

Hospitals need to become less introspective organisations

Big Data power will improve healthcare

Hospitals and health systems must embrace a Big Data approach if they are to deliver better care for patients, a leading analytics expert tells EH correspondent Mark Nicholls

Big Data sits at the heart of addressing the challenges that will lead to a more sustainable health and social care system, according to Dr Mark Davies, Medical Director of healthcare analytics company MedeAnalytics.

A speaker in a panel discussion entitled *The Power of Big Data*, at the EHI Live conference in Birmingham, United Kingdom, he warns that health and social care still lies 'about 15-20 years behind almost every other industry' in its uptake of technology.

However, change is beginning because the ability to hold and process massive amounts of information offers the potential to process and model data in areas such as predictive analytics, mathematical modelling and segmenting populations.

If they are to exploit the potential of Big Data, however, health systems and hospitals need to address their fundamental approach to IT and Big Data, harness the potential of the technical capability, exploit IT capacity and shift from introspective organisations to actively participate in broader population health management. 'These elements have come together in something of a perfect storm, which has put Big Data at the heart of trying to address some of the real challenges that lead us to getting a much more sustainable health and social care system,' Davies said.

The challenges that exist in hospitals are often determined by outside factors, such as referral numbers, levels of illness or help-seeking behaviour in the populations they serve. Therefore, the answers to



those problems will be derived from a joined-up data set that understands the entire patient journey and the context in which the hospital operates.

This linked data that describes a whole care economy is changing, becoming more timely and granular, down to individuals rather than departments or services and includes patient-generated data with patient-reported outcome and experience measures, data from wearable health devices and even patient-generated diagnostics.

Now, that is being augmented by other data sets, such as transport, housing and weather.

'This data is available to us to understand the broader eco-system of our population and some of the interplay between these and illness and wellbeing,' said Dr Davies, former Executive Medical Director for Health and Social Care Information Centre.

'No conversation on Big Data is complete without talking about genomics and proteomics – starting to understand our genetic make-up in a way that we get a much better understanding of our risk of developing disease, which opens up the whole prospect of personalised medicine.'

Four critical areas where Big Data

offers opportunities within a health-care setting are: targeting care more efficiently; understanding interdependence; using boundaries and redesign principles to measure outcomes; and audit capability.

In terms of targeting care more efficiently, examples could include combining data on people at risk of respiratory disease with weather or pollution data, or analysing populations at risk of falling – an area where MedeAnalytics has developed an algorithm that combines primary and secondary care data.

'That algorithm is outperforming face to face assessments by a community nurse, so it is very reliably identifying groups of people who are suitable for fall prevention intervention,' Davies points out.

With interdependence, Big Data can be used to combine data sets to influence the relationship between elements of the care delivery system to model onward care pathways with an 'information architecture' based around individuals.

Big Data can be used to measure clinical outcomes from particular levels of intervention and used as the basis for discussion on any service reconfiguration, and also to audit performance and deliver quality improvement programmes focused more on joined-up care.

There are challenges, particularly information governance and finding ways of sharing data to improve healthcare, but not breach patient confidentiality or privacy protocols. There are privacy-enhancing techniques that mean there are no longer excuses to link data.

However, other challenges lie in system alignment and the capacity in the system to use insights to redesign services, so new ways of working are required.

Data security also remains a paramount concern but, as in everyday life with risks in online shopping or banking, the risk/benefit balance is largely around convenience and cost.

'But, in health it's literally life and death,' said Davies. 'I think there's a very clear relationship between data driven decision-making and design



Mark Davies MD is Medical Director of MedeAnalytics International. With more than 20 years' experience as a GP, he joined the company in 2014 having previously worked in a number of informatics roles in the Department of Health, Cabinet Office and as Medical Director of the Health and Social Care Information Centre. With a particular interest in clinical quality measurement and opening up data to the public, he was previously National Clinical Director for NHS Connecting for Health.

and its impact on reducing mortality.'

Big Data, he believes, will make healthcare more viable, deliver improved clinical outcomes and bring health and social care closer together because of that ability to 'join up' systems, break down barriers and create an 'information architecture built around the individual'.

Davies concludes: 'If you put the individual at the centre of things, it forces different sectors involved in their care to interoperate and share information meaningfully, to create a much more coordinated approach to care.'

Also speaking at the EHI Live session was Julian David, CEO of techUK, the UK's technology trade association. 'Whilst the health and social care sector has made good progress in its approach to harnessing Big Data,' he said, 'there's still huge potential to use intelligent analytics to deliver better public services to the most vulnerable. The benefits are clear from the potential to bring efficiencies, reduce treatment costs, increase prevention and improve the quality of life for patients.'

The global migration ...

continued from page 1

ing inform decisions in trade, demography, transportation and economics, he said. However, the study team does acknowledge limitations to the data set because seasonal migration is not captured by the censuses, nor movement triggered by war and natural disaster.

Professor Andy Tatem, Director of WorldPop, said: 'Understanding how people are moving around within countries is vital in combating infectious diseases such as malaria. The parasite that causes the disease can be quickly re-introduced to a malaria-free area by highly mobile populations. Having an accurate overview of how different regions of countries are connected by human movement aids effective disease control planning and helps target resources, such as having treated bed nets, or community health workers, in the right places.'

'Having data for all low and middle income countries across three continents will greatly aid disease control and elimination planning on global and regional scales.'

The WorldPop project was initiated in October 2013 and aims to provide an open access archive of detailed spatial demographic datasets for Central and South America, Africa, and Asia to support development and health applications.

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IBM Watson's first cooperation in undiagnosed diseases in Europe

Cognitive assistance for rare diseases researchers

Rhön-Klinikum AG (RKA), a private German hospital group, is cooperating with IBM's cognitive assistance system 'Watson' to help physicians diagnose rare and unexplained diseases at Marburg University Hospital, Mélisande Rouger reports



American TV drama Dr House might make you believe there is a solution for every medical mystery. But, there are cases even the smartest physician on TV could not handle, especially if faced with 6,000 so far unsuccessfully diagnosed patients at the same time.

At Marburg University Hospital, Germany's local Dr House, Dr Jürgen Schäfer, is head of the Centre for Undiagnosed and Rare Diseases, one of the leading hubs in the country. Schäfer, who earned the nickname 'House' after using the show as a key to turn medical students' attention to rare diseases, currently has to solve more than 6,000 unexplained cases with his team. All of these patients have suffered illness for years and carry hundreds of pages of clinical history.

'Each has a very long medical record and all of them wait desperately for help. It's a real nightmare. If you want to get an overview of each patient, you sit down for one, sometimes two or three days, just to check their paper work. Even worse, you have to read it very carefully, since you cannot miss anything,' Schäfer told European Hospital.

Cutting down on laborious and time-consuming evaluations

Patient medical records usually include a large number of unstructured data, such as laboratory tests, clinical reports, drug prescriptions, radiology findings and pathology reports.

Schäfer mentioned one of his colleagues had discovered one single lab value out of range in between hundreds of pages, which itself explained the disease was hypophosphatasia – a rare, sometimes fatal, metabolic bone disease.

'Should she have missed it, we would have missed the correct diagnosis, as had many colleagues before us. So it's very laborious and time-consuming work. We are only a few physicians here who undertake this task. So it was clear for us that we needed new strategies to face this

The team of the Centre for Undiagnosed and Rare Diseases

challenge; we simply needed more IT support,' he said.

Schäfer's team had used IT support systems for a long time and recently started working with Isabel software, a diagnostic tool. Then, earlier this year, IBM Watson approached RKA with their cognitive system Watson for a 12-month pilot project, to support physicians in complex patient data analysis and help speed up the decision-making process.

'The amount of medical knowl-

edge continues to explode to the point where it will double every 73 days by the year 2020,' said Bernd Griewing MD, Chief Medical Officer at RKA. 'Therefore, the planned use of cognitive technology such as IBM Watson is intended to support our evidence-based and individual optimal treatment for each patient.'

'We are developing an assistance system to facilitate the preparation and evaluation of existing patient information before and during a consultation with physicians. This will help our doctors in diagnosis decisions and selection of treatment

options.'

The Marburg medical team is currently working on an extended patient digital questionnaire, which will enter the data in an anonymised form into the diagnostic process.

'We ask more than 1,000 questions on symptoms and patients former professions, exposure to toxic agents or allergic material, previous long distance travel, etc. We hope to get critical information, which we might miss during the interviews, and to get a hand on very complex diseases.'

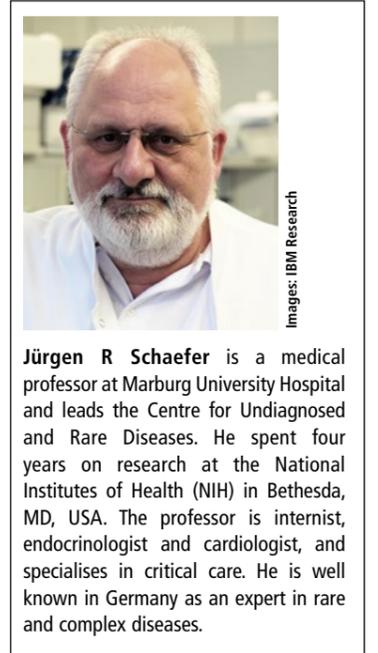
'We have had a few very interesting examples and we've been surprised how easy it was to solve, once you know the full story behind a patient,' Schäfer explained.

Watson could work in a clinical setting early in 2017

The insight obtained from the Marburg University Hospital pilot project will be analysed and used across other hospitals in the group. The system is expected not only to help physicians find a diagnosis, but also support the process of patient admission and provide the best possible patient routing, which will prevent cost and time intensive misdirection of patients to the wrong specialists and treatment plans, the RKA explained in a communiqué.

Until then, more training is necessary, Schäfer pointed out. 'We are very confident that, early next year, we will be able to use Watson in a clinical setting.'

'However, this is not such an easy programme as Windows Office or Isabel. Watson needs to learn the database in the Big Data environment that it is screening and needs



Jürgen R. Schaefer is a medical professor at Marburg University Hospital and leads the Centre for Undiagnosed and Rare Diseases. He spent four years on research at the National Institutes of Health (NIH) in Bethesda, MD, USA. The professor is internist, endocrinologist and cardiologist, and specialises in critical care. He is well known in Germany as an expert in rare and complex diseases.

to be told what database is helpful for us.'

This is the first cooperation for IBM Watson in the undiagnosed diseases field in Europe. The company is multiplying collaborations with the healthcare sector on the continent, notably with Alder Hey Children's Hospital, in London, to help alleviate the administration process and improve communication between patients and the medical team.

IBM also cooperates with Novo Nordisk to create diabetes solutions built on the Watson Health Cloud, and the Italian government for the creation of the first Watson Health European Centre of Excellence in Milan.

IBM plans to invest up to €135 million over the next several years and bring together Watson Health data scientists, engineers, researchers and designers to develop a new generation of data-driven healthcare applications and solutions.

Last, but not least, the group announced a new cooperation with Teva Pharmaceutical Industries Limited. earlier in October, to help treat and improve chronic disease management.



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NEW wearable open healthcare platform

A Dutch e-health start-up – 112Motion – has developed new wearables and an open platform to connect medical and consumer devices. As an open platform, any vendor can connect and begin to monitor people's health.

Healthcare data is recorded in personal dossiers in the cloud and the patients have full control over ownership, and thus themselves can decide when and with whom to share their data.

The platform features an IoT connector, decision support and case management, using workflows and medical business rules & personal rules to trigger actions.

The system combines the newest technologies to share data and reports, thus breaking traditional barriers between corporate IT systems and the internet as we know this today.

'This concept works for both the user and the healthcare parties,' said Nanno van der Laan, founder and CEO of 112Motion. 'The user has



**112Motion is at Medica
Hall 15 / Stand A23**

more control over their own health data and caretakers and doctors will be able to access a dossier with all the historical data. It's a huge step forward in preventive care and really

the kind of technology innovation that this sector needs. It's actually one of the goals set by Minister Edith Schippers of the Dutch Ministry of Public Health.'

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Adding a new dimension to healthcare

Space technology influences wearable dev

Wearable monitoring devices are offering patients the chance to play a greater and more active role in their own healthcare, Mark Nicholls reports

Wearable monitoring devices are alerting physicians and carers when a patient may be unwell, or their condition needs closely monitoring, and they have potential to improve the accuracy of findings within clinical trials.

The role of wearable healthcare was a keynote issue in a session at the EHI Live conference – the United Kingdom's largest digital health event – held in Birmingham this November.

Chaired by Maxine Mackintosh, Chair of HealthTech Women – an organisation that aims to promote more participation by women in healthcare innovation – the event included representatives from across the National Health Service (NHS) and industry.

Devices have become much smaller and discreet

Deb El Sayed, Director of Digital and Multi-Channel for NHS England, explained how experiments in the 1990s to try to monitor patients remotely, such as those with COPD, had proved 'clunky' and relied heavily on the patient, but within the space of two decades had reached a scenario where there is the ability for continuous effective monitoring. 'We are getting data from individuals continuously, which is giving clinicians a much broader view of what is going on,' she explained.

The period has seen devices become much smaller and more discreet, to the extent that there has been the development of wafer thin patches with minute circuitry and space technology developed by NASA, which is now seen in healthcare settings.

'Wearable patches can monitor

patients after surgery, using the skin as a digital platform,' El Sayed said. 'The next step is looking at "digestibles" that look inside the body rather than invasive procedures, such as a colonoscopy.

'However, with all these technologies, the important aspect is ensuring their accuracy and that adoption is evidence-based so that these systems can be used much more pervasively.'

From there, she added, it is also about addressing how that captured data is stored securely in the future.

The question of wide variability in data delivered by different devices was raised, but panel members felt that it was still better that on-going data was delivered, rather than the occasional snapshot in response to a face-to-face consultation with a general practitioner (GP) or other health professional.

El Sayed said a number of trials are taking place aimed at offering a better understanding of that data variability and to help improve accuracy.



From left: Deb El Sayed, Director of Digital and Multi-Channel, NHS England; Elin Haf Davies, founder and CEO of Aparito; Suzanne Homewood, Enterprise Sales Director, Samsung; Maxine Mackintosh, Chair of HealthTech Women; and Louise Sinclair, Head of the UK Network at HealthTech Women

Dr Elin Haf Davies, founder and CEO of Aparito – which uses wearables and disease specific mobile apps to deliver patient monitoring beyond the hospital – outlined how wearables can have an important role in clinical trials. 'Using an episodic or static snapshot of the patient is not really reflective of how the patient is doing; we need to be moving towards an overall understanding of how they are doing between these assessments and that's where a wearable really lends itself,' she pointed out.

With rare diseases often affecting children, she suggested that assessing them consistently with traditional data gathering was more difficult



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Personalised medicine will affect healthcare staff

Digitisation in hospital care is the future

Data are to the 21st century what oil was to the previous century: a resource that promises immense progress in many areas – particularly in healthcare where so many data are generated that no human can process them without machine support. 'Big Data' are the buzzwords. In our 4/2015 issue, *European Hospital* analysed the potential benefits of Big Data in healthcare. Anja Behringer reports.

How exactly does healthcare's Big Data stream trickle down to the very end of the chain – the bedside, where patients and medical staff alike have to deal with the diseases, their various expressions and the knowledge produced by data mining?

Will healthcare professions change? Will new ones emerge, triggered by Big Data? In this era of paradigm shifts in healthcare there are very few clear answers to very many complex questions, but initial trends do show the way ahead.

IT is today's new tele-medicine

Innovations in medical technology such as surgical robots, navigation systems, nanotechnology, bionics, hybrid systems or artificial organs profoundly change the roles of the different healthcare actors. Technological progress triggers new requirements, profiles, competencies and organisational structures in several healthcare professions. It creates new responsibilities and drives the development of specialisations within professions and

disciplines.

In this continuous process of change it is a daunting task to define new professions and their training and qualifications requirements. One thing seems to be clear though: in the future, physicians will have to treat patients according to the insights culled upstream from the patient's personal data by analysing physicians.

Healthcare service providers that join forces in start-up companies increasingly offer such preparatory tasks. Dr Friedrich von Bohlen und Halbach is Managing Director of dievini Hopp BioTech Holding, a company that provides venture capital for personalised medicine in connection with neurodegenerative diseases and early cancer detection. 'Today, molecular variants are clearly structured in medical literature, the initial work has been done, data have been digitised and contextualised. With the help of data mining, logical relationships between these data can be established upon request.'

Worldwide, biomedical literature is based on six million patient cases. We asked von Bohlen und Halbach, a biologist by training, what the service entails.

'The service provider performs the genome analysis for any disease. In case of cancer, the driver will be identified as well as possible treatments – and treatments that should not be done. A report is generated and sent to the requesting physician. Moreover, the context of the diseases is interpreted.'

As of January 2017, health insurers in the USA will start to pay for this service, Von Bohlen und Halbach points out, adding: 'However, in Germany it will remain a service that has to be paid for by the patient, since personalised medicine requires deviation from the guidelines. Sequencing provides information on the drugs to which a patient will respond well and will identify the side effects of each medication. This leads to an entirely new approach: from trial and error to test and act. Healthcare will be faster, more efficient and above all more patient-oriented.'

How does the pharmaceuticals industry view these developments?

'We have to look for molecular patterns – that is something the pharmaceuticals industry is not interested in, yet. They are holding on to their blockbuster drugs and are apprehensive of the costs. We are in a period of transition. The pharmaceuticals industry is not clear yet about the steps discovery, development and commercialisation. The companies have to adjust their models: today we have different allocation patterns depending on the specific mutation – and these patterns are valid for many organs.'

Healthcare in transition

With the progress of IT and the possibilities associated with personalised medicine, healthcare is in the process of transiting from observational medi-

cine to 'medicine of understanding. One of the pioneering thinkers along these lines is Markus Müschenich MD. The specialist in paediatric and adolescent medicine, who also has a Masters in Public Health and is co-founder of a start-up company, who founded the German association for internet medicine in 2012. The latter provides a platform where established healthcare players can meet the agile and creative newcomers in order to jointly develop solutions that make healthcare more affordable and more efficient throughout Europe.

The varied technological innovations have triggered a fundamental question: Does the healthcare professional have to be a trained physician?



Known as a pioneer of future medicine, and co-founder and manager of Flying Health, Dr Markus Müschenich specialises in paediatric and adolescent medicine and has a Masters degree in Public Health. He has been a board member of independent not-for-profit hospital groups for over a decade, and the founder of the think tanks ConceptHospital (2000) and ConceptHealth (2008). In addition, he founded the German association of internet medicine in 2012 and currently serves on the its board. He has also been a member of the Advisory Board of the Charité Entrepreneurship Summit since 2013 and of the expert panels of Peppermint Venture Partners and Mentor at XLHealth.



Dr Friedrich von Bohlen und Halbach is managing partner and co-founder of dievini Hopp BioTech Holding GmbH & Co. KG, a firm that manages the life science activities and investments of Dietmar Hopp, co-founder of SAP, and his family. He gained his biochemistry diploma at the University of Zurich and PhD in neurobiology from the Swiss Federal Institute of Technology (ETH), in Zurich. He has held various positions at Fresenius AG, FAG Kugelfischer KGaA and WASAG Chemie AG. In 1997 he founded LION bioscience AG (now Sygnis AG) being its CEO for seven years. He chairs the Board of Apogenix AG, CureVac AG, Molecular Health GmbH and Novaliq GmbH, as is a board member of AC Immune SA, Cosmo Pharmaceuticals N.V., immatics biotechnologies GmbH, Willex AG and is on the evaluation board of Wyss Translational Centre Zurich.

Many new technological solutions integrate the patient actively in disease management. Consequently, the patient influences the outcome. Internet medicine allows the patient to use initial treatment and digital service offerings and organise them via smartphone and tablet. Several apps are already available, be it on the different forms of migraine, an online amblyopia treatment with exercises, or to track depressions – these are but a few initial projects.

Obstacle: aversion to change

The number of visits to the physician's office might drop – at least the patient will collect information on his or her condition, potential treatment, on specialists and hospitals prior to the consultation. Hospitals,

continued on page 7

Services



because of their tender age and, consequently, a significant number of trials were showing inconclusive outcomes.

New size – and fashion – could improve trial data consistency

However, by making wearables smaller, more attractive and trendy, with a longer battery life and requiring no input from the patients, they could play a role in helping trial data become more consistent, particularly of that acquired in younger people. But, she did stress, 'Wearables will not replace the doctors, but will be augmenting the service they offer.'

Suzanne Homewood, Samsung Enterprise Sales Director, pointed out that, whilst wearables were new to people in a healthcare setting, they were not new to them as consumers.

'What is important is that we enable people to use their consumer experience in a health environment and from the viewpoint of improving their own health,' she advised.



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Hospitals need a holistic approach to cyber security

Hospitals and healthcare providers are being urged to adopt a holistic view of cyber security to help protect critical patient data, Mark Nicholls reports.

A number of organisations within healthcare remain at risk of leaving systems vulnerable by failing to ensure there is a broad range of protection in place to safeguard data from hackers or cyber attack.

IT expert Dr John Lockley, Clinical Lead for Informatics with the Bedfordshire Clinical Commissioning Group (CCG) in the UK, also believes healthcare providers need to factor in more elements alongside IT considerations.

In a presentation at the EHI Live event in Birmingham, entitled 'A holistic view of healthcare cyber security', he suggested it was wrong to think of IT in isolation:

'We have to consider what IT interacts with – programmes interacting with patients, the paperwork, protocols, processes and pounds, as well,' Lockley explained. 'We need also to remember that people are involved and how they and their psychology work.'

This is not just about individuals falling for phishing emails and clicking on unauthorised websites, or hospitals installing advanced virus

blockers and other firewall safeguards, but also in ensuring staff are adequately trained in how to respond to such threats.

Additionally, personnel need the time, a robust infrastructure, and the correct hardware and software needed to carry out their roles correctly and safely.

Dr Lockley said that the National Health Service (NHS) often invests heavily in certain parts of the system but fails to guard against 'back door' attacks on the more vulnerable aspects of their IT.

He also warned that systems running unsupported software, such as Windows XP, were particularly vulnerable to attack and added: 'My advice is for hospitals to spread resources carefully and thoughtfully in terms of cyber security and educate and train staff. That means having money available to buy in people to do the teaching and then giving staff the time to receive the training.'

Equally, hospitals should not go to the opposite extreme of having so many technical and procedural checks inserted into their systems

that it can actually prevent people from working efficiently.

With NHS organisations now working more closely with local authorities, as health and social care come together, the health service need to ensure it is not left vulnerable when linking with outside bodies that have older, or more vulnerable, IT systems and equipment.

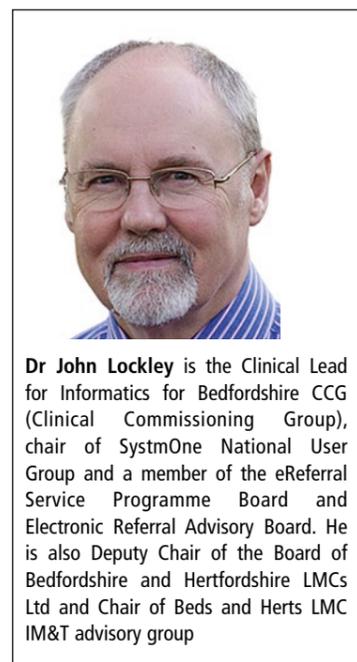
Health remains a prime target for hackers and the consequences of not adequately protecting data can be devastating, with patient and clinical information potentially lost, encrypted or even altered by hackers.

'The first priority is, take regular backups; the second priority is to ensure that you've put in all the lat-

est software patches; and the third element is to train the staff to think carefully about what they are doing and not automatically click on links of open documents just because they are there,' Dr Lockley advised. 'Cyber security also needs board level priority and it's important to have the IT team available 24 hours a day to respond.'

Hospitals and healthcare providers also should be aware that it is not always straightforward to upgrade to the latest versions of software, because that may impact, or not be directly compatible, with other parts of the system.

'Overall,' Lockley added, 'when it comes to cyber security, hospitals should think holistically and not just about the software, or the hardware, but also remember to



Dr John Lockley is the Clinical Lead for Informatics for Bedfordshire CCG (Clinical Commissioning Group), chair of SystemOne National User Group and a member of the eReferral Service Programme Board and Electronic Referral Advisory Board. He is also Deputy Chair of the Board of Bedfordshire and Hertfordshire LMCs Ltd and Chair of Beds and Herts LMC IM&T advisory group

give ordinary front-line staff enough training in cybercrime awareness - and then give them enough time to put these defensive procedures into action.'

Launching the LLETZlearn Training Simulator

Practical colposcopy training

Surgical instruments specialist and award-winning single-use instrument supplier DTR Medical is presenting its new LLETZlearn Training Simulator at Medica this year.

Developed in collaboration with Anna Barbour, gynaecology out-patient sister, and Theresa Freeman-Wang, who is a consultant gynaecologist, the new training simulator enables a trainee to practice performing cervical procedures while also gaining necessary confidence and competence prior to working on a patient.

This simulator has been designed for use with electro-surgical tools to further simulate real-life procedures, which in turn improves the trainees' skills, while also eliminating the risk to patients, the manufacturer points



to the fact that something was needed for both experienced and inexperienced clinicians to practice, to essentially create safer procedures for patients, the manufacturer adds.

The LLETZlearn Training Simulator features intuitive assembly and, DTR underlines, it is easy to clean.

The Simulator also has pins that securely hold the specimen in place, offering ease and efficiency during procedures.' Other products include those for general and neuro-surgery, ophthalmology, orthopaedics, etc. www.dtrmedical.com

out. 'It is difficult for new clinicians to know exactly what to do when carrying out procedures with certainty for the very first time, coupled with the fact that it's also challenging for trainees to truly know the extent of how to use new tools,' Anna Barbour confirms. These realities pointed directly

DTR is at Medica Hall 16 / Stand F42

Biomod 3S

The 3-D reconstruction alternative

Providing a complete range of solutions for radiology, bone densitometry, stereo-radiography and post-urology, DMS Imaging, the newly created division of the three decades old firm, includes the brands Apelem, DMS, AXS Medical and Medilink.

Among the products is Biomod 3S, which the manufacturer proudly describes as 'an elegant tool that brings three-dimensional technology to classic two-dimensional X-ray rooms'. This technology combines optic information about back morphology with a radiographic image of the spine (stitching) to yield a 3-D reconstruction of the vertebral column, the manufacturer adds.

'With absolutely no additional dose com-

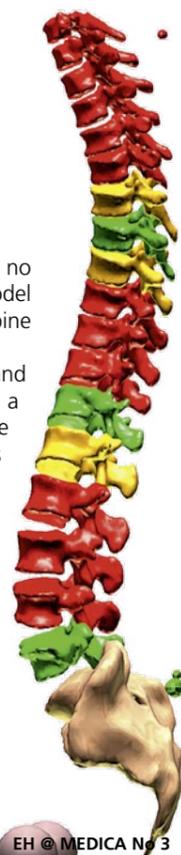
pared to a classic stitching exam, and no change in the clinical routine, the 3-D model gives practitioners a complete view of the spine in an upright weight-bearing position.

The automatic calculations of frontal and sagittal 2-D/3-D measurements allow for a thorough and accurate evaluation of spine deformities common in pathologies such as scoliosis, kyphosis, vertebral compression, dorsopathy, as well as posture and balance anomalies, just to name a few spinal problems.

Biomod 3S, can be seamlessly integrated into any chest and bone room or R/F suite capable of full spine stitching exams, adding value to an existing suite, the company adds.

Details: www.dms-imaging.com

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Researchers aim to reduce biopsy and treatment errors

Robots assist with intervention needles

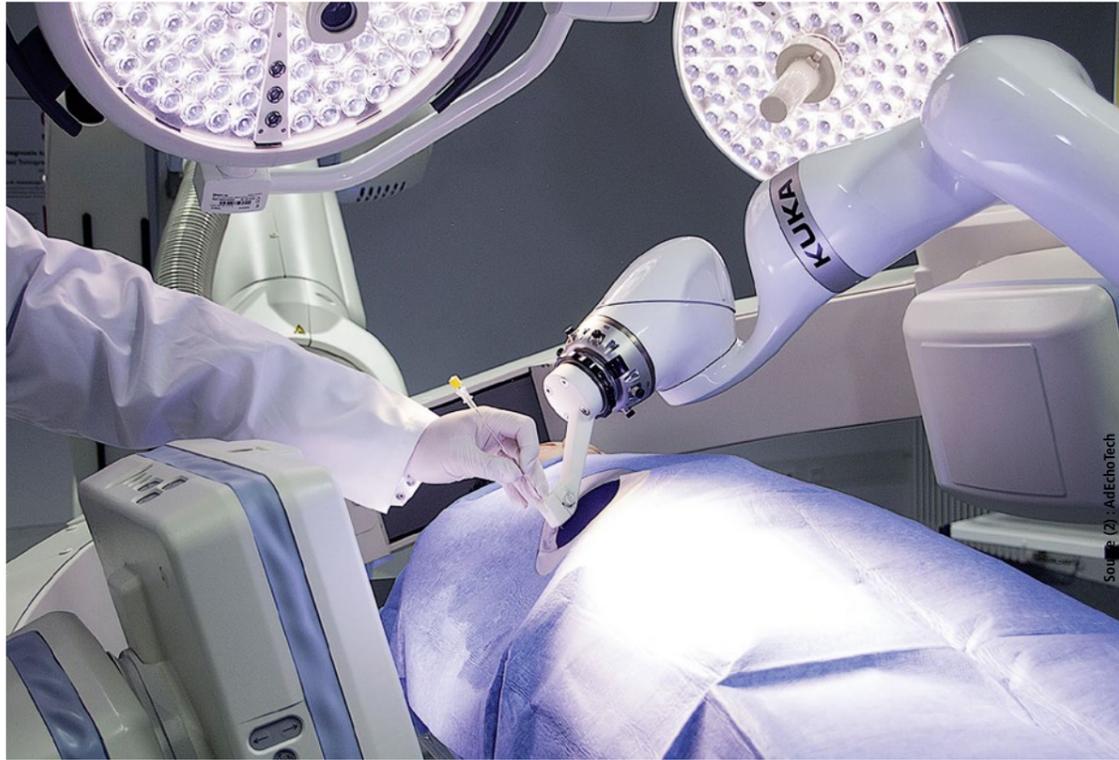
Finding the ideal position for intervention needles, as used in biopsies, for instance, is a difficult and time-consuming process. However, this can now be performed automatically, using a robotic arm to place a needle guide for the physician at the optimal insertion point. With robotic assistance, doctors need five minutes to position the needle, compared to 30 minutes with conventional techniques.

An ultrasound shows a shadow on the liver – but is it a tumour? Often, the only way to conclusively answer this question is a biopsy, the procedure in which a long needle is inserted to remove a piece of the suspected tissue to be sent to a laboratory for testing. Placing that biopsy needle with precision is far from easy. On one hand, the doctor needs to be sure of reaching the suspected tissue – and not healthy tissue just millimetres to the side. On the other, the needle must not damage veins, nerve pathways, and organs such as the lungs, and cannot penetrate bony structures such as ribs.

To obtain an overview, doctors begin with a computed tomography scan, used to manoeuvre the needle to the correct position. The same challenges arise in treatments that use needles to direct heating, cooling, or high-energy beams into the cancerous tissue, thereby destroying the tumour.

Robot precision combined with physician's expertise

Soon, precisely positioning needles will become faster, thanks to a robotic arm modified specifically for this purpose by researchers



The new foetal monitoring solution

from the Fraunhofer Institute for Manufacturing Engineering and Automation IPA's Project group for Automation in Medicine and Biotechnology PAMB, and the Fraunhofer Institute for Medical Image Computing MEVIS. 'Whereas humans struggle to position this sort of needle, it's hard to beat a robot designed for the purpose,' says

PAMB researcher Andreas Rothfuss. 'Our system removes burdens for doctors while leaving them in control.' In other words, the robot does what it does best – locating the right path and positioning the needle guide so that there is no risk of hitting or injuring either doctor or patient. Thereafter, the doctor again takes command and inserts

the needle into the tissue. 'A human needs 30 minutes to position the needle, but with robot assistance this is cut down to five minutes at most,' Rothfuss explains.

To begin the new procedure, the doctor takes a CT scan of the patient. This time, however, the robot arm accompanies the scan, using a calibration tool to determine the ideal position to target a specific point in the image. Software from Fraunhofer

MEVIS analyses the image and supports the operator in placing the virtual needle via the image showing the needle in situ.

If the doctor is administering treatment, instead of a biopsy – seeking to destroy a tumour by applying heat, for example – the software simulates how the heat will spread through the tissue. The last step is to determine the number of needles and their positions required to kill off the entire tumour.

The robot arm's calibration tool is then replaced with a needle guide. The robot transports the guide to the calculated position and places it on the skin at the correct angle. However, it does not insert the needle itself: this is left to the operator, who pushes the needle into the tissue step by step through the needle guide held in place by the robot.

Less radiation exposure for all

To ensure the needle is in the planned position, doctors take X-rays as a standard procedure while they insert the needle into the tissue. Here, the robot also offers several advantages. In conventional needle insertion, doctors manually hold the needle in place, which obscures part of the X-ray. This also exposes doctors' hands to radiation each time a monitoring image is taken. Now, the robot, impervious to radiation, can hold the needle in place with its needle guide. There is also a significant reduction in the patient's radiation exposure – the doctor inserts the needle through the guide, eliminating needle slippage. As a result, the number of monitoring X-rays is greatly reduced.

Now, at Medica 3016, the researchers, who believe their system will be ready for the market in three years, are demonstrating the robot arm as it positions its needle guide over a transparent plastic box complete with artificial ribs and a 'tumour' embedded in a transparent polymer. Visitors can see exactly where the needle is.

Fraunhofer is at Medica Hall 10 / Stand G05

Digitisation in hospital ...

Continued from page 5

says MÜschenich, do not use these possibilities' because they haven't understood yet that internet medicine is not out-patient medicine'.

He is currently working with a start-up on the development of a free-of-charge app that accompanies pregnant women until they give birth. How is this app going to be financed? MÜschenich: 'Different partners have to cooperate. Health insurers should be interested in such an app because each premature baby costs thousands of euros. Consequently high-risk deliveries must be avoided. Hospital should be interested, since the app can use it for marketing purposes. Patient acquisition is an increasingly important issue for hospitals.'

The generations that have grown up with the internet will accept therapy forms that are provided digitally. And those who use the internet in everyday life, to save time and money, will be inclined to do so with regard to routine healthcare issues as well. This will take some pressure off the healthcare system – and it could happen much faster, MÜschenich explains, if the players in the healthcare system overcome their aversion to change with regard to the digital world and if 'internet medicine were properly reimbursed. Privacy issues during teleconsultation are nothing but a cheap excuse'.



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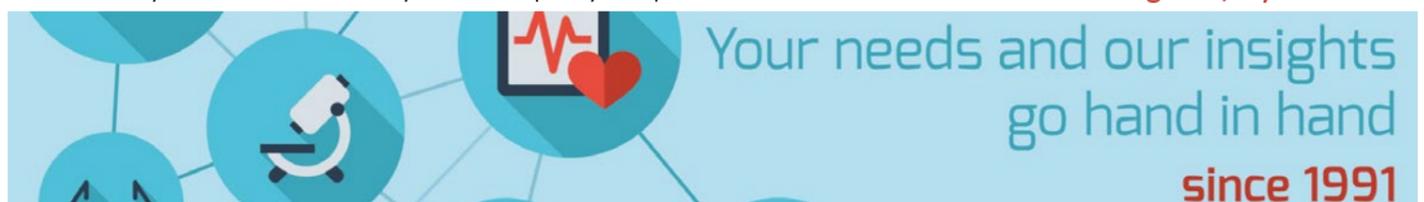
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Up to 50 patients will be monitored by 2017

Spanish hospital checks vital signs remotely

Not having to visit hospital daily, or stay there too long, can improve the lives of patients tremendously. The Vic Hospital Consortium, in Catalonia, Spain, has begun to use a new remote monitoring system that enables it to monitor patients wherever they are. *European Hospital* correspondent **Mélanie Rouger** spoke with Enrique de la Vega, digital product manager at Catalonia's technology centre Eurecat, the organisation behind the tool.

Asked what is unique about its new remote monitoring system, digital product manager Enrique de la Vega explained that this is a professional solution to monitor patients remotely. 'Its name, eKenku, means health in Japanese. Basically this is a patient kit, which comes with a tablet and an already uploaded application, sensors and medical devices, to collect physical parameters and vital signs. The system connects with arm tensiometer, glucometer, pulse oximeter and balance. So far we have been working with one provider, Medisana.

'Our objective is to reduce the possibility of technical problems due

to misuse and focus on improving the clinical process rather than diversify the technical scheme with multiple devices and app versions.

'It's not enough to offer new technology and complete clinical information flow; but it is essential to bring solutions that fit new business models and current priorities, such as guaranteeing sustainability through a more efficient healthcare ecosystem.'

Which vital signs does it help to monitor?

'We can monitor glucose, tension, pulse, weight, hydric balance, oxygen saturation in blood, and information send by activity trackers and wearables, as well as d information about patient's well being through personalised questionnaires. Patients can also take part in virtual sessions using the videoconference module.

'We estimate eKenku will be able to follow 100 patients a year, whether they take part in clinical studies for pharmaceutical companies or suffer complex chronic illness and need monitoring for a few weeks, or months, to avoid readmission to hospital and reduce hospital stay. These patients may have suffered acute episodes or had to prepare or recover from surgical interventions.

'Opportunities for adequately equipped hospitals, pharmaceutical groups, insurance companies and clinical research institutes are huge.'

What are the first results?

'Ekenku was launched a few months ago and currently monitors 30



Eurecat works with hospitals and companies in the healthcare sector on innovative solutions in consulting, training, applied research and development, technology services and professional events.

patients; we expect it will follow 50 by the end of the year. The product's introduction has been a success both with patients and healthcare professionals, and we have received feedback about its high reliability and quality. Following the data brought by eKenku the medical team can work out new scenarios to assist patients and this will determine the future evolution of the tool.'

What are your projections?

'We want to offer the service to more hospitals and patients with different pathologies next year. We will also offer more features.

'The curiosity from healthcare professionals is very high, since many have taken a growing interest in telemedicine over the past few years. However, management and organisation in a hospital are not aligned with remote patient monitoring and

virtual assistance; healthcare actors do not understand the deployment of a product such as eKenku equally.

'Further development must be based on positive results and there must be a return on investment, which we estimate will take about six months.

The capacity to generate savings for the healthcare system is huge and type of solution will be a key element to sustain the system in the future.'

Can you ensure patient data remains safe if, for example, the tablet is stolen?

'We avoid having personal data within the devices; the tablet is linked to a specific patient and the information stored within it is referenced with a code, which is not sent to anyone outside the security of healthcare networks. So, if the device is stolen, or another user tries to access the



information, no patient reference will be found.'

What benefits a patient as well as healthcare providers?

'For patients the benefits include reduction in hospital stay and life quality improvement, because they don't have to visit the hospital. People have a direct and rapid access to doctors whenever needed.

'Doctors can work better in the case of an emergency, because they receive the information earlier. Treatment adherence also increases and clinical follow up is more precise. Finally eKenku monitoring helps us to reduce costs and empowers patients.'

What are the challenges to ehealth in Spain?

'In Spain healthcare works in a very dispersed fashion and, despite ongoing efforts to integrate the clinical history and improve processes, a lot of work remains to be done regarding continuous care and data access and management.'

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Enrique de la Vega is digital product manager in knowledge transfer at Eurecat. A telecommunications graduate from Madrid Polytechnic University (2005), he gained a master's degree in biomedical engineering at Madrid Polytechnic University and another MA in integrated projects management at the University of Barcelona (2011). Currently manages two eHealth-based products, eKauri and eKenku. Formerly a healthcare consultant and product manager supporting Phillips healthcare portfolio in monitoring, electrocardiography and obstetrics, he also had been product specialist and healthcare consultant in radiological imaged-based Alma IT Systems Company, and worked for a Catalanian Health Department initiative to develop policies and initiatives in the non-radiological image integration field.

Uniform, homogeneous and shadow-less illumination

Lighting up minor surgery and more

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SOLED15, one of ACEM Medical Company's Starled range of lamps, is an LED examination light for diagnostics, minor surgery and universal applications, and can be used for intensive care, the recovery room, first aid, cosmetic surgery and dentistry. The firm adds that there is excellent light intensity, IR-free light beam, colour temperature (CCT) of 4.500°K, colour rendering index (CRI) of 95 and low power consumption for a long life.

'The high technological level combined with the use of high-powered

LEDs allow SOLED15 to have a very linear yield and a negligible performance decay for its entire life duration,' Acem continues. 'Thanks to the high efficiency achieved, SOLED15 has a light intensity of 65,000 Lux (85,000 Lux with 'Boost' function) and a low power consumption (16W).

'The LEDs layout gives a visual comfort and produces a uniform, homogeneous and shadow-less light.

The company also points out its round shape, which 'makes it handy and functional both in use and to move'.

The new 'SEL' function allows



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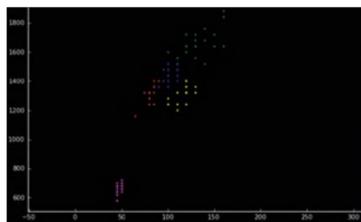
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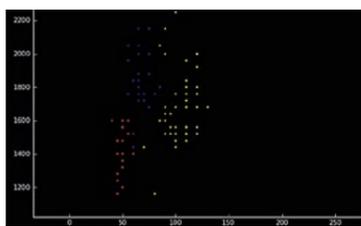
From qualitative to quantitative imaging

Magnetic Resonance Fingerprinting

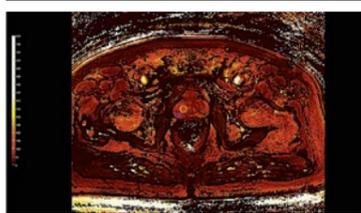
From the beginning of MRI scientists dreamed of not only translating data sets into images, but also classifying tissue directly. Five years ago this would still have been inconceivable. However, MR fingerprinting might now make it possible to diagnose a disease from a distinctive combination of information about the tissue. This original technology is being largely driven by Case Western Reserve University and Cleveland University Hospitals, Ohio, with research support from Siemens Healthineers. Reto Merges, Head of Scientific Marketing for the Magnetic Resonance Business Line, discussed the technique and how it could change MRI diagnostics in the future.



1.5-T MR Fingerprinting T-1 and T-2 map of high grade glioma. MRF promises the possibility to differentiate the solid part of tumour, central necrosis, lower grade part of tumour, surrounding oedema and tumour infiltration from normal looking white matter. (Courtesy of Medical University of Vienna. MR Fingerprinting of the brain)



3-T MR Fingerprinting T-1 and T-2 map of a biopsy confirmed low grade prostate cancer. (Courtesy of University Hospital Essen, Germany. MR Fingerprinting of the prostate)



Report: Karoline Laarmann

Just as each person has unique fingerprints, each body tissue, whether diseased or healthy, also has an individual, physical pattern. This pattern is encrypted in signals sent by the tissue during an MRI scan. To date, it has only been possible to measure different signal intensities, which are then represented as light/dark contrasts on the MRI image. However, this qualitative and relative measurement alone does not allow any conclusions as to whether the tissue is healthy or diseased.

However, MR Fingerprinting (MRF) opens up entirely new opportunities for quantitative measurements, explains Reto Merges: 'This procedure now makes it possible to obtain quantified information about a tissue section without having to consult reference values. With this method we do not record the signal intensities of individual image sequences or weightings that can vary according to the device and data acquisition. Instead, we record the signal sequences from a single exposure sequence that contains a multitude of parameters that can be characteristic for a certain type of tissue. These signal sequences are correlated with simulations in a digital MRF dictionary, similar to a fingerprint, which is fed into a database to find out to whom it belongs.'

Currently this database, developed by Case Western Reserve University, contains simulations for all T-1 and T-2 weightings. The aim is to add signal sequences for all other sequences as well. The procedure is already delivering the first promising results, which radiologist Vikas Gulani and physicist Mark Griswold and their US research team already presented in Nature

magazine in 2013, attracting world-wide attention. At the moment the particular focus of clinical trials is on oncological applications for the head, prostate, breast and liver, but also for cardiac examinations and multiple sclerosis.

MRF advantages

Compared to conventional procedures of qualification, MRF offers some decisive advantages, Merges confirms. 'Firstly, the procedure is very fast. The various parameters are not consecutively recorded in different sequences but captured simultaneously. This not only shortens the examination period from up to one hour to just five minutes, but also makes the procedure less interference-prone.

'If a patient moves during a conventional MRI examination the entire exposure sequence that has just been run can lose its diagnostic relevance. With the fingerprinting procedure the signal sequences measured up to that point remain useable.'

The procedure also copes very well with field inhomogeneities; whether or not a signal is a little stronger or weaker is not that important for the signal sequence.

A further strength of MRF, along with its speed, is its great robustness. 'We are currently experimenting with transferring the procedure to different MRI scanners and field strengths,' Merges says. 'The technology is now at a point where we have also been able to trial it in other international centres, such as Essen University Hospital and the Medical University of Vienna from the beginning of the year.

'Phantom measurements, which we carried out with all of our clinical cooperation partners, have already shown that fingerprinting delivers consistent, comparable results measured on different devices and in different locations.

'This is an important step towards introducing MRF into the hospital. However, we currently cannot say exactly when this will be.'



After gaining an electrical engineering and IT degree at Karlsruhe Institute of Technology, Germany, Reto Merges Dipl.-Ing began his career at Siemens, developing segmentation algorithms for coronary artery segmentation on CT data. Based in China for four years, he built up an organisation for research collaboration for the CT division in greater China and South Korea. Within the Magnetic Resonance division, Merges held various positions in global marketing, which included heading the clinical marketing team, before he was appointed director of scientific marketing in early 2015. In this role he focuses on innovations, education and the future of value-based imaging.

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the selection of single parts of the light beam and the activation of the desired LEDs in a sequential way according to the requirements and needs.

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The model can be ceiling, wall or trolley mounted and a battery is available.

Finally, the SOLED with ABPS has the same performance and appearance, since the structure containing the battery is within the trolley base. The structure that covers and protects the battery is made of resistant plastic (dimensions: 550 x 340 x 240).

'The control panel on the structure allows managing all fundamental parameters, such as residual charge, type of power supply, recharge status and electrical power supply presence, amongst others,' the firm reports. 'ABPS is a rechargeable battery powered system made by ACEM Medical Company dedicated to power surgical lamps as by European Directive 93/42/EEC.'

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28 new cameras go to work in Tübingen University Hospital

Investment: 4K-UHD and full-HD

28 new specialist cameras have been delivered to Tübingen University Hospital in Baden-Württemberg by Ikegami, leading producer of high- and ultra-high-definition imaging and display equipment for broadcast, process-control and high-end medical applications worldwide.

Headed by medical director Professor Bartz-Schmidt, the hospital provides teaching, research and advanced medical services as one of the university's 17 clinics.

'This is a highly prestigious order from one of the largest and most important ophthalmic medical centres in Germany,' said Zeljko Romanic, Industrial and Medical

Video Division Manager, Ikegami Electronics (Europe). 'The cameras will be integrated into a new building, which is nearing completion. We provided and installed the camera systems in partnership with our partner and distributor Bildsysteme Horn.

'The project includes 25 Ikegami MKC-210HD full-HD cameras. These will be used to capture real-time video from slit-lamp bio-microscopes that allow detailed inspection of the front segment of each patient's eyes. The cameras are equipped to allow monitoring and recording of the entire examination.'

'University Hospital Tübingen has also taken delivery of three Ikegami

MKC-750UHD 4K cameras, making it one of the first medical facilities in Europe to invest in the 4K ultra-high-definition format.

'The MKC-750UHD cameras will be deployed in an operating suite specialising in advanced treatment of macula degeneration and retina disorders, as well as for neuro-ophthalmology and refractive surgery.

'The UHD resolution and very high quality of Ikegami 4K medical cameras opens new possibilities for studying eye conditions in very precise detail. Robot precision combined with physician's expertise.'

Videoring surgical procedures as well as attaching to the micro- or endoscopes

'Studying medical conditions at this very advanced level demands very good doctors, very good microscopes and very good cameras. University Hospital Tübingen now has them all.'

Ikegami's first 4K 3-sensor medical camera, the MKC-750UHD, is a full 4K ultra-high-definition camera, the firm points out. Introduced at Medica 2015, it is designed to capture video of surgical operations as well as attachment to microscopes or to endoscopes. 'The integral 3840 x 2160 pixel UHD 3-CMOS optical

sensor is capable of resolving much higher image detail than high-definition cameras.'

The MKC-750UHD can output pictures in UHD and full HD, allowing use with existing HD monitors as well as UHD displays. 'An image correction function enables the camera to express high image resolution in detail. Also included is a gradation correction function, which delivers high contrast without over-exposure or black-crushing.

'Structurally, the MKC-750UHD consists of miniature camera head with integral optics. The head connects via cable to a mains-powered compact control unit (CCU). The camera and CCU have an antibiotic coating to assist infection control. All major camera functions, plus the ability to record video and capture still images, can be controlled from the front panel of the CCU,' the company reports.

'The Ikegami MKC-210HD employs a single 2.1 megapixel full HD 1/3-inch CMOS sensor to deliver 900 TV lines of horizontal definition video images. Providing f/7 at 2000-lux high sensitivity performance, it delivers the video quality required for high-end medical video system.

'Optimised signal processing circuitry achieves a high signal-to-noise ratio of 50 dB. Video signal processing is performed in the same application-specific integrated circuit as Ikegami's HDTV broadcast cameras, ensuring the same high level of quality and reliability.'

www.ikegami.de/medical.html



O2C – oxygen

Fibre-optic probe non-invasively measures blood flow and more

'O2C (Oxygen to see) is a non-invasive diagnostic tool used to determine the oxygen supply in blood perfused tissue,' explains its manufacturer Lea Medizintechnik GmbH. 'It allows a non-invasive measurement of blood flow (AU), capillary venous oxygen saturation (%), regional haemoglobin value and relative post capillary filling pressure (AU) using a fibre optic probe.'

O2C can be used to monitor continuously the pedicle and microvascular flaps, such as visible and buried flaps. 'The flap perfusion is continuously monitored using microcirculatory parameters. The microcirculatory assessment can be done during operation and post-operation. O2C guarantees an alarm at the earliest during the critical conditions of flap that was caused by an arterial occlusion or venous congestion.'

Lea is at Medica Hall 09 / Stand D



Ikegami is at Medica Hall 10 / Stand B12

Images are superimposed into the surgeon's eyepiece

Microscope imaging system integrates virtual reality technology

CaptiView – a microscope image injection system from Leica Microsystems, which overlays critical virtual reality imaging directly onto the brain when viewed through the eyepiece (the ocular) during surgery, has been used for the first time by a neurosurgeon, Joshua Bederson MD, Professor and System Chair for the Department of Neurosurgery at Mount Sinai Health System.

This new microscope technology allows images of chosen objects, including original CT, MRI and angiogram datasets, to be superimposed, or 'injected', directly into the neurosurgeon's eyepiece during microscopic surgery. 'This next-generation augmented virtual reality tool provides real-time information in ways never before realised,' Bederson says. He has worked closely with

Leica Microsystems and Brainlab to develop the surgical navigation tool and confirms that he now uses this technology for all his cases.

The CaptiView image injection system utilises Brainlab Cranial 3.1 Navigation Software in conjunction with a Leica M530 OH6 microscope. The heads-up display provides neurovascular and fibre-track information in 2-D or 3-D, as well as on-screen video overlays visible through the ocular.

The microscope integration also allows the surgeon to switch views in the eyepiece, toggling between live and pre-operative anatomical images using handle control buttons, or a footswitch, for ease of use and uninterrupted workflow. Markers

attached to the microscope enable positional tracking and autofocus.

This new technology will be utilised alongside Surgical Navigation Advanced Platform (SNAP) developed by Surgical Theater, LLC, which is a standard feature in the operating room. 'SNAP,' the firm explains, 'provides advanced 3-D visualisation technology that gives surgeons an intraoperative and patient-specific 3-D environment to plan and understand surgical approaches.'

Bederson concludes: 'We are driving and advancing the development of next-generation simulation and virtual reality technology, which can help improve patient outcomes and solve neurosurgical challenges.'

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A Mount Sinai neurosurgeon is the first to use Microscope Imaging System that stunningly integrates virtual reality technology.



Image: Mount Sinai Health System

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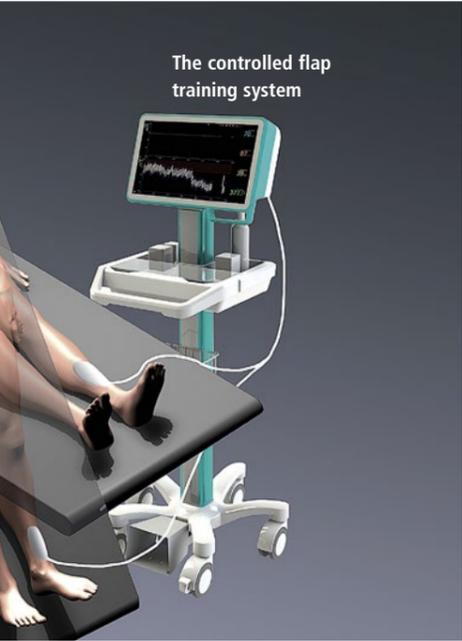
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The controlled flap training system

gen to see

'The screen displays the Stasis or Stenosis of the flap,' Lea continues. 'The measured parameters can be transferred to an external computer via remote connection during the monitoring of flap. This helps to avoid unnecessary delays for doctors and reliable access of data.'

'O2C is also used to control the mobilisation after lower extremity reconstruction. The probe is placed and fixed in the distal third of the free flap to measure the microcirculatory parameters.'

'The blood flow of microcirculation is used to most precisely control the mobilisation of patient,' Lea point out. 'When there is a critical drop in blood flow below 10AU during mobilisation, then the flap training has to be stopped suddenly (reposition the patient back to supine position). Thus O2C provides a controlled flap training that minimises the risk of partial or total flap loss. This helps the patient to achieve an early and efficient mobilisation and to reduce hospital stay.'

www.lea.de

Which way to go in tomorrow's med-tech markets?

The shift to services

In 2015, global healthcare (HC) spending represented €7.5 trillion, expected to grow 6% in the three years to come, reports Natalie Christie, who works on business development at TforG Group, provider of business intelligence and decision support to international med-tech businesses worldwide, with its focus on medical devices and medical technology markets within a hospital context. In the USA and Europe the number of patients continues to increase (aging population, more chronic patients). Budgetary pressures push most countries to reform HC financing, she points out.

'In emerging economies, HC is becoming accessible for a larger part of the population, often without the required increase in public funding.'



Natalie Christie

'To deal with these cost and volume pressures, care providers and national HC systems worldwide move to some level of value-based healthcare and to integrated care models,' Christie reports.

'A survey of 250 hospitals in Western Europe, Turkey, Russia, Brazil, and China resulted in three important findings:

1. The pre- and post-acute care provision impacts on their efficiency and profitability. 2. Volumes of patients represent a bigger challenge than quality of care. 3. Solutions are often beyond the authority or budget of the hospital.

'Today, most med-tech companies want to address this changing context and analyse where their products are used in pathology's clinical pathway.'

Christie says the key questions to validated potential strategies are: How do you generate the required level of competitiveness and differentiation? Who are the stakeholders? Do we have the appropriated sales force to reach them

Are the benefit holders also the budget holders? How fast will the

market adopt the new solution?

The hospitals' conclusions and strategic answers take different directions, Christie adds, listing: technology/product-oriented services: products/technologies allowing new clinical pathways. Hospital/clinic-oriented services: Services to optimise the supply chain; inventory management.

Outsourcing becomes more often an option. Care provider-oriented services: Products and services that reduce or reallocate workloads and tasks, such as tele-monitoring and home services/aids.

Patient-oriented services: This refers to reducing hospital stay, new e-health solutions, etc.

Christie advises that the insights and the firm's answers to future challenges in the shift from pure product manufacturing to a full healthcare service can be downloaded from tforG.com/whitepaper.

Natalie Christie is available at Medica: Phone: +32 3 201 64 25

The widest gold standard range

Specialist single-use suction devices

With foresight, and as a direct response to UK hospitals' concerns over cleaning practices involving fine lumen instruments that posed a high risk of cross contamination between patients, Single Use Surgical was established in 2001.

'Since then, the company has developed the widest range of high quality and specialist single-use suction capturing the same look, feel and functionality as the re-usable equivalent,' Single Use Surgical points out.

'Unlike many other disposable instruments,' the firm adds, it manufactures its products with stainless steel tubes rather than aluminium, 'a factor that has helped them to become a global leader within the

single-use medical devices market.' The range spans many specialities including ENT, head and neck, gynaecology, laparoscopy, general and vascular surgery

New in the sinus suction range

New in the firm's ENT range, is an extension to its popular Sinus Suction range. 'The new suction incorporates a gentle 60-degree bend for improved access during Functional Endoscopic Sinus Surgery (FESS),' the firm explains.

Developed with surgeons, for surgeons, the choice of disposable Sinus Suctions are designed to suit each case. 'Their lightweight, ergonomic handles are available with or without



a control hole, with a choice of tip styles and sizes including the new 60-degree bend. Each suction tip is atraumatic for patient safety, as well as curved for maximum visibility and improved reach in difficult to access areas.'

Export Manager, Michael Denver added: 'Many of our innovations provide improved ergonomics and functionality, as well as consistent quality and a safe alternative to re-usable instruments.'

Details: www.susl.co.uk

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