CVD risk tools help target clinical approach

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Improving neonatal outcomes in Europe

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Although innovations in tests and treatments have allowed a dramatic reduction in cardiovascular disease mortality in recent decades, CVD is still the leading cause of death in Europe. And the major concern now is that this steady reduction in mortality is beginning to plateau due to the diabetes and obesity ‘epidemics’ as well as Europe’s rapidly ageing population. It has even been suggested that in 15 years time up to 40% of the population could be affected by CVD. How can European healthcare providers respond to the predicted huge demand for effective, but currently expensive, treatments for this burgeoning number of patients?

Clearly if available budgets are to cope, the number of times CVD patients are hospitalized as well as the duration of each stay will need to be reduced with the aid of innovative new devices facilitating more timely diagnosis and less costly treatment.

While the discovery of novel diagnostic tests and treatments is usually the result of academic programmes in cooperation with expertise from medical device companies, it is the latter that are responsible for developing the final products. Of course no one would dispute the fact that safety, clinical efficacy and quality control must be proven before a product can be marketed, and that surveillance should continue post-marketing. But there must be a high probability that the inevitably large costs incurred by manufacturing companies will lead to at least an adequate and timely return on investment. Unfortunately this is frequently not the case: the approval process is unnecessarily cumbersome, the unwieldy bureaucracy of the European Commission is notorious, and the updated EU clinical trials directive is overly complex with experts agreeing that it falls short of what Europe really needs.

In contrast to that for medical device approval, there is no pan-European process deciding which products qualify for reimbursement and what price will be paid once a device has been marketed. Indeed diverse strategies are adopted by different European countries and national requirements for relevant data also vary. And just to muddy the waters further, the reimbursement processes in the various countries can change depending on current budgets and healthcare system reforms. All this makes it highly problematic for medical device companies to forecast what the demand will actually be for really innovative and exciting products. It is vital that an appropriate solution is found for the resulting dearth of cardiovascular disease R&D in Europe, otherwise medical device companies, cardiologists, and especially patients and their families, will all be the losers.
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Study finds that opioids administered in the ER don’t influence patient satisfaction

A new study co-authored by investigators at the University of Massachusetts Medical School found that there is no correlation between opioids administered in the emergency room setting and Press Ganey ED patient satisfaction scores, one of the most commonly used metrics for measuring patient satisfaction. Based on these findings, the study’s authors suggest that emergency room clinicians should administer pain medications in the emergency room setting according to clinical and patient factors without being concerned about satisfaction scores.

“Right now there is an epidemic of opioid related deaths and the FDA has identified prescribers as essential to the reduction of opioid misuse,” said study author Kavita Babu, MD, associate professor of emergency medicine and director of the medical toxicology fellowship at the University of Massachusetts Medical School. “When we identify modifiable factors, things that we can change, in order to curb this epidemic, one of the issues that comes up frequently is responsible opioid prescribing.”

Clinical encounters in the emergency department (ED) often involve treatment of painful conditions. However, treatment of pain and the administration of opioids in the ED can be challenging for physicians because of a lack of familiarity with the patient, time constraints and concerns about patient safety. Additionally, in some emergency medicine settings, compensation and metrics of care are linked to Press Ganey ED patient satisfaction scores which may be perceived to be adversely influenced by the failure to administer opioids.

“In conferences and settings where we teach physicians about responsible opioid prescribing, one of the obstacles frequently mentioned is patient satisfaction, and the idea that physicians might be chastised because their patient satisfaction scores are low,” said Dr. Babu.

Seeking to quantify and validate the concerns of their colleagues, the study’s authors looked at the link between opioids administered in the emergency room and patient satisfaction scores more rigorously. The researchers matched patient satisfaction responses to the corresponding de-identified electronic medical record data of 4,749 patients seen in the emergency room of two New England hospitals. Looking at patient survey responses, as well as medication orders, age, sex, race, health insurance status, time of arrival at ER, time of wait to see a physician, total length of stay, patient-reported pain levels and year and month of visit, the investigators performed a retrospective analysis of the data.

The study found that there was no association between how much opioid pain medication was administered in the emergency room and patient satisfaction scores. Other factors such as wait time and physician and nurse communication play a far greater role in patient satisfaction, according to Babu.

EurekAlert
http://tinyurl.com/ogwz7gw

Operating theatre time, where does it all go?

In this single centre study, the authors assess the accuracy of surgeons and anesthetists in predicting the time it will take them to complete an operation or procedure and therefore explain some of the difficulties encountered in operating theatre scheduling. The study was set in operating theatres at a level 1 trauma centre serving a population of about 370,000. Participants were 92 operating theatre staff including surgical consultants, surgical registrars, anesthetic consultants, and anesthetic registrars. Participants were asked how long they thought their procedure would take, and this was compared with actual time data recorded at the end of the case. General surgeons underestimated the time required for the procedure by 31 minutes, meaning that procedures took, on average, 28.7% longer than predicted. Plastic surgeons underestimated by 5 minutes, with procedures taking an average of 4.5% longer than predicted. Orthopedic surgeons overestimated by 1 minute, with procedures taking an average of 1.1% less time than predicted. Anesthetists underestimated by 35 minutes, meaning that, on average, procedures took 167.5% longer than they predicted. The authors conclude that the inability of clinicians to predict the necessary time for a procedure is a significant cause of delay in the operating theatre. This study suggests that anesthetists are the most inaccurate and highlights the potential differences between specialties in what is considered part of the “anaesthesia time.”

Health Improvement and Innovation Resource Centre
http://tinyurl.com/aqf6xg

Music and stories kids choose themselves lessen their pain after major surgery

Pediatric patients who listened to 30 minutes of songs by Taylor Swift, Rihanna and other singers of their choosing -- or audio books -- had a significant reduction in pain after major surgery, according to a new Northwestern Medicine study.

The children, ages nine to 14, chose from a playlist of top music in different genres including pop, country, rock and classical. Short audio books were another option in the study.

A strategy to control post-surgical pain without medication is important because opioid analgesics -- most commonly used to control post-surgical pain -- can cause breathing problems in children. Thus, caregivers usually limit the amount of opioids prescribed, and children’s pain is not well controlled.

“Audio therapy is an exciting opportunity and should be considered by hospitals as an important strategy to minimize pain in children undergoing major surgery,” said study senior author Dr. Santhanam Suresh.

“This is inexpensive and doesn’t have any side effects.”

This is believed to be the first randomized study to evaluate and demonstrate the use of patient-preferred audio therapy as a promising strategy to control post-surgical pain in children. Prior studies looked at the effectiveness of music for pain during short medical procedures. Those studies also did
not use objective measures of pain nor did they show whether the perception of pain was affected by the music itself or if an alternate audio therapy would be equally as effective.

Santhanam Suresh believes the audio-therapy helped thwart a secondary pathway in the prefrontal cortex involved in the memory of pain.

“There is a certain amount of learning that goes on with pain,” he said. “The idea is, if you don’t think about it, maybe you won’t experience it as much. We are trying to cheat the brain a little bit. We are trying to refocus mental channels on to something else.”

Letting patients choose their music or stories is an important part of the treatment, Suresh said. “Everyone relates to music, but people have different preferences.”

Northwestern University
http://tinyurl.com/pahckmp

Antidepressant treatment for pain catastrophizing

A select population of patients having surgery experience what is called pain catastrophizing – an irrational thought process that leads a patient to perceive pain as worse than it actually is. Antidepressant medications reduce negative mood and might change this way of thinking, but according to a study that may not be the case, at least for acute pain.

“Pain catastrophizing patients report more pain right after surgery, but whether or not targeted therapy can reduce pain among these patients had not been investigated,” said Troels H. Lunn, M.D., Ph.D., lead author, Department of Anesthesiology and Intensive Care, University of Copenhagen, Denmark.

“Our study was the first to investigate the effects of SSRIs (selective serotonin reuptake inhibitors, one class of antidepressants) on pain immediately after surgery.”

Dr. Lunn and his colleagues studied 120 patients with pain catastrophizing disorder who were scheduled for total-knee replacement surgery. The patients were given either the escitalopram or a placebo daily from the day of surgery to the sixth day after surgery, in addition to a pain medication regime. Twenty-four hours after surgery, patients were asked to report their level of pain while walking. The researchers found that the antidepressant treatment did not reduce pain 24 hours after the procedure. They did, however, find that overall pain scores days two through six after surgery were reduced with the antidepressant treatment. According to Dr. Lunn, the findings suggest that initiating antidepressant treatment earlier may reduce pain immediately after surgery.

“This topic calls for future studies on the effect of this and other classes of antidepressants on postsurgical pain, and our study can serve as a basis for such research,” said Dr. Lunn.

The American Society of Anesthesiologists
http://tinyurl.com/pafp7a7

Spider venom may have legs as future painkiller

University of Queensland researchers have found seven peptides (mini-proteins) in spider venom that block the molecular pathway responsible for sending pain signals from nerves to the brain. The discovery could inspire a new class of potent painkillers with fewer side effects than current medications.

The research team, led by Professor Glenn King from UQ’s Institute for Molecular Bioscience, said the seven peptides discovered in tarantula venoms blocked the human proteins known as voltage-gated sodium channels, which play a key role in pain transmission.

“Previous research shows people who lack Nav1.7 channels due to a naturally-occurring genetic mutation are unable to experience pain, so blocking this channel could potentially help us to switch off pain in people with normal pain pathways,” Professor King said.

“We have nine sodium channels in our bodies and our challenge is to find peptides that can distinguish between these channels and target only Nav1.7 – something current pain relief drugs can’t do but spider venom peptides most likely can.”

Dr Julie Kaae Klint, a former IMB postdoctoral researcher and current research associate at Evotec, said spider venom peptides had evolved to help spiders immobilize or kill their prey.

“A conservative estimate indicates that there are nine million spider-venom peptides contained within the venoms of the world’s 45,000 known spider species, and only 0.01% of this vast pharmacological landscape has been explored so far,” Dr Klint said.

Professor King said the team built a system that allowed them to rapidly analyse a huge number of venom peptides in order to search for those with the potential to block Nav1.7 channels.

“We analysed venom from 205 spider species and found that 40 per cent of the venoms contained at least one peptide that blocked human Nav1.7 channels,” he said.

“Importantly, of the seven promising peptides we identified, we discovered one that had the right structure, stability and potency to form the basis of a future painkiller.

“Our next step is to continue exploring the clinical potential of these peptides – and the ones we are still yet to find – in the hope of developing better treatments for the one in five Australians living with persistent pain,” Professor King said.

University of Queensland
http://tinyurl.com/prw44q

Amniotic fluid may be safe and effective alternative to hyaluronic acid for osteoarthritis pain

An early snapshot of study outcomes suggests that the use of a processed amniotic fluid allograft may be safe and effective for the treatment of knee osteoarthritis (OA) as an alternative to hyaluronic acid (HA). Longer-lasting ‘AmnioClear LCT is demonstrated in this study to offer pain and functional improvement that is greater at 13 weeks than at 30 days; thus it appears to offer longer-lasting relief at a higher level,” said lead author Didier Demesmin, M.D., a pain management specialist with the University Pain Medicine Center in Somerset, N.J.

“It also demonstrated much lower incident of pain, swelling or inflammation compared to other injections,” said Noreen Rana, M.P.H., research director at the Center.

The most common form of knee arthritis is OA in which the cartilage wears away in a gradual process with pain that worsens over time, according to the American Academy of Orthopedic Surgeons (AAOS). Steroids, which may offer
quick transient pain relief but are not recommended for repetitive use, and HA are standard alternatives to surgery. HA is a naturally occurring substance found in the synovial fluid, which lubricates the cartilage and reduces friction in the joint.

The effects of HA decline after 7 weeks for a single injection or 12 weeks with multiple injections, the study authors said. Further, the Centers for Medicare and Medicaid Services (CMS) and AAOS have questioned the effectiveness of hyaluronic acid in the treatment of knee OA in patients over 65 and in the general population.

“Payer coverage has started to decline as a result of the AAOS recommendation, and many believe the CMS Tech Assessment will eventually cause further and more severe decline in HA coverage,” Demesmin said.

As an alternative, investigators looked at amniotic fluid, noting its similarity to the synovial fluid in that both protect and lubricate the contents of a closed environment. Furthermore, the transplant of fetal membranes and fluid from one individual to another is not new and has been used to treat orthopedic conditions. The cushioning action of amniotic fluid for the fetus is the same – “homologous,” as the FDA terms it -- function in a recipient’s knee, the fetus is the same – “homologous,” as the FDA terms it -- function in a recipient’s knee, Demesmin said.

“This all-natural supplement alternative to synthetic treatments and the anti-inflammatory nature of amniotic fluid is precisely what painful OA knees need.” Demesmin added that HA is FDA cleared only for use in the knee, while OA knees need. “Demesmin added that HA has been used to treat orthopedic conditions.

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The American Academy of Pain Medicine
http://tinyurl.com/p7gf6k

Two thirds of the world have no access to surgery

Five billion people worldwide do not have access to safe and affordable surgery and anesthesia when they need it. As a consequence, millions of people are dying from common, easily treatable conditions like appendicitis, fractures, or obstructed labour. This is according to a major new Commission co-led by experts at King’s College London. Just under a third of all deaths in 2010 (32.9%, 16.9 million deaths) were from conditions treatable with surgery – well surpassing the number of deaths from HIV / AIDS, TB, and malaria combined. Access is worst in low-income and lower-middle income countries, where as many as nine out of ten people cannot access basic surgical care.

Despite this enormous burden of death and illness –which is largely borne by the world’s poorest people – surgery has, until now, been overlooked as a critical need for the health of the world’s population. As a result, untreated surgical conditions have exerted substantial but largely unrecognized negative effects on human health, welfare, and economic development.

“In the absence of surgical care, common, easily treatable illnesses become fatal,” says Andy Leather, Director of the King’s Centre for Global Health, and one of the Commissioners lead authors. “The global community cannot continue to ignore this problem – millions of people are already dying unnecessarily, and the need for equitable and affordable access to surgical services is projected to increase in the coming decades, as many of the worst affected countries face rising rates of cancer, cardiovascular disease, and road accidents.”

Of the 313 million operations done worldwide each year, just one in 20 occur in the poorest countries, where over a third of the world’s population lives. New estimates produced for the Commission find that there is a global shortfall of at least 143 million surgical procedures every year, with some regions needing nearly twice as many additional operations as others.

The Commission estimates that with an investment of $US 420 billion, a cost far outweighed by the devastating economic costs incurred by the current global shortfall in access to surgery, the countries where access is weakest could be scaled up to acceptable, and achievable, levels of access to surgery by 2030. This highly cost-effective investment in surgery needs to be accompanied by sustainable financing mechanisms across the healthcare system, say the authors, and a firm commitment to universal health coverage.

King’s College London
http://tinyurl.com/nhrhr6g

Novel imaging technique improves prostate cancer detection

In 2014, prostate cancer was the leading cause of newly diagnosed cancers in men and the second leading cause of cancer death in men. A team of scientists and physicians from the University of California, San Diego School of Medicine, with counterparts at University of California, Los Angeles, describe a novel imaging technique that measurably improves upon current prostate imaging – and may have significant implications for how patients with prostate cancer are ultimately treated.

“This new approach is a more reliable imaging technique for localizing tumours. It provides a better target for biopsies, especially for smaller tumours,” said Rebecca Rakow-Penner, MD, PhD, a research resident in the Department of Radiology and the study’s first author.

The current standard of care for detecting and diagnosing prostate cancer is contrast enhanced magnetic resonance imaging (MRI), which involves intravenously injecting patients with a contrast agent to highlight blood flow. Greater blood flow is often a requirement of growing cancer cells. When compared to surrounding healthy tissues, it’s hoped that contrast enhanced MRIs will reveal the shape and nature of any tumours present. But many tumours do not significantly differ from surrounding healthy tissues with contrast enhanced MRI and so evade easy detection. An imaging technique called diffusion MRI measures the diffusion of water and has been a standard imaging technique in the brain and an emerging technique in the prostate. Cancer tissues are denser than healthy tissues and typically limit the amount and mobility of water within them. But diffusion MRI suffers from magnetic field artifacts that can distort the actual location of tumours by as much as 1.2 centimetres or roughly half an inch – a significant distance when surgeons are attempting, for example, to assess whether a tumour extends beyond the prostate and into adjacent nerve bundles.

The new approach described is called restriction spectrum imaging-MRI or RSI-MRI. It corrects for magnetic field distortions and focuses upon water diffusion within tumour cells. By doing both, the ability of imaging to accurately plot a tumour’s location is increased and there is a more refined sense of the tumour’s extent, said Nathan White, PhD, assistant project scientist at UC San Diego, study co-author and co-inventor of the RSI-MRI technique.

The same team of researchers reported that RSI-MRI appears to predict tumour grade. Higher grade tumours correlate with higher restricted water volume in the cancer cells’ large nuclei.

University of California – San Diego
http://tinyurl.com/q4e23z2u
University hospital in Louvain, Belgium successfully applies innovative technique for liver transplants

Surgeons at the University Hospitals Leuven have used a new technique for two recent liver transplants. In both cases the organ was preserved prior transplantation in a device that mimics the environment of that in the human body, making sure the liver stays ‘healthier’. The device can even assess and improve the quality of the liver. So far, this innovative technique had not yet been performed outside the UK. The first transplantation was performed early December 2014, followed by a second one a couple of weeks later. In the meantime both transplanted patients have left the hospital and are recovering well.

Damage to the donor organ
It is standard practice to cool down a donated liver to a temperature of 4 to 6 degrees and to store it on ice. The cold slows down the metabolism and ensures that the organ, which is left with no oxygen supply, remains ‘healthy’ for a longer time. Professor Jacques Pirenne, one of the physicians of the transplant team, explains: “The classic preservation method usually causes damage to the organ. When this damage is too extensive, it renders the liver unsuitable for transplantation. Another disadvantage is the limited preservation time, turning every transplantation into a race against the clock.”

Perfusion with oxygenated blood
The University of Oxford has developed OrganOx Metra, a device intended to preserve and maintain a liver in an environment that mimics that of the body: the organ is perfused with oxygenated blood at normal body temperature. Research in pigs has already shown that this preservation method offers many advantages over cold storage technologies.

“In the UK, already more than fifty liver transplants have been performed using the OrganOx Metra. And now the University Hospital Louvain team follows suit by participating in an international trial. This trial enables us to test the technique on a larger scale while at the same time checking whether it can live up to its expectations,” said Professor Jacques Pirenne: The trial is part of the European Consortium on Organ Preservation in Europe (COPE), a project financed by the European Commission which aims to optimise organ preservation.

Important advance
Professor Pirenne believes this new technique is a game changer. “Over the last decades, there has been little progress as far as preserving livers for transplantation is concerned. This new technique changes all that. Now that a liver can be kept ‘alive’ outside the body, the quality of the organ improves, leading to better outcome for transplant patients. We expect that, because of the improved quality as well as the fact that the device can assess liver function, more organs will become viable for transplantation. This is important, as today there are still patients dying because of a lack of suitable organs.”

University Hospital Louvain
http://www.kuleuven.be/english
Interventional radiology - opening up new frontiers

Interventional radiology (IR) has been revolutionizing modern medicine for a half century. Today, interventional radiologists diagnose and treat life-threatening conditions in some of the most inaccessible areas of the body.

Both therapeutic and diagnostic

IR originated as an invasive subspecialty within diagnostic radiology, but has become recognized as a specialty in some countries. According to a Consensus Statement in 2010 by professional IR societies in the US, Canada, Europe, Australia, Korea, Philippines, Singapore, Japan, Israel, Lebanon and the BRIC countries (Brazil, Russia, India and China), interventional radiology comprises “a wide range of minimally invasive image-guided therapeutic procedures as well as invasive diagnostic imaging.”

The Consensus Statement lists the following features common to IR both as a subspecialty or specialty, different from all other surgical, radiologic, and medical subspecialties and specialties.

- Expertise in diagnostic imaging and radiation safety.
- Expertise in image-guided minimally invasive procedures and techniques as applied to multiple diseases and organs.
- Expertise in the evaluation and management of patients suitable for the image-guided interventions included in the scope of IR practice.
- Continual invention and innovation of new techniques, devices, and procedures.

IR fits an outpatient setting

IR physicians provide patient evaluation and management independently, or in collaboration with other physicians. Most IR procedures do not involve general anesthesia and are available on an outpatient basis. In some countries, IR physicians have opened outpatient clinics to provide radiation, chemo, cryo and burn therapies to patients.

Close association with minimally invasive surgery

The key to IR’s success is its close association with minimally invasive surgery (MIS). MIS was pioneered by interventional radiologists, through their invention of angioplasty and catheter-delivered stents. Using non-invasive imaging modalities, interventional radiologists deploy catheters through a patient’s blood vessels and guide increasingly miniaturized instruments to organs needing treatment. Compared to the large incisions required in traditional surgery, the risks of interventional procedures are far lower.

Johns Hopkins University School of Medicine sums up these concepts. Interventional radiology is used "to diagnose and treat patients using the least invasive techniques currently available in order to minimize risk to the patient and improve health outcomes. These procedures have less risk, less pain and less recovery time compared to open surgery.”

Significant dividends have been realized, as IR expanded the range of available MIS procedures. It has led to dramatic cutbacks in pain experienced by patients, minimized risks of infection from open surgery, limited damage to healthy tissues surrounding a tumour or fragmented bone. These attributes have meant that IR translates into saving healthcare costs.

Limited awareness outside profession

Nevertheless, few outside the profession are aware of IR. Dr. James Spain, chief of interventional radiology at Ohio State University’s Wexner Medical Center, summed it up in a recent issue of ‘Columbus CEO’. Interventional radiology is “perhaps the most interesting medical field that a lot of folks haven’t heard about.”

Canada’s National Post newspaper endorses this view: “Interventional radiology is faster and less-risky than conventional surgery, but still little used in Canada.”

Full range of imaging modalities

IR deploys a wide range of imaging modalities - planar imaging, computed tomography, MRI, ultrasound and PET. Rather than a single modality, combinations are chosen based on information requirements and the complexity of the interventional procedure planned. A very general classification would, however, be as follows.

In vascular patients, duplex ultrasound would be used to make a pre-interventional assessment to avoid ionizing radiation. For interventions in the aorta and iliac vessels, MR angiography would provide specific advantages, while multi-detector row CT would be the mainstay for repair of endovascular abdominal and thoracic aneurysm as well as following up stent-graft deployment.

Catheter angiography is rarely used any more for diagnosis. However, in some cases, it allows physicians to proceed immediately to intervention - a critical factor in situations like uncontrolled cerebral hemorrhage where it is still seen as a ‘gold standard’.

Early IR procedures

Some of the first major IR procedures consisted of “angioplasties, thrombolysis, treatment of gastrointestinal (GI) bleeding and non-vascular procedures like biliary, urinary tract and abscesses drainages.” Growth in the use of IR in subsequent decades was driven by advances in the design of catheters, probes and instruments, and the development of powerful imaging systems with ever-higher resolutions.

Since the late 1990s, the therapeutic...
possibilities of IR have been “exponentially expanded” via new arterial stents and stent grafts, percutaneous tumour ablation techniques, embolization procedures such as chemoembolization, venous ablation, venous access and musculoskeletal interventions.

**Milestones in evolution**

Much of the IR story consists of continuous, incremental developments. Nevertheless, there are still identifiable milestones and watersheds in its evolution.

Prof. Duncan Ettles, President of the British Society of Interventional Radiology and chairman of the Interventional Radiology Clinical Reference Group for NHS England, singles out the endovascular treatment of abdominal and thoracic aortic aneurysms as a revolutionary breakthrough. In 1994, he recalls, “I remember reading reports of Parodi’s first experimental cases of endovascular aortic repair. Across the globe we now routinely undertake aortic repair replacement of the aorta by using minimal surgical or even percutaneous access. While that is still a major procedure, it has completely changed the way that we look at dealing with a major life-threatening condition” in “literally millions of patients.”

Prof. Ettles also recalls early clinical trials of systemic thrombolysis for myocardial infarction. His cardiacological colleagues, he says, “now undertake immediate percutaneous intervention in such patients on a scale that would have been unimaginable 30 years ago. We can treat symptomatic carotid disease, mesenteric and renal arterial disease in the same way.”

**New materials, miniaturization drive IR**

IR developments, in turn, were also rooted in new materials and miniaturization. Dr. John Lippert, an American interventional radiologist highlights 2011 as a watershed year. “We had been freezing tumours since the ‘60s,” he noted, “but the probe was as big as my finger. Now the technology means probes just a little bigger than an IV needle,” Lippert told ‘Columbus CEO’.

The scope of targets for image-guided IR procedures is constantly evolving. They include diseases and elements of the vascular, gastrointestinal, hepatobiliary, genitourinary, pulmonary, musculoskeletal, and the central nervous system.

**IR and cancers**

One of the most promising application areas for IR is oncology. The high resolution and definition of current imaging technology allows for accurate detection and characterization of small and early lesions.

For cancer patients, miniature probes and catheters deliver radiation or chemotherapy, or alternatively provide precision burning or freezing of tumours to destroy malignant cells, avoiding nearby muscles, blood vessels and nerves.

Embolization therapy, which seeks to block blood supply to a tumour or malignant cells and minimize damage to adjoining areas of the body, is an area of considerable attention. The process consists of the release into an artery of precision-targeted clotting agents - very small quantities of fine chemoembolization agents, microscopic radioactive isotopes, tiny coils or microscopic particles. This eventually causes the flow of blood into artery and the capillaries to be blocked and results in much lower bleeding.

Embolization is seen to offer particularly promise in certain cancers. For example, renal carcinoma can often result in the kidney getting very large, and substantial blood loss if the kidney is taken out. Embolization techniques are also often an alternative to amputation or organ extraction and in addressing challenges associated with uterine fibroids and postpartum uterine bleeding.

To treat liver cancer, IR specialists recently introduced TARE (trans-arterial radioembolization) via TheraSphere, a branded process of delivering microscopic glass particles filled with yttrium-90 directly to liver tumours.

Another promising technique in the fight against cancer is ablation. Tumours can be ablated without harming surrounding tissue, once again due to the minimal invasiveness of IR.

Cryoablation kills cancer cells by freezing them. New catheter and probe designs are being researched to reduce frostbite complications during entry of the probe into the skin.

Radiofrequency (RF) ablation uses RF energy to kill malignant or malfunctioning cells. In the future, drawing on the success of RF ablation against tumours, IR researchers are studying the application of microwave therapy by catheter for benign prostatic hypertrophy.

**Vascular disease: angioplasty born as IR procedure**

Vascular diseases have long been a mainstay of IR. IR procedures typically add precision to stents that open up blood vessels and balloon angioplasty, now a standard procedure for cardiologists, was originally a radiological innovation.

While carotid artery angioplasty and stenting remain major weapons against stroke, catheter-directed thrombolysis is used (increasingly since the late 2000s) to open up blood vessels via precision delivery of drugs to a blockage site, such as a pulmonary embolism. Other than stroke, another condition addressed successfully by IR and thrombolysis is preventing deep vein thrombosis.

Elsewhere, the use of catheter-based renal sympathetic denervation to treat drug-resistant hypertension has drawn considerable attention after SYMPLICITY HTN-2, a multicenter, randomized trial, which demonstrated significant blood pressure lowering in treatment-resistant patients at 12 months, compared with control, medication-only patients. In June 2014, researchers reported sustained decreases in blood pressure in select patients with severe, treatment-resistant hypertension, after three years.

**IR in spinal interventions**

The imaging component of IR is leading the way to its high profile applications in spinal injuries and disk deterioration. Portable CT scanners are used to feed real-time information to spine masks displaying detailed LED images of the spine, surrounding tissue and surgical instruments. In vertebroplasty, surgeons have begun using image-guided catheters to deliver medical-grade bone cement to reinforce damaged spinal tissue and discs.

**A glimpse into the future**

Interventional radiologists are also at the forefront of research looking into the possibility of connecting artificial limbs to the brain. This is however expected to take a few decades to yield usable benefits.

Even further down the line, robotics is expected to play a major role in interventional procedures such as internal radiotherapy or transarterial chemoembolization, where it offers a significant advantage in reducing operator risk. For now, however, many challenges remain to be overcome such as the effects of respiration, movement and cardiac pulsation.
Dr Gerald Antoch, professor of radiology and chairman of the department of diagnostic and interventional radiology at Düsseldorf University Hospital and active member of several scientific societies, delivered the prestigious Wilhelm Conrad Röntgen Honorary Lecture at ECR 2015 on ‘Hybrid imaging: Let the two worlds of radiology and nuclear medicine come together.’

‘A hybrid in medicine has nothing to do with hybrid cars, hybrid bicycles or hybrid golf clubs,’ Professor Antoch emphasized by way of introduction. ‘It is the combination of two imaging modalities, such as PET/CT or PET/MRI, adding that a good imaging system is basically nothing more than a good computer. ‘PET/CT technology, developed to show tumours and metastases that went undetected before, has seen many enhancements since the first system was installed in 2001. However, while in the early days clinicians would say “PET is easy: where it’s light, it’s bad”, today we know that it is not that easy.’

‘The best technology is useless if not supported by people who can read – interpret – the images generated by the technology. ‘You need as much morphology as you can get, but you also need the expertise to read these images,’ Antoch stressed.

‘This expertise has to be available not only for the morphological but also the functional side,’ he added, to avoid misinterpreting findings in different images, because ‘accurate hybrid imaging is a question of knowledge’.

The term ‘Theranostics’ describes the combination of therapy and diagnostics, which requires accurate hybrid interpretation by specialists as a basis. For ‘Theranostics’ to be implemented properly, Dr Antoch said, it must be clear who is responsible for scans and who provides them but, even more importantly, ‘who reads and interprets hybrid F-FDG PET studies.’ Often, today, two specialists – a radiologist and a nuclear medicine physician – cooperate on each scan and to ensure that the images were read correctly and to avoid misinterpretation.

‘We need to adapt the workflow to real life,’ Antoch said – with ‘real life’, meaning ‘limited resources’. He proposes the implementation of new training programmes where nuclear medicine specialists familiarize themselves with necessary radiology knowledge and vice versa, depending on the local or country-specific regulations.

Antoch’s vision for the future is very clear: ‘We must move from separate departments towards one imaging centre. We need new training programmes, a flat organization, interlinked reimbursements and no turf battles. Let’s work as a team.’

Healthcare-in-Europe
http://tinyurl.com/qfcbrh5

Analysis compares stent expansion achieved with guidance from optimal coherence tomography versus intravascular ultrasound

Data from the ILUMIEN II trial found that guidance from optimal coherence tomography (OCT) was associated with comparable stent expansion as guidance from intravascular ultrasound (IVUS) in patients undergoing percutaneous coronary intervention (PCI). Coronary stents must be optimally deployed with full lesion coverage and complete stent expansion to optimize outcomes. Less than full expansion can result in stent thrombosis or restenosis. Previous studies have found that the strongest predictor of stent thrombosis and restenosis is the minimum stent area (MSA) achieved after PCI.

Advanced imaging techniques, such as IVUS and OCT, help cardiologists to measure, place, and expand the stent with optimal precision. By achieving greater stent luminal dimensions, IVUS-guidance has been associated with improved event-free survival compared to angiographic guidance alone. Compared to IVUS, OCT has superior resolution but does not penetrate as deeply into the arterial wall. Consequently it has limitations in assessing the true diameter of the native artery. It is unknown whether stent expansion, a surrogate of clinical outcomes, is as great with OCT-guidance as with IVUS-guidance.

ILUMIEN II was a prospectively planned, retrospective comparison of OCT-guidance in ILUMIEN I and IVUS-guidance in ADAPT-DES. The overall study population initially included a total of 940 patients (one lesion randomly chosen per patient; 354 from ILUMIEN I and 586 from ADAPT-DES). After 1:1 propensity matching, 286 patients/lesions from each group were analyzed (n=572). Both the OCT and IVUS analyses were performed by the CRF Clinical Trials Center.

The primary endpoint was post-PCI stent expansion (%)(defined as the minimum stent area (MSA) divided by the mean reference lumen area as assessed by OCT in ILUMIEN I and by IVUS in ADAPT-DES). The secondary endpoints were the following IVUS and OCT core lab measures:

Mean stent expansion (defined as stent volume/stent length divided by the mean reference lumen area);

Prevalence of major edge dissection (≥3 mm in length);

Prevalence of major stent malapposition (malapposition distance/luminal diameter ≥20%).

The secondary endpoint using angiographic core lab measures (independent of technique) was post-PCI mean lumen diameter (MLD), percent diameter stenosis, and acute gain. The post-PCI stent expansion was 72.8% [63.3, 81.3] in the OCT-guided group compared to 70.6% [62.3, 78.8] in the IVUS-guided group (p=0.29). Similar rates of major stent edge dissection (2.4% vs. 1.0%, p=0.29) and major stent malapposition (1.4% vs. 0.7%, p=0.69) occurred in both groups.

“In this comparison of patients undergoing OCT-guided stenting from ILUMIEN I and IVUS-guided stenting from ADAPT-DES, OCT-guidance was associated with comparable stent expansion, slightly greater in-segment percent diameter stenosis, and similar rates of major stent malapposition, tissue protrusion, and stent edge dissection as IVUS-guidance,” said Gregg W. Stone, MD, the lead investigator. Dr. Stone is Co-Director of CRF’s Medical Research and Education Division. He is also Professor of Medicine at Columbia University College of Physicians and Surgeons and Director of Cardiovascular Research and Education at the Center for Interventional Vascular Therapy at New York-Presbyterian Hospital/Columbia University Medical Center.

“Because this was a retrospective comparison from two separate study databases, with different patients, sites, and operators, additional research is needed to confirm these findings. The results of angiography-guided, IVUS-guided and OCT-guided stent implantation are currently being evaluated in a prospective, multicenter randomized trial - ILUMIEN III: OPTIMIZE PCI.”

Cardiovascular Research Foundation
http://tinyurl.com/ooqmn6
第74届中国国际医疗器械(秋季)博览会
The 74th China International Medical Equipment Fair (CMEF Autumn 2015)
第21届中国国际医疗器械设计与制造技术(秋季)展览会
The 21st International Component Manufacturing & Design Show (ICMD Autumn 2015)

2015年10月18-21日
Oct. 18th-21st, 2015
武汉国际博览中心
Wuhan International Expo Center
**New method for investigating and classifying liver tumours**

Adenomas are rare liver tumours, a certain percentage of which can become malignant. Using a new MR (magnetic resonance) technique at MedUni Vienna, it is now possible to classify adenomas without subjecting patients to invasive tissue sampling procedures.

Hitherto patients have had to undergo biopsy to take tissue samples for histological examination in order to determine whether a hepatocellular adenoma is benign or potentially malignant. Using a new imaging technique at the University Department of Radiology and Nuclear Medicine at MedUni Vienna (Christian Herold), this type of tumour can now be clearly classified by means of a liver-specific MR contrast agent.

Adenomas of the liver are relatively rare. They can develop in different ways. Hence there are three subtypes (benign, inflammatory, pre-malignant) and a fourth unclassifiable subgroup with different clinical courses and potential progression. It is now possible to determine which group a particular adenoma belongs to using a new MR imaging technique.

The liver-specific contrast agent, gadoxetic acid, targets the bile transporters OATP (organic anion-transporting polypeptide) and MRP (Multidrug Resistance-Related Protein) in adenoma cells and normal liver cells. These will either absorb the agent or re-excrete it. The tumours can then be classified on the basis of the relative proportion of these surface transporters as compared to normal liver cells, as shown in the MR image.

"This new investigation technique enables us to evaluate the nature of an adenoma without the need for invasive sampling," explains Ahmed Ba-Ssalamah of the MedUni Vienna Department of Radiology and Nuclear Medicine at Vienna General Hospital, "and that is less stressful for patients. Moreover, this method opens up new avenues, in terms of research, so that we can gain a better understanding of the biology of adenomas and other liver tumours."

**Minimally-invasive procedure provides high-risk patients with advanced option for treatment of aortic stenosis**

NYU Langone Medical Center became the first academic medical centre to implant a newly FDA-approved heart valve for transcatheter aortic valve replacement (TAVR) in patients with severe aortic stenosis. Mathew R. Williams, MD performed the TAVR procedure and the patient was discharged to her home only two days later. Five additional patients have successfully undergone the procedure since then.

“We’re excited to be the first centre to use the new TAVR technology, which is the most advanced option for patients with severe aortic stenosis who are at high risk or unable to have open-heart surgery,” said Dr. Williams, a cardiac surgeon in the Department of Cardiothoracic Surgery at NYU Langone, chief of Adult Cardiac Surgery, and director of Interventional Cardiology and Structural Heart. Because the newly FDA-approved heart valve is recapturable and repositionable, accuracy in placement and control during the procedure is increased. In addition, the valve is smaller than previous generations of valves. A physician using the new TAVR technology can optimize the outcome of the procedure, which means that more complex patient cases can be treated, and many will leave the hospital more quickly.

“A main benefit of this type of procedure is the fact that it helps patients who aren’t surgical candidates or are at high risk for surgery,” says Dr. Williams. “After this procedure, in many cases patients can leave the hospital in one or two days, and most start to feel better immediately afterwards. The rapid recovery with this type of procedure is a huge benefit.”

**3D printing helps doctors rehearse complex brain procedures**

Boston Children’s Hospital physicians report the first cases of children benefiting from 3D printing of their anatomy before undergoing high-risk brain procedures. The four children had life-threatening cerebrovascular malformations (abnormalities in the brain’s blood vessels) that posed special treatment challenges.

Reporting online the physicians describe the use of 3D printing and synthetic resins to create custom, high-fidelity models of the children’s vessel malformations along with nearby normal blood vessels. In some cases, the surrounding brain anatomy was also printed.

“These children had unique anatomy with deep vessels that were very tricky to operate on,” says Boston Children’s neurosurgeon Edward Smith, MD, senior author of the paper and co-director of the hospital’s Cerebrovascular Surgery and Interventions Center. “The 3D-printed models allowed us to rehearse the cases beforehand and reduce operative risk as much as we could.”

The children ranged in age from 2 months to 16 years old. Three of the four children had arteriovenous malformations (AVMs), in which tangles of arteries and veins connect abnormally, and were treated surgically. “AVMs are high-risk cases and it’s helpful to know the anatomy so we can cut the vessels in the right sequence, as quickly and efficiently as possible,” says Smith. “You can physically hold the 3D models, view them from different angles, practice the operation with real instruments and get tactile feedback.”

The 2-month-old infant had a rare vein of Galen malformation in which arteries connect directly with veins—bypassing the capillaries—and was treated with an interventional radiology technique to seal off the malformed blood vessels from the inside.

“Even for a radiologist who is comfortable working with and extrapolating from images on the computer to the patient, turning over a 3D model in your hand is transformative,” says Darren Orbach, MD, PhD, chief of Interventional and Neurointerventional Radiology at Boston Children’s and co-director of the Cerebrovascular Surgery and Interventions Center. “Our brains work in three dimensions, and treatment planning with a printed model takes on an intuitive feel that it cannot otherwise have.”

The life-sized and enlarged 3D models were created in collaboration with the Boston Children’s Hospital Simulator Program (SIMPeds) using brain magnetic resonance (MR) and MR arteriography data from each child. Measurements of the models showed 98 percent agreement with the children’s actual anatomy.

All four children’s malformations were successfully removed or eliminated with no complications. When two of the AVM patients were compared with controls who did not have 3D-printed models—matched for age, size and type of AVM, surgeon and operating room—those with 3D models had their surgical time reduced by 12 percent (30 minutes). (Actual surgical time was 254 and 257 minutes for the cases with 3D models and 285 and 288 minutes for the controls.) Even a 30-minute reduction is significant for children who are especially sensitive to anesthesia.

Boston Children’s Hospital
http://tinyurl.com/qaqjvhg

**INTERVENTIONAL RADIOLoGY NEWS**

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NYU Langone Medical Centre
http://tinyurl.com/ozykm9j

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Boston Children’s Hospital
http://tinyurl.com/qaqjvhg
Cardiovascular disease (CVD) is a major cause of death and disability across the world. In recent decades, the battle against CVD has focused on prevention, with the management of lifetime cardiovascular (CV) risk superseding treatment of individual cardiovascular (CV) risk factors. Such a strategy in turn is anchored in two complementary approaches - a population-based one promoting community health (e.g. anti-smoking campaigns, diet and nutritional management) and a clinical approach targeted at high-risk individuals.

Complexity of risk factors
In spite of this, CVD management remains less than optimal - even in countries with advanced and well-funded healthcare systems. In 2007, the authors of an article in the 'Journal of Vascular Health and Risk Management' observed: “Effective implementation of the knowledge, treatment guidelines, diagnostic tools, therapeutic interventions, and management programs that exist for CVD continues to evade us.” One reason for such a situation is that CVD results from the complex interplay of biological, socio-economic and environmental factors. These factors are not constant in at-risk patients. In addition, the increased CVD risk from multiple risk factors is frequently greater than simply their sum. Finally, in spite of “declines in the prevalence of most major CVD risk factors, low-risk status remains rare” among adults.

Moving out of siloed management
Reflecting the above, the management of CVD too has been in a state of flux. Previously, CVD management centred on the modification of single risk factors, such as hypertension. The mid-2000s saw a spate of calls to move away from this siloed approach. One of the first major moves to concurrently target multiple risk factors by lifestyle and therapeutic interventions was announced in 2005 by the Joint British Societies (JBS), which brings together the British Cardiac Society, British Hypertension Society, Diabetes UK, HEART UK, Primary Care Cardiovascular Society and The Stroke Association. Many experts have strongly endorsed such a change of perception and believe that a multifactorial approach will “become the cornerstone of how CVD is viewed, assessed, and ultimately managed.”

CVD Risk Assessment Tools
At present, some of the best known tools for assessing CVD risk consist of the US-developed Framingham System, the World Health Organization (WHO)/International Society of Hypertension (ISH) risk charts, Germany’s PROCAM (PROspective Cardiovascular Munster) Quick Check and Health Check, the European Systematic Coronary Risk Evaluation (SCORE) charts and the British QRISK2. These tools are used to identify patients who need to be recalled and assessed in more detail to reduce CVD risk. They are also incorporated in guidelines for the clinical management of dyslipidemia, hypertension, and dysglycemia.

The Framingham System
The Framingham System was derived from North American populations in the 1960s to 1980s when coronary heart disease (CHD) was at its peak. As a result, it overestimates risk in contemporary European populations by around 100% in Southern European populations and by 50% or more in Northern European populations. In spite of such concerns, it is currently reported to be transportable (with calibration) “to culturally diverse populations in Europe, the Mediterranean region, and Asia.”

The WHO / International Society of Hypertension
The WHO/International Society of Hypertension (ISH) risk charts use data on sex, age, systolic blood pressure, smoking status, diabetes and total blood cholesterol to predict a 10-year absolute risk of stroke and heart attack in adults aged 40-79 years. The results are colour-coded and easy to use. Charts which allow for estimating CV risk without measuring blood cholesterol have been developed for low resource settings. Alongside risk estimates, the presence of established heart disease, stroke, peripheral vascular disease and/or diabetes is used to guide the physician in making decisions such as anti-hypertensive, lipid-lowering, or anti-platelet therapy.
PROspective Cardiovascular Münster (PROCAM)
The PROCAM Quick Check and Health Check systems provide an estimate of risk for two types of cardiovascular events, namely myocardial infarction (whether or not fatal) and sudden coronary death, for men and women aged 20-75 years. It was initiated in 1979 and involved over 20,000 participants drawn from 52 companies and government offices in the Münster and northern Ruhr areas of Germany. The subjects were followed up for 22 years. PROCAM Quick Check allows an assessment of coronary risk without laboratory testing, while PROCAM Health Check includes results from laboratory tests (both low- and high-density lipoprotein cholesterol, triglycerides, and blood glucose). Measurements of glucose and triglycerides lead to differences in results between PROCAM and other CVD risk assessment tools.

Systematic Coronary Risk Evaluation (SCORE)
The SCORE system is based on pooling data from 12 European prospective studies and includes five parameters (sex, smoking status, systolic blood pressure, total cholesterol and age). It seeks to define the absolute 10-year probability of any fatal cardiovascular event for men and women in the 40-65 age group. Like the WHO/ISH system (see above), SCORE also consists of colour-coded risk charts. Separate charts cover high- and low-risk regions of Europe. In recent years, more explicit clinical priorities have also been developed. Emphasis on terms such as ‘primary’ and ‘secondary’ prevention have been reduced, given that risk is a continuum and asymptomatic persons may have investigational evidence of atherosclerotic disease. Patients with established CVD and diabetes are placed in the high-risk group without a calculation of their risk, and a risk of CVD death of 5% or greater among the other participants is considered to be at increased risk. SCORE is used in CVD management guidelines from the European Society of Cardiology, the European Atherosclerosis Society and the European Society of Hypertension.

QRISK2
QRISK2 has been in use across the National Health Service since 2009. It was developed by academics and physicians on the basis of researching electronic health records of over 10 million patients registered with 550 general practices. The findings were published in the British Medical Journal in 2008. QRISK2 estimates the risk of people in the 25-84 age group developing CVD over the next 10 years. One of the goals of its developers is to go beyond Framingham scores. Although, like the latter, it takes account of age, sex, cholesterol/HDL ratio, blood pressure, diabetes and smoking history, it also contains important additional risk factors such as ethnicity, family history, socio-economic status, body mass index and conditions such as rheumatoid arthritis and chronic kidney disease.

No definitive correlation between use of tools and outcomes
In spite of initiatives such as QRISK2 (which seek to address some key shortcomings of CVD risk assessment tools), critics remain concerned about other, more structural challenges - for example, the fact that algorithms underlying risk estimates differ in thresholds indicating high risk, in the base population, dataset sample sizes and age ranges. The accuracy of estimates is also influenced by the number of risk factors assessed and the selected end points (e.g. events or deaths, CHD or CVD). The biggest drawback is a paucity of research to support the belief that outcomes improve after the introduction of CVD risk tools and clinical guidelines. For example, in 2010, an evidence-based review of 18 studies on CHD (including 14 clinical trials) found that risk information “may increase intent to initiate CHD prevention among individuals at moderate to high risk” while its effect “on more distal outcomes is less clear and seems to be related to the intensity of accompanying interventions.” The authors concluded that the effect of total risk assessment on long-term clinical outcomes, including maintenance of therapies, remained unclear. Nevertheless, demand for further research on risk tools and outcomes also faces its own challenges. Some recent studies found only ‘modest’ improvement in risk prediction models after the addition of extra risk factors.

The promise of imaging technologies
In the light of the above, some specialists are proposing moving away from CVD ‘screen and treat’ to ‘screen, diagnose and treat’, whereby the risk assessment is used as a first (screening) step to identify high- and intermediate-risk patients. A second (diagnostic test) step then aims to decide on treatment. Imaging technologies offer a way to make such a transformation possible.

MRI
MRI of atherosclerotic vessel walls, for example, has the ability to non-invasively evaluate multiple biomarkers of the disease such as luminal stenosis, plaque burden, tissue composition and plaque activity. A study in 2014, led by Dr. David Bluemke, director of radiology and imaging sciences at the US National Institutes of Health (NIH), found that MRI imaging of carotid artery plaque can “accurately predict future cardiovascular events like strokes and heart attacks in people without a history of cardiovascular disease.” This is because MRI can discern features of vulnerable plaque, such as a lipid core with a thin fibrous cap, which increases the likelihood of rupture.

The choice of imaging modality is however large. In addition to magnetic resonance, several other imaging approaches, including B-mode ultrasound and computed tomography, have been proposed to evaluate atherosclerotic plaques.

Ultrasound, CT and others
B-mode ultrasound can measure intima-media thickness (IMT) in the carotid arteries, and since two decades, it is known that a rise in IMT is associated with increased overall CVD risk. IMT was in fact successfully used in clinical trials in the mid-1990s for risk assessment and drug therapy evaluation. Nevertheless, IMT measurement has several limitations: it studies the thickness of only one layer of the vessel wall and is not a direct measurement of plaque. Furthermore, accuracy of measurement is limited by the plane of acquisition and imaging angle.

On its part, computed tomography (CT) can detect and quantify plaque calcification. However, its scope is limited due to radiation risk as well as its inability to detect other plaque components. Other imaging modalities, such as positron emission tomography (PET) and optical coherence tomography (OCT) have also been studied, but they are mainly restricted for use as research tools since the early 2000s. Although the recent NIH study (mentioned above) seems to have swung the verdict in favour of MRI, its lead author, Dr. David Bluemke of the NIH, believes that availability and cost effectiveness might lead to more efforts to develop ultrasound and CT as viable alternatives for screening, especially given improvements in CT dose reduction.
For more than four decades, SCHILLER has been committed to the fight against sudden cardiac death. While the most established manufacturers still sold heavy and bulky emergency devices, SCHILLER launched a handy emergency electrocardioscope that was ten times lighter. In one stroke the company not only made a name for itself, but also set new standards. Two years later, the smallest emergency ECG device with integrated printer followed. A built-in microcomputer allows the automatic measurement and interpretation of the ECG. This in turn enables the early detection of heart disorders. Thanks to suitable therapies and rehabilitation measures, physicians can thus protect people of all age groups from sudden cardiac death.

As success grew, so did the product portfolio: devices such as blood-pressure monitors and spirometers came to complete the offer, while complete diagnostic stations and monitoring devices are now being produced for clinics and medical practices.

Similar to the product line, the production sites and competence centres also expanded. In addition to the headquarters in Baar (Switzerland), a competence centre has been established in Wissembourg (France), specializing in the fields of defibrillation and monitoring. Further on, another competence centre opened up in Graz (Austria). The company medilog became part of the SCHILLER group.

This new alliance allowed SCHILLER to acquire additional know-how in the field of high-end long-term ECG and to remain in the leading position. The next major step was achieved in 2014, through the alliance with the company GANSHORN, specialized in the field of pulmonary function diagnostics. At a time when pulmonology and cardiology are moving closer together, smart and combined solutions are required. Both leading companies recognized this market need early on and consequently decided to consolidate their long-term collaboration. SCHILLER AG has now acquired the majority of the share capital of GANSHORN.

SCHILLER has developed unique products, such as FRED easyport®, the world’s smallest defibrillator, or the “Fire of Life” software, which analyses the autonomic nervous system. The HRV (heart rate variability) is analysed and the patient’s condition is displayed in the “Fire of Life” graphics. This graphics shows how well the patient can cope with stress and how he reacts to rest. This opens up completely new diagnostic possibilities, allowing for example to reduce the risk of a burnout.

However, resting on its laurels is not an option for SCHILLER because innovation is a priority for this Swiss company. One of the latest developments, for example, are the two newest ECG devices. The CARDIOVIT FT-1 and the CARDIOVIT AT-170, as described in the boxes on the right.

Swiss-designed innovative medical technology

SCHILLER was founded in 1974 by Alfred E. Schiller. Starting in a four-room flat as a one-man business, the company has become a successful group with around 1000 employees, 30 subsidiaries and a global sales network. Today, SCHILLER is a world-leading manufacturer and supplier of devices for cardiopulmonary diagnostics, defibrillation and patient monitoring as well as software solutions for the medical industry.

CARDIOVIT FT-1
Maximum performance in a compact electrocardiograph

Designed for users who value state-of-the-art technology SCHILLER's CARDIOVIT FT-1 offers:

• Power and flexibility of a PC in a portable ECG
• Bidirectional Wi-Fi communication to EMR
• Culprit Coronary Artery Algorithm™ for early STEMI detection

CARDIOVIT AT-170
Robust design with high-performance

SCHILLER's new high-end electrocardiograph completes the proven AT product range. It offers robust design for the busiest hospitals, as well as a combination of applications that makes it the ideal multi-use workstation for private practices.

• Wide high-resolution touch screen for easy ECG review
• Full-size keyboard with antibacterial protection
• Stress test option and 16-lead acquisition and analysis

www.schiller.ch
Guidance from the Resuscitation Council, the British Cardiovascular Society and the National Council for Palliative Care.

Clear challenges arise when people with an implanted device approach or reach the end of their life. What many people want in that situation is care and treatment to maintain their comfort and quality of life for whatever time they have left. Receiving treatment (for example electric shocks from an implanted defibrillator) as they are dying may provide no benefit but may cause them pain and may cause distress both to them and to those who care about them.

So as to provide the best care for people in the last days, weeks or months of their life it is important to consider deactivation of some of these devices. This requires informed and sensitive discussion with patients and those close to them. Healthcare professionals caring for such people may be faced with practical questions about the exact nature and purpose of each device, how the device can be deactivated and what arrangements are in place in their locality to provide the equipment and the expert support and advice needed. It is important also that healthcare professionals know what actions should be taken when someone has died with an implanted device in place.

Quite distinct from those circumstances, an implanted device may lead to uncertainty when someone with one in place suffers cardiac arrest, and cardiopulmonary resuscitation (CPR) is attempted. Those involved may not have detailed information about the implanted device and may be unsure whether they should modify their approach to CPR.

Dr David Pitcher, President of the Resuscitation Council (UK) says, “This important new document provides comprehensive guidance on what should be done when someone with one of these implanted electronic devices is approaching the end of their life, suffers sudden cardiac arrest or has died. It emphasizes the importance of good communication and of patients and their healthcare teams making shared decisions about their care whenever possible. The detailed guidance is supported also by a practical guide for health professionals on deactivation of implantable defibrillators and by an information leaflet for patients and carers.”

First 3D heart using multiple imaging techniques printed

Congenital heart experts from Spectrum Health Helen DeVos Children’s Hospital have successfully integrated two common imaging techniques to produce a three-dimensional anatomic model of a patient’s heart.

The 3D model printing of patients’ hearts has become more common in recent years as part of an emerging, experimental field devoted to enhanced visualization of individual cardiac structures and characteristics. But this is the first time the integration of computed tomography (CT) and three-dimensional transesophageal echocardiography (3DTEE) has successfully been used for printing a hybrid 3D model of a patient’s heart. A proof-of-concept study authored by the Spectrum Health experts also opens the way for these techniques to be used in combination with a third tool – magnetic resonance imaging (MRI).

“Hybrid 3D printing integrates the best aspects of two or more imaging modalities, which can potentially enhance diagnosis, as well as interventional and surgical planning,” said Jordan Gosnell, Helen DeVos Children’s Hospital cardiac sonographer, and lead author of the study. “Previous methods of 3D printing utilize only one imaging modality, which may not be as accurate as merging two or more datasets.”

The team used specialized software to register images from the two imaging modalities to selectively integrate datasets to produce an accurate anatomic model of the heart. The result creates more detailed and anatomically accurate 3D renderings and printed models, which may enable physicians to better diagnose and treat heart disease.

Spectrum Health
http://tinyurl.com/p52zyf

Few older heart patients complete cardiac rehab

A recent study led by DCRI Fellow Jacob Doll found that approximately two-thirds of the patients who were referred to rehabilitation did not attend an initial session.

Cardiac rehabilitation programmes include a mixture of exercise regimens, health education, and cardiovascular risk reduction and medication adherence support. These programmes, which typically comprise 2 to 3 weekly sessions for a total of 36 sessions, are associated with improvements in lifestyle, functional capacity, and quality of life for older adults. Despite this, rates of referral and adherence have traditionally been low, particularly in older adults.

In this study, Doll and his colleagues used data from the National Cardiovascular Data Registry Acute Coronary Treatment Intervention Outcomes Network Registry and Medicare claims to identify 58,269 patients 65 years or older who had a heart attack between 2007 and 2010. Of these patients, 36,376 (62.4 percent) were referred to cardiac rehabilitation. Only 11,862 patients (32.6 percent) attended at least one rehab session during the

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Spectrum Health
http://tinyurl.com/p52zyf

Poor ‘Real-world’ adherence to BP meds ups heart-failure risk

Although non-adherence to medication is common in patients with newly diagnosed hypertension, those with greater compliance may have a lower risk of early heart failure, according to a new study from Italy.

Specifically, in 6.6 years of follow-up, compared with patients who filled their prescriptions less than a quarter of the time those who filled their prescriptions more than three-quarters of the time had a 34% lower risk of being hospitalized for heart failure. The inverse relationship between drug adherence and hospitalization for heart failure was similar in 71- to 80-year-olds vs 40- to 70-year-olds. ACE inhibitors, angiotensin-receptor blockers (ARBs), and diuretics protected patients against heart failure, but calcium-channel blockers did not.

This research shows that “in the real-life setting, achieving a suitable adherence with antihypertensive medications is effective for the primary prevention of hospitalization for heart failure,” Dr Giovanni Corrao (University Milano-Bicocca, Milan, Italy) and colleagues write.

Thus, adherence to antihypertensive medications needs to be improved, which should be “a fundamental goal to pursue for protecting patients against HF,” the authors write.

Medscape
http://tinyurl.com/p52zyf
year following hospital discharge. Of those who had not been referred, 1,795 (8.2 percent) attended at least one session.

Only about 5 percent of the patients completed all 36 sessions, even though the sessions are usually covered by insurance. These findings, the study’s authors concluded, illustrate the need for hospitals to improve not only referral rates but also to address barriers to participation. These include transportation difficulties, complicated co-payment systems, and a lack of co-ordination between inpatient and outpatient physicians. They also recommended that hospitals explore alternative methods of providing cardiac rehabilitation, such as home-based programmes.

Duke Clinical Research Institute
http://tinyurl.com/q5qqsr7

Restrictive ruling on cardiac procedure

In the future, TAVIs can only be carried out in German hospitals with cardiac surgery departments and cardiac wards, as decided by the German Government’s Expert Panel on Health (G-BA) last January. An interim arrangement in force until 2016 is anticipated for Heart Centres that currently carry out the TAVI procedure without cardiac surgery departments on site. The Federal Ministry of Health is still to confirm this decision. The interdisciplinary G-BA justified a decision to restrict TAVI procedures to hospitals with cardiac surgery departments and wards by stating that complications following the procedure cannot be ruled out, and that in-patient aftercare provided by heart surgeons is therefore a necessity. The decision was taken in the context of a new G-BA guideline that sets minimum standards for minimally invasive aortic valve interventions in German hospitals.

Heart surgeons have therefore asserted themselves over their cardiologist colleagues with a demand that TAVIs should only be carried out in heart centres with cardiac surgery on-site, as per recommendations defined in the European Guidelines on Management of Valvular Heart Disease. In a position paper published last year, the cardiologists had argued in favour of allowing heart centres without cardiac surgery departments on-site to continue performing these interventions under certain conditions and in the presence of a cardiac surgeon.

As expected, when the decision was announced Professor Jochen Cremer, President of the German Society for Thoracic and Cardiovascular Surgery (DGTHG), welcomed this move. Professor Christian Hamm, President of the German Cardiac Society (DGK) also views the G-BA guidelines, along with the mentioned quality criteria listed in the DGK position paper, as a positive contribution towards quality assurance for TAVIs in Germany.

Health care in Europe
http://tinyurl.com/pobkaocm

First gene that causes mitral valve prolapse identified

An international research collaboration led by Massachusetts General Hospital (MGH) investigators has identified the first gene in which mutations cause the common form of mitral valve prolapse (MVP), a heart valve disorder that affects almost 2.5 percent of the population. The research team reports finding mutations in a gene called DCHS1 in affected members of three families in which MVP is inherited.

“This work provides insights into the pathways regulating valve growth and development and implicates a previously unrecognized basis for the long-term structural integrity of the mitral valve,” says senior author Susan A. Slaugenhaupt, PhD, scientific director of the MGH Research Institute.

Robert Levine, MD, of the MGH Corrigan Minehan Heart Center, co-senior author of the paper, says, “This finding can teach us how to prevent this inborn disease from manifesting as an illness in people who inherit mutated forms of this gene. Understanding how defects in this gene cause errors in early valve formation can point to ways we can prevent the progression of this condition to keep the valve and the heart healthy and help the patient avoid complications.” The other MGH co-senior author – David Milan, MD, of the MGH Cardiovascular Research Center – led studies of gene impact on the heart in zebrafish models.

One of four valves controlling the flow of blood through the heart, the mitral valve lies between the left atrium and the left ventricle, which handle oxygenated blood returning from the lungs. The valve consists of two leaflets that open to let blood pass through and close to keep it from moving backwards. In MVP, the leaflets become thickened, elongated and floppy, preventing the valve from closing completely and allowing blood to leak backwards in a process called regurgitation. Patients with serious MVP can develop shortness of breath, cardiac arrhythmia, heart failure or an infection of the heart valves; and MVP is the most common reason for mitral valve surgery.

Massachusetts General Hospital
http://tinyurl.com/rqmkq6l

Atrial fibrillation patient website launched in Italian and Spanish

The atrial fibrillation patient website AFib Matters has been launched in Italian and Spanish by the European Heart Rhythm Association (EHRA), a registered branch of the European Society of Cardiology (ESC).

Italian version: www.fibrillazionetatraile.org
Spanish version: www.fibrilacion-auricular.org

“Atrial fibrillation is a global phenomenon,” said Professor Gregory YH Lip, who was chairman of the task force that initially developed www.afibmatters.org. “Patients and their carers have many questions and requests for information. The new translations will reach out to even more patients and carers.”

Atrial fibrillation is the most common cardiac rhythm disorder and affects 1.5-2% of the general population in the developed world. More than 6 million Europeans suffer from atrial fibrillation but the prevalence is expected to at least double in the next 50 years as the population grows older.

Atrial fibrillation substantially increases the risk of stroke, heart failure and impaired cognitive function including dementia. When strokes occur in patients with atrial fibrillation they are associated with more death and disability, longer hospital stays, and less chance of returning home.

AFib Matters was designed to provide clear, reliable information and practical advice to patients with atrial fibrillation, their families and carers. It outlines what atrial fibrillation is, symptoms, complications, treatment with drugs, ablation and devices, and the need for stroke prevention. The website was written by expert clinicians and patient representatives and has been visited 468,858 times since its launch in June 2013.

The Italian and Spanish translations join the English, German and French websites. Patients in Italy and Spain can use the dedicated URLs or visit www.afibmatters.org and be automatically redirected to the translated website.

ESC
http://tinyurl.com/ogqznzk
Development, empowerment and accountability of front line employees

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ABSTRACT: Facilitating patient-focused, cost-effective care throughout the continuum is a challenge that requires creativity of healthcare administrators. At BLK Super Specialty Hospital, a Guest Relationship Executive (GRE) and Patient Care Coordinator (PCC) role was developed to improve communication and linkage among clinical and non-clinical departments. Management also innovated various other processes which needed improvement for facilitating the improvement of services provided to the patients. Empowering PCC and GRE to take the initiative, make decisions and take actions to prevent and resolve service issues has elevated service levels and lead to an enhanced patient experience.

Mettez en place des Plans Stratégiques qui réussissent : Une Formule Simple
La planification stratégique est un processus. Pour penser planification stratégique, il faut imaginer son développement et sa conception comme une structure qui permettra à votre hôpital de naviguer au fil du temps à travers des environnements internes et externes changeants. Bien que le processus de planification stratégique puisse paraitre décourageant, il suffit de suivre une formule simple consistant en cinq étapes selon le procédé mnémonique B.E.G.I.N. (Begin, Evaluate, Goals & Objectives, Integration, and Next steps) qui permettra de gérer plus facilement le processus de planification, et de favoriser votre réussite.

Saving lives together

ALIYAH KAREN
CEO OF THE MAA MEDICARE CHARITABLE FOUNDATION (MEDICARE) – MALAYSIA

ABSTRACT: Established 20 years ago with a single dialysis center assisting only 20 patients with 6 hemodialysis machines, Medicare has grown leaps and bounds to assist thousands of poor patients to obtain a highly subsidized rate for quality treatment. Millions of ringgit raised via various fundraising projects and events have been well utilized to serve the growing
number of kidney patients in Malaysia who simply cannot bear the exorbitant cost of treatment. Staying true to its mission, Medicare extends its assistance to needy kidney patients and their families, who indirectly have become part of the Medicare family.

Sauver des vies ensemble
Fondée il y a 20 ans avec un seul centre de dialyse qui aidait seulement 20 patients pour 6 machines d’hémodialyse, Medicare a beaucoup grandi et prend désormais en charge des milliers de patients pauvres et les aide à obtenir un taux fortement subventionné pour un traitement de qualité. Des millions de Ringgit malaisiens récoltés grâce à différents projets de collecte de fonds et événements ont été correctement utilisés pour venir en aide au nombre croissant de patients souffrant d’insuffisance rénale en Malaisie qui ne peuvent tout simplement pas supporter les coûts exorbitants des traitements. Fidèle à sa mission, Medicare étend son aide aux patients nécessiteux souffrant d’insuffisance rénale et à leur famille, qui indirectement sont devenus des membres à part entière de la famille Medicare.

Quality improvement initiatives by Aga Khan Health Service in the mountains of northern Pakistan

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ABSTRACT: Improving health care quality in a resource constraint environment in an emerging economy that is in a hard-to-reach geographic terrain can become a challenge especially when it has to follow the international standard which AKHS, P envisions to implement across the nation in all of its health facilities. Healthcare of the nation is a responsibility which is shouldered by both the government and the private sector. Private sector, however, remains under pressure as its resource size is limited and it remains subject to stringent regulation and quality control requirements regardless of whether it is in the remotest corner of the country where proper road routes are either lacking or not safe. This article shares the unique experience of AKHS, P in achieving ISO 9001:2008 International Quality Management System Certification. Particularly at one of the world’s highest valleys — situated at Gilgit Baltistan at an altitude of 13,083 ft. above sea level in Northern Pakistan. The experience was unique in terms of demonstrating and recording how a quality management system can be implemented in one of the most difficult to reach areas where compliance to international quality standards was previously unthinkable.

Initiatives pour l’Amélioration de la Qualité par le Service de Santé Aga Khan Health Service dans les montagnes du Nord du Pakistan

Améliorer la qualité des soins de santé dans un environnement aux ressources limitées, avec une économie émergente et sur une zone géographique difficile d’accès, peut devenir un véritable défi notamment lorsqu’il faut respecter les normes internationales que l’AKHS, P prévoit de mettre en place dans tous les établissements de santé du pays. La santé du pays est une responsabilité qui est soutenue à la fois par le gouvernement et le secteur privé. Cependant, le secteur privé reste sous pression car ses ressources sont limitées et il reste soumis à des exigences de contrôle qualité et des normes contraignantes qui ne prennent pas en compte le fait que l’établissement soit situé dans la zone la plus reculée du pays où les routes terrestres appropriées sont absentes ou non sécurisées.

Cet article fait partager l’expérience unique d’AKHS, P pour obtenir la Certification Internationale du Système de Management de la Qualité ISO 9001:2008. En particulier dans une des plus hautes vallées du monde située à Gilgit Baltistan à environ 4000 m d’altitude au nord du Pakistan. Cette expérience fut unique et a permis de démontrer et de décrire comment un système de management de la qualité peut être mis en place dans une des zones les plus difficiles d’accès, où le respect des normes de qualité internationales était auparavant impensable.

Built environment and wellbeing in Italian psychiatric wards

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If you are interested in this journal visit www.ifh-flh.org/Publications World Hospitals and Health Services Vol 51 No.1
ABSTRACT: The healthcare built environment has effects on patient’s wellbeing. These effects are even heavier on sensitive patient such as psychiatric ones. Therefore the environment design can be a key factor in promoting the patients’ well-being and the care process. This paper investigates how this vision is influencing the design of psychiatric facilities in the Italian context, known for its radical innovation of mental health services due to Law 180 (1978). The article identifies the current built environment issues of the psychiatric ward, the design indications available and the possible future actions to meet the needs of users and to improve wellbeing and care process. Keywords: mental care facilities, psychiatric ward, healing environment, healthcare design.

Environnement bâti et bien-être dans les services psychiatriques italiens

L’environnement bâti dans les services médicaux a un impact sur le bien-être des patients. Ces effets sont d’autant plus prononcés sur les patients sensibles tels que ceux atteints de troubles psychiatriques. C’est la raison pour laquelle la conception de l’environnement peut être un facteur clé pour promouvoir le bien-être et le processus de soins des patients. Cet article permet de comprendre comment cette vision influence la conception des établissements psychiatriques dans le contexte italien, connu pour ses innovations radicales en matière de services de santé mentale suite à la Loi 180 (1978). L’article identifie les problèmes liés à l’environnement bâti actuel dans les services psychiatriques, les solutions de conception adéquates et les possibles actions futures à engager pour répondre aux besoins des usagers et améliorer leur bien-être ainsi que le processus de soins.

Fast track surgery, a strategy to improve operational efficiency in a high-complexity hospital in Latin America

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ABSTRACT: Fast Track surgery is designed to optimize time in low-complexity procedures, thus improving efficiency in care provision, and preserving patient safety. METHOD: Before and after intervention study in a surgical setting, with failure mode and effects analysis, identification and prioritization of improvement opportunities, process measurement before the intervention, improvement implementation, practical application, process measurement after the intervention, and surgical time comparisons. RESULTS: With the Fast Track program, 19% of the operating room capacity available was freed per day; before surgical FastTrack implementation, 50% of the procedures started 23 minutes behind schedule. After the Fast Track program was implemented, procedures start 5 minutes ahead of schedule. Anesthesia induction time was reduced by 50%, and skin-to-skin surgical time dropped by 28%. The number of surgical procedures performed in the day increased by 33-50%. There were no incidents or adverse events. CONCLUSIONS: Fast Track surgery is a useful strategy for improving operating room efficiency and reducing surgical time. Procedures start on time, with increased timely care, patient and practitioner satisfaction, and lower service costs. Key Words: Fast track, Operating room, Safety, Effectiveness, Surgery.

La chirurgie Fast Track, une stratégie qui vise à améliorer l’efficacité opérationnelle dans un hôpital de haute complexité en Amérique latine

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The burden of neonatal mortality

The World Health Organization (WHO) estimates that more than 4 million neonates die each year, largely due to infections. Only 2% of these deaths, however, occur in industrialized countries. A principal reason for this is the availability of neonatologists and trained support staff in NICUs, which allow for the management of fetal-neonatal infections.

The burden of neonatal mortality (death in the first 28 days after birth) is also underlined by another yardstick. Overall, about 40% of deaths in children below 5 years in age are in this (28-day neonatal) period. Average neonatal mortality is about 30 times higher than the postnatal period (1-12 months of age).

Nevertheless, once again, the rate of neonatal mortality is significantly different in industrialized countries, as compared with developing ones. In Europe, the neonatal mortality rate was 2.73 per 1,000 live births in 2013. In the US, the corresponding figure was 4.04 in 2011.

Key challenges, the high-tech response

The key challenges faced by neonatologists in a NICU include chronic lung disease, bacterial/fungal infections, retinopathy of prematurity, intraventricular hemorrhage, necrotizing enterocolitis and periventricular leukomalacia. Others include respiratory distress syndrome (RDS), patent ductus arteriosus (PDA), sepsis and intracranial hemorrhage.

Arrayed against this swathe of life-threatening conditions is a staggering range of high-technology. Apart from imaging systems such as X-ray, ultrasound, CT and MRI, NICUs at European and US hospitals are typically equipped with the following: mechanical ventilators, endotracheal (ET) tubes, CPAP (continuous positive airway pressure) tubes, temperature probe coupled to warmers, blood pressure monitors (intermittent or continuous/catheter-based), cardiorespiratory monitors, pulse oximeters and transcutaneous oxygen/carbon dioxide monitors. Some NICUs also have extracorporeal membrane oxygenators (ECMO), which pumps blood from a baby’s vein through an artificial lung where oxygen is added and carbon dioxide removed, after which the blood is returned to the baby.

Most of this equipment is specially designed. For example, pulse oximeters need to be small enough to be taped to (premature) infants’ fingers, ET and CPAP tubes to go through their mouth and nostrils, respectively. Similarly, data acquisition sensors for other machines also must be miniaturized.

The sub-half kilo infant

By the year 2006, newborns weighing just 450 grams with 22 weeks gestation were considered to have a chance of survival provided a NICU was accessible. In modern NICUs, infants weighing more than 1,000 grams and born after 27 weeks gestation have an approximately 90% chance of survival, with the majority having normal neurological development.

A brief history of neonatology

The field of neonatology is relatively recent. The first NICU was established in New Haven, US, in 1960, and the American Board of Pediatrics established sub-board certification for neonatology in 1975. The methodologies and technology underpinning the NICU, however, date back to 1952, when Dr. Virginia Apgar, an American obstetrical anesthesiologist, compiled a scoring system to evaluate the effects of anesthesia on an infant. Soon after, mechanical ventilation permitted survival of ever-smaller newborns.

The next major milestone was the advent of pulmonary surfactant replacement therapy in the 1980s, which reduced chronic
lung disease, one of the complications of mechanical ventilation.

**Preterm babies and the NICU**

At present, an estimated 10-15% of babies born in industrialized countries are admitted into a NICU. The large majority of these are preterm or premature - usually defined as being born before 37 weeks of gestation. In both Europe and the US, the total number of babies born preterm is about half a million every year. Low birth weight (less than 2.5 kgs or 5.5 pounds) usually accompanies preterm births. Twins, triplets, and other multiples are also routinely admitted to the NICU, as they tend to be born earlier and smaller than single birth babies.

Premature birth remains the leading cause of death of children under 5. Figures from Europe show 60% of all infant deaths occur in infants born prematurely. The rate is approximately similar in the US, where two thirds of infant deaths occur among preterm infants, with costs of more than $26 billion (£23.5 billion).

Preterm birth is often accompanied by respiratory distress syndrome (RDS). This is a major and enduring challenge since infants with RDS have a high probability of other complications for the first 12 months of life - e.g. bronchopulmonary dysplasia and reactive airway disease, as well as heightened susceptibility to respiratory syncytial virus.

**Preterm birth rate: Europe and the US**

Meanwhile, the number of preterm births remains relatively high. Data from the European Perinatal Health Report show a prevalence rate of preterm birth at 7.1%. There are however wide variations, ranging from 5.5% (in Ireland) to 11.4% (in Austria). In addition, the figures are not considered to be authoritative; indeed, some believe them to be under-estimates. The US incidence of premature birth is well documented. This rose steadily from 9.4% in 1981 to 12.8% in 2006 - when there were 4.28 million neonates born in US hospitals - but the rate has since been declining. However, at 11.4%, it remains significantly higher than that in Europe. A campaign called "The March of Dimes" seeks to reduce the US preterm birth rate to 9.6% by 2020 and 5.5% by 2030. The American College of Obstetricians and Gynecologists explains the rise in preterm birth rates (until 2006) as the result of "a dramatic rise" in late preterm births (34 to 36-6/7 weeks of gestation). According to a study published in the October 1, 2013 issue of 'Pediatrics,' late preterm newborns were the fastest growing subset of neonates, accounting for approximately 74% of all preterm births and about 8-9% of total births. The figure in Europe is similar. For instance, late and moderately preterm (32 to 33-6/7 weeks) births "comprise 6-7% of UK births and 75% of all preterm births," according to a study last year.

US concerns on premature birth, however, resonate especially strongly, given the country’s relatively poor rankings in terms of infant mortality (47th in the world, according to the World Bank). A recent Stanford University paper cites the State of the World’s Mothers report (by Save the Children), and notes that every year "twice the number of US babies die on their first day alive than in all 27 European Union nations combined, although 1 million more are born there (4.3 million versus 5.3 million respectively).

**EU lacks preterm policy, data**

Nevertheless, the challenge of preterm births in Europe is also substantial. The European Foundation for the Care of Newborn Infants (EFCNI) observes that the question of preterm infant health is absent in the development of EU health and social policies. Indeed, EFCNI notes there is currently "no single source of up-to-date, comparable European data on the prevalence, mortality and morbidity associated with premature births" and that "official national sources of prematurity data do not appear to be available to decision-makers in a number of countries to support the development of neonatal policies."

EFCNI labels such gaps "surprising" given the "significant and rising prevalence of preterm births and related health complications in Europe."

Not everyone agrees with EFCNI - about a rising prevalence of preterm births. One recent study in the obstetrics and gynecology journal BJOG found that many European countries "had maintained or reduced rates of singleton preterm birth" since 1996, thereby challenging the widespread belief that "rising rates are the norm."

Nevertheless, it is clear that unless data sources are made more rigorous and comprehensive (as EFCNI urges), policy and regulatory support in the neonatal area is unlikely to be cohesive. Meanwhile, the challenge of wide variations across Europe in the per capita incidence of preterm births, discussed by the European Perinatal Health Report (see above), remains a major challenge for European policy makers.

**Improving neonatal outcomes**

Rather than just sophisticated technology and more NICUs, EFCNI has called for better neonatal health outcomes by increasing access to high quality maternal and neonatal health services, including specialized healthcare professionals, prevention programmes and dedicated neonatal transport services. It observes that EU member states with the most successful neonatal health policies are those which have provided this kind of improved access.

EFCNI also points to the fact that NICUs frequently lack adequate numbers of specialized healthcare staff (nurses and neonatologists), and that neonatal assistance in Europe is "often being provided without the necessary specialization." To cope with this, it urges EU national governments to implement policies aimed at improving the recruitment, education and training of NICU staff, including supporting development of a European postgraduate training programme in peri- and neonatology.

**Involving parents in the NICU**

An innovative approach to address the multiple challenges of NICU outcomes was made recently in Canada at a Toronto hospital. This centred on involving parents in developing, implementing and evaluating a nursing education programme to support family-integrated care. Six months into the programme, in October 2013, nurses reported that they had benefited from assessing the interface between nursing and parental responsibilities in infant care, learning about the parent experience in the NICU, and jointly devising developmental care strategies.

A parallel effort at the Toronto NICU focused on ‘veterans’ - parents of preterm infants previously discharged from the NICU who participated in the design and implementation of a pilot for the family-integrated care programme. Also included were 5 staff members (a physician, a NICU nurse, a parent education nurse, a lactation consultant, and a social worker). Once again, the results were encouraging. "Veteran NICU parents brought a wealth of wisdom and expertise developed through personal experience and played a significant role in both the initial development of the programme and in the provision of peer-to-peer support during programme implementation."


“Spare parts” for human beings: narrowing the gap between vision and reality

It sounds simple, but remains wishful thinking: “recreating” a new organ from a patient’s cells in order to heal serious illnesses and injuries. A group of researchers in Würzburg, Germany, has now developed systems which could make this vision become a reality a lot sooner. One of the keys to this is the right combination of incubator, cell system and bioreactor which the researchers employ to stimulate maturation of the cells and tissue development. The team uses an integrated and efficient combination of engineering software, Human Machine Interface devices and controller to automate and visualize this internationally ground-breaking solution.

by Marcel Roske & Dominik Schwab

When one thinks about Würzburg, the first things to come to mind may be the river Main, the impressive Residence palace or the vineyards that stretch all the way into the city. However, Würzburg is more than a city of culture and wine: it is also a city of science. The University of Würzburg is one of the oldest universities in the German-speaking world and has always been the preferred workplace of many renowned researchers, such as Wilhelm Conrad Röntgen who discovered the X-ray here in 1895. Scientific history may once again be in the making today in the classical buildings of the University located at the Röntgenring: several teams of researchers at the Chair of Tissue Engineering and Regenerative Medicine led by professor Heike Walles are currently working on generating new tissue and even entire organs from human cells. One goal of this research is to create implants from these cells to help patients with severe illnesses or injuries.

Just like a science fiction movie
Dr.-Ing. Jan Hansmann manages the Electronic-Tissue Interfaces junior research group belonging to the Chair of Heike Walles and is one of the researchers working on the development and production of such implants: “The core of our work at the institute is embedding human cells into a special, three-dimensional matrix where they mature. In this way, we can create different types of tissue, for example, a complete piece of skin with dermis, epidermis, stratum corneum and blood vessels or colon and lung tissue with the corresponding blood vessels and surfaces.”

A new organ created out of a test tube? What may sound like a science fiction movie can already be seen in one of the laboratories at the institute. Here, in a controlled environment, special reactors are housed in small incubators in which the respective tissue, for example a small lung, matures. “Unfortunately, it is not enough to simply place the cells into a Petri dish and wait,” explains Hansmann. “It is important to select a suitable matrix with the right structure and biochemistry. We use a matrix consisting of different proteins as platform, the so-called BioVaSc. This matrix offers the following benefits: it does not contain any substances which could trigger an immune reaction in the implant later, and it offers important surface molecules which make it easier to embed the cells and stimulate tissue development. In other words, it is an ideal breeding ground for the cells.”

Especially in complex implants such as a lung or skin, it is important that the tissue receives additional stimuli even during the maturation process so that it develops in such a way that it adapts to its future task/environment. These can be, for example, mechanical loads such as pressure differences caused by the simulation of the blood circulation.
or breathing as well as physical or chemical stimuli that the researchers introduce into the bioreactor by means of different media and nutrient solutions. It is important for the maturation and differentiation of the cells that the bioreactor and the organ, implant or tissue match perfectly. This is why the bioreactor and cell model are developed jointly in Würzburg, first with in-silico models – which means on the computer – and later as actual bioreactors with the corresponding control engineering. “This means we can control pumps, motors and sensors in the incubator as needed so that we can stimulate such biological processes in an optimal manner. A lung, for example, needs the stimulus from breathing to develop according to the loads it will encounter later, and a stratum corneum will only form when the skin tissue of the boundary layer is suspended between liquid and air,” explains Hansmann.

**Integrated automation solution supports research**

The team is relying on its own know-how and the proven technology from Siemens for automation of the incubators and the bioreactors. Each incubator is equipped with a SIMATIC HMI Comfort Panel which is used to conveniently call up measured values, analyse them, and operate all systems in the incubator. The controller is a distributed SIMATIC T200 I/O with its own CPU. Jan Hansmann developed this solution with his team during his time in Stuttgart and simply migrated it when moving to the new work group in Würzburg. The solution consisting of incubator and automation engineering is designed and built by the employees themselves. Fifteen of these systems are now available in the lab and more are planned. The employees in Würzburg are using the TIA Portal engineering environment for the configuration of the panels and controller. “The system is really simple and easy to understand. In our lab, we have to integrate many individual units into a continuous architecture – and with the flexibility of the TIA Portal, we can simply expand our equipment step-by-step while having a uniform system that has the same look and feel for the employees in the lab,” explains Hansmann further. “This makes dealing with the technology much easier and reduces the workload by about 50% as compared to our old engineering system. Another plus is the modular approach: different incubators use different modules and we can simply add these to the configuration as necessary. We implement the reusability of the previously developed blocks and operating screens very easily with the library concept in the TIA Portal.”

The operating screens for visualization and the blocks for control of the incubator can be saved in global libraries and are thus available at all times. The Simatic Comfort Panels ensure that the researchers have access to all important information at any time and can easily control the processes in the incubator.
available for other projects. The configuration can be simply expanded and adjusted for further development stages. “This means we were able to easily integrate the incubators into our IT landscape so that we can store the data of the trials on a central server and simply evaluate and analyse it later on the respective PC. The research data is backed up reliably and we can create an automatic and permanent backup with the SIMATIC HMI Comfort Panels by simply pressing a button”, says the team leader. The researchers were able to rely on the excellent support by the automation supplier from the very beginning. “We started developing our first studies in cooperation with Siemens back in Stuttgart”, confirms Hansmann. The employees in his team are currently being trained by the company in customized training sessions so that they can solve upcoming automation tasks even more efficiently and have more time to focus on the important topics of the research project.

Step-by-step to the “real” application
The researchers in the Chair have set themselves some ambitious goals. Their work regarding tissues with blood vessels, i.e. vascularized tissues, have caused quite a stir, not only in research circles. “In cooperation with the university hospital and the Robert Bosch hospital, we recently created a complete piece of human trachea in the bioreactor and implanted it in a very sick patient as part of a special clinical trial” says Hansmann, describing one of the biggest successes of tissue engineering in Würzburg. There is actually no other research group worldwide that has created such a complex biological implant. The researcher points out that the road to regular clinical application is still long, but this is by far not the only application of tissue engineering. “Our tissue and organ models are very important for research on diseases and the development of new drugs. They make it possible to use actual human tissue with blood supply and mechanical load in the research. This can be used to find specific active substances against infections, test the harmlessness of substances or to better research and understand biological processes of diseases such as lung cancer or skin infections”, explains Hansmann. The researcher sees a high demand for automated solutions for the production of the corresponding test systems especially for these purposes. “We have already developed an initial production line for artificial human skin in which we can manufacture batches with up to 5,000 test systems. We are doing this in cooperation with the Fraunhofer Institute for Interfacial Engineering and Biotechnology (IGB) here in Würzburg to promote the application of our work in the pharmaceutical and cosmetics industry.” These skin models – basically a pallet with small indentations in which the skin is located – can be used for a large variety of purposes: for example, to study cell interaction after injuries or to determine whether and how well substances are absorbed by the skin or whether they cause skin irritations. The automated production of these skin models speeds up these studies and makes for easier screening of substances. Validation studies are currently being conducted to receive regulatory acceptance so that the test on the skin model can be used as an alternative to animal trials. Such an acceptance will pave the way for applications in the pharmaceutical industry.

The next step: the new Translational Centre
Soon the “tissue engineers” in Würzburg will have even more opportunities for their work. In a building right next to the Chair, the Fraunhofer translational research centre “regenerative therapies for cancer and musculoskeletal diseases” is being built. Its goal is to advance the development of new materials and their transfer from the laboratory to the clinic as well as cell-based regenerative therapies in medical applications. The centre will cover the entire value-added chain of regenerative therapies, from product development all the way to approval of medical products, biologized medical products and cell-based transplants. The infrastructure established in the translational centre is to be made available to companies for joint development. “The centre will help optimize the possibilities of targeted production of implants based on human cells to the extent that we can introduce these implants to the clinic. We will also be using the efficient Siemens technology based on the TIA Portal engineering framework and the SIMATIC HMI Panels for this centre to set the course for a successful future of regenerative therapies”, believes team leader Hansmann. He adds: “It is very important that we have these powerful, automated bioreactor systems available for production so that the numerous products which are currently being developed or are due for clinical trials soon can actually be made.”

Dr.-Ing. Jan Hansmann: pioneer in tissue engineering
Dr.-Ing. Jan Hansmann studied technical cybernetics in Stuttgart and addressed, among other things, the mathematical modeling of biological processes. He earned his doctorate at the Fraunhofer Institute for Interfacial Engineering and Biotechnology (IGB) in Stuttgart for his work on the sprouting of blood vessels in tissues. He then managed the work group “Medical Interfacial Engineering” at the Institute of Interfacial Process Engineering at the University of Stuttgart. He was the assistant director of the Cell Systems department at the Fraunhofer Institute for Interfacial Engineering and Biotechnology (IGB) in Stuttgart before he moved to Würzburg in 2013 to establish the Electronic-Tissue Interfaces junior research group.

References

The authors
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Siemens AG, Digital Factory, Factory Automation, Nuremberg, Germany
www.siemens.com/mobile-panels
The Vygon Group buys Perouse Medical

Vygon, the specialist single-use medical devices group, has acquired Perouse Medical, a French company which designs, manufactures and markets cardiovascular medical devices (stents, vascular grafts and patches, radial compression and inflation systems, hemostatic valves, angiographic syringes as well as consumables for contrast media injectors for CT scanners and MRI, etc.) and long-term vascular access devices (implantable ports, PICCs, Huber needles, catheter maintenance dressings, etc.).

Established in 1984, Perouse Medical generated a turnover of €28.2 million in 2014. It has a presence in 90 countries and a network of 200 distributors; 55% of Perouse Medical’s turnover stems from its international operations. With French offices in the Oise region (Ivry-le-Temple) and in the Greater Lyon area of the Rhône-Alpes region (Irgny), the company employs 336 people. Perouse Medical will be the cardiovascular and long-term vascular access specialist within the Vygon group. Thomas Walter, the current deputy director general of Perouse Medical, will be responsible for the general management of the company and will join the Vygon Group Executive Committee. This operation is in line with Vygon’s development plan and is primarily intended to reinforce the existing product ranges. With this acquisition, Vygon strengthens its position in the adult long-term vascular access market, which is estimated to be worth €1.1 billion. The synergies between Perouse and Vygon’s various product ranges will allow Vygon to expand its portfolio of available products and strengthen its commercial foothold in France and abroad. The operation also aims to develop expertise on new single-use health product families, with a focus on interventional cardiology and the treatment of cardiovascular diseases. This market is worth €2.1 billion and is growing at an annual rate of 12%. Perouse Medical’s patent portfolio, with 162 patents, will become property of Vygon. “With this new acquisition, Vygon consolidates its position in the French and international markets, thereby demonstrating its determination to achieve by 2022 the objectives set out in its growth plan,” said Stéphane Regnault, chairman of Vygon’s board of management. “Perouse Medical is renowned amongst health professionals for its strong expertise, the quality of its medical devices and its capacity for innovation. For these reasons, Perouse is a perfect fit for the Vygon Group development strategy.”

Barco Coronis Uniti™ named a 2015 Silver Edison Award winner

The Edison Awards, celebrating 28 years of honoring the best in innovation and excellence in the development of new products and services, announced today that the Barco Coronis Uniti™ display system was voted a Silver Winner for innovation at the April 23rd event at The Capitale in New York City. Hundreds of senior executives from some of the world’s most recognized companies gathered to acknowledge the hard work and commitment of all of the 2015 Edison Award winners.

Being recognized with an Edison Award has become one of the highest accolades a company can receive in the name of innovation and business. The awards are named after Thomas Alva Edison (1847-1931) whose inventions, new product development methods and innovative achievements literally changed the world, garnered him 1,093 U.S. patents, and made him a household name around the world.

“Our judges recognized the Barco Coronis Uniti as a true innovation out of the many products in its category,” said Frank Bonafilia, executive director of the Edison Awards. “The Coronis Uniti is the only display specifically designed for both PACS and breast imaging to deliver the first unified workflow. With the ability to replace all display configurations, it eliminates the need for a multi-head set-up or for a radiologist to move to another workstation to view additional exams. It is unique in its representation of calibrated colour and greyscales, offering both 2D and 3D image viewing capability of static and dynamic images.

“The Coronis Uniti fulfills the promise of ‘one display, any image,’ representing a one-time investment that will forever change the way radiologists work. It helps them simplify management of their imaging desktop, enabling them to see more patients per day while reading more comfortably,” comments Lynda Domogalla, VP Product Marketing for Barco’s Healthcare division.

The ballot of nominees for the Edison Awards™ was judged by a panel of more than 3,000 leading business executives including past award winners, academics and leaders in the fields of product development, design, engineering, science and medical.

www.barco.com

Education technology partnership between SCHILLER and EPICARDIO

SCHILLER has teamed up with medium-sized specialists EPICARDIO to offer a market-leading simulation-based ECG e-learning program to its customers.

Responding to requests from its customers to provide innovative training techniques to complement its medical technology solutions, SCHILLER has worked with the UK-based company to bring them a cutting-edge customized e-training package.

This fully interactive “flight” simulator for the heart provides a unique live 3D view of the human heart including tutorials, which enables active learning-by-doing on any web browser. SCHILLER customers will be offered subscriptions for the package, which provides self-training and reference materials for their medical staff via their existing computer resources.

Dominik Doppler, VP Marketing and Sales of SCHILLER said “We are very excited to be able to bring this unique e-learning tool to our customers. It will be a real added value. The fact that most pathologies are integrated allows the customers an extremely effective ECG reading training.”

“The co-operation with SCHILLER has enabled us to access their expertise and extensive ECG data to tailor the package to provide maximum benefit to the physician and trainee alike” says Dr Vassilios Hurmusiadis, CEO of EPICARDIO “we are thrilled to be able to combine our technology with the excellence of SCHILLER products”.

The success of this partnership has led SCHILLER and EPICARDIO to begin developing further diagnosis support tools together. Information on these projects will be provided during the course of the year.

www.schiller.ch

www.epicardio.com
High-end CT system

The high-end Somatom Force system enables particularly gentle examinations since up to less than half the X-ray and contrast medium dose is required compared with existing premium systems. At up to 74 cm per second, its scan speed is so high that patients no longer have to hold their breath or stay still. This opens up access to state-of-the-art medical imaging to even the most sensitive patient groups such as small children or people with renal failure. The system is safeguarded by more than 90 new patents, including the Vector X-ray tubes, which have helped reduce the contrast medium for thorax examinations from 90–110 mL to 25–35 mL. Siemens CT therefore uses over 50% less than other premium systems, making it a viable option for older people and patients with renal failure such as diabetics, for whom contrast medium exerts too much of a strain. Patients stand to benefit from the fact that 4D imaging on Somatom Force requires less than half the X-ray dose than was previously needed to characterize tumours and to detect whether a cancer treatment is effective at an early stage. This procedure can now be routinely implemented, and physicians can make faster and better-founded decisions about the best tumour therapy for an individual. The highly sensitive Stellar Infinity detector and Adaptive Dose Shield are used for blocking unnecessary radiation and with the help of the Turbo Flash Scan and two spectral filters for optimizing the X-ray spectrum, the X-ray dose can also be significantly reduced: clinical studies have shown that scanning the rib cage for lung nodules using Somatom Force CT can be performed with the very low effective dose of 0.06 millisievert. This radiation dose for a CT scan is no higher than that for a conventional X-ray thorax examination. This means that it could potentially be used for early detection examinations, for example in cases of suspected lung cancer or heart disease. Thanks to the fastest acquisition speed on the CT market (74 cm per second), thorax examinations can now be performed in under a second. Cardiac patients therefore no longer have to take beta-blockers to slow their pulse to prevent motion artifacts. This speed also pays off when examining patients who are unable to hold their breath for several seconds – critically ill patients, trauma cases, or babies, for example. With Somatom Force, breath-holding is no longer necessary in almost all radiology cases.

Portable POC hemoglobin analyser

The Hemo Control point-of-care (POC) diagnostics analyser provides laboratory accurate hemoglobin and hematocrit results in one simple test. The new hemoglobin POC analyser enables full upgrade with data management functionality as required, giving the user complete flexibility over their future connectivity options via its bi-directional interface. Using the new LIS2-A2 communication standard, this bi-directional interface allows the analyser to connect directly to third party software and enable simple integration with LIS (Laboratory Information System) middleware. LIS2-A2 succeeds the ASTM communication standard commonly used for small to mid-size analysers and is easier to integrate than POCT-1A. Available as a cost effective basic device which stores up to 4000 patient results, the new Hemo Control offers enhanced on-board Data Management (DM) functions following upgrade with the DM ‘add pack’ if required at a later date. In addition to enabling lists to be sent directly from the LIS to Hemo Control, DM upgrade also offers barcode identification of patients, operators, cuvette lot and control materials, as well as quality control with lock-out functions and the ability to add comments to results. Hemo Control requires no docking station when handling on-board data management as it uses simple cable connections (e.g. RS-232 to USB or LAN), or integrated Bluetooth technology which is available with Hemo Control Manager – the top of the range device available with preinstalled DM functions. As a highly robust, portable analyser, Hemo Control is designed to provide quantitative, lab quality results for both hemoglobin and hematocrit (imprecision of <2%) from 25 seconds for blood banks, hospitals and clinics. User friendly with step-by-step on-screen instructions and no calibration or maintenance needed, the device requires minimal training. Furthermore, this compact analyser uses NXT shape microcuvette technology, which enables improved finger stick sample collection by virtually eliminating appearance of air bubbles.

Glucose meter system receives FDA clearance for use with critically ill patients

Last May, the U.S. Food and Drug Administration (FDA) cleared Nova Biomedical’s StatStrip Xpress Glucose Hospital Meter System for use throughout all hospital and all professional healthcare settings, including critically ill patients. StatStrip Glucose and StatStrip Xpress Glucose are now the only two hospital blood glucose meters to be cleared by the FDA for use with critically ill patients. Use of all other glucose meters with critically ill patients is considered off-label by the FDA and high complexity testing under the Clinical Laboratory Improvement Amendments. High complexity testing requirements are so stringent that to use a glucose meter other than StatStrip Glucose and StatStrip Xpress Glucose are not a practical alternative. Stat-Strip Xpress Glucose utilizes the same test strip measurement technology as StatStrip Glucose, which was cleared in 2014 after an extensive, four-year study conducted at five major university medical centres. The study included 1,698 critically ill patients with over 257 medical condition subcategories as designated by the World Health Organization. Over 8,000 medications were investigated for potential interference to StatStrip Glucose measuring technology. StatStrip Glucose demonstrated excellent agreement compared to central laboratory reference methods and no clinical interferences were found. In addition to the study submitted to the FDA, 138 other

UNFORS RAYSAFE

The RaySafe i2 is an active dosimetry system that gives real-time insight about personal radiation exposure, as well as access to time-stamped dose data. By providing easily accessible information about radiation exposure, RaySafe i2 allows medical staff to immediately change their behaviour in order to minimize their radiation dose. Components of the system include real-time display, 4 dosimeters, cradle and storage rack, dose viewer software and mounting material. Additional dosimeters, rack and the dose manager software can be ordered separately.

SIEMENS HEALTHCARE

For more information please visit www.ihe-online.com & search 46867

EKF DIAGNOSTICS

For more information please visit www.ihe-online.com & search 46829
3D navigation system enhances minimally invasive treatment of vascular disease

The VesselNavigator is a 3D catheter navigation system to guide the minimally invasive treatment of patients with vascular diseases such as aortic aneurysms. It is designed for use in conjunction with Philips’ interventional X-ray systems, enhancing the precision and accuracy of stent placement, while at the same time significantly reducing contrast medium usage. As a result, minimally invasive treatment options will be available to patients previously unable to benefit from new image-guided intervention techniques. Developed in collaboration with clinical partners such as the University Hospital Cologne (Germany) and the University Hospital Ghent (Belgium), VesselNavigator complements Philips’ current image-guided therapy portfolio within the field of endovascular and hybrid suite solutions. It addresses the need for advanced 3D live-image guidance solutions, as the treatment for vascular disease is experiencing a major transition from open surgery to minimally invasive procedures, with such procedure volumes growing at high single-digit rates.

During endovascular procedures a catheter is manoeuvred, with the aid of image guidance, through major arteries or veins in order to locally position and deploy implants such as stents to reinforce the wall of the affected blood vessel. Using conventional 2D X-ray image guidance, clinicians often perceive the visualization of the vessel anatomy during these procedures as if a dimension is missing, adding to procedure complexity. Many are more familiar with open surgery, during which they can physically see and touch the blood vessels they are trying to repair. VesselNavigator brings back the 3D anatomy they were used to seeing in open surgery. It can be used for all types of endovascular procedures, but one of its key applications is guidance during the treatment of aortic aneurysms, which if left untreated could lead to severe complications such as massive internal bleeding. At the location of the aneurysm, the aorta often has smaller side branches, such as those that supply blood to the patient’s kidneys. Custom-made stents are therefore often made with dedicated openings that need to be precisely registered with these feeding vessels in order to repair the aorta and maintain critical blood flow to other abdominal organs.

With conventional X-ray imaging it is very challenging to position the stent in the precise orientation. Endovascular aortic aneurysm repair is therefore a very complex procedure, and the more time it takes, the more contrast medium is needed for X-ray visualization and guidance in order to succeed. VesselNavigator fuses live interventional X-ray images with pre-acquired 3D MRI or CT images of the patient’s vascular structures. The resulting 3D colour-coded images of the vessels provide enhanced real-time visual guidance, making it easier to manoeuvre through the vascular network without the need to enhance the X-ray visualization with the repeated use of an injected contrast medium. In recent studies, VesselNavigator has been shown to reduce contrast medium usage by 70% and procedure times by 18%, contributing to more patient friendly, more efficient and more cost effective treatment of vascular conditions. With a growing population of elderly and diabetic people who suffer from poor kidney function, reducing contrast medium requirements will open up endovascular treatments to a wider range of patients. The strong growth in image-guided therapy procedures is driven by the significant benefits they offer for healthcare systems and patients, including reduced patient trauma, shorter hospital stays, and lower healthcare costs.

PHILIPS HEALTHCARE
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Premium laser imager

The Carestream Dryview 6950 laser imager is designed to produce rapid output of high-resolution images for all imaging modalities including mammography. In addition to CT, MR, CR, DR and other modalities, this new laser imager also will support output of full-field digital mammography (FFDM) and CR mammography images. It can deliver a maximum film density of 4.0, which is preferred for mammography. Key test patterns are included to assist with mammography quality assurance procedures and regulatory requirements. A built-in densitometer measures and displays key film density values, which can eliminate the need for manual density measurements from test films. The laser imaging system delivers from 160 to 250 films per hour with 650 pixels-per-inch resolution on every film size. Three film supplies come standard with the laser imager, and film size changes are made easy by simply exchanging the film cartridge. The intuitive user interface includes a multilingual touch-screen user panel with a built-in “help interface” to simplify instruction, operation and user training. Each cartridge holds 125 film sheets to minimize loading frequency. An optional five-bin, top-mounted sorter provides quick access to desired patient films by modality for greater efficiency and control. Carestream Smart Link remote management services provide technical support with remote monitoring and diagnostic solutions that can continuously track the status of each laser imager. Users also have access to Carestream’s Customer Success Network that includes a global team of experts.

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independent studies over the last eight years—including 53 critical care studies—have found no clinically significant interferences for StatStrip Glucose measuring technology.

NOVA BIOMEDICAL
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Ultrasound imaging system with research functions

RS80A with Prestige incorporates an enhanced diagnostic package designed for radiology departments. The RS80A strengthens research ability versus the existing RS80A over a broad spectrum of diseases related to abdominal, breast, cardiovascular, and musculoskeletal ailments, to provide higher clinical value. RS80A with Prestige is equipped with S-Fusion, which is a function that can compare the body parts under examination by ultrasound imaging with CT or MRI images simultaneously for analysis. In particular, S-Fusion allows auto-registration that aligns CT or MRI images within 30 seconds to enable a quick diagnosis. S-Shearwave, which helps analyse the characteristics of body tissue without biopsy, provides quick diagnosis. S-Shearwave, which helps enhance visualization of PACS or breast images, boosting radiologist productivity and performance. Barco’s bright LED backlights help radiologists see many more shades of gray. Furthermore, Nio 5MP LED comes with a unique front-of-screen sensor, which works seamlessly with Barco’s online MediCal QAWeb solution for automated Quality Assurance and on-demand calibration. Additionally, Uniform Luminance Technology makes subtle details more noticeable more quickly, resulting in reduced windowing and leveling time. Nio 5MP LED offers a high-bright LCD panel with a display resolution of 2560 x 2048 pixels. Featuring a DICOM calibrated luminance of 500 cd/m² throughout its entire lifetime, the new display system is perfect for diagnostic imaging. It offers accurate grayscale and a high contrast ratio (1200:1) to ensure confident image reading. The on-demand image quality checks ensure maximum uptime of the display. Additionally, Barco’s LED backlights produce less heat, requiring less cooling and reducing the overall operational costs for the hospital.

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www.ihe-online.com & search 46806

Urged DR tablet

A host of new features will now be integrated into ArtPix Mobile EZ2GO tablets. The tablet completes a revolutionary imaging system. Its new capabilities will facilitate day-to-day workflow and efficiency, as well as open the door to new users thanks to its multi-lingual option. The innovative ArtPix Mobile EZ2GO V3.01 embodies a new standard in the radiography market. These decisive improvements in imaging sub-system technology, optimize technician productivity whilst ensuring the highest quality digital images generated at a low dose. Some of the key upgrade features include a swap option between 3 Pixium Portable EZ Thales detectors (3543EZ, 2430EZ and 3543EZH); unlimited multi-lingual capability; exposure index to evaluate dose levels; reject image analysis to prove dose management. This new version is CE marked and FDA cleared.

THALES ELECTRON DEVICES
www.ihe-online.com & search 46866

Mammography display

FDA-cleared for radiology and mammography and featuring a number of unique image-enhancing technologies, the Nio 5MP LED features a clean and modern design and a smaller desktop footprint for more reading comfort. It helps enhance visualization of PACS or breast images, boosting radiologist productivity and performance. Barco’s bright LED backlights help radiologists see many more shades of gray. Furthermore, Nio 5MP LED comes with a unique front-of-screen sensor, which works seamlessly with Barco’s online MediCal QAWeb solution for automated Quality Assurance and on-demand calibration. Additionally, Uniform Luminance Technology makes subtle details more noticeable more quickly, resulting in reduced windowing and leveling time. Nio 5MP LED offers a high-bright LCD panel with a display resolution of 2560 x 2048 pixels. Featuring a DICOM calibrated luminance of 500 cd/m² throughout its entire lifetime, the new display system is perfect for diagnostic imaging. It offers accurate grayscale and a high contrast ratio (1200:1) to ensure confident image reading. The on-demand image quality checks ensure maximum uptime of the display. Additionally, Barco’s LED backlights produce less heat, requiring less cooling and reducing the overall operational costs for the hospital.

VARIAN
www.ihe-online.com & search 46803

Open surgery dissection system

Specifically designed for open surgical procedures that require delicate and fine tissue dissection, the new THUNDERBEAT Open Fine Jaw (OFJ) is now available, alongside the THUNDERBEAT Open Extended Jaw (OEJ) for open surgery launched last December. The new Thunderbeat OFJ fully integrates bipolar high-frequency and ultrasonic technologies. The device is specially designed to be utilized in open surgery particularly in superficial and confined areas, such as thyroid and ENT procedures or breast surgery. The by-now familiar benefits of fastest-in-class cutting and dissection with reliable sealing and cutting of vessels up to 7mm in diameter are supplemented with a fine curved tip design for precise dissection. The Thunderbeat OFJ has been developed as part of a complete energy platform offered by Olympus, supplementing the Olympus Surgical Tissue Management System and covering new applications in open surgery. The platform itself combines an ultrasound generator with a complete, integrated high-frequency (HF) generator compatible with all conventional HF instruments available in the market. Having a single generator platform across a multitude of surgical specialties and applications reduces complexity, helping hospitals to streamline both surgical workflows and OR staff training. The benefits are increased efficiency, patient safety and staff satisfaction, whilst also reducing inventory costs and management complexity. Special features of the Thunderbeat Open Fine Jaw include: scissors-type grip, specifically designed for precise and direct manoeuvring in open surgery and integrated in a light, ergonomic and perfectly-balanced handpiece that fits into

LEO Radiographic Housing

This new LEO radiographic housing is designed for 3” rotating anode inserts. Varian’s innovative technology allows customers to take full advantage of high heat load, high throughput and quiet operation. The LEO comes in one standard configuration which allows for a significant cost reduction and will be able to compete in the price sensitive radiographic tube market.

SAMSUNG MEDISON
www.ihe-online.com & search 46868

FRONT COVER PRODUCT

Ultrasound imaging system with research functions

RS80A with Prestige incorporates an enhanced diagnostic package designed for radiology departments. The RS80A strengthens research ability versus the existing RS80A over a broad spectrum of diseases related to abdominal, breast, cardiovascular, and musculoskeletal ailments, to provide higher clinical value. RS80A with Prestige is equipped with S-Fusion, which is a function that can compare the body parts under examination by ultrasound imaging with CT or MRI images simultaneously for analysis. In particular, S-Fusion allows auto-registration that aligns CT or MRI images within 30 seconds to enable a quick diagnosis. S-Shearwave, which helps analyse the characteristics of body tissue without biopsy, provides quick diagnosis. S-Shearwave, which helps enhance visualization of PACS or breast images, boosting radiologist productivity and performance. Barco’s bright LED backlights help radiologists see many more shades of gray. Furthermore, Nio 5MP LED comes with a unique front-of-screen sensor, which works seamlessly with Barco’s online MediCal QAWeb solution for automated Quality Assurance and on-demand calibration. Additionally, Uniform Luminance Technology makes subtle details more noticeable more quickly, resulting in reduced windowing and leveling time. Nio 5MP LED offers a high-bright LCD panel with a display resolution of 2560 x 2048 pixels. Featuring a DICOM calibrated luminance of 500 cd/m² throughout its entire lifetime, the new display system is perfect for diagnostic imaging. It offers accurate grayscale and a high contrast ratio (1200:1) to ensure confident image reading. The on-demand image quality checks ensure maximum uptime of the display. Additionally, Barco’s LED backlights produce less heat, requiring less cooling and reducing the overall operational costs for the hospital.

BARCO
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SAMSUNG MEDISON
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the surgeon’s hand and provides precise and direct tactile feedback; curved fine tip, for enhanced target area visibility with easy entry and separation of the tissue plane in confined areas, optimized for the anatomy around the thyroid, the head and neck area and the breast; atraumatic jaw design ensuring secure, non-slip grasping, with even tissue compression thanks to the “wiper-jaw” technology; tissue stopper to prevent tissue sticking inside the shaft.

OLYMPUS
http://www.ihe-online.com & search 46875

Wall gas-independent ventilator

This turbine ventilator will be used at hospitals in parts of the world that do not always have access to air from wall outlets. Throughout the entire development project Maquet worked together with physicians, nurses and respiratory therapists from the regions where the product was expected to be used, for example, India, South Africa, Japan and the USA, to ensure a great user experience. An addition to the SERVO line, the SERVO-air wall gas-independent ventilator can be used in the ICU as well as in intermediate care, for invasive and non-invasive ventilation. Built-in features like context-based guidance, on-screen information and dynamic images can guide the users in applying advanced ventilation every day. The turbine offers a high flow and pressure capacity, which is crucial to provide comfortable ventilation to sick and hard to ventilate lungs. At the same time, it is surprisingly quiet, which helps keeping noise levels down. Thanks to the battery powered turbine and hot-swappable batteries, SERVO-air is set to follow the patient easily throughout the hospital. SERVO-air is also a strong choice for the growing trend towards non-invasive ventilation (NIV), reducing the need for separate dedicated NIV ventilators.

MAQUET CRITICAL CARE
http://www.ihe-online.com & search 46873

Compact ultrasound bone densitometry system

A new approach has been used in the development of the bone densitometry system, EggQus. It has been created using the design concept of an “eggshell”. The result is a strong, lightweight, easy to handle unit that guarantees maximum portability. EggQus is light, compact and versatile compared to conventional ultrasound bone densitometry systems. The large integrated handle facilitates in-hospital rounds and house visits. The system is powered by rechargeable batteries enhancing its portability. Continuous and convenient use can be sustained using the AC adapter accessory. The motor-controlled transducer unit moves automatically, minimizing manipulation by the operator. The short measurement time of approximately three seconds is convenient for elderly examinees and for screening that requires rapid handling.

HITACHI ALOKA MEDICAL
http://www.ihe-online.com & search 46874

Structural heart analysis software

3mensio Structural Heart is dedicated to the planning of structural heart interventions. This new release contains an optimized Mitral workflow and a new Septal Crossing workflow for the planning of mitral valve procedures to determine the appropriate access route based on CT images. More insight in the size and shape of the mitral valve is vital for pre-procedural planning of mitral valve replacement and repair procedures. The Mitral workflow provides advanced visualization and sizing of the mitral annulus and its surrounding structures like the aortic valve and coronary arteries. Also the possible impact of placing a valve on the left ventricular outflow track (LVOT) clearance can be simulated. The Septal Crossing workflow enables visualization of cardiac structures in a simulated angioview that allows anatomic relations between the interatrial septum, LAA ostium, mitral annulus and vena cava to be easily determined.

PIE MEDICAL IMAGING
http://www.ihe-online.com & search 46877
CMEF & ICMD Spring 2015: Asia Pacific’s leading event serving the entire value chain for the medical devices market

Held at the brand new National Convention & Exhibition Centre (NECC) in Shanghai from 15 to 18 May, the Healthcare Industry Summit (THIS) is a large-scale healthcare event that combines China’s three top medical equipment and pharmaceutical exhibitions CMEF, PHARMCHINA and API China (pharmaceutical manufacturing) into one mega healthcare event, in doing so completing the entire value chain for the health industry.

CMEF at a glance
Covering over 170,000 m² of exhibit space, CMEF Spring 2015 attracted a total of 100,500 visitors from more than 140 countries. Over 10,000 products spanning the entire value chain were on display including 600 new products. The show brought together 3,880 exhibitors from 26 countries. A large majority of visitors (close to 90%) were from China with just over 10% coming from foreign countries. Medical device distributors accounted for 50% of the turnout while visitors working in medical institutions numbered 29% of the total.

International participation
One of the most important highlights of CMEF was its international hall enlarged over 50% versus last year. With its relocation to Shanghai the show drew more attention from the international players while new pavilions from India, Netherlands and Schleswig-Holstein presented their latest products, technologies and ideas at CMEF for the first time. Pavilions such as France, Israel, Canada and Malaysia acquired more space than last year, which enabled them to bring many new SMEs to show their wide range of products in the fields of imaging, IVD, laboratory testing, surgery, hospital management and senior care-related services.

High level conference programme
The new top level investment forum - Healthcare China - hosted an impressive list of 107 participants. The conferences covered hot topics related to medical imaging, development of non-public medical institutions in China, medical equipment manufacturing standards and senior care policies interpretation etc.

ICMD
The International Component Manufacturing & Design Show (ICMD) is specially geared to the business of medical device manufacturers and upstream product suppliers, which include materials, design, R&D, components, parts, modules, software, data processing, manufacturing equipment, OEM technology, packaging, printing, cleaning, disinfecting and other related services. In 2015 ICMD had an unprecedented 300% growth in exhibitor participation. Alongside the show the 3rd Customized Medical Equipment Manufacturing Technological Innovation Forum also proved to be a big success.

CALENDAR OF EVENTS

| September 8-10, 2015 | 11th International Health Asia Exhibition & Conferences 2015 | www.health-asia.com |
| September 10-12, 2015 | Medical Fair Thailand | www.medicalfair-thailand.com |
| September 26-30, 2015 | CIRSE Lisbon, Portugal | www.cirse.org |
| October 3-7, 2015 | ESICM LIVES Berlin, Germany | www.esicm.org |
| October 18-21, 2015 | CMEF Autumn 2015 Wuhan, China | www.chinaexhibition.com |
| October 6-8, 2015 | IHF 39th World Hospital congress Chicago, IL, USA | www.ihf-fih.org |
| November 16-19, 2015 | Medica Dusseldorf, Germany | www.medica.de |
| November 29-December 4, 2015 | RSNA Chicago, IL, USA | www.rsna.org |
| January 25-28, 2016 | Arab Health Dubai, UAE | www.arabhealthonline.com |
| March 2-6, 2016 | ECR Vienna, Austria | www.myesr.org |
| March 15-18, 2016 | 36th ISICEM Brussels, Belgium | www.intensive.org |
| April 6-8, 2016 | Med-e-Tel Luxembourg | www.medetel.eu |
| April 15-18, 2016 | CMEF Spring 2016 Shenzhen, China | www.cmeft.com.cn/g1250.aspx |
| April 19-21, 2016 | ConhIT Berlin, Germany | http://www.conhit.de/en/ |

For more events see www.ihe-online.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.
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