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## INTERNATIONAL

### Electronic Skin Helps Detect Breast Tumors

A nanoparticle-based film that can sense texture and relative stiffness could significantly enhance clinical breast examinations (CBE) for early detection of cancer.

Developed by researchers at the University of Nebraska Lincoln (UNL; USA; [www.unl.edu](http://www.unl.edu)), the nanotechnology thin-film sensor

*Cont'd on page 3*

### Top 10 Medical Innovations To Impact the Coming Year

Cleveland Clinic (CC; OH, USA; <http://my.clevelandclinic.org>) has announced its 9th annual list of the top 10 medical innovations likely to have major impact on medical care in 2015.

In first place is the mobile stroke unit. Using telemedicine, in-hospital stroke neurologists interpret symp-

toms via broadband video link, while an onboard crew performs neurological evaluation and administers t-PA after stroke detection, providing faster, effective treatment for the affected patient.

Second is a Dengue fever vaccine that could aid the 50-100 million people in more than 100 countries

*Cont'd on page 5*

### Drug-Delivery Device Could Replace Injections

An innovative capsule that is coated with tiny needles can deliver drugs directly into the lining of the gastrointestinal (GI) tract.

Researchers at MIT (Cambridge, MA, USA; [www.web.mit.edu](http://www.web.mit.edu)) and Massachusetts General Hospital (MGH; Boston, MA, USA; [www.massgeneral.org](http://www.massgeneral.org)) have devised a

*Cont'd on page 4*

## Atherectomy System Treats Peripheral Calcifications While Protecting Healthy Tissue

New orbital technology can remove plaque buildup in peripheral arterial disease (PAD) and critical limb ischemia (CLI) while protecting soft arterial tissue. The Stealth 360° Orbital Atherectomy System (OAS) could significantly improve the treatment of calcified and fibrotic plaque in arterial vessels by way of endarterectomy.

*See article on page 4*



Image: The Stealth 360° Orbital Atherectomy System

### Ultrasound Detects Abdominal Aneurysms

Researchers are assessing the effectiveness of the use of ultrasound to study lethal abdominal aortic aneurysms (AAAs), a bulging of the aorta that is typically fatal when it ruptures, and for which there is no effective medical treatment.

Abdominal aortic aneurysms are the 13th leading cause of death in

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### Microfluidic Blood-Cleansing Device Battles Sepsis

A dialysis-like therapeutic device inspired by the human spleen that filters bacteria, fungi, and toxins, could radically transform the way doctors treat sepsis. The biospleen device, developed by researchers at Harvard University (Boston, MA, *Cont'd on page 6*)



### Evaluation System Leads To Incontinence Relief

An innovative evaluation system for incontinence therapy offers a more discreet and unobtrusive experience for patients during the evaluation period. The Medtronic Verify Evaluation system is used temporarily to determine if bladder or bowel control therapies to be delivered by the

*Cont'd on page 6*

### Guidance System Helps Achieve Healthier Sleep

A new noncontact device monitors sleep patterns and the environment to help improve sleep quality. The ResMed S+ uses patented bio-motion SleepSensor technology to measure an individual's sleep stages and environment, as well as deliver personalized feedback that helps improve sleep

*Cont'd on page 5*

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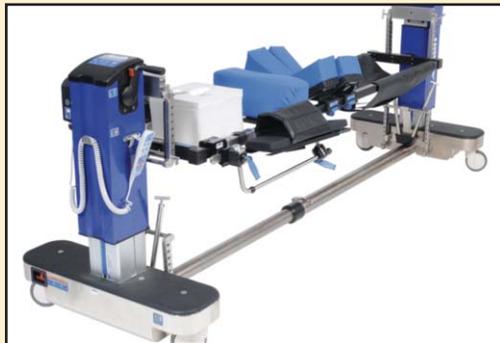
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### SURGICAL LAMP ACEM

The StarLED 5 NX features shadowless, clear, and homogeneous light for visual comfort and enhanced working conditions. The StarLED 5 NX produces a light spot of 21 cm at one meter, with a high illumination level of 135,000 lux for a steady life cycle of 50,000 hours.

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### SURGICAL TABLE Allen Medical Systems

The Allen Advance table offers a safety feature to ensure that if the pin that connects the H-bracket to the table base is pulled out, the patient support top will not fall. The table is designed for complex spin surgery, with key features including an intuitive user interface and central locking casters.

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### DISPLAY RETROFIT KIT Ampronix

The OEC 9800 Greyscale LED Lit LCD features a 178-degree viewing angle, and an articulating arm for easy LCD movement. The system offers enhanced brightness and detail, 900 cd/m<sup>2</sup>, 1500:1 contrast ratio, 2MP per display, one-hour installation, and increases the life of C-arm systems.

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## Variable Angle Plating Systems Treat Calcaneal Fractures

Two novel plating systems allow surgeons to adapt screw trajectory to match patient anatomy and fracture pattern.

The DePuy Synthes Trauma 2.7 mm variable angle locking calcaneal plating (VA LCP) system features

new plate designs for leading surgical techniques, including the lateral extensile approach and the minimally invasive approach. The low profile, pre-contoured plates are designed to treat both simple and complex fractures, with multiple fixation

points targeting key areas of hard cortical bone in the calcaneus. Additionally, innovative instrumentation is available to assist in fracture reduction.

The DePuy Synthes Trauma 3.5 mm VA LCP medial column fusion plating system with variable angle locking technology offers advanced stabilization capabilities for fusion applications. Plantar and talus extension medial column fusion plates are also available, which allow the surgeon to independently compress each joint through the plate, gaining up to 6 mm of compression, as well as angulating the screws towards specific fragments of bone.

Additionally, a screw targeting clamp instrument set provides the ability to maintain compression while inserting screws through targeted areas, which is especially useful in challenging fusion cases. An adjustable rail ensures screw placement of solid or cannulated screws, in sizes ranging from 3.5 mm through 7.3 mm in diameter. The DePuy Synthes Trauma 2.7 mm and 3.5 mm variable VA LCP systems are products of DePuy Synthes (West Chester, PA, USA; [www.depuysynthes.com](http://www.depuysynthes.com)), a Johnson & Johnson (New Brunswick, NJ, USA; [www.jnj.com](http://www.jnj.com)) company.

"This is a comprehensive and versatile system of plates and screws that may be used to treat a broad array of calcaneal fractures through open or minimally invasive tech-



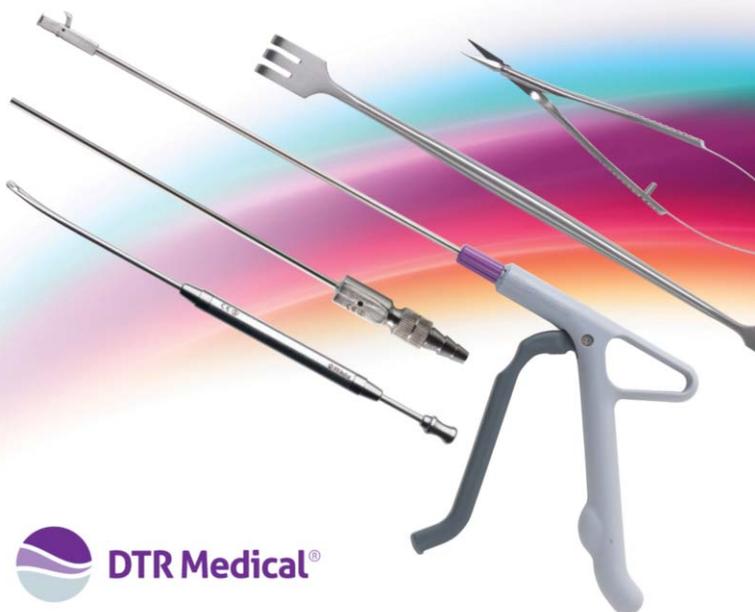
niques," said Michael Swords, DO, director of orthopedic trauma at Michigan Orthopedic Center (Lansing, USA). "As a surgeon who takes care of these injuries, the design of the plating system has the elements required to successfully treat calcaneus fractures."

The calcaneus is the largest of the tarsal bones and the largest bone of the foot, and is responsible for transmitting the majority of the body's weight from the talus bone to the ground. It serves as the insertion point for three muscles: the gastrocnemius, soleus, and plantaris, which have a variety of functions including plantar flexion of the foot, flexion of the knee, and steadying the leg during standing. Calcaneal fractures are typically linked to injuries from falling from a height, automobile accidents, or muscular stress.

*Image: The Locking Calcaneal Plate is indicated for fractures and osteotomies of the calcaneus including, but not limited to, extra-articular, intra-articular, joint depression, tongue type, and severely comminuted fractures (Photo courtesy of DePuy Synthes).*

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## Innovative Needle Driver Allows Vertical Suturing

A novel needle driver allows the surgeon to apply sutures vertically, in areas that would be difficult to reach with traditional drivers. The Alshemari Needle Driver holds the needle parallel to the handles, and is thus rotated 90 degrees from traditional needle drivers. A lever clamp method is used to ensure that the needle is firmly held in a position while the operator's hand is in a neutral position. The needle thus automatically moves into an ideal position between two targets in a straight vertical line, rather than in an elliptical path as in conventional needle drivers.

The Alshemari Needle Driver was first conceived as an instrument for general ear, nose and throat (ENT) procedures, reaching challenging sutures at the base of the tongue or the tonsillar pillar. But the design can also be used throughout the body, thus enabling less invasive procedures and reducing time wasted completing inaccessible sutures. The Alshemari Needle Driver is a product of Alshemari Instruments (Charlotte, NC, USA; [www.alshemariinstruments.com](http://www.alshemariinstruments.com)), and features 316 stainless steel construction, tungsten carbide jaw inserts, and gold plated handles.

"I first came up with the concept for my needle driver device in the OR while applying sutures in the mouth of a patient," said Hasan Alshemari, MD, inventor of The Alshemari Needle Driver and a pediatric otolaryngology spe-



cialist at Zain Hospital (Kuwait). "As physicians, we have to be nimble in tight spaces. I wanted to invent a device that would minimize hand twisting in order to ensure greater accuracy, precision and superior reach."

*Image: The Alshemari needle driver holds the needle perpendicular to its length, allowing a more comfortable approach in situations where traditional drivers are not as appropriate (Photo courtesy of Alshemari Instruments).*

## LED Light Provide Perfect Illumination of Surgical Fields

An innovative operating room (OR) surgical lamp with light emitting diode (LED) technology grants users optimal performance, reliability, and visual comfort. The STARLED5 NX is made up of five reflector groups (with seven LEDs in each), and another eight LEDs that are circularly positioned around the handle. The combined 43 LEDs generate a shadowless, clear, and homogeneous light that assures visual comfort and the best working conditions for both the surgeon and medical staff. The excellent optical quality of next-generation LEDs produces a high illumination level of 130,000 lux (optional 160,000 lux). A color rendering index (CRI) of 95 and color temperature of 4,500 K reproduce the exact chromatic scale of the human body.

To enable the delivery of the heatless infra-red (IR)-free light according to different needs, the light field focusing system adjusts the light-spot diameter to accent sharpness of details in the operating area. An ambient light-up system situated on the upper part of the lamp provides adjustable illumination levels according to use, and is particularly suitable for use during minimal invasive surgery (MIS) by not only visualizing the microscopic operating field but the surrounding areas and the environment as well.

All functions are managed via the digital and easy-to-read I-SENSE control panel, positioned on the cardanic shaft structure. The panel controls power, light intensity, light spot diameter dimension (focusing), the ENDO-light for endoscopy, and depth of field (DOF) for a full visualization of the operating field and deep cavities. An optional SYNC mode synchronizes controls among combined lamps in different configurations, such as a STARLED5 NX twin dome configuration, or a STARLED5 NX with STARLED7 NX or STARLED 3 NX.

The STARLED5 NX is also practical for the medical team, since it can be



*Image: The STARLED5 NX LED OR lamp and I-SENSE control panel (Photo courtesy of ACEM Medical Company).*

moved using lateral handles that assure stability and constant illumination even during movement. An ergonomic design takes into consideration sanitary requirements of the OR. For example, the lamp is manufactured of a smooth and resistant material that makes cleaning quick, easy, and complete. A removable and sterilizable central handle can house a video camera (on demand) for recording the surgical operations accurately (alternatively, the video camera can be placed on a separate arm). The STARLED5 NX LED is a product of ACEM Medical Company (Bologna, Italy; [www.acem.it](http://www.acem.it)).

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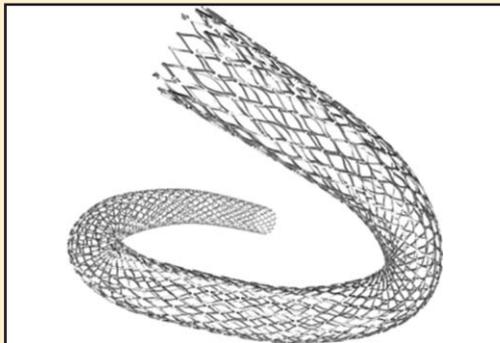
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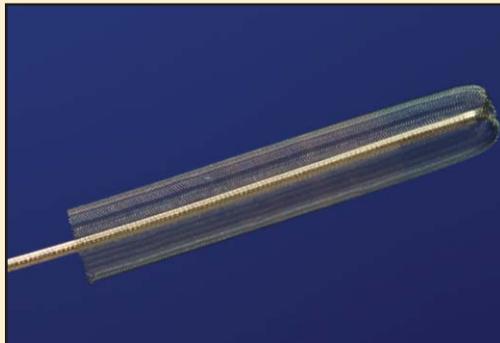
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## PERIPHERAL STENT SYSTEM Covidien

The Ever-Flex stent system is designed for atherosclerotic disease on common and external iliac arteries up to 100 mm with a reference vessel diameter of 4.5-7.5 mm. The self-expanding system consists of a nitinol stent and a catheter-based delivery system.

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## VASCULAR ACCESSORY DEVICE Lazarus Effect

The Lazarus Cover device is a nitinol-mesh cover that surrounds a retriever device and captured material during removal from a blood vessel. It provides a solution to the limitations of current retrieval systems, and doesn't require switching from a favorite stent or other retriever device.

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## WASHER / DISINFECTOR Miele

The G 7889 is designed for the cleaning and intermediate-level disinfection of hard-surfaced surgical instruments prior to sterilization. Features include a large capacity, stainless steel finish, steam condenser, and standard options such as electric door lock and program failure check.

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## Simple Test Predicts Sarcoma Wound Healing Complications

A new study reveals that transcutaneous oximetry (TcO<sub>2</sub>) may be able to predict which patients with soft tissue sarcomas will experience complications while healing from surgery. Researchers at Loyola University Medical Center (Maywood, IL, USA; [www.loyolamedicine.org](http://www.loyolamedicine.org)) and the University of Iowa (Iowa

City, USA; [www.uiowa.edu](http://www.uiowa.edu)) followed 10 patients who underwent surgery for soft tissue sarcomas in the lower limbs after receiving radiation treatment. All patients underwent TcO<sub>2</sub>, a noninvasive test that measures the oxygen level of tissue beneath the skin using adhesive sensors. Measurements were obtained at five time

points and at five locations around the operative field, as well as on the contra-lateral limb.

Soft tissue sarcomas are cancers that originate in tissues such as muscles, fat, blood vessels, nerves, and tendons. External beam radiation therapy, in combination with surgical resection, is used to improve local control. Advantages of preoperative radiation include smaller overall

field size and dose which is believed to result in improved function of the spared limb. Furthermore, it may potentiate limb salvage by allowing safe marginal resection along vital neurovascular structures. But while patients often do better and require less radiation when it is administered before surgery, this also increases the risk of wound-healing complications.



## Medical Lighting System



## STARLED5 NX LED lamp for operating room

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## Incorrect Use of Splints Causes Poor Healing in Children

A new study reveals that more than 90% of potential pediatric fractures are splinted improperly, which can lead to swelling and skin injuries. Researchers at the University of Maryland School of Medicine (Baltimore, USA; [www.medschool.umaryland.edu](http://www.medschool.umaryland.edu)) reviewed 275 cases involving children up to the age of 18 who were initially treated in community hospital emergency rooms and urgent care facilities in Maryland (USA), and then later evaluated by pediatric orthopedic specialists. A standardized questionnaire was used for patient demographics, type of splint, facility type, practitioner type, and time from splint application to orthopedic evaluation. Clinical evaluation included functional position, appropriate length, and presence of an elastic bandage on the skin.

The results showed that the most common reason for improper placement of a splint was putting an elastic bandage directly onto the skin, which occurred in 77% of the cases. In 59% of the cases, the joints were not immobilized correctly, and in 52% the splint

was not the appropriate length. Skin and soft-tissue complications were observed in 40% of the patients. The study was presented at the American Academy of Pediatrics (AAP) national conference and exhibition, held during October 2014 in San Diego (CA, USA). "Splints are effective for immobilization of fractured extremities in children and adolescents when placed appropriately," said senior author and study presenter Assistant Professor of Orthopedics Joshua Abzug, MD.

Broken bones are common in children and adolescents, with nearly half of all boys and a quarter of all girls experiencing a fracture at some point before the age of 16. Emergency departments (EDs) and urgent care centers use splints to temporarily stabilize a possible fracture; the splint is made of rigid strip placed on the extremity, which is then wrapped with a soft padding followed by an elastic bandage to hold it in place. Once splinted, the patients are referred to an orthopedic surgeon, who removes the splint for further evaluation.

## Slim Surgical Lamp Provides Full-Size Illumination

A new surgical lamp utilizes next generation light emitting diode (LED) technology to provide excellent visual comfort and working conditions.

The STARLED3 NX surgical lamp is suitable for a range of diagnostic and surgical applications, including in the dental sector, gynecology and obstetrics, dermatology, and general medicine. Three reflectors produce a well-blended and intense (130,000 lux) cone of light with a color temperature of 4,500 K and a color-rendering index (CRI) of 95. Despite the intensity, the STARLED3 NX maintains a low energy consumption of just 69 W, even as the LED's maintain a life cycle of about 50,000 hours.

All functions are managed via the digital I-SENSE control panel, including power, light intensity, light spot diameter dimension (focusing), and depth of field (DoF) adjustment for a full visualization of the operating field as well as deep cavities; an ENDO function is available for endoscopy. The I-SENSE panel can also be used to synchronize controls of combined lamps, such as a double STARLED3 NX (twin dome) configuration, or the STARLED3 NX combined together with a STARLED5 NX or a STARLED7 NX surgical lamp.

The slim, practical, and compact design provides ergonomic handling, making it easy to move and position. The lamp has also been designed taking in consideration laminar airflow in the operating room, resulting in a smooth and resistant material composition that also makes cleaning quick and easy. The STARLED3 NX is a product of ACEM Medical Company (Bologna, Italy; [www.acem.it](http://www.acem.it)), and is available in a ceiling mounted version (single, double, or together with other STARLED NX lamps); a wall mounted version; and a trolley-mounted version that can also be battery operated.

*Image: The STARLED3 NX surgical lamp, ceiling-mounted version (Photo courtesy of ACEM).*



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