oldenburg Hospital, confirmed, and then added: 'The times they are a-changing'. However, the more important problem, Raab underlines, is the fact that, today, economy calls the tune in many hospitals, curtailing the autonomy of medical directors and thus impairing the quality of care: 'It is high time for us surgeons to regain control of our own fate. This also means that the managing director of a hospital has to be a physician, not an economist.'

W. B.



Dr. Yasuhiro Kodera is professor of gastroenterological surgery at Nagoya University, Japan, member of the Japanese Surgical Society. His research focuses on surgical oncology of gastric cancer.



Prof. Dr. Joachim Jähne is Medical Director of the Department of General and Visceral Surgery at Diakovere Henriettenstift in Hanover, Germany. He specializes in gastroenterological and endocrine surgery, surgical intensive care and emergency medicine.

responsibility on one person: himself. 'I can't expect a positive attitude from my team members if I am not a role model. Therefore my philosophy is: I will smile at each and every one. I know every person on my team, student and physician alike, by name. This is by no means the case in every department.'

This practice of individual appreciation is successful. Since he was named head of department Ohki has ensured that the number of surgeons in his team is continually rising. 'Even with working hours and higher salaries in other departments, the students follow the smile – and the smile is at home in our surgery



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Seeking more young surgeons

Technology and team spirit are the lure

Over the past decade surgical interventions in Germany increased by around 30%. However, it would be wrong to talk of a heyday – mainly due to a lack of young talent, according to Professor Jörg Fuchs. The president of the German Society of Surgery (DGCH) and director of the Clinic and Polyclinic for Paediatric Surgery and Paediatric Urology at Tübingen University Hospital, spoke with our correspondent Wolfgang Behrends about challenges in his field. These include the increasing importance of robotics and AI tools.

'According to current statistics, around 11,000 surgeons, currently working, will reach retirement age by 2020, representing fifty-percent of surgeons in private practice and around twenty percent of hospital surgeons,' said Professor Jörg Fuchs, President of the German Society of Surgery. 'This increases the existing lack of specialist medical staff, which in the field of surgery is deemed to be between twenty and thirty percent. In other words, we have a significant problem.'

A team member, not a gopher

The discipline is desperately seeking young doctors who can take over the baton and meet the growing demands of surgery. 'We require an innovative approach,' Fuchs believes. The focus of these efforts is the recruitment of students who are completing their Practical Year (PJ) as they are most likely to consider choosing surgery. 'We must therefore do a lot more for students, rather than merely treating them as menial assis-

tants,' he said. Junior staff should be made to feel part of the team and be able to explore career opportunities in surgery. 'Technical innovations, such as robotics, play an essential part here. They will become increasingly common in surgery, which also makes this discipline more enticing for those who are technically gifted.'

Support from artificial intelligence (AI) will be increasingly important for surgeons, which can also be an enticement for junior staff, along with the improved training facilitated through advanced simulators. However, one should not conceal the high physical demands of surgery.

'Standing at the operating table for several hours is not for everyone,' Fuchs pointed out.

The contract and training structure also need to be improved, Fuchs believes. 'Surgical training is not exactly cheap. However, whether or not the employer gives a financial contribution is regulated in very different ways – frequently, residents are left to their own devices with this problem and end up paying for it out of their own pockets.'

Consecutive fixed-term contracts are another common problem because they make career planning for surgeons very difficult. The paediatric surgeon feels that the combination of these factors is fatal: If a young resident funds the required courses not knowing whether this will lead to long-term employment, this will put them off. 'It's not only hospital operators who need to act here, but also politicians,' the DGCH-President advised.

This also applies to research – important for many young surgeons: 'In many hospitals staffing levels are so tight that research is something which has to be carried out after hours and at weekends - as in days gone by.' However, in view of annual deficits running to several millions in many university hospitals it is unlikely

that more resources will be freed up for academic work. Last but not least, this is incompatible with the concept of a work-life balance, which is very important to junior staff. 'You cannot expect someone who would like a career in surgery to carry out research in the laboratory after 14 hours in the hospital. These days this would not be possible also from a legal perspective.'

The alternative would be finance models that include dedicated periods for research and qualifications alongside clinical work. Compared to other disciplines, such as genetics or internal medicine, surgery is under-represented in the allocation of research grants, Fuchs criticised.

Structural decisions are needed

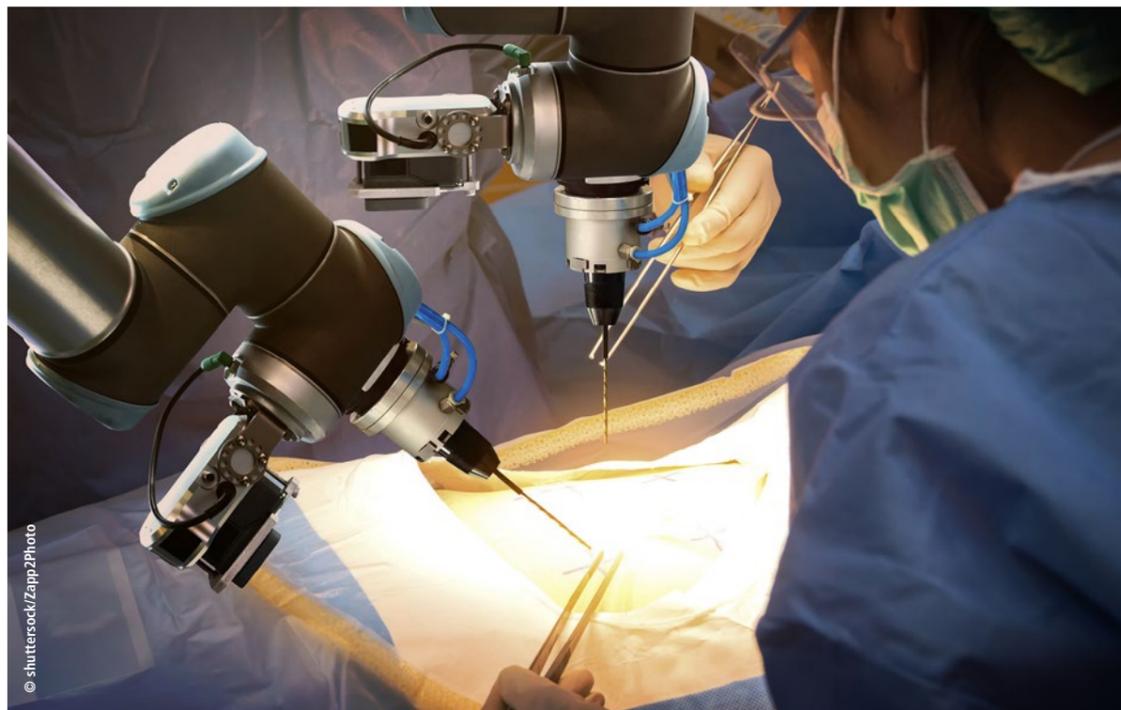
Globalisation is a further challenge and a two-edged sword for this field: Although many foreign patients choose high quality surgery in Germany, many surgeons trained in Germany leave the country, because the working conditions and earning potential are better in countries such as Norway or Switzerland. 'This is another area of tension which will ultimately need a political solution,' Fuchs observed. The DRG system, which classifies hospital cases

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Expanding European manufacturing

Expanding its European medical equipment manufacturing and support, Ikegami is enhancing its facilities at its EU headquarters in Neuss, Germany, and modernising other areas within the 25-year-old building. The investment will help meet increased demand for its wide range of imaging and display solutions, according to Zeljko Romanic, Industrial & Medical Video Division Manager at Ikegami Electronics (Europe) GmbH.

Ikegami is at Medica Hall 10 / Stand B12

'Among additional resources to be provided are expanded circuit-board design capabilities plus assembly, configuration and testing areas,' he said. 'All are being equipped to meet the newest production standards, especially those directly relevant to the medical market. We source many

of our electronic boards from suppliers in Germany, which enables us to meet the specific needs of our European customers with maximum efficiency and reliability.

'In addition to electronic component integration and inspection, the facility will be equipped with enhanced optical testing capabilities to ensure consistent performance in optics and imager combinations. We will also be expanding our production team to make the best possible use

of these enhanced facilities which will be a true Centre of Excellence.'

Products assembled at Neuss by Ikegami Europe include the firm's range of medical camera heads and control units, all designed to provide the facilities needed to televise surgical procedures both for routine operations and for student training purposes.

'The new resource will extend Ikegami's European camera assembly capacity and also encompasses a



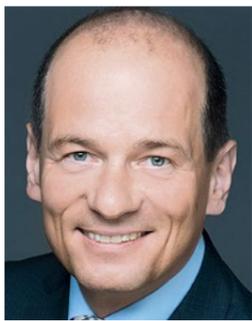
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Professor Jörg Fuchs MD is president of the German Society of Surgery (DGCH) and Director of the Clinic and Polyclinic for Paediatric Surgery and Paediatric Urology at Tübingen University Hospital, Germany. Between 1983-1989 he studied medicine at the Humboldt University in Berlin. In 1997, he became a specialist for paediatric surgery at the Medical Academy Carl Gustav Carus in Dresden, becoming Senior Consultant in 1998. From 2010-2013 Fuchs presided over the German Association of Paediatric Surgeons (DGKCH). His research includes cancer and minimally invasive surgery, as well as research into solid tumours in children.

into groups for payment purposes, is one key problem that increases cost- and working pressure for hospital staff. 'Compared to many other countries, German hospital doctors and nurses clearly must look after more patients. Solving the problem by increasing salaries would be mere window dressing,' the DGCH president said. 'Instead, workloads must be reduced, through better staffing ratios, for instance.'

At the German Medical Assembly 2017, in Freiburg, the controversial DRG system was criticised as being counterproductive and obsolete from an ethical perspective. 'We should ask ourselves if politicians should make clear statements and decide, in the context of a structural plan, which hospitals in Germany are really essential and which require special financial support – I'm mainly thinking about centres of excellence and university hospitals. Decisions on hospital locations should not just be left to local politicians.'

Medical students and patients 'enter' an operating theatre

Neurosurgery taught via Virtual Reality

Report: Mark Nicholls

Virtual Reality (VR) technology is aiding trainee surgeons to practise complex procedures in a simulated setting, rather than learning skills on real patients. VR is also helping to demystify neurosurgery in that it enables medical students and patients to 'enter' and experience a neurosurgical operating theatre. Alex Alamri, a trainee neurosurgeon at Barts Health NHS Trust in London, UK, said hands-on experience of brain surgery in an operating theatre is not always straightforward for medical students. The Barts Health Trust surgeons have been working on the project with Fundamental VR, a London-based firm that has developed a VR system to allow trainees to conduct virtual surgeries. Haptic feedback, which recreates the sense of touch to the user, provides real-time responses to what surgeons feel during procedures.

'We have been helping to develop Hololens-based applications so that neurosurgery trainees can attempt procedures safely, pre-operatively,' Alamri said. 'It means that the first time you try to perform a complex procedure it is simulated, and not on a real patient. When performing procedures in real life there is a certain anxiety that goes with the high stakes, which can definitely affect performance.'

'If you can practice a high-fidelity simulation over and over again before you even set foot in an operating theatre, your procedural fluency and confidence undoubtedly will be better than without these tools.'

Sharing experiences

Surgeons are also using the initiative to encourage patients who have



undergone neurosurgery to share their experiences to help other patients and their families, as well as healthcare professionals, understand neurosurgical decision-making processes.

Mr Alamri said that advent of VR and hardware solutions such as Google cardboard mean that medical students no longer need to 'sit at the back of the operating theatre' and not get a clear view of what is going on.

The Barts team used a number of GoPro Hero 4 cameras strapped the heads of surgeons to film the 360VR sequences that formed the basis of the neurosurgery training solution and steps towards wider public engagement in the specialty.

Alamri, along with surgical colleague Chris Uff, and others at The Royal London Hospital, conducted one of the first brain surgery procedures on an aneurysm to be recorded in VR. At around the same time, a team from Helsinki used the Nokia OZO system to stream augmented neurosurgery to neurosurgeons, but the London team's emphasis was to open up the 360 film of the brain surgery procedure to a

wider public audience.

'We stitched in head mounted GoPro views, so that the public could see exactly what a consultant neurosurgeon sees when they operate,' he explained.

The film is part of a larger endeavour called Brainbook, which uses brain surgery videos to educate students and is the world's first project dedicated to public engagement in neurosurgery.

Social media discussions and high quality videos

The online multimodal neurosurgical resource uses social media to discuss cases and provides insight into life at the Royal London Hospital, the UK's busiest neurosurgical major trauma centre, with particular highlights of the activities of the multidisciplinary team.

'Brainbook places emphasis on using lay terms and providing definitions for terminology to allow everyone to participate in discussions,' Alamri explained. 'Social media conversations are pitched at levels appro-



Alex Alamri is at Barts Health NHS Trust, in London, studying in his third year of eight to become a neurosurgeon. He also has a major interest in developing the application of Virtual Reality technology within a surgical setting.

priate for everyone from members of the public to neurosurgeons around the world. The initiative encourages patients who have previously undergone a neurosurgical procedure to share their experiences.'

The Brainbook team has collaborated with medical illustrators Dr Ciléin Kearns (Artibiotics.com) and Dr Luis Domitrovic (Ladvic.com) to provide high-quality medical art and animation to help better illustrate concepts that participants may find more difficult to grasp.

'High quality videos are produced to explain common pathologies and procedures, and each of these are embedded within a case based on a real patient story,' he continued. 'The videos are uploaded to YouTube, without restriction, allowing universal access. The aim is to help patients and their families, as well as allied healthcare professionals, understand neurosurgical decision-making processes and what to expect if they need to undergo neurosurgical treatment. The videos also act as a primer for junior neurosurgical trainees with limited access to resources.'

The development of haptic, or kinesthetic, communication, is the key to advancing the concept, though development costs remain a challenge, Alamri said 'Better haptics means better fidelity.'

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Stairs are no problem for this ambulance chair

Safe and comfortably seated

United Kingdom manufacturer Paraid is demonstrating its latest version of the IBEX ambulance chair, used by ambulances throughout the UK. This easy-to-use patient transport chair is designed for use across all terrains including restricted, spiral and narrow staircases, the manufacturer reports. 'The innovative product features a plastic seat and backrest with harness, which allows patients

to be easy manoeuvred. It also minimises the operator's exposure to the weight capacity of the chair.'

For thirty years, Paraid has specialised in bespoke transportation equipment for hospitals and road ambulances. During this time, it has become known for identifying prominent issues within the neonatal and paediatric sector and has pioneered the acclaimed ACR (Ambulance Child

Restraint) and the Neo-Restraint safety products. Both products are on display here at Medica.



Paraid is at Medica Hall 11 / Stand G46

'The Neo-Restraint answers to the need for a safe, fully adjustable close proximity harnessing system reducing the harmful effects of excessive movement during neonatal transfer,' Paraid explains. 'It has been designed to secure infants ranging in weight from 500g to 6kg and is currently used by 90% of UK based neonatal transport teams. The ACR was also developed to help keep paediatric patients safe during transportation. It is compatible with all models of ambulance stretchers and can be found in more than half the ambulances across the UK.'

'Paraid are at the forefront of design and manufacturing patient transport systems,' the company adds. 'Using the latest 3-D CAD software, our expert design and production teams are dedicated to understanding the needs of both the

patient and medical professionals. The company offers a bespoke and personalised design service, working with clients to ensure products are constructed to their exact specifications.'

Lee Searle, Head of Paraid adds: 'Paraid's level of expertise and experience means we can offer a variety of innovative transportation solutions for road ambulance, pre-hospital care, neonatal and paediatric sectors. We are committed to investing in high quality manufacturing, design and engineering in the UK and can assist customers nationally and worldwide.'

To book an appointment with Lee Searle, e-mail: lee@paraid.com



Walking – upward on onward

Exoskeleton technology

In 2011 **Tian-Zong** injured his spine in a car accident. He could neither feel his legs nor stand and walk. His visual field shrank from 180 cm standing height to 110 cm when sitting in his wheelchair. When the accident happened, he was 36 years old. His wedding had to be cancelled. Moving around in a wheelchair, Tian-Zong often needed help, which makes him uncomfortable and embarrassed. He dreamed of standing up again.

His life was to change when, in 2012, a Taiwan team at the Industrial Technology Research Institute (ITRI) began to develop robotic exoskeleton technologies for disabilities. After receiving a 2016 R&D 100 award, in 2017 the start-up Free Bionics was founded as a spin-off from ITRI by Cheng-Hua Wu. This became the first independent company in Taiwan in R&D of the powered exoskeletons/exo-suits. 'To help people stand up again and walk independently,' Wu explained, 'has been the main reason that drives our team to devote themselves to technology R&D.'

The firm aims to become a global leading brand of lower limb robotic exoskeleton by 2019. Wu's plan, to take the firm's products world-



Tian-Zong, wearing the exoskeleton, can now take walks alongside his wife and toddler

wide, has begun with an agreement with USCI Japan, Ltd., that country's largest medical device marketing agent. According to the USCI President Kiyotaka Mori, Free Bionics is already receiving positive feedback from Japanese physicians and physiotherapists and the agent expects to distribute Free Bionics' product to

more than 10 Japanese hospitals and as well as SCI centres.

'The device is estimated to be applicable to 15% of SCI patients, an equivalent of 15,000 patients, with an annual increase of 750 people. Afterwards we will expand the

scope, for example, to include elderly care. For rehabilitation purpose, a larger patient population may benefit from Free Walk. Patient safety is our top priority, so we'll take a step by step approach to market this product in Japan with Free Bionics. We'll first start with the cooperation with hospitals to ensure the use of this product is safe,' he explained in a recent interview.

The Taiwan firm also has a subsidiary in Hong Kong

Tian-Zong now stands and walks. The exoskeleton was designed for people with lower limb paraplegia. The anthropomorphic apparatus mimics natural human gait. With

user-oriented technology and intelligent control, it recognises the user's intention to walk or stop by detecting postural changes, the manufacturer explains. With normal upper limb function, users can strap into and out of the device independently.

Free Walk provides power at the hip and knee joints that greatly reduces the energy necessary for paraplegics to sit, stand, and walk, the firm adds. When paraplegics can walk independently, it provides not only psychological effect, but also improves their physical conditions.'

Tian-Zong spoke of his feelings when he could walk again for the first time since the accident. 'The thought that I could finally interact with others at the same level instead of always looking upwards; the joy brought tears to my eyes.'

Wearing the exoskeleton, Tian-Zong at last walked down the wedding aisle with his wife. Now he is also the father of a one-year-old boy.

'He is much stronger than I imag-

ined him to be,' Tian-Zong's father observed. 'I'm happy that, in my lifetime, I can see him stand up again.'



The powered robotic exoskeleton/exo-suit aims to aid those patients with lower limb damage

More than just MRI accessories



Pressure mattresses to avoid

A UK company that specialises in the development and manufacture of 'zero pressure' technology is showing its full range of mattress solutions at Medica this year.

Over the last few years, Rober Ltd of Chesterfield, has invested heavily in R&D to develop a complete range of pressure ulcer mattresses that cater for a variety of needs, including patients who are immobile, bariatric or have existing pressure injuries.

Developed in conjunction with clinicians, the mattresses feature clinically proven technology that prevents pressure injuries from developing.

They also have therapeutic properties to promote the healing of established ulcers.



Rober is at Medica Hall 16 / Stand F18-8

The mattresses are fully automatic, and patients nursed on them require less frequent manual repositioning, thus relieving the pressure on busy nurses. The mattresses can be used in everyday nursing environments, as well as acute care facilities.

'Designed and manufactured in

the UK, Rober's mattresses and overlays have been developed to replicate the body's natural movements by

responding to a patient's weight, spontaneous movement pattern and body position,' explained. 'They provide enhanced comfort and complete pressure elimination at regular intervals.'

Discreet staff, patient and asset monitoring

In future, healthcare intelligent IoT solutions for real-time and location-based management of assets, employees and patients will be integral. 'Medicosolution is working on holistic digital concepts for the healthcare sector and offers a platform for integration for existing solutions,' the IT firm reports. 'All processes can be tracked in real time,' Max Schröfelbauer, its CEO, explains. 'This creates process transparency, increases effectiveness and reduces costs - for the good of patients and medical staff.'

A high-precision indoor localisation infrastructure that transforms physical spaces into interactive,

measurable environments forms the basis for solutions for asset monitoring, patient safety, indoor navigation, staff and patient flow. A precise and unique database is generated, which can be transferred to the respective HIS system, the firm's report continues. 'The system is designed so that medical solutions and devices of any kind can be integrated via Bluetooth Low Energy (BLE) - for relevant information at the right place and time.'

Medicosolution lists the following benefits:

Asset monitoring - helps to locate and protect portable assets from loss, as well as optimise provisioning.

Patient safety - Monitors, in real-time, with careful respect for privacy, a patient's position. When risk is automatically detected the nearest staff member is alerted.

Staff workflow - Monitors processes and procedures by tracking hospital workflows. Enhance staff coordination and improve efficiency of operations. Monitor deviations and automate reporting. Manage notifications and reminders.

Patient flow - tracks patients throughout their care. The system also highlights bottlenecks and eliminates waiting times and inefficiencies. Optimises the use of facilities and assets. Enhances the quality of care and patients' satisfaction.

The system can be experienced live at this year's show.



Medicosolution is at Medica In Start-Up Park Hall 15 / Stand 15 B57-14

Gluing outdoes stitching

Results after suturing are not always aesthetic. Wound treatment with tissue adhesives offer a quick healing process, good tolerance and low scarring.

cation of the adhesive with single-use fine dispensing pipettes prevents germ development and the wound is protected against infections. The efficient content of the vials makes

Meyer-Haake GmbH is at Medica Hall 5 / Stand P21

Among these, EPIGLU is an especially fast polymerising product, an Ethyl-2-cyanoacrylate with good closure properties even for injuries that are under tension, Meyer-Haake GmbH Medical Innovations reports: 'The product, which has been on the market more than 20 years, can be easily applied, does not require anaesthesia and allows fast patient care. Thanks to its tear resistance and adhesive power, this tissue adhesive can also be used for long wounds.'

It is especially suitable for cuts, lacerations, surgical wounds and skin lesions, the firm adds. 'The wounds should not bleed anymore, may not be infected and should not be older than six hours. By eliminating stitch channels and tension, the patient benefits from a higher level of treatment comfort, associated with less pain and faster healing without complications.'

Epi glu is available as single-dose with 0.3ml and 0.5ml contents, or in a 3g vial for multiple use. 'The appli-

the product a very economic treatment option which is, even under financial aspects, a major competitor to traditional sutures.'



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Regional efforts set the tone of Spanish e-health strategy

National initiatives show limited success

Spain has powerful regional e-health projects, but implementing a national strategy remains a complicated task. Lack of interoperability and low resources slow down data sharing across 17 autonomous communities, and sometimes even within the same region, key experts in the field explain.

The process of promoting the electronic patient record nationwide has stalled because the different systems used across the country are simply not interoperable

Report: Melisande Rouger

Although Spain transfers skills to its communities, everyone can benefit from emergency and primary care wherever they are in the country. Thus the electronic patient record (EPR) was launched to grant Spanish physicians, nurses and patients access to relevant patient information, by connecting some of the data acquired in local primary, emergency and nursing care into one national repository.

Having a platform regrouping patient data all across the country has huge potential, according to Vicente Caballero Pajares, national coordinator of the New Technologies group of the Spanish Society of Primary Care Physicians. However, although 12 years have passed since its introduction, primary care professionals do not use the EPR, he pointed out. 'The truth is that it's not yet available. No one uses it in daily practice.'

Why? The different systems used



across Spain are simply not interoperable. 'Just consider this: some communities use Linux, others Windows,' Caballero explained. 'How do you plan on harmonising anything on that

basis?' Carlos Mateos, vice-president of the Spanish E-health Researchers Association, agreed. 'Healthcare professionals are currently not able to access or share the EPR on a national level, because each region uses a different system.'

Although the EPR currently stores the data of 78% of the population, many communities have not connected all relevant patient information to the EPR and, according to Caballero, some still don't have access to the platform.

Healthcare authorities have not invested enough money into the EPR because they have other priorities, the physician argued. 'They know what the necessities are, but they are short-sighted. They'd rather invest in reducing waiting times in primary care. They don't have a vision for the future.'

In 2006, Javier Quiles Del Rio, eHealth Programme Manager in the Galician healthcare service SERGAS, helped design the EPR alongside other communities' representatives and experts. He believes the tool already brings value, just by looking at usage data: 'Every month in Galicia we issue 500 electronic records for patients who have their information in other communities, and answer 5,000 requests from other communities to access our clinical information.'

The new yet powerful initiative of making the electronic prescription available across the area is bringing results. 'The project is showing great promise and will be a major advance for patients travelling across the country.'

The service, now available in six communities, means patients can go to a pharmacy and pick up medication prescribed by a physician in another community, but the deal should be available in the whole country within the next two years, Quiles estimated.

A Spanish agenda on digital affairs does exist, but only to issue recommendations. It is up to the regions to organise themselves and develop common strategies regarding e-health – which they do, at different speeds.

Interoperability is also a local issue. Systems are often incompatible



Vicente Caballero Pajares (pictured) is national coordinator of the Spanish Society of Primary Care Physicians New Technologies group. He is also a specialist in family and community medicine at Don Benito Oeste Health Centre in Badajoz, Extremadura.

Susana Iglesias Tamayo is head of applications development and maintenance at the Basque Regional Health Service Osakidetza in Vitoria-Gasteiz.

Javier Quiles del Río is e-health programme manager in the Galician healthcare service SERGAS in Santiago de Compostela.

Carlos Mateos is Vice president of the Spanish E-health Researchers Association and Director of Com Salud PR and communication agency in Madrid.

er analysis. We've saved time and efforts using the same EPR, and it has improved clinical efficiency and productivity.'

A number of apps have been released for patients and professionals to improve healthcare delivery. Osakidetza has released Osasun, an increasingly popular app for patients to access their health records using their smart phones and tablets. 'We've had 72% more consultations through Osasun in 2016. Over 200,000 accesses have been registered and 43,000 people have accessed at least one of the services offered on the platform,' Iglesias said.

Many users are patients with chronic diseases, accounting for 70%+ of total healthcare cost. For them, remote monitoring is rising; Osakidetza attended 61,109 chronic patients using remote technology in 2016. The Basque Country has also released four apps for bedside care. Nurses assessing vital signs, taking blood tests, administering medication and utilising nursing care techniques can do so using apps on their tablets. Iglesias added that the tool is expected to decrease errors in medication administration or when entering data while performing tests.

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Embracing the digital age

France simplifies healthcare

Successful pilot scheme means Terr e-Santé will be rolled out for the whole of the Ile-de-France.

Report: Jane MacDougall

The French have a reputation as early adopters of telemedicine driven by the desire to modernise healthcare by the judicious use of the latest technology. The first 'carte vitale' (national health card) with a microchip was introduced in 1998. Since 2011, the information stored on the cards has evolved to provide a secure system to transfer treatment codes and payment of healthcare professionals and patients via the social security system NOEMIE, a system of open exchange between patients and external providers. Functional throughout most of France this is used by everyone over 16 years old covered by the social security system.

It ensures reimbursement by the social security and private insurance is fluid and timely. While a welcome advance on the complex paper procedures required in the past it is still reliant on the vagaries of the internet and can cause severe problems for doctors and pharmacists alike if the system goes down. Only approved social security engineers can access and repair the encrypted system for data exchange and delays can be costly and result in administrative backlogs and potential mistakes.

Although to arrive at this point has often been painful and subject to delays, successive governments have seen digitisation as a way to streamline healthcare administration and eventually save money. Additionally, and perhaps even more importantly, for the economy's future, healthcare digitisation and connectivity is seen as growth market for nascent biotechnology companies with exciting and novel ideas to transform traditional healthcare by giving patients control over their medical destiny.

From conception the carte vitale was considered for storing medical data that could be shared between healthcare professionals. Indeed, today a mini-medical dossier is embedded in the chip, providing information on the patient, their named family doctor (GP) and recently prescribed medicines.

Sharing of data via a secure internet server

However, due to technical difficulties

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of compatibility between the varied IT systems used by doctors, radiologists and pharmacists, and also concerns about data security, the original idea has altered. A new system based on the sharing via a secure internet server, controlled under the data protection act, Terr-eSanté was launched in 2017.

The idea behind Terr-eSanté is to facilitate healthcare of certain patient groups by coordinating the exchange of information between the different healthcare professionals involved in their treatment and, of course, the patient themselves.

Centred on the patient's healthcare journey, six different steps are included; the first visit, either to the

GP or hospital where the dossier is initiated; results of prescribed tests, e.g. laboratory analyses and radiology; prescriptions; appointments; on-line payment of professionals and pre-admission administration, to facilitate hospital stays.

Pilot system tested in Paris

Five different healthcare situations are covered; diabetes, cancer, cardiovascular disease, out-of-hours healthcare and perinatal care. However, for the moment only diabetes, perinatal care and cardiovascular options are operational. Terr-eSanté services are provided free, but require an online account.

There are two points of access one for healthcare professionals and the other for patients. The pilot system was tested over a defined territory of the Paris area that included a dense urban population of 370 000 inhabitants with general poor health indicators. The pilot scheme ran until the end of 2017 and will now be rolled-out over the whole of Parisian region from this year.

Because of its server-based nature, Terr-eSanté is compatible with all the different IT systems in use by healthcare professionals, does not require any further investment in IT equipment and can be accessed remotely. Unlike the carte vitale, all the information is accessible to the patient.

The patient chooses which healthcare professionals may access their medical dossier, although the doctor initiates a dossier for a patient. Only registered professionals can access the site, likewise a patient's identity needs to be confirmed by a doctor. Patients retain the right to remove a healthcare professional's access to their dossier, if for whatever reason. Elderly or infirm patients can name a representative to manage their dossier for them.

An exciting concept that is patient-centric will probably override initial fears of public sharing of sensitive data, especially in peoples' minds considering the on-going Facebook allegations. If these can be overcome, the potential for the system looks very promising, new telemedicine tools or apps can be added to the patient's dossier.

For instance, 'Ortif Cardio' for patients with cardiovascular problems enables them to upload their blood pressure readings, weight etc. directly to their doctor. The range of ORTIF home monitoring systems is already extensive and very popular among doctors and patients who like to feel in control of their health via their smart phones.

So, perhaps the wider service offered by Terr-eSanté will become popular, particularly for patients suffering chronic illnesses that cross different medical specialties.

Further information

NOEMIE, Norme Ouverte d'Echanges Maladie avec les Intervenants Extérieurs, <https://www.ameli.fr/l-assurance-maladie/documentation-technique/norme-noemie/index.php>

ORTIF, Outil Régional de Télémedecine en Ile-de-France, regional telemedicine for the Parisian area. <http://ortif.fr/>

Terr-eSanté, <https://www.Terr-eSante.fr/>



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Long-term communication success in digitised healthcare

E-health in Denmark

The Danes have shown for some time how e-health can work successfully on a national level. The health portal sundhed.dk (= health), initiated in 2001 and launched in 2003, is part of the public healthcare system. As of January 2018, the Danish national strategy describes sundhed.dk as a national access point for personal health-related data for hospitals, general practitioners and communities, said Morten Elbæk Petersen. As Director of the Danish health portal he was describing the portal's functions during the 'Emerging Technologies in Medicine' (ETIM 2018) conference, in Essen this February.

For Petersen, the digitisation of the healthcare system is, above all, an opportunity to safeguard patients' personal responsibility and to turn citizens into equal partners when dealing with healthcare employees. The idea behind sundhed.dk is not only to advance the networking of data for doctors, hospitals and care homes but also to empower patients. 'Since the introduction of the publicly organised and funded portal, the mortality rate has fallen and the average length of stay in Danish hospitals has fallen to 3.4 days,' Petersen said.

Doctors and patients can access the data

The portal collates medical informa-

tion and data of all Danish citizens aged 15 years and over, and serves as a central access point for doctors and patients to view results, medication, treatment plans and billing. Doctors can issue e-receipts and can also use the system to send letters to medical staff. Doctors can access images and laboratory data as well as results from specialists, hospitals, care homes, home carers, psychologists and physiotherapists.

Via sundhed.dk citizens can access contact data of all doctors, as well as information about the quality and price of treatments and medical prevention. They also can view their bills, make appointments with GPs, enter their own vital signs, renew medication prescriptions and enter advance healthcare directives. The portal also offers free healthcare programmes for chronic disease treatments such as diabetes, cancer, osteoporosis as well as advice on weight loss, pregnancy and birth.

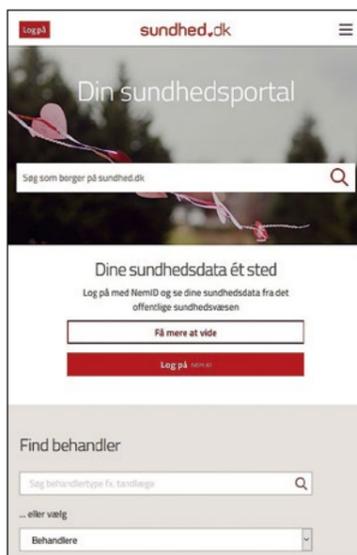
The effort required for patients to access the system is minimal. At birth, all Danes are issued with an identification number which they can use to register with the portal at any time – via their desktop PC, smartphone or tablet,' Petersen explained. The login facilitates access to a personal page where the individual medical history, examination results and medication, going back to 1977, can be viewed.

Users need not worry about data protection. 'Patients can see which employees of the healthcare system have accessed their personal data,' Petersen pointed out.

There are only about 'three to five cases of misuse a year' involving unauthorised access to patient files.

Is a portal like this also viable in Germany?

Citizens can access to sundhed.dk to communicate with medical staff and for an overview of their correct and updated healthcare information



The basis for the success in Denmark is a culture rooted in trust and the open access to personal data. 'It's important to emphasise the advantages of digitised and available data for patients and medical staff to achieve acceptance of the portal,' portal director said, adding that the general public's acceptance of the portal is consequently high. According to study results, 3.3 million of all Danes know about the portal; 24% of them reported that their treatment improved through use of the e-health portal and 41% stated that access to the data had provided better understanding of their illness. Access statistics also confirm the success. The portal has a continuously increasing number of users. In January 2018 around 1.8 million individual visitors used the portal that month out of the total population of 5.8 million.

Concerns around the protection of personal data are higher in Germany than in Denmark. At the same time, the medical IT infrastructure and acceptance among doctors in Germany, for instance, is less developed than in Denmark. Structurally, Denmark also offers better prerequisites for this model of health-IT. The country has a smaller population, with Germany having 14 times more inhabitants. Also, there is only one public health insurer in



Morten Elbæk Petersen is the Director of the Danish ehealth portal sundhed.dk. The site won Petersen the HIMSS Europe eHealth Leadership Award in 2015.

Denmark, whilst Germans have a choice of 120 different providers.

However, Petersen can imagine such a portal being successful in Germany. He advises that those in charge should make German citizens more aware of the advantages of an electronic patient file. The public Danish platform shows how well such a system works and to what extent it is accepted, giving citizens access to their own data.

Petersen views the healthcare digitisation as an opportunity to safeguard the personal responsibility of patients and to make citizens equal partners in their interactions with healthcare workers. This should be achieved step by step, 'so that citizens feel safe and experience the advantages of data exchange and transparency,' he suggested. The technical solution is likely to be the easiest part of digitisation.

The European Society of Medical Imaging Informatics

Aiding radiologists to stride forward

Growth! New hardware, new software, richer imaging, enhanced communication and image transfer plus artificial intelligence (AI) are all pushing the pace that medical organisations, radiologists and device manufacturers must run to keep up. Daniela Zimmermann spoke with Dr Erik Ranschaert, Vice-President of EuSOMII, about today's changing face of radiology.

Alongside exceptional advances affecting radiologists, the European Society of Medical Imaging Informatics (EuSOMII) developed. Explaining the society's current strong focus on AI, Dr Erik Ranschaert, an expert in IT, AI and a range of teleradiology applications, and Vice-President of EuSOMII, said: 'What we are trying to do, is be a society not only for radiologists but also for clinical physicists and professionals of imaging informatics and other specialties and experts, so that we can

join forces and communicate on how we can collaborate.

'This is about sharing information on the one side and, on the other, informing radiologists and other specialties about changes. In an educational role, we want to give them a better view or insight into what is going on related to digitisation of our profession.'

EuSOMII is affiliated to the European Society of Radiology (ESR) and has links with other sub-specialty societies with experts available to

collaborate with the ESR on production of publications and White Papers on subjects such as AI.

Ranschaert is keen to point out that AI is rapidly becoming a very broad subject, for example moving beyond automated analysis of images and categorisation to detect whether a lesion is benign or malignant.

This has evolved into segmentation: AI can automatically segment and differentiate areas of an organ; detection, such as identifying whether there is a tumour or not; and skeletal imagery to analyse bone type and size, for example to automatically calculate the age of a child.

'All these are simple, narrow types of AI tasks, but another way we can use AI is to manage and detect the gaps in the workflow,' Ranschaert added. 'AI can automatically assign specific determinations to specific experts or radiologists, or also be used to reduce waiting lists.'

'A very good example of this is in using electronic patient records. When a patient needs a CT scan, the scanner will be automatically programmed to choose the right scanning protocol depending on size, age, weight of patient and questions asked.'



That can be extended to managing radiation dose based on scanning protocols and the nature of the scan needed for a specific patient, a move he suggests will lead to fewer errors. However, there remains one critical area that has yet to be resolved, that of standardisation.

'There is no standardisation yet and this is one of the topics that needs to be discussed and addressed,' Ranschaert pointed out. Optimal interoperability between all e-systems involved in this process is primordial, facilitating the exchange of all necessary data.

The American College of Radiologists (ACR DSI) is actively considering this issue but, he said, there still needs to be a standardised way of software validation; a need to develop standards and guidelines about how to approve software, and monitor how or whether the software is getting better. The ACR DSI calls this the 'AI Ecosystem', in which all stakeholders know which pathways they have to follow to develop and implement AI-based software.

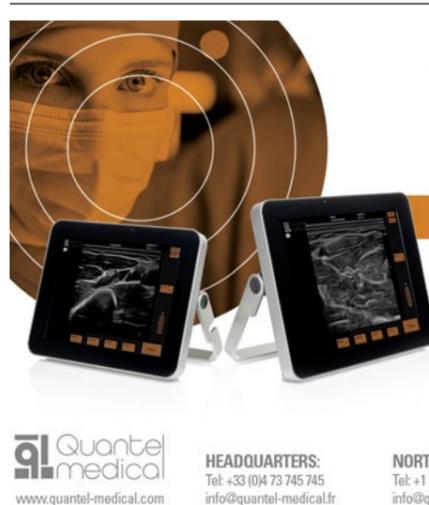
'We need to look at what the effect is on the disease outcome, for example, and how much it is influenced by certain software bias,' Ranschaert said. 'We do need to

work on that. It is a very important topic.'

EuSOMII will hold its annual meeting in Rotterdam (3 November) with speakers from the USA and Europe, and hopes for a joint meeting in 2019 by establishing a partnership with the USA's Society for Imaging Informatics in Medicine (SIIM). 'We are trying to exchange information and collaborate and establish standards,' he explained.

As regards development of AI globally – not just in healthcare – he said the USA is a clear leader, followed by China and India, but Europe is 'lagging behind', though the UK is a leader in the field along with Germany, France and the Netherlands, with Israel also being quite active.

However, he stressed that, Europe is a frontrunner in terms of protection and regulation of patient data when using AI, notably with the implementation of the GDPR (General Data Protection Regulation). On the other hand this could also bear the risk of a conflict between the legal protection of health data for privacy reasons and the growing demand for such data to the benefit of improving healthcare services for the European population, which might be a sub-



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Increasing medical precision

Digitisation in three stages

Healthcare information and communication technology has become an everyday companion for physicians and serves as a strategic tool for change. Jarmo Reponen, Professor of Health Information Systems at the Faculty of Medicine, University of Oulu, Finland, focuses his research on the effects of digitisation in healthcare in Nordic countries, with target areas of availability, use and usability of the information system. 'The digital transformation process,' he explains, 'can be described in three waves of digitisation.'

The first digitisation wave supplied healthcare systems with electronic medical records (EMR), digital image archives (PACS) and networks in imaging and the laboratory. All the medical data is transformed into and available in a digital format in hospitals and primary care institutions.

In Finland and other Nordic countries those tools reached practically 100% availability ten years ago in public and private care. 'However, this basic infrastructure is not enough to carry out eHealth successfully. The national strategies in various countries emphasise a citizen-centred care that can also be used in an appropriate way for healthcare professionals,' Reponen explained.

This is why, and when, we entered the second digitalisation wave, which has given professionals more connectivity through national health information exchanges (HIE) and tools for interacting with their patients. 'The core of the second wave is patient empowerment. It's essential



Nordic countries like Finland are at the forefront of using nationwide e-prescription

for any healthcare reform to have freedom of choice and patient mobility,' Reponen explained and pointed out that the Nordic countries were at the forefront of using nationwide e-prescription.

Whilst the second wave continues, the first steps have been taken into the third digitalisation wave. This will

add artificial intelligence to the professional tools, for example, machine learning. 'The third wave has already improved the intelligence within the digital systems, e.g. speech recognition is used more than before and also automated warnings of medical interactions are now commonplace.' And, Reponen added, 'Decision sup-

port tools have become more integrated into the EMRs and care process management is also taking its first steps.'

The age of decision support tools

The transition into the third digitalisation will transform the workflow of diagnostics and therapy. 'It will give professionals even more connectivity and more interactions with the patients,' the specialist said. With the availability of the archives of previous data and patient data from other areas of health information platforms physicians can make better diagnoses, which mean, 'we can make more precise diagnoses and more accurate decisions on patient treatment.'

However, that a system stores and delivers medical data to support the efficiency of medical treatment is not enough for Reponen. 'We need more workflow orientated software for professionals that will give us guidance in our work. So that, if we have a certain kind of patient in our consultation, the software automatically lists the tools we need to diagnose and treat this specific patient.'

For those tools, Reponen has specific requirements in mind. 'We need more standardisation in various softwares. They need to have application programming interfaces (API) and connectivity in their add-on tools because there will always be new kinds of invention,' Reponen said adding a prediction: 'Those vendors who can rapidly react to those innovations have the edge.'

Impact on education and citizens

Of course, using these decision support tools will have implications for



A past president of FSTeH and EuroPACS, radiologist Jarmo Reponen MD PhD, is Professor of Health Information Systems at the Faculty of Medicine, University of Oulu, Finland. He has more than 25 years of experience in the development, implementation and evaluation of hospital information systems, particularly in the electronic patient record and radiology systems. 20 years ago his team co-developed the world's first mobile app for smartphones. Currently their research focuses on the effects of digitisation in healthcare, with target areas of availability, use and usability of the information systems.

the education and teaching of physicians and nurses. 'Most younger professionals use social media channels such as YouTube and Facebook in their personal life. But that doesn't help them with regards to the professional usage of those new software tools. So we really need a change in the curriculum in medical and nursing schools, to better save patients in the future.'

The patients' own role in their healthcare, he concludes, will increase with the new eHealth and mHealth tools. 'It will,' he said, 'empower the patients and citizens even more.'



Dr Erik Ranschaert, Vice-President of EuSOMII, is co-editor of a book featuring aspects of AI and medical imaging informatics, to be published near the time of the RSNA.

stantial hurdle for the fast development of AI software in Europe.

EuSOMII is a young society working to expand from its current membership of around 200, and aiming to attract a younger generation of practitioners. 'We think they should be involved in this evolution because it will be they who will have to embrace AI in the future,' Ranschaert emphasised.

Outreach, through the use of channels such as social media, is working to attract as many residents as possible by having a very low threshold for the society membership and a reduced price for younger radiologists.

In an address to the annual meeting of the Belgian Society of Radiology (BSR), the younger section has organised a separate AI-meeting during which Ranschaert and several other experts in the field will speak to residents. EuSOMII is also participating in an online programme organised by the RSNA and SIIM to teach residents about AI and imaging informatics. This National Imaging Informatics Course (NIIC) takes place from October 9-12.

IT specialists study nurses' needs

Every nurse is an e-nurse

Report: Mark Nicholls

Following a report from software firm Nuance Communications that suggests technology firms should consider shadowing nurses to fully understand their workflows and inform the creation of solutions that work for them, nurses' views on technology and data are to be consulted in a new Royal College of Nursing initiative alongside NHS Digital's chief nurse Anne Cooper.

Cooper is supportive of the theme proposed in the report "Clinical documentation and nurses: the challenges and opportunities". 'If technology firms develop a deep understanding of how nurses work it will enable them to provide better quality solutions,' she believes, but emphasises that nursing is a complex profession and, more than ever, in the digital era nurses need solutions that reflect that complexity.

'Nurses and midwives are creative; they have been finding solutions to problems for hundreds of years,' Cooper adds. 'If we can tap into this creativity it will lead to better technical solutions. To achieve this we need to see nurses and midwives as partners in technology developments, not merely "users".'

Deeper understanding of the workload

With recognised nurse shortages in the UK, new ways had to be found to help and support nurses in their role to enable them to work more effectively. 'Technology, if we get it right, has the potential to help,' she suggests. 'For example, if we can bring information and knowledge



Anne Cooper is head nurse at NHS Digital, an arm's-length body (non-governmental) in England which is responsible for creating, delivering and managing the digital systems, services, products and standards upon which healthcare professionals and citizens depend. She qualified as a nurse in 1986 and has spent the last 15 years working in informatics.

nearer to where nurses and midwives make decisions then this can support nurses to deliver the best outcomes, efficiently.'

In terms of technology specialists shadowing nurses she emphasises, 'Observing actual practice is critical to ensuring technology solutions meet the needs of staff. Unless we understand the complexity of nursing we are likely to provide imperfect tools.'

Results from this technology initiative – part of the 'every nurse an e-nurse' campaign of the Royal College of Nurses (RCN) are expected this May at the 2018 RCN Congress.

Data savvy

'It will be interesting to hear what the most important issues are for nurses and midwives so that we can look to taking the most important steps to support modern nursing practice. If we listen carefully we are much more likely to do the right things.'

'If we give nurses and midwives the best tools to do their work and pay attention to their education needs, we will be moving towards

the best modern nursing practice using technology and data.'

Whilst Cooper acknowledges the importance of technology, she stresses this is only a tool to deliver data and information. 'Nurses and midwives will also need to become data savvy to ensure we make the best use of the new information that technology will provide.'

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