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Cancer remains the second leading cause of death in Europe after cardiovascular diseases with approximately 3.5 million new cases diagnosed every year and an annual death toll of 1.5 million. However, the good news is that the trend of total cancer mortality levels is downwards for both men and women and also children for which the progress of 5-year leukemia survival has been spectacular.

Breast cancer provides a good example of this trend, being not just the most common female cancer globally but also the number one diagnosed cancer in Europe (13%). Its 5-year survival rate has more than doubled in 40 years, from 40% of patients in 1970 to 90% in 2013. Looking into the future there are also some encouraging signs for certain types of cancer, particularly cervical cancer as the full impact of the HPV vaccination programmes becomes measurable.

In Europe, some of the credit for these positive developments should go to the European Organization for Research and Treatment of Cancer (EORTC), founded in 1962. Over the years, EORTC’s clinical research has helped make significant progress in the treatment and management of cancer, evaluating new molecules, refining existing treatment regimens, identifying biomarkers and assessing patients’ quality of life. In 2016, the EORTC research network counted more than 4850 physicians from about 870 institutions while patient accrual from 2000 to 2016 totalled over 89,000 patients in clinical studies.

The bad news is that the overall burden of cancer continues to increase not just because of progress in early detection but largely because of the ageing of the population (65% of new cancer cases are diagnosed in patients who are 65 or older). Also, smoking, particularly in women, is linked to a rising incidence of lung cancer.

There are still a number of challenges to be met if the promises of translational research and personalized medicine for cancer therapy are to be fulfilled. Effective coordination in Europe of advances in basic research and quality clinical research programmes is essential. New models of partnerships between academia and the pharmaceutical industry are also required as well as public funding for research on rare cancers. Prevention is paramount, though, as no cancer research will have a bigger and quicker impact than smoking cessation. Tobacco kills over one third of its users and studies have shown that smokers lose at least 10 years of life expectancy compared to non-smokers and that quitting smoking before the age of 40 reduces the risk of tobacco-related death by 90%.
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New technologies in ultrasound: high-end drives innovation, commodity products ease workflow

Conventional or B-mode ultrasound has been used as a diagnostic imaging tool for over four decades. Over the last few years, however, ultrasound systems have witnessed a blizzard of developments in their underlying technology. This has catalysed a significant change in the patterns of ultrasound usage vis-a-vis other, older imaging modalities, especially in terms of concerns about the latter - for example, radiation risk in X-rays and computer tomography (CT), and cost for both CT and magnetic resonance imaging (MRI).

Technology drivers
The ultrasound market is largely driven by innovations in underlying technologies and more sophisticated software algorithms, which allow manufacturers to offer smaller, more powerful and complex systems. Key developments include an acceleration in processing speed and enhancement in the quality of diagnostic images – coupled to advances in contrast-enhanced imaging and precision in the timing of image capture. This has been accompanied by a sharp reduction in noise-to-signal ratios in the final data to optimize spatial, contrast and temporal resolution, including rotatable views for better visualization.

GE’s cSound technology, for example, offers CT level image quality based on advanced algorithms that capture much larger amounts of data than possible previously (by some estimates, about a DVD worth of data per second). The technology also makes pixel-by-pixel selections of the most precise information to display.

Developments in transducers, beam formation
Ultrasound has also made quantum leaps in factors such as transducer sensitivity and beam formation. For example, line-by-line imaging in beamformers has been replaced in some systems by large zone acquisitions, allowing users to view examinations in greyscale and colour Doppler. Meanwhile, retrospective imaging makes it possible to process raw data multiple times, while retention of channel domain data allows for patient-specific imaging.

Because of all the above, clinicians are able to use ultrasound to image blood perfusion and blood flow in vessels with diameters of 2 mm and less, with small vessel beds displayed via Doppler flow false-colour 3-D or greyscale reconstructions. The result is better assessments of organ perfusion, which have traditionally been difficult on ultrasound.

Commodification trends
Take-up of ultrasound has also been recently boosted by a growing commodification trend. Certain categories of ultrasound have become relatively inexpensive, mobile and less demanding of power. Mobility-related innovations include portable hand-held devices, and more recently, the world’s first wireless transducer. Even some low-end machines are now enabled for full bi-directional communication with electronic medical records.

As healthcare reforms and budgetary pressures favour use of cost-effective solutions, this has led to especially sharp growth in the use of low- and mid-range ultrasound systems. It is now commonplace, for example, to see ultrasound systems in a recovery room, next to hospital beds, or equipping NGOs at health outreach projects in developing countries.

For many hospitals, this kind of product/technology mix makes sense, since not all patients require the sophisticated features offered by high end machines, while their smaller, inexpensive counterparts provide solutions for an everyday challenge faced by most hospitals – workflow bottlenecks.

High-end remains motor for new applications
At the other end, the high-end segment is leading innovation not only in ultrasound technologies, but driving the overall medical imaging market, too. Despite their cost, the advanced features of premium systems have moved ultrasound well beyond traditional applications such as ob/gyn to interventional cardiology and internal medicine. Several ER clinicians, for instance, now routinely utilize ultrasound for echocardiograms and abdominal imaging, while radiologists and surgeons use it to guide needle placement or perform bone sonometry.

Some cutting-edge areas – such as matrix transducers - remain ensconced in the premium category. Matrix transducers have direct relevance to two fast-emerging applications, namely volumetric ultrasound and 3-D/4-D applications.

Key developments
Given below is an overview of key recent developments in ultrasound systems.

Mobility and Ergonomics
Ergonomics and mobility are being addressed by vendors in order to differentiate their systems and grow user volumes. Some surveys suggest that over three out of four of ultrasound users experience work-related pain, with a fifth of these suffering a career-ending injury.

New-generation ultrasound systems stand out in terms of design. Most are noiseless to permit sonographers to minimize distraction and focus on the exam, with settings customized and organized depending on clinical preferences.

Some have slanted bodies to prevent users hitting their knees or feet on the machine, with keyboards that can be raised or lowered depending on user height, probes that are shaped to the human palm and rotatable LCD monitors for sharing the display with colleagues. Other innovations include the possibility of use in both sitting and standing positions, with memory features to accommodate different users.

Some recent ultrasound machines have tablet-sized touchscreen-based interfaces, which significantly reduces the reach and steps (in some cases by 15-20%) in order to start and complete an exam. This enables faster workflow. Touchscreens allow users to tap in order to start functions, pinch and drag to zoom in and out, and swipe
to expand the image. Some vendors offer exam presets, with several enhanced functions such as continuous wave Doppler or transducers.

Miniaturization
As discussed below, there is an increase in the use of ultrasound as an alternative to CT and MRI in many point-of-care (PoC) settings. One of the reasons for the trend is mobility as well as increasing miniaturization. Smaller ultrasound machines provide solutions to concerns about cables or wheeling bulky machines around patient rooms, and address tight space demands in key hospital settings such as the operating room. Compact models can be transported by being wheeled or atop a cart. In some cases, smaller portable machines can also be moved between departments within a hospital or clinic - on a user’s back.

Enhanced quality drives ultrasound to point of care
Ultrasound images today are available with far-higher resolutions than in the early 2000s, when most physicians were used to pictures being fuzzy. One of the key reasons is enhancement in real-time computer processing of images. Superior image quality has also driven ultrasound to the point-of-care (PoC) setting – both for diagnostic and interventional procedures. PoC ultrasound is now widely available in operating theatres and emergency rooms. Between 2010 and 2013, anesthesiologists are reported to have doubled the use of ultrasound procedures, and ultrasound is also far more common today in certain interventional procedures such as image-guided biopsies and ablations, previously dominated by CT and MRI.

Volumetric ultrasound development
Volumetric ultrasound allows superior characterizing of tissue and the performance of procedures with far greater accuracy. Ultrasound was previously only able to capture a single imaging plane, but it can currently acquire volumes. This is because transducers which enable the acquisition of real-time volumes of tissue and allow imaging in multiple planes such as the transverse and sagittal have recently become available. For instance, transducers can detect the altered speed of high-frequency sound waves through adipose layers versus other tissue, and make the system aware of increased adipose content. Though several new-generation transducers remain expensive, in areas where they make a difference, the added price tag is becoming justified. For instance, high-resolution matrix transducers are finding use in interventional cardiology applications such as transesophageal echocardiogram (TEE) and 4D imaging.

3-D/4-D imaging
While 2-D continues to be widely used in clinical applications, recent technological advances such as matrix transducers have been enabling factors and triggered interest in 3-D and 4-D ultrasound. 3-D/4-D ultrasound has a more rapid acquisition rate of datasets and subsequent improved image visualization. 4-D imaging consists of the three spatial dimensions as well as the element of time. It projects a cinemagraphic, motion picture view of an organ or a specific part of an organ, and is emerging as the next generation in advanced imaging.

In combination with advanced visualization functions, 4-D ultrasound aids complex surgical applications and interventional procedures. Multiplanar reconstructed (MPR) images are now available for review in the same manner as CT and MR scans. Leading imaging vendors already offer 4-D imaging products - across all modalities, PET/CT, MRI and ultrasound. However, 4-D ultrasound is capturing a great deal of interest in applications where ultrasound has already made a case for itself, due to cost, mobility or radiation concerns.

The close connection between 4-D and ultrasound dates back to cutting edge efforts in the early 1980s, when a Duke University team determined that although MRI was faster, ultrasound was the closest to “achieving 3D real time acquisition.” The researchers, led by Dr. Olaf von Ramm, developed a single-transmit, multiple-receive ultrasound scanner called Explosocan to increase data bandwidth.

Elastography
One of the most revolutionary technologies in ultrasound consists of elastography, which utilizes B-mode ultrasound to measure the mechanical characteristics of tissues, which are then overlaid on the ultrasound image. This provides physicians the ability to view stiffer and softer areas inside of tissue, with image quality and clinical outcomes equivalent to X-Ray, MRI, and CT. Elastography techniques include strain elastography and shear wave elastography (SWE). It has begun proving its use in the characterization of thyroid nodules, lymph nodes and indeterminate breast lumps as well as the detection of prostate cancer. None of these were achievable via conventional ultrasound.

The application which has generated maximum attention is liver fibrosis staging. Biopsies are not only invasive but carry bleeding and infection risks. Elastography, which can be repeated as often as required, is being seen as a way to get the data needed by clinicians to diagnose and stage liver diseases without the associated complications. Elastography is also used to predict complications in patients with cirrhosis. SWE in particular is also seen as a tool to assist in earlier detection of conditions such as Hepatitis C, and both fatty liver and alcholic liver disease. Alongside lab studies, it offers a means to closely monitor the impact of treatment and assess if the liver will normalize. For many hepatologists, fighting a liver condition before Stage 4 cirrhosis provides a good chance of reversibility. SWE can also provide information on which Hepatitis C patients might benefit from viral therapy.

From smartphone apps to AI: the future
App-based ultrasound have recently been showcased. These use transducers connecting via a USB port to a mobile device and a downloadable app. The transducer performs data acquisition, processing and image reconstruction. The result is an ultrasound feature in a consumer-grade smartphone. Some vendors have launched artificial intelligence systems to enhance speed and automatically take image volume data from 3-D echo to recreate optimized diagnostic views. In cardiac echo in particular, the result offers major potential by permitting reproducibility of imaging. Nevertheless, such cutting edge technologies are still in their infancy. Only time and user experience will determine their eventual success.
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New imaging technique aims to ensure surgeons completely remove cancer

Of the quarter-million women diagnosed with breast cancer every year in the United States, about 180,000 undergo surgery to remove the cancerous tissue while preserving as much healthy breast tissue as possible. However, there’s no accurate method to tell during surgery whether all of the cancerous tissue has been successfully removed. The gold-standard analysis takes a day or more, much too long for a surgeon to wait before wrapping up an operation. As a result, about a quarter of women who undergo lumpectomies receive word later that they will need a second surgery because a portion of the tumour was left behind.

Now, researchers at Washington University School of Medicine in St. Louis and California Institute of Technology report that they have developed a technology to scan a tumour sample and produce images detailed and accurate enough to be used to check whether a tumour has been completely removed.

Called photoacoustic imaging, the new technology takes less time than standard analysis techniques. But more work is needed before it is fast enough to be used during an operation. “This is a proof of concept that we can use photoacoustic imaging on breast tissue and get images that look similar to traditional staining methods without any sort of tissue processing,” said Deborah Novack, MD, PhD, an associate professor of medicine, and of pathology and immunology, and a co-senior author on the study.

The researchers are working on improvements that they expect will bring the time needed to scan a specimen down to 10 minutes, fast enough to be used during an operation. The current gold-standard method of analysis, which is based on preserving the tissue and then staining it to make the cells easier to see, hasn’t gotten any faster since it was first developed in the mid-20th century.

To speed up the process, the researchers took advantage of a phenomenon known as the photoacoustic effect. When a beam of light of the right wavelength hits a molecule, some of the energy is absorbed and then released as sound in the ultrasound range. These sound waves can be detected and used to create an image. “All molecules absorb light at some wavelength,” said co-senior author Lihong Wang, PhD, who conducted the work when he was a professor of biomedical engineering at Washington University’s School of Engineering & Applied Science. He is now at Caltech. “This is what makes photoacoustic imaging so powerful. Essentially, you can see any molecule, provided you have the ability to produce light of any wavelength. None of the other imaging technologies can do that. Ultrasonic will not do that. X-rays will not do that. Light is the only tool that allows us to provide biochemical information.”

The researchers tested their technique by scanning slices of tumours removed from three breast cancer patients. For comparison, they also stained each specimen according to standard procedures.

The photoacoustic image matched the stained samples in all key features. The architecture of the tissue and subcellular detail such as the size of nuclei were clearly visible. “It’s the pattern of cells – their growth pattern, their size, their relationship to one another – that tells us if this is normal tissue or something malignant,” Novack said. “Overall, the photoacoustic images had a lot of the same features that we see with standard staining, which means we can use the same criteria to interpret the photoacoustic imaging. We don’t have to come up with new criteria.”

Having established that photoacoustic techniques can produce usable images, the researchers are working on reducing the scanning time.

Siteman Cancer Center
http://tinyurl.com/y87u35l5

Ultrasound for children with abdominal trauma

Despite evidence showing that the routine use of sonography in hospital emergency departments can safely improve care for adults when evaluating for possible abdominal trauma injuries, researchers at UC Davis Medical Center could not identify any significant improvements in care for pediatric trauma patients. The findings, which resulted from a randomized clinical study involving 925 children with blunt torso trauma who were evaluated in the emergency department at the medical centre, showed no difference in important clinical outcomes. The outcomes assessed were developed for the study mainly based on previous research in injured adults.

The UC Davis team investigated the Focused Assessment with Sonography for Trauma (FAST) to determine whether the use of the FAST examination could safely lead to a decrease in the use of computed tomography (CT) scans for children, and other outcomes. FAST is a bedside ultrasound examination using a portable ultrasound machine. It has not been routinely used in the initial emergency department evaluations of injured children. CT scans represent the “gold standard” in diagnostic imaging for clinicians, including the identification of intra-abdominal injuries, but they also pose a greater radiation risk for children than they do for adults.

“A lot of our work has looked at the appropriate use of CT scans in injured patients,” said James Holmes, professor of emergency medicine and the study’s lead author. “At least in the adult trauma population, there’s evidence that you can use ultrasound to safely decrease CT use. One of the big questions has been whether that holds true for children, too.”

Holmes and his colleagues identified a study cohort of hemodynamically-stable children who presented in the emergency department at UC Davis Medical Center with blunt torso injuries resulting from mechanisms such as motor vehicle collisions and falls greater than 20 feet (6m). Four hundred and sixty patients were randomized to the FAST group and 465 to the no-FAST group, who received the same standard trauma evaluations but without ultrasound.

As in previous studies, the researchers wanted to determine whether the FAST protocol could significantly decrease the length-of-stay for patients in the emergency department, reduce hospital billing charges and still identify injuries when compared to patients who did not receive a FAST examination.

“We were surprised that the routine use of FAST did not show any significant differences,” said Nathan Kuppermann, professor and chair of emergency medicine at UC Davis and the study’s senior author and co-principal investigator. “The use of FAST compared with our standard trauma care did not decrease CT scan use, improve resource use, emergency department length-of-stay, safety or hospital charges.”

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MADE IN USA
Ultrasound scoring system for thyroid nodules to reduce unnecessary biopsies

Nodules — a type of abnormality detected by ultrasound — are extremely common in the thyroid gland. Up to two-thirds of adults have nodules in this gland, and most are benign or only cause a slow-growing cancer that is no threat to life.

A minority are aggressive cancer that requires treatment, leaving physicians and patients with a problem — which nodules need to be biopsied for malignancy tests, which nodules show a small risk and merit observation without a biopsy, and which need no follow-up at all?

“If you have a cancer that is not going to harm you, and you are not aware of it, is it useful to do a fine-needle aspiration?” said Franklin Tessler, M.D., C.M, a professor in the University of Alabama at Birmingham Department of Radiology. “People are asking, what are we doing? Are we using scarce resources wisely?”

Thyroid cancers are greatly over-diagnosed in the United States. About three-quarters of thyroid cancers in women and nearly one-half in men would not — if the nodules had been left alone and not biopsied with a needle — resulted in symptoms or death.

Tessler and a national committee of experts have now published American College of Radiology guidelines for an ultrasound-based risk stratification system to identify nodules that warrant biopsy or sonographic follow-up. The guidelines, they write, are “designed to identify most clinically significant malignancies while reducing the number of biopsies performed on benign nodules.”

“This potentially will have a big public health effect,” said Tessler, who is also the Radiology executive vice chair and medical director, vice chair for Radiology Informatics, and division director of Diagnostic Radiology.

Their Thyroid Imaging, Reporting and Data System, or TI-RADS, is modelled after the American College of Radiology’s BI-RADS, a widely accepted risk stratification system for breast lesions.

The experts sought guidelines that are 1) founded on ultrasound features defined in their previously published lexicon; 2) easy to apply across a wide gamut of ultrasound practices; 3) able to classify all thyroid nodules; and 4) evidence-based, to the greatest extent possible, with the aid of underlying data on 3,800 nodules and more than 100,000 cancers.

Their new guidelines follow many attempts over the past 15 years to create guidelines for whether to do a fine-needle aspiration biopsy. Most are based on details of the appearance and size of nodules that are visualized with high-resolution ultrasound.

But “the plethora, complexity and lack of congruence of these systems has limited their adoption by the ultrasound community and inspired our effort to publish a classification system under the auspices of the American College of Radiology,” Tessler and colleagues write.

The American College of Radiology TI-RADS has five different categories for nodule appearance — composition, echogenicity, shape, margin and echogenic foci. The shape category has two choices — wider-than-tall vs. taller-than-wide. The other four categories have four choices each, such as “hypoechoic” under the category echogenicity or “lobulated or irregular” under margin. Each choice as a point value, ranging from 0 to 3 points. “Wider-than-tall,” for example, is 0 points, and “taller-than-wide” is 3 points.

As the authors explain, “Points are given for all the ultrasound features in a nodule, with more suspicious features being awarded additional points. … When assessing a nodule, the reader selects one feature from each of the first four categories and all the features that apply from the final category and sums the points. The point total determines the nodule’s ACR TI-RADS level, which ranges from TR1, benign, to TR5, high suspicion of malignancy.”

If the sum is 0 points, the nodule is TR1 and the guidelines recommend no fine-needle aspiration or follow-up. If the sum is 2 points, the nodule is TR2, or “not suspicious,” and the guidelines recommend no fine-needle aspiration or follow-up.

A sum of 3 points is TR3, or “mildly suspicious.” For these nodules, the guidelines recommend fine-needle aspiration if the nodule is 2.5 centimeters or greater, or about 1 inch or more, and they recommend follow-ups with subsequent ultrasounds if it is 1.5 centimeters or greater.

TR4 nodules, or “moderately suspicious,” are 4 to 6 points, and TR5 nodules, or “highly suspicious,” are 7 points or more. For TR4 nodules, the guidelines recommend fine-needle aspiration if the nodule is 1.5 centimeters or greater and follow-ups if it is 1 centimeter or greater. For TR5 nodules, the guidelines recommend fine-needle aspiration if the nodule is 1 centimeter or greater and follow-ups if it is 0.5 centimeters or greater.

The guidelines recommend limiting fine-needle aspiration to two nodules per patient because biopsy of three or more nodules is poorly tolerated by patients, and the third biopsy increases cost with little added benefit and some additional risk. The guidelines also suggest appropriate timing for follow-up sonograms.

University of Alabama
http://tinyurl.com/y7q9gbse

Ultrasound findings correlate with inflammatory myopathies

Ultrasonography findings seem to correlate well with the disease activity of idiopathic inflammatory myopathies (IMs), and may be a useful tool for patient evaluation, according to a study.

Joana Sousa Neves, M.D., from the Hospital Conde de Bertrandos in Ponte de Lima, Portugal, and colleagues evaluated 15 IM patients (from 2005 to 2015). Patients had a mean age of 52.2 ± 22.09 years and mean disease duration of 4.6 ± 3.20 years. Assessments included a physical examination, muscle strength tests, laboratory analysis, and a selective muscle ultrasonography assessment.

The researchers found that nine of the 15 patients were in clinical remission, and ultrasonography revealed a preserved muscle pattern. In one patient with longstanding polymyositis with proximal weakness, symmetrical proximal muscle atrophy was found. In the remaining five patients, inflammation and focal or generalized muscle edema were present with muscular weakness, suggesting active disease. One of these patients in acute flare presented with atrophy changes plus edema. An additional patient had early untreated myositis with moderate power Doppler signal.

“As far as muscle ultrasonography assessment is concerned, a single specific pattern was not observed in our study. A mixture of muscle edema and atrophy was detected depending on disease activity and duration,” the authors write. “Ultrasonography findings seem to correlate well with disease activity, suggested by clinical data, and may be a useful tool to complement patient evaluation.”

Physician’s Weekly
http://tinyurl.com/yao7u9u
Early acceptance of robotic telepresence
Such shortcomings are sought to be addressed by ICU robots, one of the latest applications in the emerging field of ‘robotic telepresence’. The use of ICU robots, also referred to as teleoperated medical devices, is growing rapidly as a supplement for patient care in the ICU. In its early stages, healthcare providers were overwhelmingly convinced of their potential. In September 2012, for example, a survey of over 10,000 ICU robotic interventions in the journal ‘Telemedicine journal and e-health’ found 100 percent of practitioners considered the robot to improve both patient care and patient satisfaction.

Autonomous, optimised for ICU, hospital environment
ICU robots essentially provide access for physicians and other specialists to implement a variety of medical procedures round-the-clock, while reducing delays for difficult admissions or procedures. The robots can be pre-programmed to drive on their own around an ICU, or this mode can be overridden and controlled by an individual, located on the premises, at a facility near by or thousands of kilometres away, via a keyboard or joystick. The robotic sensors are optimized to perform in a hospital environment, enabling the robot to identify and avoid things like IV lines, cables and glass doors.

Plug-and-play for medical devices
The robot itself contains combinations of display types, microphones, speakers and cameras; these have pan-tilt and zoom capabilities, and are powerful and manoeuvrable enough to permit physicians to view fine details and listen to the smallest sounds.

Typical accessories in an ICU robot include an integrated electronic stethoscope to allow physicians to listen remotely to heart and lung sounds using earbuds. However, most Class II medical devices can be plugged into the robot, which streams data back in real time. On the other side, robots can also access digitized medical records of patients.

Recent innovations include a smartphone application, enabling physicians to access the robot’s camera. Another is ‘point and click’ navigation, by virtue of which a user can simply click somewhere on a map of the hospital and the robot gets itself there.

UCLA pioneers ICU robot
The history of ICU robotics dates to 2005, when the University of California at Los Angeles (UCLA) Medical Center became the world’s first hospital to introduce a robot in its neurosurgery intensive care unit under a US military-funded pilot project. The UCLA pilot saw intensivists (clinicians specialized in the care of critically ill patients) monitoring patients from their homes and offices.

The robot was RP-6, developed by California-based InTouch, a company known for its ‘auto-drive’ robotics technology used in defence and public safety. Controlled by a webcam and joystick over a broadband connection, the 65 inch (166 cm) wheeled robot boasted 8-hour runtime from a single charge. Onwards from 2006, InTouch offered hospitals an option to rent the RP-6 for USD 4,000 a month, or buy it outright for USD 120,000. Its earliest customers included Detroit Medical Center and Baltimore’s Sinai Hospital.

The iRobot-InTouch Health Alliance
Meanwhile, another US company iRobot (vendor of the robotic household vacuum, Roomba) set up a Healthcare Robotics division in 2009.

In 2011, iRobot and InTouch Health announced an alliance targeting healthcare. The next year they unveiled the RP-VITA (Remote Presence Virtual + Independent Telemedicine Assistant), a robot which went beyond simply providing remote interactive capability between a clinician and patients to a hugely-enhanced navigation capability, based on sophisticated mapping and obstacle detection and avoidance technologies tailored to a hospital environment. Its aim was to free the clinician for clinical tasks.

FDA clearance
The most revolutionary capability of RP-VITA was autonomous navigation, which was submitted to the the US Food and Drug Administration (FDA) for 510(k) approval. In January 2013, the FDA cleared RP-VITA, making it the first autonomously navigating telepresence robot in healthcare, with clearance for use before, during and after surgery and for cardiovascular,
neurological, prenatal and psychological as well as critical care.

**Demand driven by range of factors**

The key drivers of demand for ICU robots today include time factors (urgency in ICU cases) and access (unavailability of ICU expertise) in remote areas. Both these are compounded by staff shortages. There are fewer than 6,000 practising intensivists in the United States today and more than 5 million patients admitted to ICUs annually. A few years ago, Teresa Rincon, chair of the Tele-ICU Committee of the Society of Critical Care Medicine (SCCM) noted that the number of intensivists in the US was “not enough for each hospital to have one.” Indeed, it is estimated that only about 37 percent of ICU patients in the US receive intensivist care, although trained intensivists in the ICU correlates to better outcomes and decreased length of stay – both in the ICU and hospital.

**The challenge of coma**

In terms of urgency, the SCCM notes that up to 58% of emergency department admissions in the US result in an ICU admission. Following admission, one of the major drivers of demand for ICU robots is coma. The reliable assessment of comatose patients is always critical. A hospital needs to quickly identify clinical status changes in order to determine and implement appropriate interventions.

In January 2017, the prestigious Mayo Clinic published results from a 15-month study of 100 patients, which is reported as the first to look specifically at telemedicine in assessing patients in coma. The results suggest that patients with depressed levels of consciousness can be assessed reliably through telemedicine. Another urgent complication is delirium. Delirium incidence has been estimated at over 80% in critically ill patients. This is accompanied by a threefold increase in mortality risk, according to an oft-cited study in an April 2004 issue of the 'Journal of the American Medical Association.'

**Clinician availability**

Medical emergencies like coma and delirium require the presence of highly qualified clinicians, but as discussed previously, real-life constraints limit their availability round-the-clock. Access is another crucial consideration. Most hospitals simply lack the patient volume to employ full-time intensivists in fields like neonatology, while their availability is limited for the same reason in remote rural locations.

**The tele-ICU**

The first attempts to address such challenges were centred on telemedicine or Tele-ICU care, involving continuous surveillance and interactive care by offsite clinicians. This was achieved by video observation of the patient and interrogation of equipment, along with instructions conveyed to other ICU staff. Although more studies are needed, there is evidence of an association of the Tele-ICU with lower mortality and shorter length of stay in both the ICU as well as the hospital. Another benefit is that a Tele-ICU enables stricter adherence to guidelines.

**US leads the way**

Europe was a relative latecomer to ICU telemedicine, with a near-total focus on teleconsultation and almost-total reliance on the US experience. For example, Britain’s NHS refers extensively to US studies on ICU telemedicine in its own Technology Enabled Care Services (TECS) Evidence Database, while the University of Pittsburgh Medical Center has opened a Tele-ICU centre in Italy, which allows US physicians to perform remote consultations for Italian ICU patients.

From telemedicine to robotics: business model turned around

In many senses, ICU robotics have been a natural successor to the Tele-ICU, albeit with a significant reversal in its operating model. The Tele-ICU functions centrally. Rooms are hard-wired with high-resolution cameras and transmit data to a remote command centre staffed by an intensivist (tele-intensivist). The intensivist, who typically covers multiple ICUs, has access to the same clinical information (e.g. vital signs, lab values, notes, physician orders etc.) as the ICU bedside team consisting of nurses, respiratory therapists, non-ICU physician and transfers instructions to them via a two-way communication link. Robotics, driven by advances in technology and mobility, have made it possible for the Tele-ICU care model to become decentralized. The ICU robot is controlled wirelessly by the tele-intensivist, who is freed from a dedicated command centre, and can indeed be just anywhere. The robot moves from room to room, examining patients based on instructions from the intensivist and interacting as required with staff. The latter interaction is now seen to be far more efficient, since it occurs only after the intensivist has given instructions on the procedures which need to be performed on a patient.

**The cost factor**

ICU robots seem to also address another major limitation of Tele-ICU, namely cost. Most studies on Tele-ICU have found that though the technologies deployed have been adequate, they have also been much too expensive. In the US, some hospitals collided with reality, quickly and harshly, “removing tele-ICUs after outcomes failed to justify the costs.” A study in December 2009, in the prestigious 'Journal of the American Medical Association' also questioned a key maxim of the Tele-ICU, pointing to evidence that remote monitoring of patients in ICUs was not associated with an overall improvement in the risk of death or length of stay in the ICU or hospital. Perspectives have been similar in Europe. For example, a Dutch study published in 2011 in the 'Netherlands Journal of Critical Care' concluded that hospitals were unlikely to see the “enormous” investment entailed by a tele-ICU as being cost-effective. Concerns about Tele-ICUs were also echoed the same year in Canada, where critical care clinicians, writing in the 'Journal of Critical Care' expressed scepticism regarding the ability of a Tele-ICU to address challenges of human resource limitation or even deliver quality care.

**The personal touch**

While a conclusive answer to the question of cost-effectiveness of OCU robots will require a larger user base, one powerful advantage seems to be the ability to target the eventual subject of the healthcare process, the patient. According to Paul Vespa, a neurosurgeon at UCLA’s David Geffen School of Medicine patients “interact with the robot as if it is a person.”

**Steps to realize full potential**

Before there is growth in numbers of ICU robots, some of the factors which will need to be addressed have been identified in a ‘Journal of Critical Care’ article in December 2013 by the Center for Comprehensive Access and Delivery Research and Evaluation, Iowa City, US. These consist of formal training and orientation, identification of roles, responsibilities, and expectations, needs assessment, and administrative support and organization. Failure to adopt these, say the authors, will mean ICU robots may not see their full potential realized.
Encouraging family visiting for hospital patients

Visiting hours for hospitalized patients have traditionally been restricted to set periods during the day and limited in duration. However, the situation is slowly changing towards a more open approach to family visits, even in wards where visits are often most restricted, such as intensive care units (ICUs). As just a few examples of this general change in attitudes towards visiting, many American hospitals have now completely removed restricted visiting hours; a campaign of extended visiting hours was launched in France a few months ago; and a bill is currently being discussed in Italy to expand hospital visits.

by Prof Jean-Louis Vincent

Why restrict hospital visiting?
The reasons behind restrictive visiting are not very clear or, in today’s context, very credible. The fear of transmission of infection was perhaps the earliest reason for restricting visits, but with improved infection control measures, this concern is generally unfounded. Other suggested reasons include the need for patient to have adequate rest periods and the belief that visitors interfere negatively with medical and nursing care.

Because sick patients need rest?
It was widely believed that having periods of the day without visiting would ensure that patients had sufficient periods of rest, without disturbance from visitors. However, the need for sick patients to rest is often exaggerated. Indeed, this idea is now rather out-of-date, even for the sickest of patients. Although patients must clearly not be exhausted by their visitors, too much rest can encourage muscle weakness and prolong convalescence. When a family member says “doesn’t he/she need to rest Doctor?”, I often reply “certainly not; in fact you should wake him/her up!” The current trend is to encourage physical and intellectual stimulation for all patients.

Of course patients need some time to sleep and rest, as we all do, but this can be determined on an individual basis, preferably after discussion with the patient, rather than being enforced at fixed times by restricted visiting hours. Moreover, the presence of a loved one in the room does not necessarily prevent restorative sleep. Rest is also important for family members and it is sometimes necessary to remind them to take a break, particularly at night. In any case, access to hospitals is generally limited during the night, for security reasons.

Because visitors interfere with patient care?
The presence of visitors was often believed to interfere negatively with medical care. Visiting hours were therefore concentrated on periods of the day during which patients were least likely to be undergoing medical consultations or examinations. However, hospitals of today function almost continuously or at least with considerably more extensive hours than in the past, notably for laboratory and radiological investigations, making it difficult to predict when examinations and rounds are most likely to take place.

The presence of visitors was also often believed to hinder good nursing care, and perhaps much restricted visiting was devised for the benefit of nurses, rather than the patient. Nurses often complained that they were unable to perform the necessary care in the best possible way, because they were bothered by the presence of relatives, sometimes numerous and noisy, who asked a lot of questions, and were even critical of the care being provided!

However, it is now widely believed that extended visiting hours can be beneficial not only for the patient and visitors, but also for the staff. Staff members, especially nurses, are often initially reluctant to the proposed change to more extensive or unlimited visiting, concerned that it will increase their workload. But this is not necessarily true, and is in fact often the reverse. Allowing visitors to be present at different times during the day enables them to understand better the work of the nurses, doctors and other healthcare personnel. When visiting hours are restricted, nurses often make use of the visiting periods to have a small break, to catch up or even have a joke with their colleagues. This can sometimes give visitors the impression that nurses have nothing to do, or are not really concerned about looking after the patients under their care. By arriving at different times of the day and staying for longer periods, family members can better appreciate hospital life and realize that nurses also need some time for relaxation and distraction, thus reducing the risk of conflicts between family members and staff. Extending visiting hours also reduces the number of telephone calls from relatives asking after their loved one, thus freeing up nursing time.

Let’s welcome visitors
Importantly, fixed visiting hours can discourage relatives from visiting a patient. For example, it can be difficult for family members who are working to request time
off during the day to be able to observe the fixed visiting hours; sometimes family members simply forget (or are unaware of) the specified times, especially when units have different hours on different days of the week, and have to go home having missed the allocated slot; similarly, visitors who have to travel some distance to visit their loved one may be put off by the risk of being late and missing the fixed visiting period. Finally it is sometimes just easier to say, “I’ll visit when they’re better and out of hospital…”

Rather than being made to feel that they are the enemy and not welcome, relatives should be encouraged to visit and be involved. We must not talk about “them” and “us”. The patient must be at the centre of our preoccupations at all times and we must all work together to ensure he/she has the best possible chances of a good recovery without complications. Family members and loved ones form part of the patient’s immediate supportive environment and can form a useful bridge between the patient and hospital staff. They can also play an active role in patient surveillance, for example by indicating to staff if there is a problem that has not been noticed or that the patient may not want to report. In certain American hospitals, pamphlets are now available to explain how relatives can identify and report important signs of deterioration, for example, confusion that wasn’t there before or a small change in respiration that has gone unnoticed.

Family members can even sometimes contribute directly to some aspects of patient care, for example helping with feeding, washing or dressing. Indeed, these practices are commonplace in countries with limited resources, where family members never leave the bedside. In western society, however, patient care has been completely transferred from the family to professional carers, which can sometimes lead to the patient feeling patronized or being treated like a child.

The hospital structure is also changing to be more welcoming for visitors. Instead of a few folding seats at the end of the corridor for relatives waiting while the patient is examined or comes back from an examination, many hospitals have now introduced reception rooms where relatives can stay as long as they wish, in comfortable conditions. In the United States in particular, hospitals have set up small kitchen-lounges where families can rest, prepare a meal in the microwave or watch television... and why not socialize, chat, share experiences with relatives of other patients.

Indeed, the hospital is no longer a detached world, which we are somewhat hesitant or even scared to enter. Hospitals are increasingly user friendly and should be seen as somewhere positive and welcoming. After all, many hospitals now have a cafeteria (if not a restaurant), small shops, a bank, a post-office, pleasant gardens... creating the idea that hospitals can be part of everyday life, and indeed are for the many patients and visitors that pass through the doors daily. Visitors can make use of these areas when their relative is undergoing an examination or receiving nursing care.

Family presence during interventions?
As families spend more time visiting their loved ones in hospital, the chances that they will be present when an intervention is needed are increasing, perhaps particularly on high acuity wards. But should they be allowed to stay in the room? Perhaps yes for a simple blood test or changing of a dressing, but what about during cardiopulmonary resuscitation (CPR)? This issue continues to raise considerable debate, not least because the patient needing CPR cannot be asked if they mind. Although some staff members find having family members present adds stress to an already complex situation, studies have suggested that the presence of a relative can help a surviving patient understand what has happened and, if the patient dies, having been present can reassure the family member that everything possible was done. This is an area where attitudes are changing and, if a family member wishes to be present during CPR, this request should not be refused.

The rights and responsibilities of visitors …
Clearly, although visitors have the right to see their loved ones in hospital, they must also abide by certain rules. They must leave the room when asked to do so by the hospital staff and should not interfere with patient care. They should not slow the work of the nursing or medical staff by asking repetitive, unnecessary questions or by engaging in prolonged conversation. Importantly, too, visitors are there to visit only their relative/loved one and must not look, even surreptitiously, into the rooms of other patients!

… and the rights of the patient
On reflection, rather than asking whether visiting the sick patient is allowed, the question should rather be the reverse, whether the patient is allowed to see his/her relatives? Limiting hospital visits is generally harmful for the patient and opening up visiting is reported to improve patient satisfaction. By bringing news from the outside world, family, friends, pets, … visitors can stimulate a patient’s intellect and interest, helping promote a quick recovery. There is nothing worse than lying in bed all day just looking at the ceiling... But, it is important to consider the patient’s viewpoint when considering visitor access. For example, some patients may prefer to have only close family members visit, feeling embarrassed about less well-known friends and relatives seeing them unwell, and others may prefer not to discuss their condition when family members are present for fear of upsetting them. Patients have the right to see visitors whenever they wish, but should not have visiting forced upon them.

Conclusion
It is not so long ago that, when visiting a patient in hospital, an often rather officious nurse would announce the end of visiting hours and insist you leave your loved one. Such strict practices have become less common and there is much more flexibility, particularly on general hospital wards. We need to go further and extend open visiting to all areas of the hospital, including ICUs, where visiting still remains, in general, more restricted. In many cases, we should be actively inviting relatives to visit more and to stay longer, especially when the patient has few visitors and feels isolated. Visiting is humane and good for the patient.

If you still have restricted visiting hours at your hospital, I am sure this will change in the near future. I am not convinced that there should be a law on this subject, whether in Belgium, Italy or elsewhere, but rather a collective effort needs to be made to change our mentality related to visiting hours and thus improve the quality of care for our patients.

Suggested reading
McAdam JL & Puntilllo KA. Open visitation policies and practices in US ICUs: can we ever get there? Crit Care 2013; 17: 171

The author
Jean-Louis Vincent, MD, PhD
Dept of Intensive Care, Erasme University Hospital, Université libre de Bruxelles, Route de Lennik 808, 1070 Brussels, Belgium
jlvincent@intensive.org
Guidelines promote more family engagement in intensive care units

Having a loved one go through a critical illness is a stressful and traumatic experience that may have lasting effects months after the patient is discharged from the intensive care unit (ICU). To improve the well-being of both patients and family during this vulnerable time, a set of new guidelines has been released, providing physicians with evidence-based strategies to optimize outcomes for the critically ill and those at their bedside.

“There is increasing awareness that support for family can also improve patient outcomes,” said Judy Davidson, lead author of the guidelines and a nurse at UC San Diego Health. “Families in the ICU aren’t visitors — they are an integral part of the care and the care team.”

Based on an analysis of more than 450 qualitative and quantitative studies, a multidisciplinary, international panel of 29 health care experts developed a series of recommendations for family-centred care, defined as an approach to healthcare that is respectful of and responsive to individual families’ needs and values. The experiences and perspectives of former ICU patients and family members from UC San Diego Health, the University of Maryland (UOM) School of Medicine, patient advocacy organizations and the LGBTQ community were used to develop the new guidelines.

The 23 recommendations grouped into five categories include: space for loved ones to sleep; educational programmes to teach family how to assist with care; encouraging family members to be part of the decision-making process; implementing ICU diaries to reduce a family’s anxiety and post-traumatic stress; and involving a multi-disciplinary team, such as psychologists, social workers and spiritual advisors. UC San Diego Health is among the first hospitals in the nation to embrace the concept of implementing a family diary in the ICUs.

“Structured interventions and approaches to support family members of critically ill patients are needed both to mitigate the impact of the crisis of critical illness and to prepare family members for decision-making and caregiving demands,” said Davidson. “Up to half of families with a critically ill loved one experience psychological symptoms. A robust programme built around family-centred care may decrease the negative impact surrounding critical illness. It is a matter of public health.”

The guidelines suggest that clinicians and institutions need to decide which intervention or combination of interventions are likely to be the most successful in specific circumstances.

“We have developed a self-analysis tool that ICUs can use to build a customized family-centered plan that will bring change,” said Robert El-Kareh, MD, MPH, hospitalist at UC San Diego Health and associate professor at UC San Diego of Medicine, who was instrumental in building translational tools to help ICUs move recommendations into practice.

University of California – San Diego
http://tinyurl.com/y732jdfk

Picture guide to improve spiritual care and reduce anxiety in ICU

Hospital chaplains provide spiritual care that helps patients facing serious illness cope with their symptoms and prognosis, yet because mechanically ventilated patients cannot speak, spiritual care of these patients has been limited. A study was undertaken to determine the feasibility and to measure the effects of chaplain-led picture-guided spiritual care for mechanically ventilated adults in the intensive care unit (ICU).

Researchers conducted a quasi-experimental study at a tertiary care hospital between March 2014 and July 2015. Fifty mechanically ventilated adults in medical or surgical ICUs without delirium or dementia received spiritual care by a hospital chaplain using an illustrated communication card to assess their spiritual affiliations, emotions, and needs and were followed until hospital discharge. Feasibility was assessed as the proportion of participants able to identify spiritual affiliations, emotions, and needs using the card. Among the first 25 participants, they performed semi-structured interviews with 8 ICU survivors to identify how spiritual care helped them. For the subsequent 25 participants, they measured anxiety (on 100-mm visual analogue scales [VAS]) immediately before and after the first chaplain visit, and performed semi-structured interviews with 18 ICU survivors with added measurements of pain and stress (on ±100-mm VAS).

The mean (SD) age was 59 (±16) years, median mechanical ventilation days was 19.5 (interquartile range, 7–29 d), and 15 (30%) died in hospital. Using the card, 50 (100%) identified a spiritual affiliation, 47 (94%) identified one or more emotions, 45 (90%) rated their spiritual pain, and 36 (72%) selected a chaplain intervention. Anxiety after the first visit decreased 31% (mean score change, −20; 95% confidence interval, −33 to −7). Among 28 ICU survivors, 26 (93%) remembered the intervention and underwent semi-structured interviews, of whom 81% felt more capable of dealing with their hospitalization and 0% felt worse. The 18 ICU survivors who underwent additional VAS testing during semi-structured follow-up interviews reported a 49-point reduction in stress (95% confidence interval, −72 to −24) and no significant change in physical pain that they attributed to picture-guided spiritual care.

The researchers found that chaplain-led picture-guided spiritual care is feasible among mechanically ventilated adults and shows potential for reducing anxiety during and stress after an ICU admission.

American Thoracic Society
http://tinyurl.com/z4phyfr

New hope for shock patients in intensive care

Care for critically-ill patients with shock could be improved, it is hoped, after the first successful testing at the John Radcliffe Hospital of a new machine to record oxygen consumption in real time. The new technology has arisen through a collaboration between Professor Peter Robbins in the University of Oxford’s Department of Physiology, Anatomy and Genetics and Professors Grant Ritchie and Gus Hancock in the Department of Chemistry.

It combines laser spectroscopy and precise
flow measurement of breath in a single medical device which fits into a standard ventilation tube.

The work has received public funding from the NIHR Oxford Biomedical Research Centre, a collaboration between the University of Oxford and Oxford University Hospitals NHS Foundation Trust, and the Medical Research Council.

Professor Peter Robbins, who is directing the research, said: “This is the culmination of many years of development and it has finally come to fruition.

“It is exciting for us to be able to offer something to doctors that has the potential to improve significantly the care of very sick patients.”

Patients in shock suffer a lack of oxygen throughout the body, causing many of their organs to deteriorate and eventually even stop working altogether.

The possible underlying causes of shock include heart attack, hemorrhage and sepsis. Common treatments include drugs, oxygen and blood transfusions.

Doctors do not at present have any direct way of measuring how much oxygen is being used by the body, making it difficult for them to judge which treatments are likely to be most beneficial. Tests in healthy volunteers and in patients having anesthetics at Oxford’s John Radcliffe Hospital indicate the precision of the device is better than anything previously achieved.

Stuart McKechnie, Consultant in Intensive Care at the John Radcliffe Hospital, said “Though we already monitor critically-ill patients very closely, this device promises to provide highly useful additional information that may help us to care better for patients with sepsis and shock in the future.”

One in three former ICU patients show symptoms of depression, study finds

An analysis of reports on more than 4,000 patients suggests that nearly one in three people discharged from hospital intensive care units, or ICUs, has clinically important and persistent symptoms of depression, according to researchers at Johns Hopkins Medicine. Symptoms can last for a year or more for some patients and are more likely to occur in people who have a history of psychological distress before an ICU stay, the investigators say.

The prevalence of depressive symptoms in this population is three to four times that of the general population, says study co-author O. Joseph Bienvenu, associate professor of psychiatry and behavioural sciences at the Johns Hopkins University School of Medicine.

“Not only can people with depression have slower physical recovery, but they also experience financial strain because they often cannot return to work and their caregivers must stay home with them,” Bienvenu says.

Psychological symptoms occurring before an ICU stay and psychological distress experienced during the ICU stay or hospitalization were the risk factors most associated with depressive symptoms after hospital discharge, the review found.

“It’s very clear that ICU survivors have physical, cognitive, and psychological problems that greatly impair their reintegration
into society, return to work, and being able to take on previous roles in life,” says senior study author Dale Needham, professor of medicine at JHU’s School of Medicine. “If patients are talking about the ICU being stressful, or they’re having unusual memories or feeling down in the dumps, we should take that seriously,” Needham adds. “Healthcare providers, family members, and caregivers should pay attention to those symptoms and make sure they’re not glossed over.”

More than 5 million patients in the United States are admitted to ICUs each year, Needham says.

John Hopkins Medicine
http://tinyurl.com/jnkqmj6

Study of four common conditions finds ICU use didn’t improve mortality rates

With the use of intensive care units (ICUs) on the rise in many hospitals, researchers at LA BioMed and UCLA examined ICU usage and found patients who were admitted to these units underwent more costly and invasive procedures but didn’t have better mortality rates than hospitalized patients with the same medical conditions who weren’t admitted to the ICU.

The study examined records from 156,842 hospitalizations at 94 acute care hospitals for four medical conditions where ICU care is frequently provided but may not be medically necessary: diabetic ketoacidosis, pulmonary embolism, upper gastrointestinal hemorrhage and congestive heart failure. The study found the hospitals that utilize ICUs more frequently were more likely to perform invasive procedures and incur higher costs. But the study found these hospitals had no improvement in mortality among patients in the ICU when compared with other hospitalized patients with these four conditions.

“The study findings suggest that optimizing the value of ICU care will require assessments of systematic institutional factors that may lead clinicians to overutilize ICU care,” said Dong W. Chang, MD, an LA BioMed researcher and corresponding author of the study. “In addition, overuse of ICUs among patients who can likely be treated in non-ICU settings may lead to inappropriately aggressive care and misallocation of resources away from patients who may truly need critical care services.”

“This study begins to tell the story of how the inappropriate use of ICUs can be harmful for patients and costly for the healthcare system,” said Dr. Chang. “But the story is incomplete, and we need more information on the mechanisms that drive some hospitals to use their ICUs more readily. In the meantime, hospital policies and institutional protocols in non-ICU settings that lead to overutilization of ICU care should be examined because they represent the best opportunities for reducing invasive procedures and lowering costs while ensuring the best possible care for the patient.”

LA BioMed
http://tinyurl.com/y78d2xnq

Global study identifies key areas for emergency department improvement

Research from Philips and the George Washington University School of Medicine & Health Sciences reveals unsustainable emergency department (ED) use in seven developed nations. The paper, titled, “Acute unscheduled care in seven developed nations: a cross-country comparison,” compares the similarities and differences across nations with a focus on care delivery and the impact of socioeconomic factors. Countries evaluated for the report include: Canada, the U.S., the U.K., the Netherlands, Switzerland, Germany and Australia.

Better access to primary care can result in lower ED use

Combining public data with extensive, regional physician interviews, researchers from Philips and the GW School of Medicine & Health Sciences were able to highlight key insights from the seven countries studied. There’s a belief that easy access to primary care can result in lower emergency department use. However, as a result of this report, it is clear that even if people have easy access to primary care and full healthcare coverage, there is no guarantee the patients will make economically prudent decisions to seek the most appropriate medical care setting. More specifically, the findings of the report show Germany (22%) and Australia (22%) as having the lowest ED use, likely resulting from better (and faster) access to primary care—nearly two-thirds of Australians (58%) and three-quarters of Germans (72%) were able to make same or next day appointments with their primary care physicians (PCPs) compared to less than half of Americans (48%) and Canadians (41%). In relation to readmissions, a metric used to determine the quality of care delivered, the U.S. showed the best performance for readmissions due to gaps in hospital or surgery discharge, discharge planning and transitional care. This, despite the fact it has the lowest compulsory insurance coverage. This could be attributed to the fact that the U.S. has instituted a number of programmes with payment incentives proven to be effective in improving care transitions and reducing hospital readmissions. As a result of the Patient Protection and Affordable Care Act, for example, U.S. hospitals are now facing financial penalties if patients are readmitted to a hospital.

Key areas for improvement

Taking the global data, researchers distilled their findings into a list of key areas impacting the way care is delivered in emergency settings. Making these observations actionable, researchers produced a list of the ten areas that cause these broad differences in available treatments, provider trainings and care quality across countries. Key takeaways include: social determinants (smoking, eating, violence, substance abuse and poverty) have a strong impact on the use of EDs; reduced access to health insurance results in poorer population health, placing a greater strain on emergency departments; sick patients do not make the most efficient decisions about when and where to seek medical care; extensive provider training is mandatory for effective delivery of acute unscheduled care; quality measures for EDs are immature and not standardized.

“In looking at the way emergency departments are used around the world, we were able to obtain valuable new insights to help improve care delivery,” said Jesse Pines, MD, MBA, MSCE and Director of the GW Center for Healthcare Innovation and Policy Research at the GW School of Medicine & Health Sciences. “Because of research findings presented in this report, all emergency departments (no matter their location) have the opportunity to efficiently improve the way care is delivered in emergency department settings.”

GW School of Medicine & Health Sciences Media Relations
http://smhs.gwu.edu
Comprehensive Corporate Social Responsibility Health Programs: Providing Quality, Affordable and Accessible Healthcare for Financially – Challenged Patients (Private Tertiary Hospital Setting)

JILL S. ALVAREZ
HEAD
MANILA DOCTORS HOSPITAL
CORPORATE SOCIAL RESPONSIBILITY OFFICE
MANILA, PHILIPPINES

LEVI GRACE D.C. AMBON-ROTA, RSW
SENIOR SOCIAL WORKER
MANILA DOCTORS HOSPITAL
CORPORATE SOCIAL RESPONSIBILITY OFFICE
MANILA, PHILIPPINES

ABSTRACT:

In 2012 the Manila Doctors Hospital became the first hospital in the Philippines to launch and commit to a Social Vision. Since then, this Social Vision has served as a guide for good governance and a blueprint for its Corporate Social Responsibility (CSR) programs focusing on health, environment and gender. The goal of the Manila Doctors comprehensive CSR health program is to render the fundamental right to health care available to marginalized patients. Through our CSR programs, more than 20,000 financially challenged patients gain access to quality medical services annually. This directly contributes to the country’s health development agenda 2016-2020 of achieving the health related SDG Targets of Financial Risk Protection, Better Health Outcomes and Responsiveness.

The R.K. Khan Hospital Pharmacy Decongestion Project: An Innovative Partnership in Service Delivery

BRIAN PILLAY
PHARMACY MANAGER
R.K. KHAN HOSPITAL
DURBAN, KWAZULU NATAL

ABSTRACT:

In its quest to improve service delivery and reduce congestion, the busy R.K. Khan Hospital Pharmacy has embarked on a unique partnership with community organizations whereby 13 community facilities including community halls, temples and churches, are being used as venues for issuing chronic medicines to patients. Patients receive their initial supply at the hospital and are then referred to a facility most convenient to them to collect their repeat medicines. They only return to hospital after six months on their review dates. Almost 24000 patients per month are currently utilizing this service. Medicines are pre-dispensed, transported
Implementation of Enhanced Anesthesia Recovery Program (EARP) for improving Anesthesia Related patient care outcomes & enhancing early recovery

DR. MUKUL CHANDRA KAPOOR
PRESIDENT
INDIAN ASSOCIATION OF CARDIOVASCULAR THORACIC ANAESTHESIOLOGISTS

DR. BINDU SHARMA
ASSISTANT GENERAL MANAGER
INDIAN ASSOCIATION OF CARDIOVASCULAR THORACIC ANAESTHESIOLOGISTS

ABSTRACT:

The Enhanced Anesthesia Recovery Program (EARP) is a unique patient-centered, Anesthesiologist-led quality improvement initiative designed to reduce postoperative anesthesia-related complications and to accelerate recovery. Anesthesia-related complications are known to be associated with poor patient outcomes and higher morbidity/mortality. This project was designed to develop protocols to improve anesthesia recovery and thereby the quality of patient outcomes. A detailed review of national & international guidelines was carried out and EARP pathways were designed to incorporate changes in perioperative management, as per recent clinical research findings, to improve the patient surgery experience, ensuring better postoperative cognitive function and a reduction in postoperative morbidity. Following project implementation, a remarkable improvement was seen in Anesthesia Related patient care outcomes, benefitting around 6233 patients. The median Length of Stay in PACU was reduced from 26 minutes to 18 minutes. Early Return of Cognitive Functions (Early Recovery) was evident by a reduction in the time for a post-operative return of cognitive functions, from 10 minutes to 3 minutes. The percentage of people requiring oxygen supplementation was reduced from 20% to 5%. The unplanned tracheal reintubation Rate was reduced from 0.05 to 0.02. The percentage of patients experiencing postoperative nausea and vomiting was reduced from 8% to 3%. This initiative also resulted in about a 50% reduction in

Integrating Medical and Social Support for Elderly in Hong Kong – System and Technology Enabled Service Innovations

DR. NARAYAN H.K.V.
DEPUTY DIRECTOR
TATA MEMORIAL CENTRE – ACTREC
NAVI MUMBAI, INDIA 410210

ABSTRACT:

Tata Memorial Hospital (TMH) is a Comprehensive Care Centre for Cancer located in Mumbai, India. Patients from all over India and some from neighboring countries choose to travel to Mumbai (Bombay) to receive treatment at our centre. Given the geographical constraints, TMH has adopted Information Technology to reach out to patients in distant communities. TMH has a home-grown Electronic Medical Record System, the contents of which are shared with patients and providers over the hospitalwide Intranet, and globally through our website. TMH has been carrying out paperless and filmless operations since 2013, enabling the real time exchange of information and ensuring a continuum of care. Paper Records preceding this year are scanned, archived and made available as part of the EMR.

Prior to Smart Card implementation, it was not uncommon to find patient or their relatives queuing up for services or payments. This had resulted in delays in providing services, and hardship for patients and their
relatives queuing up for services or payments. This has resulted in delays in providing services, and hardship for patients and their relatives. Overcrowding meant staff being stressed with a propensity for mistakes in data entry, resulting in a faulty service. This would compromise patients if unnoticed, or result in a repetition of service if noticed. In addition, hospital management was concerned about lengthy transaction times and deficiency of service. It was in this context that in the year 2011, the Hospital Management took an initiative to integrate Smart Card Technology with the existing Electronic Medical Record (EMR) and Electronic Financial Record (EFR), to improve interaction between patients and the Institution. The strategy was to use Smart Card (SC), containing an embedded IC chip for patient identification, to carry out all transactions involving patient care, in order to minimize transcription errors and enhance patient safety. The implementation of this strategy involved process re-engineering and training of all staff members. The results of the past 4 years 2013-16 have been analyzed to determine the efficacy of this initiative.

Key Interventions that Support the Realisation of Data Driven Hospitals

ANNA LEHONG  
PROJECT MANAGER HOSPITAL DATA QUALITY HEALTH INFORMATION SYSTEMS PROGRAMME

BONGI ZONDO  
PROJECT MANAGER HR INFORMATION SYSTEMS HEALTH INFORMATION SYSTEMS PROGRAMME

SONJA VENTER  
TECHNICAL ADVISOR HEALTH INFORMATION SYSTEMS PROGRAMME

ABSTRACT:
The District Health Information System (DHIS) is used in South Africa to collect routine aggregated data. Analysis of hospital data in the DHIS revealed that reporting in hospitals (especially clinical data) is generally inconsistent and incomplete. The NDoH recognise these reporting and data quality challenges in hospitals and the impact they have on the ability to make informed management decisions and monitor the impact of health interventions.

A data quality improvement initiative was undertaken in ten of the biggest Central and Tertiary hospitals in South Africa. The methodology to identify areas of incomplete reporting, findings of the onsite visits and interventions implemented to improve reporting rates in these hospitals are all discussed.

This initiative demonstrated that well-designed and targeted interventions tested and refined in a few health facilities can easily be replicated in

Nurses Experiences Regarding In-Patient Suicide in a Specific General Hospital in Gauteng, South Africa

MIRRIAM MATANDELA  
NURSE MANAGER CARLETONVILLE HOSPITAL SOUTH AFRICA

ABSTRACT:

When suicide occurs, it is regarded as an adverse event. Often, little attention is given to nurses who cared for the patients prior to that circumstances. Instead, affected nurses are expected to write statements and incident reports. Patients who attempt suicide during hospitalisation remain a stressful and anxiety-provoking experience for nurses. This is because in most cases, even if the patient survives the ordeal, nurses blame themselves. The physiological effects of such stress and anxiety are found to be harmful to the well-being of nurses and therefore should be avoided.

The aim was to explore the experiences of nurses caring for patients who successfully committed suicide whilst admitted at a specific general hospital in Gauteng Province, South Africa. Qualitative exploratory research was conducted. Data were collected through in-depth interviews with a purposive sample of six nurses, and content analysis was carried out. Nurses experienced feelings of shock, blame and condemnation, inadequacy and a fear of reprisal. This study suggests a basis for the development of support strategies to assist nurses to deal with their emotions after experiencing adverse events.
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**PLENARY SPEAKERS**
- **Ms. Nancy Howell Agee**
  Chief Executive Officer, Carilion Clinic
- **Dr. Deborah Cole**
  BDSc, GradDipHealthAdmin, MBA,
  GradCertLead & CathCulture, FAICD, FAIM
- **Dr. San-Cheng Chang**
  President, Institute for Biotechnology & Medicine Industry
- **Dr. Sidney Klayner**
  President, Sociedade Israelita Brasileira Albert Einstein
- **Dr. Tony KO Pat-sing**
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New use of blood cleaning device saves high-risk patients with liver failure

Severe acute liver failure (ALF), a rare but life-threatening illness, is associated with high death rates if patients don’t receive timely treatment or a liver transplant. Unlike the heart or the kidneys, there is no established mechanical device to replace the liver’s function. Now, University of Maryland School of Medicine (UM SOM) researchers report that a device that removes toxins from the blood can also effectively provide a bridge to liver transplantation or buy time for a traumatically injured liver to heal, suggesting broader uses for the device than previously thought.

The researchers, present the largest series of cases in the United States in which the Molecular Adsorbent Recirculating System has been used as temporary liver replacement for ALF. MARS can be likened to a dialysis machine for the liver. It essentially “washes” a patient’s blood with a solution containing albumin – normally produced by healthy livers – to remove toxins such as bile acids, ammonia, bilirubin, copper, iron and phenols from the blood.

“We’ve found in the use of MARS that we’re able to get trauma patients with massive liver injury to recovery and, in patients who are deemed good transplant candidates, get them to transplant with excellent survivals,” says lead researcher, Steven I. Hanish, MD, associate professor of surgery at UM SOM and a liver transplant surgeon at the University of Maryland Medical Center (UMMC). The US Food and Drug Administration (FDA) has approved the device to clear the liver after overdoses and poisonings, and reduce the effects of brain swelling related to liver failure. However, it is not yet FDA-approved as a bridge to transplant.

University of Maryland School of Medicine
http://tinyurl.com/ya32cuxm

Self-powered paper-based ‘SPEDs’ may lead to new medical-diagnostic tools

A new medical-diagnostic device made out of paper detects biomarkers and identifies diseases by performing electrochemical analyses - powered only by the user’s touch - and reads out the color-coded test results, making it easy for non-experts to understand.

“You could consider this a portable laboratory that is just completely made out of paper, is inexpensive and can be disposed of through incineration,” said Ramses V. Martinez, an assistant professor of industrial and biomedical engineering at Purdue University. “We hope these devices will serve untrained people located in remote villages or military bases to test for a variety of diseases without requiring any source of electricity, clean water, or additional equipment.”

The self-powered, paper-based electrochemical devices, or SPEDs, are designed for sensitive diagnostics at the “point-of-care,” or when care is delivered to patients, in regions where the public has limited access to resources or sophisticated medical equipment.

The test is initiated by placing a pinprick of blood in a circular feature on the device, which is less than two-inches square. SPEDs also contain “self-pipetting test zones” that can be dipped into a sample instead of using a finger-prick test.

The top layer of the SPED is fabricated using untreated cellulose paper with patterned hydrophobic “domains” that define channels that wick up blood samples for testing. These “microfluidic channels” allow for accurate assays that change colour to indicate specific testing results. A machine-vision diagnostic application also was created to automatically identify and quantify each of these “colorimetric” tests from a digital image of the SPED, perhaps taken with a cellphone, to provide fast diagnostic results to the user and to facilitate remote-expert consultation.

The bottom layer of the SPED is a “triboelectric generator,” or TEG, which generates the electric current necessary to run the diagnostic test simply by rubbing or pressing it. The researchers also designed an inexpensive handheld device called a potentiostat, which is easily plugged into the SPED to automate the diagnostic tests so that they can be performed by untrained users. The battery powering the potentiostat can be recharged using the TEG built into the SPEDs.

“To our knowledge, this work reports the first self-powered, paper-based devices capable of performing rapid, accurate, and sensitive electrochemical assays in combination with a low-cost, portable potentiostat that can be recharged using a paper-based TEG,” Martinez said.

Purdue University
http://tinyurl.com/ya32cuxm
Artificial intelligence tool promises earlier detection of deadly form of skin cancer

New technology being developed by researchers at the University of Waterloo and the Sunnybrook Research Institute is using artificial intelligence (AI) to help detect melanoma skin cancer earlier.

The technology employs machine-learning software to analyse images of skin lesions and provide doctors with objective data on tell-tale biomarkers of melanoma, which is deadly if detected too late, but highly treatable if caught early.

The AI system—trained using tens of thousands of skin images and their corresponding eumelanin and hemoglobin levels—could initially reduce the number of unnecessary biopsies, a significant healthcare cost. It gives doctors objective information on lesion characteristics to help them rule out melanoma before taking more invasive action.

The technology could be available to doctors as early as next year. “This could be a very powerful tool for skin cancer clinical decision support,” said Alexander Wong, a professor of systems design engineering at Waterloo. “The more interpretable information there is, the better the decisions are.”

Currently, dermatologists largely rely on subjective visual examinations of skin lesions such as moles to decide if patients should undergo biopsies to diagnose the disease.

The new system deciphers levels of biomarker substances in lesions, adding consistent, quantitative information to assessments currently based on appearance alone. In particular, changes in the concentration and distribution of eumelanin, a chemical that gives skin its colour, and hemoglobin, a protein in red blood cells, are strong indicators of melanoma.

“There can be a huge lag time before doctors even figure out what is going on with the patient,” said Wong who is also the Canada Research Chair in Medical Imaging Systems. “Our goal is to shorten that process.”

University of Waterloo
http://tinyurl.com/ybbq9kek

Guidelines on ST-segment elevation myocardial infarction published

Guidelines on the management of acute myocardial infarction in patients with ST-segment elevation have been published.

The document provides recommendations on topics not covered by the 2012 Guidelines and changes some previous recommendations following new evidence.

For the first time there is a clear definition of when to start the clock for the 90 minute target to treat patients with percutaneous coronary intervention (PCI). The clock should start at the time of ST-segment elevation myocardial infarction (STEMI) diagnosis by electrocardiogram (ECG).

“Until now there was confusion over whether the clock starts when the patient has the first symptoms, when he or she calls the emergency services, when the ambulance arrives on the scene, or when the patient arrives at the hospital,” said Task Force Chairperson Prof Stefan James (Sweden). “We don’t know if the patient is suffering from STEMI until the ECG so this is a sensible starting point and the vessel should be opened within 90 minutes from then.”

The vague term door-to-balloon has been removed from the guidelines and first medical contact (FMC) is defined as the time point when the patient is initially assessed by a physician, paramedic or nurse who obtains and interprets the ECG. “Door-to-balloon is no longer a useful term,” said Task Force Chairperson Dr Borja Ibanez (Spain). “Treatment used to be initiated in the hospital but now it can start in the ambulance so the ‘door’ varies according to the situation.”

In cases where fibrinolysis is the reperfusion strategy, the maximum time delay from the diagnosis of STEMI to treatment has been shortened from 30 minutes in 2012 to 10 minutes in 2017.

Complete revascularization was not recommended in the 2012 document which said that only infarct-related arteries should be treated. Today’s guidelines state that complete revascularization should be considered, with non-infarct-related arteries treated during the index procedure or another time point before discharge from hospital.

Thrombus aspiration is no longer recommended, based on two large trials in more than 15 000 patients. Also not recommended is deferred stenting, which involved opening the artery and waiting 48 hours to implant a stent. Regarding PCI, the use of drug eluting stents instead of bare metal stents has gained a stronger recommendation than the use of radial, instead of femoral, arterial access.

When it comes to medications, the authors state that dual antiplatelet therapy extension beyond 12 months in selected patients may be considered. Bivalirudin has been downgraded from class I to IIa, and enoxaparin upgraded from class IIb to IIa. Cangrelor, which was not mentioned in the 2012 document, has been recommended as an option in certain patients. Also new is a recommendation for additional lipid lowering therapy in patients with high cholesterol...
Catheter ablation better than traditional drug therapies for treating atrial fibrillation

Every year millions of people around the world are diagnosed with heart failure, a chronic, progressive condition where the heart is unable to pump enough oxygenated blood throughout the body. Researchers at the University of Utah Health and Klinikum Coburg, Germany co-led a clinical trial that showed radiofrequency catheter ablation lowered hospitalization and mortality rates by 47 and 44 percent respectively in patients with atrial fibrillation (AF), a contributing factor to heart failure. “None of the traditional drug therapies are improving the patient’s condition, a major medical dilemma when we see these patients in our clinics,” said Nassir F. Marrouche, M.D., professor in Internal Medicine and Executive Director of the Comprehensive Arrhythmia Research and Management (CARMA) Center at U of U Health. The medical community has long debated the ideal treatment for AF, especially for patients who suffer from left ventricular dysfunction, a weakening of the left ventricle that supplies most of the heart’s pumping power. Until now, no clinical studies have been conducted that support one definitive treatment. Marrouche and Johannes Brachmann from the Klinikum Coburg conducted the eight-year CASTLE-AF clinical trial to compare catheter ablation to conventional drug therapies recommended by the American Heart Association and European Heart Society to control the heart’s rate. “The CASTLE-AF clinical trial represents a landmark in the history of cardiovascular medicine because of its potential impact on our patients who are suffering from heart failure,” said James Fang, M.D., Chief of Cardiovascular Medicine at the University of Utah Health. “For the first time in a randomized study, the strategy of catheter ablation for atrial fibrillation may be better than the current approach for these patients. It is also one of the many landmark contributions to cardiovascular medicine that the University of Utah has made over the past five decades.” After evaluating more than 3,000 patients from North America, Europe and Australia, researchers selected 363 participants with temporary or persistent AF and heart failure, characterized by heart function at less than 35 percent capacity, for the clinical trial. The patients were separated into two groups, receiving either radiofrequency catheter ablation (179) or a conventional drug therapy (184). The clinical trial’s end point was set at all-cause mortality and worsening of heart failure, resulting in an unplanned overnight hospitalization. Patients in the ablation group experienced lower overall mortality (28%; 51/179) compared to the medication group (46%; 82/184). In addition, catheter ablation resulted in lower cardiovascular mortality (13%; 24/179) compared to the medication group (25%; 46/184). Special heart cells create electrical signals that cause the heart's upper and lower chambers to beat in the proper sequence to pump blood through the body. Abnormal cells can cause the heart to beat faster or irregularly, resulting in AF. “Atrial fibrillation prevents the heart from filling and pumping properly,” said Marrouche. “When the heart is not synchronized, it hastens heart failure and increases the risk of stroke.” During the ablation process, a catheter is snaked through the patient’s body to the site of abnormal heart cells. The doctor delivers a dose of radiofrequency energy, similar to microwaves, to destroy the abnormal cells, which restores the heart’s regular rhythm. All of the participants included in the CASTLE-AF trial had previously received an implantable cardioverter defibrillator (ICD), which allowed for continuous monitoring of heart rate. The ICD may have improved mortality, which Marrouche believes is the primary limitation in this study that may have affected death rates in both groups. “This clinical trial is the first time we can show with hard data that ablation is saving more lives than arrhythmia medications,” said Marrouche. “It also lowers the cost of treating patients by keeping them out of hospital due to lower incidence of worsening heart failure.” University of Utah Health http://tinyurl.com/y7fmfm2s
Study identifies methods for preventing overcrowding in emergency rooms

No single solution exists for alleviating crowding in emergency rooms, but a new study identifies four key strategies that have reduced the problem. The study concludes that engaged executive leadership can alleviate the problem when combined with a data-driven approach and coordination across the hospital from housekeepers to the CEO. Crowding in emergency rooms has been associated with decreased patient satisfaction and even death.

“Emergency department crowding can be dangerous for patients,” said senior author Benjamin Sun, M.D., a professor of emergency medicine in the OHSU School of Medicine. “We know, for example, that emergency department crowding can lead to delays in pain medications for patients with broken bones, as well as delays in antibiotics for patients with pneumonia. We know the risk of death is higher when the emergency department is more crowded than when it’s less crowded.”

The study identified groups of hospitals categorized as low, high or highest-improving in terms of lengths of stay and boarding times (the length of time an admitted patient must wait for an inpatient bed), as measured through statistics provided by 2,619 U.S. hospitals to the Centers for Medicare and Medicaid Services. The authors picked a representative sample of four hospitals in each of the three categories of performance, then systematically interviewed a broad range of stakeholders.

The researchers talked to 60 people at the 12 hospitals. Interviewees included nursing staff, emergency department directors, directors of inpatient services, chief medical officers and other executive officers.

The study identified four key strategies:

1) Involvement of executive leadership: The study noted that executive leaders in high-performing hospitals identified hospital crowding as a top priority complete with clear goals and resources to achieve those goals.

“In contrast, low performing hospital executive leadership did not prioritize crowding initiatives, despite acknowledging the causes,” the authors wrote. “Emergency department leadership often felt isolated in their struggle with significant boarding and lengths of stay.”

2) Hospital-wide coordinated strategies: High-performing hospitals performed as a cohesive system across departments to alleviate crowding, in contrast to low-performing hospitals that operated in silos. For example, one executive at a high-performing hospital developed strategies for improving bed turnaround times on inpatient rooms.

“Instead of waiting for the room to go from dirty to clean and then to book transportation for a patient to come, we started doing things in parallel so that we would cut down on waiting time,” the executive said in the report.

3) Data-driven management: High-performing hospitals gathered and used data to adjust operations in real time, provided immediate feedback to key personnel, and predicted patterns of flow in the emergency department and hospital, matching resources to meet expected demand.

“In contrast, at low-performing hospitals, data were most often available only retrospectively, and, if the data were used, they were discussed by executive leadership at monthly or quarterly meetings,” the authors wrote.

4) Performance accountability: High-performing hospitals held staff accountable and problems were addressed immediately to reduce crowding.

Sun described a typical scenario in one high-performing hospital: “If boarding in the ED exceeded the acceptable limit, the chief medical officer would physically get out of the office, go onto the ward floors, and start reviewing charts and asking, ‘What can we do to fix the problem?’” he said.

OHSU School of Medicine
http://tinyurl.com/y8bq3gvg

A pair of medical magnets shows promise as a tool for creating an anastomosis

An experimental device that employs a pair of magnets offers surgeons a new safe and simple alternative to standard methods for creating an anastomosis for the first time in nearly 50 years. An anastomosis is a surgical connection between tubular anatomic structures, such as blood vessels, urinary tract, or bowel. In its first proof-of-concept clinical trial in humans, the device was easy for surgeons to use, even with patients who required complicated surgical reconstruction. It also was safe; none of the patients had any complications related to the use of the device or the anastomosis it fashioned.

An anastomosis is common in many kinds of operations performed by general surgeons. It currently is done in one of two ways. The first approach involves suturing two pieces of tissue together with a needle and thread. This option is inexpensive and can be done in any surgical setting. However, suturing requires either an open operation so surgeons have enough room to maneuver instruments, or highly specialized technical skills in minimally invasive procedures, and it takes time to place multiple layers of sutures during a procedure, said Claire Graves, MD, lead author and research fellow at the University of California San Francisco when the study was conducted.

When surgical staplers were introduced in the 1970s, stapling often became the preferred method for performing an anastomosis. Stapling is faster than suturing, and it produces a more consistent result. Staples are, however, expensive, and the devices can sometimes fail or misfire, added Dr. Graves, a current resident in general surgery at Columbia University Medical Center, New York City.

Magnetic compression anastomosis applies the force of magnetic attraction to form an anastomosis without sutures or staples. The technique utilizes a Magnamosis device, which houses two rare earth magnets in a specially engineered medical grade polycarbonate shell. The magnetic implants have different polarities so they are drawn to one another. The magnets also have different shapes—one is convex and one is concave—so they fit smoothly together. In the formation of an anastomosis, a magnet is placed in each side of the tube that is being surgically connected, and then the magnets are drawn together, compressing the tissue between them and blocking blood flow.

“The tissue between the magnets dies off, a hole forms from the necrotic tissue, and the surrounding area heals. Once the connection is fully formed, the magnets fall through the hole, pass into the bowel, and are excreted in the stool, leaving nothing behind,” Dr. Graves explained. In animal studies, the Magnamosis device consistently created anastomoses that were comparable or better than hand-sewn or stapled alternatives as demonstrated in tissue samples and tests of the strength of the connection.

American College of Surgeons
http://tinyurl.com/ya7k8k4a
Ampronix’s advanced ultra-high definition technology facilitates cutting-edge medical imaging

The medical industry is in the throes of entering a new epoch in imaging technology. Healthcare professionals are upgrading to ultra-high definition 4K resolution as the innovative technology provides four times the clarity than that of high definition. Typically, diagnostic and surgical procedures are guided via information gleaned from various imaging procedures. With so much weighing on these scans, the ultimate goal is to obtain unparalleled picture quality punctuated by incomparable clarity.

Our variety of UHD display options from major brands including Barco, Sony, NDS, LG, and Eizo provide clients with a variety of smart choices. For those balancing prudent budgets that include improvements to equipment, Sony’s LMD-X55MD offers affordability, efficiency, and versatility. Available in 31 inches, its slim, ergonomic design and splash proof covering will improve any operating room.

In addition to a sleek exterior, the surgical monitor is equipped with Sony’s OptiContrast technology and original Advanced Image Multiple Enhancer, which allows users to visualize images without glare or reflection. The LED backlit monitor features Quad View Mode and a user-friendly interface, which allows users to view up to four images simultaneously, manipulate images via image mirroring as well as allowing users to take advantage of side-by-side comparison, picture-in-picture, and picture-out-picture.

In minimally invasive surgeries, large displays play an integral role in facilitating the visual components necessary to perform procedures. The HYBRIDPIXX, an Ampronix original UHD 4K display recently made public, is unrivaled in image quality as it is equipped with our patented 4KBoxx.

The HYBRIDPIXX 4KBoxx video manager gives physicians the ability to select desired images and exhibit them in various layouts on the UHD display. Beneficially, hundreds of potential layout options offer a multitude of customization possibilities. With the ability to input up to 27 analog or digital signals, the HYBRIDPIXX is an ideal candidate for large scale viewing and multi-screen monitoring.

Those interested in adopting UHD 4K technology ought to consider endoscopic camera options, which will vastly improve the visual aspect of minimally invasive surgeries. These cameras have the ability to exhibit vibrant and clear images of internal structures to any UHD 4K display. Currently, Panasonic’s 4K Ultra HD 3MOS Camera is the smallest 4K camera head available.

Panasonic’s 4K camera has the ability to capture images in 3D and edit with tools to zoom-in and crop. The colour enhancement technology and video processor offers outstanding image reproduction and colorization capabilities. The camera has maximized connectivity with an output of up to 1600 lines, a resolution of 3840 x 2160 at 60p, and dual channel outputs.

The shift towards UHD 4K technology is quickly becoming a medical industry standard. Ampronix is proud to be at the forefront of leading technological shifts by equipping healthcare providers with only high caliber products. Moving forward, the company will be stocked with UHD 4K recorders from brands like Panasonic and Sony, slated for release in the upcoming months.

About Ampronix
Ampronix is a renowned authorized master distributor of the medical industry’s top brands as well as a world class manufacturer of innovative technology. Since 1982, Ampronix has been dedicated to meeting the growing needs of the medical community with its extensive product knowledge, outstanding service, and state-of-the-art repair facility. Ampronix prides itself on its ability to offer tailored, one-stop solutions at a faster and more cost effective rate than other manufacturers. Ampronix is ISO 13485:2003, ISO 9001:2008, and ANSI/ESD S20.20-2014 certified.

www.ampronix.com
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CMEF Spring is part of the world’s largest healthcare event: the Health Industry Summit (tHIS)

The Health Industry Summit (tHIS) 2017 hosted by China and organized by Reed Sinopharm, was held in Shanghai at the National Exhibition and Convention Center from May 15th to 18th with well over 200,000 healthcare industry professionals from more than 150 countries and regions in attendance.

Now in its third edition, tHIS has been firmly established as the world’s largest health industry event with over 350,000 square meters of exhibition space and 160 individual events and conferences. It comes at a crucial time as China drives forward its “Healthy China 2030 Plan” initiative to realize among other goals an industry growth target of RMB 16 trillion (USD 2.3 trillion, Euro 1.9 trillion) by 2030 and an increase of average citizen lifespan by 3 years to 79 years.

Key events at tHIS 2017 included China’s three top medical equipment and pharmaceutical exhibitions (CMEF, PHARMCHINA and API China) and the leading healthcare investment forum - Healthcare China 2017. This year’s investment forum was co-organized by Reed Sinopharm, JP Morgan Asset management, CICC and Sinopharm Capital and was attended by more than 1000 CEOs, investors and institutions.

The exhibition featured the entire industry value chain and showcased tens of thousands of the latest technologies and products. Emerging technologies such as VR, AR, wearables and AI featured strongly on the show floor as well as in the key forums. During tHIS 2017, the World Medical Robots Innovation and Development Summit was held to reflect the growing trend for robotics and AI applications.

Over 7000 exhibiting companies from 30 countries were at the show including medical device giants like GE, United Imaging, Siemens, Philips and Mindray as well as major pharmaceutical groups in China including Sinopharm, Shanghai Pharma and CR Pharmaceuticals. The majority of the most innovative companies in the medical field choose CMEF as their global or Asia Pacific new product launch platform and more than 600 new product launches took place during the 4 days of the show. Among the new products released, United imaging launched its uVR 4D vision explorer platform, enabling more detailed dissect structure and spatial information, while GE launched its first cloud-based digital application for medical equipment management APM (asset performance management), which was developed by their China team. BGI also attended with their gene sequencer BGISEQ-500, a benchtop high-throughput open sequencing platform that provides end-to-end solutions.

Natural Health and Nutrition Expo were among the fastest growing segments in the portfolio, helped by the expected population boom in light of the reversal of the single child policy last year as well as a growing health-conscious middle class in China. Popular international brands like Blackmores, Nature Made and Garden of Life made their debut at the show along with 700 suppliers of health food and supplements, bringing with them popular product lines tailored to the Chinese market.

The Health Industry Summit is organized by Reed Sinopharm, a joint venture between the world’s leading event organizer Reed Exhibitions and China’s leading state-owned medical & pharmaceutical group Sinopharm, ranked number 199 on the latest Fortune 500 list released in July. Its next edition will be held in April 2018 in Shanghai while the 78th China International Medical Equipment Fair (CMEF Autumn 2017) is to take place in Yunnan at the Kunming Dianchi Convention & Exhibition Centre from October 29 to November 1.
Visitor profile
The vast majority of visitors naturally came from China, covering all regions and healthcare sectors. However, there was also a growing segment of international visitors. Topping the list of foreign countries was India with a 20% share of international attendees followed by Korea (15%), Pakistan, Japan, USA, Russia and Germany.

Overall, CMEF visitors spanned the entire medical area – both healthcare and medical device industry. Distributors of medical devices constituted the largest single visitor group with 45% of the total followed by hospital build and design (26%) and rehabilitation centre professionals (see detailed visitor composition chart on previous page).

National pavilions
The international participation is increasing, reflecting the growing importance of China’s healthcare industry. Further adding to the show’s attraction, a large number of national pavilions were featured in a dedicated hall where a constant stream of visitors could view the latest products and technology of companies from countries as diverse as Switzerland, Canada, Taiwan or Germany. For the first time the US and Pakistan had country group exhibits while the Spanish Medical Technology Association (FENIN) led some Spanish companies to make their appearance at the CMEF Spanish pavilion and the German Land of Thuringia organized a regional exhibit for the first time.

Mindray: a world class company grown in China
Founded in 1991, Mindray is one of the leading global providers of medical devices, committed to innovation in the fields of patient monitoring & life support, in-vitro diagnostics, and medical imaging. International Hospital’s editor in chief met David Yin, Group Vice President and General Manager of International Sales and Marketing on the Mindray stand and reviewed their latest products on display at CMEF.

Headquartered in Shenzhen, China, Mindray possesses a global marketing and service network with subsidiaries and branch offices in 32 countries in North and Latin America, Europe, Africa and Asia-Pacific, as well as 31 branch offices in China. To date, Mindray has 7,600 employees. Particularly strong is its R&D department which employs 1,700 engineers and accounts for a spend of almost 10% of annual revenue. The company is dedicated to adopting advanced technologies and transforming them into accessible innovation, improving the quality of care, while helping to reduce its cost and make it more accessible to a larger part of humanity. Today, Mindray’s products and services can be found in healthcare facilities in over 190 countries besides China.

Mindray is the perfect example of a company built on growth from the domestic to the international market. Key milestones in its development include the New York Stock Exchange listing in 2006, the Datascope acquisition in 2008 and the Zonare takeover of 2014.

Among the many products on show at CMEF was the cutting edge design BeneVision patient monitor with its rotatable landscape and portrait layout as well as its innovative clinical decision support tools like HemoSight. On the ultrasound imaging side, the Resona 6 premium system was developed with Zonare and is powered by the innovative ZONE Sonography Technology. At the other end, the M6 hand-carried ultrasound system offers a wide range of tools that maximize diagnostic capabilities at the bedside. Another highlight at CMEF was the WATO EX65 Pro anesthesia workstation which is newly launched in the Chinese market.
Improving diagnostic process and speeding treatment pathways

Philips expands Minicare IVD portfolio for near-patient testing

Advances in in-vitro diagnostics (IVD) point-of-care (POC) technology have made it possible to bring the diagnostic power of the central laboratory to the patient, reducing waiting time and in turn improving outcomes [1]. A good starting point and significant pathological area for the use of IVD POC systems is cardiovascular disease. The World Health Organization predicts the number of deaths from cardiovascular disease to increase from 17 million to 23 million people per year by 2030 [2].

Innovations which accelerate diagnostic process have a key role to play in global efforts to reduce these numbers. For example, at Philips, we have enlisted the power of magnetic nanobeads to deliver a next generation of stable and rapid cardiac markers blood testing for suspected acute cardiac patients on the Minicare I-20 handheld immunoassay device, launched last year. With Minicare I-20, the emergency department (ED) can now run a cTnI test next to the patient, and obtain the result within 10 minutes.

The advantages of robust, accurate POC tests are particularly relevant to clinicians working in the ED and ambulance setting where having access to shortened assay turnaround time may improve outcomes. With near-patient testing, it is no longer necessary to send the blood sample to the hospital laboratory and wait up to 60 minutes for the results to come back.

Reduces crowding and patient waiting times

When patients present with symptoms of a heart attack, there is a critical need to make rapid yet precise decisions. However, only about 10% of patients can be accurately diagnosed as AMI based on an ECG [3]. Most patients presenting with suspected heart attack require blood tests, predominately the gold standard troponin biomarker. Serial testing of cTn is part of the recommended diagnostic protocol that aids in ruling in, or ruling out, Myocardial Infarction (MI). The availability of a sensitive and accurate point-of-care test for cardiac troponin could allow clinicians to reduce the standard serial testing of cTn at presentation and six hours after to a safe zero-three hour rule out protocol.

The use of point-of-care testing (POCT) in the ED and ambulance setting to reduce turnaround time for assay results has the potential to improve overall efficiency, by reducing crowding and the length of stay in acute care. Further, for the patient, it can reduce the stress of waiting for their results, and the time to diagnosis and initiation of therapy.

To make the most efficient use of hospital resources, near-patient testing protocols need to be integrated into the acute care workflow and the patient care pathway reorganized, with the full support of the clinical teams and their managers [4]. We are already seeing closer cooperation between clinical teams and the central laboratory, as they recognize the need to help reduce crowding in the ED by supporting the use of POC testing to speed up delivery of certain blood test results.

BNP assays for rapid ruling out of acute heart failure

Critical cardiovascular disease also covers acute heart failure (AHF), the most common cause of hospitalization in patients aged over 65 years. A brain natriuretic peptide (BNP) test measures the amount of the BNP hormone in the blood. Acute heart failure is a serious condition that accounts for 5% of all emergency admissions in Europe and USA and patients presenting with AHF require immediate treatment [5]. International guidelines recommend the use of the BNP biomarker to rule-out acute heart failure (AHF) in patients presenting with acute dyspnea.

The ED clinician needs to be able to distinguish AHF as quickly as possible. Minicare BNP is the second cardiac marker assay to be introduced on the Philips Minicare I-20 handheld analyser. It provides the ED clinician with access to a fast and accurate BNP marker test to help rule out acute heart failure patients more quickly. Like the first Philips Minicare cTnI assay, Minicare BNP provides clinicians with lab comparable results, and clinically significant information within 10 minutes. It is expected to be commercially available later this year.

The Minicare I-20 platform and both cardiac marker assays are simple and easy to use by non-laboratory POC staff. Its integrated calibration and fail-safe functionalities ensure the robustness and accuracy needed for confident, on-the-spot decision making for better outcomes.

POC test streamlines workflow

The use of POC tests, however, is not limited to the ED or hospital and there is increasing demand, for example, from clinicians to use POC testing systems for both acute and chronic conditions [6].

While the areas of medicine covered by near-patient testing are exponentially increasing, in each case the objective is the same:

• Speed up the availability of results allowing for on-the-spot clinical deci-
sion, so that clinicians can act without delay
• Improve patient satisfaction and reduce waiting time
• Streamline workflow and achieve greater overall efficiency of resources.

Two more extensions to the Minicare family are expected to be available in the second half of 2017:

Minicare H-300* point-of-care thromboelastography system:
to aid in the diagnosis and monitoring of hemostasis abnormalities. In critical care situations, such as a heavy blood loss, trauma or before, during and after surgery, understanding a patient’s hemostatic status is critical. Philips will offer a point-of-care hemostasis system that delivers real-time insights in the whole blood hemostasis status of the patient. This novel, small footprint, portable system delivers full results within 15 minutes, with the first results already visible within five. Unlike current hemostasis analysers which are complex to operate, this device is easy to use with minimal training. It is suitable for both the operating room and the ED.

Minicare C-300 clinical chemistry system with an extensive range of chemistry parameters:
Clinical chemistry testing can now be done near-patient with this small benchtop, point-of-care clinical chemistry system for rapid and efficient near-patient testing and diagnosis. Now there’s no need to send blood samples to the central lab and wait for them to return. Shorter waiting time for blood test results is likely to improve workflow and the overall patient experience. Within 15 minutes, the Minicare C-300 will deliver results for an extensive range of clinical chemistry parameters, with a good correlation to the central laboratory instruments. It is easy to operate with limited sample preparatory work required.

Improving patient care
In-vitro diagnostics tests at the point of care provide clinically significant information faster than is possible from the central laboratory. Near-patient testing offers the potential to improve levels of patient satisfaction with their treatment, while making more efficient use of healthcare resources [1]. As a global leader in health technology, Philips is expanding its Minicare family of IVD near-patient testing systems for a range of clinical care settings – from critical care in (pre) hospital acute care to primary care. The Philips message is to develop IVD POC solutions ‘ready where you are’, enabling near-patient testing to play a key part in improving patient’s experience.

References

PHILIPS MEDICAL SYSTEMS
www.healthcare.philips.com

*Philips is distributor and Entergrion is legal manufacturer
Ultra-high-field MR scanner

Siemens Healthineers has achieved CE approval for the 7 Tesla magnetic resonance (MR) scanner Magnetom Terra, making it the first-ever ultra-high-field MR scanner to be approved for clinical use. This development is now establishing 7T imaging in the clinical routine and expanding the scope of diagnostic MRI – 15 years after 3T scanners first became established. With this new clinical field strength, it is possible to achieve a new level of detail in anatomy and function, helping further pave the way for precision medicine. Thanks to its very high spatial and spectral resolution, Magnetom Terra provides detailed insights into the human musculoskeletal system, presents a precise picture of the metabolic processes in the brain and also aids in the visualization of neurological diseases such as Alzheimer’s, epilepsy, and multiple sclerosis (MS). The advantages of ultra-high-field imaging are especially apparent in brain imaging. At 7T, lesions can be identified more clearly thanks to the higher resolution and stronger image contrast. One example of this is the examination of epilepsy patients, where the clearer distinction between white and grey matter opens up new diagnostic capabilities, which are not possible at lower field strengths. Results from 7 Tesla can also be beneficial to patients with MS by improving the visibility of lesions in the grey brain matter that can lead to cognitive impairments. Here, the combination of a better signal-to-noise ratio, stronger tissue contrast and greater spatial resolution means that 7T can reveal information that would be invisible at 3T. With Magnetom Terra’s Dual Mode functionality, users can easily switch between the protocols and innovative research methods. This makes it an optimal platform for translational research, allowing the use of 7T to be expanded, such as for whole-body applications. Until now, 7T has typically been used to examine and enhance the visibility of extremely small pathologies with anatomical imaging, as well as sub-cortical brain activations utilizing functional imaging. In the near future, the exploration of metabolic changes in the patient will play an important role, and 7 Tesla could be thought of as a MRI microscope that examines the anatomy, function, and metabolism of body tissue. Furthermore, the open system architecture of Magnetom Terra is especially attractive for researchers, allowing them to utilize and build on their own developments. Manufactured at Siemens Magnet Technology in Oxford, England, the actively shielded magnet on the new ultra-high-field MR system is the lightest 7 Tesla whole-body magnet in the world, being 50 percent lighter than previous actively shielded magnets. The low total weight of Magnetom Terra facilitates its installation in the clinical environment. It uses the same software platform as other clinical scanners from Siemens Healthineers in the 1.5T and 3T segments and is closely modeled on their established user interface. In conjunction with specially optimized applications for the 7 Tesla system, this allows easy operation of the ultra-high-field system in clinical routine, as well as the easy exchange of study protocols across other MR systems. Magnetom Terra’s current FDA approval status is 510(k) pending.

SIEMENS HEALTHINEERS

Point-of-care ultrasound for use in emergency medicine

London’s Chelsea and Westminster Hospital relies on point-of-care ultrasound to help assess and treat patients in its emergency department. The emergency department uses ultrasound on a daily basis for FAST (Focused Assessment with Sonography in Trauma) scanning, central line placement, echocardiograms and to check for free abdominal fluid in trauma patients, and occasionally for guiding therapy in critically ill patients, draining abscesses and locating foreign bodies. The FUJIFILM Sonosite X-Porte is very robust, which is important in a busy department where equipment is moved around a lot. It is also very user friendly, and its intuitive operation is particularly beneficial to people who are new to ultrasound scanning.

X-Porte’s ultrasound beam to pinpoint precision. Artifact clutter is substantially reduced while contrast resolution is significantly enhanced. Other features include intuitive touchscreen interface; real-time, scan-along learning which instantly references onboard educational visual guides and step-by-step tutorials that allow the user to view videos while simultaneously performing live scans; outstanding durability and reliability.

FUJIFILM SONOSITE

Benign prostate enlargement surgical treatment systems

There is a range of different surgical approaches and techniques in therapy for benign enlargements of the prostate (BPH). On the one hand, an enlargement of the prostate can be treated by bipolar Transurethral Resection of the Prostate (TURP). On the other hand, minimally invasive laser procedures can be used to provide treatment. Richard Wolf supplies the appropriate equipment for both techniques with the latest system solutions. The company’s latest system for bipolar enucleation of the prostate was presented by Professor Thorsten Bach, Chief Physician at the Urological Centre of the Askelpios Hospital Hamburg, in a pre-recorded video showing the intervention during the European Association of Urology (EAU) 2017 Congress in London. Richard Wolf has developed a special electrode to meet the diverse requirements of bipolar enucleation. This electrode was used for this intervention. The geometry of the new bipolar enucleation electrode has been provided with a number of special features. A very small electrode head with a wedge-shaped contact surface at the distal end enables very delicate working whether using mechanical enucleation or with effective vaporization and incision using HF current. The “doughnut” footprint of the distal tip permits an efficient vaporization with reduced bleeding, and coagulation. Together with the refined Shark resectoscope and the highly efficient Piranha Morcellator, the electrode in the system offers a cost-effective alternative to laser enucleation but naturally also for standard procedures such as TURP.

Richard Wolf also presented its new
Holmium:YAG Laser MegaPulse 70+ for minimally invasive laser enucleation at the EAU Congress. The HoLEP (Holmium Laser Enucleation of the Prostate) can be easily carried out with a 70 watt power. Its high frequency and power means that it can also be used for fast and effective stone therapy. This therefore provides users with a high-speed system for stone lithotripsy.

A new, special 200 μm “power” laser fibre generates the power output of a 272 μm laser fibre. The automatic laser fibre recognition using an RFID antenna provides the user with very convenient and efficient identification of the laser-fibre size. Recognition can also be carried out in the packed sterile status of laser fibres. A flexible ureterorenoscopic lithotripsy with the COBRA vision and the new MegaPulse 70+ laser was also presented at the EAU Congress in a pre-recorded video carried out by Dr. Michael Straub, Managing Senior Physician and Head of the Urinary Stone Centre at the Clinic and Polyclinic for Urology, Rechts der Isar Hospital, Munich.

RICHARD WOLF
i www.interhospi.com & search 47202

New software for anesthesia machine

With the help of version 2.0 software for the Perseus A500 anesthesia machine, the anaesthetist can automatically recruit insufficiently ventilated lung areas during surgery. The software also provides a comprehensive ventilation monitoring function which monitors the compliance of the sensitive lung in relation to the PEEP (positive end-expiratory pressure) during a recruitment manoeuvre. As a result, the affected lung area can be made accessible again for ventilation in a gentle manner. Atelectasis is a common, but undesirable, occurrence during operations. For some patients, recruitment manoeuvres using the manual ventilation bag, for example, are the means of choice. However, several individual operating steps are sometimes required for this. The new software version 2.0 for the Perseus A500, which is now available, can assist the anaesthetist when these steps have to be performed. It supports both one-step recruitment and a multi-step manoeuvre, which usually requires a lot of quick successive manual adjustments at the machine. The anesthesia machine now performs these steps automatically after the anaesthetist has set the maximum inspiration pressure and maximum PEEP. Ventilation monitoring is also an integral part of the new software. The anaesthetist sees, for example, on the screen how successfully the lung has been recruited. In addition, compliance can be assessed in the course of time, which makes it easier to select the optimum PEEP for the respective patient. The software also takes into account the standard operating procedures of a clinic along the treatment path. The anesthesia machine can, for example, be set in such a way that it indicates the first required recruitment time for the patient undergoing surgery. The machine can also remind the anaesthetist about other necessary repetitions.

DRÄGER
i www.interhospi.com & search 47229

Mobile X-ray system with carbon nanotube technology

The CARESTREAM DRX-Revolution Nano Mobile X-ray system (pending FDA 510(k) clearance) uses carbon nanotube technology to deliver significantly reduced size and weight when compared to existing mobile X-ray systems. The new system is inaugurating the next generation of mobile X-ray systems that will offer important productivity and ergonomic advantages. The DRX-Revolution Nano system uses carbon nanotube technology in a lighter weight, non-motorized system that will be easy to move and position, even in cramped critical care areas. The new system is designed to include: carbon nanotube technology and an advanced lithium iron phosphate battery that contribute to longer life and a weight of approximately 200 pounds (90 Kg); a sleek design with enhanced visibility both over and around the system; a compact footprint that will make it easy to manoeuvre and position in tight spaces; and independent controls of the diaphragm without moving the tubehead.

CARESTREAM HEALTH
i www.interhospi.com & search 47236
Ultra-premium ultrasound systems

The Aplio i-series features innovative technology, outstanding image quality, intuitive ergonomics and advanced features for high diagnostic confidence and improved patient care. Giving healthcare providers the performance improvements needed to meet the current and future challenges of the healthcare system, Toshiba Medical has introduced the ultra-premium Aplio i-series ultrasound platform. The Aplio i-series’ powerful performance helps increase diagnostic confidence substantially and offers a more cost-effective, less invasive and safe solution in imaging diagnostics and intervention. The Aplio i-series is a new-generation, ultra-high performance, scalable platform. Specifically, the Aplio i700 and Aplio i800 are perfectly suited to radiology and shared service departments with a high patient throughput. Both systems are based on iPerformance technologies that deliver extreme processing power allowing sonographers to see more clinical detail faster and easier. A new beamforming technology – iBeam – optimizes imaging efficiency with enhanced penetration, as well as increased spatial and contrast resolution, while minimizing artifacts and clutter. The Aplio i800 offers advanced clinical applications, including Toshiba Medical’s exclusive intelligent Dynamic Micro Slice (iDMS) matrix probe technology. An ultra-high frequency transducer operating at up to 24 MHz opens a new horizon for clinicians to image anatomy and perfusion of superficial structures in the sub-millimeter range. Based on the iSense design concept, the Aplio i-series provides intuitive ergonomics to boost productivity in the daily routine and for complex exams. The systems offer an intuitive user interface, which visually guides the clinician through the exam to simplify system operation, while improving workflow efficiency. To make ultrasound exams easier and faster, the systems feature tablet-style touch screens and real-time Quick Scan, which optimizes the image quality automatically and instantaneously.

TOSHIBA MEDICAL
i www.interhospi.com & search 47238

Continuous critical care patient monitoring during in-hospital transport

Philips IntelliVue X3, a portable monitor with an intuitive smartphone-style operation, enables continuous monitoring during transport to support a more complete data record. When patients are transferred from one department to another, clinicians often struggle with incomplete data records leading to inefficiency due to multiple systems operating independently. Getting a complete view into patient data to allow for informed clinical decision support requires manual steps and can contribute to a higher potential for error, especially when dealing with critical care patients. IntelliVue X3 integrates seamlessly into the existing IntelliVue Patient Monitoring system, including bedside and transport monitors, the clinical network and the Philips family of central stations. Data from the IntelliVue X3 is also integrated into mobile applications, the hospital network, and interfaces that connect the system to other medical devices and to the hospital’s electronic medical record (EMR) system. As part of this larger patient monitoring portfolio, X3 assists clinicians in providing the best possible care for patients across all levels of acuity and supporting institution-wide standardization. Health systems need accurate and transparent information and processes to help clinical staff make faster, more consistent decisions based on patient conditions and history. With the development of the IntelliVue X3, the aim is to ensure that data isn’t being lost during transitions so that clinicians are provided with all the information they need, when they need it. In addition to delivering complete data records, IntelliVue X3 provides a comprehensive and scalable set of clinical measurements, ranging from basic to advanced monitoring. It allows for advanced monitoring during stationary and transport situations, including dual invasive blood pressure, built-in mainstream CO₂, a choice between three SpO₂ technologies and state-of-the-art ECG/arrhythmia. The IntelliVue X3 has received the CE Mark in Europe. Pending 510(k), it is not available for sale in the U.S.

PHILIPS
i www.interhospi.com & search 47231

CALENDAR OF EVENTS

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For more events see www.interhospi.com/events/

Dates and descriptions of future events have been obtained from usually reliable official industrial sources. IHE cannot be held responsible for errors, changes or cancellations.
The 78th China International Medical Equipment Fair (CMEF Autumn 2017)
The 25th International Component Manufacturing & Design Show (ICMD Autumn 2017)

The Digital Era of Healthcare

Oct 29 - Nov 1, 2017
Kunming Dianchi Convention & Exhibition Center

www.CMEF.com.cn
www.ICMD.com.cn
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- Non-HDL Cholesterol
- Cholesterol/HDL Ratio
- Triglycerides

Kidney function
- Urine Creatinine
- Urine Albumin
- Albumin/Creatinine Ratio
- Blood Creatinine with eGFR

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