

## e-Digest on Hygiene

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**Dear Friends,**

Wish you all a very happy new year ahead. We invite you to share this month's e-Digest on Hygiene with interested friends and colleagues.

### **Current News**

#### **UNICEF hails start of International Year spotlighting need for better sanitation**

2 January - The United Nations Children's Fund (UNICEF) has welcomed the start of the International Year of Sanitation 2008 which draws attention to the plight of over 40 per cent of the world's population living without proper sanitation.

Thousands of women and children die every day from largely preventable causes, such as diarrhoeal diseases which are the second biggest killer of children under five, to which the lack of proper sanitation plays a part, the agency noted in a press release.

Improving sanitation for an estimated 2.6 billion people, including 980 million children, is one of the single biggest development challenges the world faces today, UNICEF said.

Sanitation will be improved by promoting clean, safe toilets; wastewater management; and hygiene promotion. These measures prevent the transfer of pathogens in human excreta, which, if not treated properly, impacts health and can deprive children of an education as well as impede social and economic development.

During the course of the International Year, major regional conferences on sanitation will be held to share practices and bolster progress, as well as encourage public-private partnerships to raise awareness on the importance of the issue.

Many events will be held to commemorate Sanitation and Hygiene Week, from 15-21 March, and World Water Day on 22 March.

Source: UN News Centre • [www.un.org/news](http://www.un.org/news)

### ***Hygiene Review highlights***

The Health Information and Quality Authority (HIQA) published the findings of the national Hygiene Services Quality Review into 51 HSE funded acute hospitals.

The Hygiene Services Quality Review is the most comprehensive ever undertaken in Ireland and included assessments on service delivery, corporate management, unannounced visits to hospitals by the Authority's assessors and interviews with staff, managers, patients and visitors.

Speaking at the event, Jon Billings, Director of Healthcare Quality with the Authority, outlined the main findings of the report. "It is clear from the review that a lot of good work has been undertaken and positive assessments were made in relation to certain aspects of hospital hygiene and in particular, service delivery areas such as hand hygiene, equipment, medical and cleaning devices.

“The commitment and attitude of staff, adherence to mandatory staff training and management of hazardous waste should all be acknowledged. It is clear from the report that work to drive improvements on the front line has paid dividends.”

“However, it is disappointing to report, that no hospital was rated as ‘very good’ and only seven (14%) were rated as ‘good’. Thirty-five hospitals (68%) achieved a ‘fair’ rating and nine (18%) hospitals were rated as ‘poor’. The overriding message to hospitals is that they can and should do better. There are too many hospitals in the ‘fair’ category; if this group could improve, it would make a significant difference. The report concludes that there is a need to strengthen corporate structures for hygiene at every level.”

The main recommendations contained in the Review are:

The HSE should formalise corporate management structures to include long term strategic planning and annual service planning with clear goals and objectives for hygiene and reducing healthcare associated infection. This should be implemented at local, regional and national levels for acute, primary and community care settings.

Hospitals must establish robust arrangements for implementing, monitoring and managing external contracts for hygiene related services. The HSE should establish a national set of indicators for monitoring hygiene and infection prevention and control performance.

Hospitals with less than ideal environments should implement specific and active plans for managing hygiene practice, including regular internal reviews and risk assessments.

Hospitals should review ward based catering facilities on a regular basis to ensure compliance with Hazard Analysis Critical Control Points (HACCP) standards.

The Review sets a new benchmark for hospitals to aim for on behalf of their patients. Individual detailed reports have been provided to each hospital to inform them of areas of strength and areas for further improvement.

Further details of the National Hygiene Services Quality Review along with each of the 51 individual hospital reports can be found on the Health Information and Quality Authority website: [www.hiqa.ie](http://www.hiqa.ie)

### ***Wisconsin State Laboratory of Hygiene Awarded \$750,000 FDA Grant***

The Wisconsin State Laboratory of Hygiene, the State's public and environmental health laboratory is one of three laboratories across the nation to receive a \$750,000 grant from the U.S. Food and Drug Administration to enhance food screening capabilities and detect radioactive material in food. The grant will span a three year period, awarding \$250,000 per year in order to support funding for supplies, personnel, minor facility upgrades and training.

<http://www.wispolitics.com/index.iml?Article=111159>

### ***United States Food safety plan emphasizes 'effective action' to prevent food supply contamination***

U.S. Department of Health and Human Services (HHS) Secretary Mike Leavitt recently announced a comprehensive initiative by the Food and Drug Administration (FDA) designed to proactively address the safety of the nation's food supply.

Back in May, FDA was charged with developing the comprehensive plan to protect U.S. food supplies from both unintentional and deliberate contamination.

The Food Protection Plan proposes the use of science and a risk-based approach to ensure the safety of domestic and imported foods eaten by American consumers. "America's food supply is among the safest in the world, and we enjoy unprecedented choice and convenience in filling the cupboard. Yet we face new challenges to meet both the changing demands of a global economy and consumers' expectations," Secretary Leavitt said. "This Food Protection Plan will implement a strategy of prevention, intervention, and response to build safety into every step of the food supply chain."

For more information, visit

<http://www.fda.gov/oc/initiatives/advance/food/plan.html>.

### ***MRSA - surveillance, rapid screening and hospital hygiene***

The origins and future perspectives about methicillin-resistant *Staphylococcus aureus* (MRSA) are outlined

*Staphylococcus aureus* methicillin resistance was first reported in the early 1960s, but widespread resistance has only become a major public-health problem in recent decades. Hajo Grundmann (Projectleader of the European Antimicrobial Resistance Surveillance System) and colleagues outline the history and microbiological and genetic characteristics of MRSA; for example, the bacterium readily acquires resistance against all classes of antibiotics by one of two mechanisms: mutation of an existing bacterial gene or horizontal transfer of a resistance gene from another bacterium.

Also discussed are key issues such as the case for screening programmes to identify carriers of MRSA, and how community acquired MRSA - in addition to the management of MRSA in hospital settings - remains a critical public-health priority.

Professor Grundmann concludes: "If the new community-acquired MRSA clones are, however, sufficient to sustain endemic levels by transmission in the community, the MRSA situation in hospitals, which still remains out of control in many countries, could potentially become explosive. The onus is therefore on health-care authorities to develop not only surveillance systems that are able to monitor the clonal dynamics of MRSA over wide geographical areas, but also to provide the resources for early recognition of MRSA carriers through rapid screening. Hospital staff have a responsibility to implement, maintain, and adhere to strict contact precautions, should hospitals remain places where citizens can aspire to positive health-care outcomes with confidence."

A Comment highlights the dangers of ignoring community-acquired MRSA in preference to hospital-acquired MRSA. Professor Ian Gould (Aberdeen Royal Infirmary, UK) warns that outbreaks of MRSA in the community are occurring independently from hospitals - not just taken from hospitals into the community - yet very little is being done to control the outbreaks in affected communities. He warns that this lack of action threatens to spoil any success in controlling hospital-acquired MRSA and asks: "Why are we doing nothing in the community, to contain this latest bout of staphylococcal aggression, never mind that it might help us in our battle with hospital acquired MRSA." He concludes: "if we are going to act we should do it now before what is currently sporadic illness (and probably sporadic carriage) becomes epidemic and commonly used antibiotics become useless."

Review Professor Hajo Grundmann, Project Leader and Scientific Coordinator of the European Antimicrobial Resistance Surveillance System, Center for Infectious Disease Epidemiology, National Institute for Public Health and the Environment, Antonie van Leeuwenhoeklaan 9 PO BOX 1 3720 BA Bilthoven, The Netherlands

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Source: <http://www.thelancet.com>

### ***Hospital Hygiene: Keeping hospitals clean but not sterile***

Standards for contamination and infection control are getting tougher, because a trip to the hospital shouldn't make you sick

When the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) talks, hospitals listen. JCAHO is the oldest and largest healthcare accrediting body in the United States. More than 4700 hospitals nationwide voluntarily subject themselves to JCAHO's audits and accreditation. These inspections and certifications are done on a three-year cycle, which means the hospitals coming due in 2005 were last accredited in 2002. This time around those facilities will find a few changes in the JCAHO standards. The differences aren't a surprise but they are on the minds of those involved in controlling hospital contamination and infections.

"The new 2005 JCAHO standards for infection control and their patient safety goal #7 have certainly gotten the attention of healthcare professionals," says Loretta Fauerbach, director of infection control for Shands Hospital (Gainesville, Fla.). She's also a member of the Association for Professionals in Infection Control and Epidemiology (APIC).

One reason for this attention is that the 2005 standards call for procedures and processes to have a measurable impact on infection rates and outcomes. The standards also outline audit methodologies that trace and confirm the implementation of those processes. A look at three areas—construction, sterilization and information management—shows what new contamination and infection control tools and techniques might come under the scrutiny of auditors.

***Hard hats and surgical booties***

As Shands' Fauerbach notes, there can be sterile fluids and instruments but not necessarily a sterile hospital. A clean hospital, on the other hand, is achievable. This might involve the use of techniques designed to rid surfaces of such organisms as drug-resistant enterococci and *Clostridium difficile*. The latter contaminates via spores, which makes it difficult to eliminate. In particular, notes Fauerbach, there aren't any hand antimicrobial agents that can kill the spores. The solution is to use gloves and conduct a thorough cleaning before and after a patient is in a room to minimize the spread of the spores.

But Jeanne Pfeiffer, APIC's national president, notes that achieving a clean hospital also involves overcoming a basic fact. Hospitals, unlike other contamination-controlled environments, aren't static structures.

"Hospitals are always under remodeling and redesign—always," says Pfeiffer. "It's just a constant process."

Tim Baugus is a project executive in the Portland office of Skanska USA Building Inc. (Parsippany, N.J.). The company was ranked number one in healthcare construction in 2002 by the Engineering News Record. Skanska USA, according to Baugus, does a lot of hospital construction and renovation. Baugus backs up Pfeiffer's assertion by noting that Skanska USA has been on some Portland-area hospital campuses

continuously for 15 years. During that span the company might do a series of small projects intermixed with larger hospital facility expansions and replacements. While these projects, large or small, are underway, the hospital must remain open. That requires taking special contamination control measures and following specialized procedures during construction.

These steps involve the use of HEPA filters, differential pressurization, entry and exit anterooms, surgical booties and sticky mats to ensure that the dust and debris kicked up during construction don't enter the rest of the facility. This is particularly important in hospitals because a form of the mold *Aspergillus* can be carried in sheet rock dust. Hospitals house people with compromised immune systems, those most at risk of developing one of the diseases related to the mold. Many of these contamination control requirements, Baugus notes, are covered in the mandated Infection Control Risk Assessment Standards (ICRAS) for construction.

"That's a fairly new requirement, although from our perspective we've been doing what the ICRAS guidelines tell you to do for the last 15 years," he says. "There are a lot of contractors that don't do a lot of medical work; if they ever went into a medical environment, it would be a surprise to them what the requirement is."

Baugus notes that airborne particle counts are sometimes done before and during construction. However, hospitals aren't controlled access areas and so it's difficult to get highly repeatable results. Thus, it's hard to draw an accurate picture of what's going on from a potential contamination and infection point of view. However, particle monitoring does have some advantages, especially when compared with the 24 to 48 hours it takes to culture a biological sample.

"Generally it's not wise to do biological monitoring. It's better to do particle counting. It's faster. It's an immediate answer. It's a lot cheaper, and we can do something about it once it's happening," says APIC's Pfeiffer. "Biologicals take a long time."

### ***A clean machine***

On the other hand, the time for a biological test has been reduced significantly for some applications. One is the monitoring of sterilization machines, which have seen the process times tumble six fold or more in some cases. These machines are used as part of the cleaning of endoscopes and other devices employed in minimally invasive surgery. Before such minimally invasive devices can be reused, they must be cleaned and any biological contaminants killed. Thus, the cycle time of the sterilization process and the time required to confirm that everything has been killed are a factor in overall surgical throughput.

Balaji Ramamurti, an industry analyst covering medical devices at the growth consulting company Frost & Sullivan (Palo Alto, Calif.), reports that the overall sterilization market is fairly mature. In 2001, the market stood at \$647 million and for the most part was growing at a few percent per year. That wasn't the case with the segment that dealt with cleaning endoscopes, which was growing at 7.7 percent annually.

Vendors have attacked the reprocessing cycle time by cutting the time to test and time to sterilize. There are three types of sterilization technologies: steam, ethylene oxide and plasma based. The last is the newest approach, and in it an electrical plasma pumps up the effectiveness of chemicals. This improvement is achieved without boosting temperatures. Advanced Sterilization Products (Irvine, Calif.;

www.sterrad.com) makes a line of plasma machines that use hydrogen peroxide.

"The killing power is the hydrogen peroxide molecules. The plasma decomposes or splits those atoms and removes the hydrogen peroxide as a residual from the load that's being sterilized," explains Martin Favero, director of scientific and clinical affairs for ASP.

The cycle time, according to Favero, is less than an hour, and there are plans to cut that time in half within the next year or so. The devices to do this are already available outside the U.S. and the company is in the process of working its way through the Food and Drug Administration approval to sell the machines inside the U.S.

Besides the speed, which Favero says is four to eight times that of competing ethylene oxide sterilizers, the plasma-aided approach does not have any toxic components. Nothing is dumped into the environment other than water and oxygen and there's no need to wait for instruments to cool down or to be flushed of nasty chemicals.

On the testing front, in April the healthcare arm of 3M Co. (St. Paul, Minn.; www.3m.com) announced an extension of its Attest rapid readout biological indicator for monitoring ethylene oxide sterilization. The company's products are loaded into the machine and undergo the sterilization process. They're then removed and can provide proof of success in as little as four hours instead of the 48 or so needed for standard biological monitoring.

Kevin Habas, marketing manager for 3M sterilization, says that the company also makes chemical indicators. These items verify that a sterilization load reached a certain temperature and chemical concentration. These indicators can be read very quickly.

"You'll get that result as soon as you open the door," says Habas.

Depending on how sure a hospital is of its procedures, this quick test may be good enough. The strips used in the biological tests have a high concentration of spores and killing all of the spores is difficult. As a result, no growth, or a negative result, in the biological test is a more certain sign of killing success than the chemical indicators are.

### ***Beyond biocides***

Besides faster machines and tests, some hospitals are turning to other technologies for contamination and infection control. One of these additional techniques is based on a service offered by MedMined Inc. (Birmingham, Ala.; [www.medmined.com](http://www.medmined.com)). This method makes use of information technology to spot trends and uncover data buried within hospital and medical records. This is based on data mining, which MedMined chief medical officer Patrick Hymel characterizes as a form of artificial intelligence.

"Data mining is a process where you use very sophisticated technology to discover important patterns within data that may be unsuspected by a human user or a human analyst," says Hymel.

According to Hymel, the process begins by scrubbing the incoming data to assure its cleanliness. Healthcare records have a lot of free-form text entry fields, where the same information may be entered any number of ways. The same term may be spelled differently, for example. MedMined uses an automated process, backed by human intelligence, to assure that the incoming data is clean. This information is then examined for what Hymel describes as patterns in patient results that indicate a process causing or placing patients at risk for infection. Examples could be patients that develop certain infections after undergoing surgery in a particular area.

The system also can pick up problems that originate outside of the hospital. Hymel notes that the service has spotted health problems such as salmonella outbreaks before local public health officials have. Such discoveries, however, cannot be done immediately. Because the system is looking for patterns and not random, individual events, the analysis must look at a long enough time span. According to Hymel, the analysis window typically runs from two weeks to a month.

As for the future, Frost & Sullivan's Ramamurti notes a trend toward putting ultraviolet light in air ducts in order to clean the air circulating within hospitals of pathogens. Ultraviolet light of the right wavelength strikes at the foundation of life because it is absorbed by DNA molecules. That makes it more difficult for a DNA-bearing organism to evolve an ultraviolet defense, unlike antibiotics for which resistant strains have already appeared.

However, such techniques may not help in the destruction of prions, point-like particles that are thought to be the cause of bovine spongiform encephalopathy (BSE, or "Mad Cow disease"). Prions are proteins that reproduce without the need for nucleic acid. Because of this and other prion characteristics many of the standard detection and destruction techniques won't work. That's why reliably detecting and eliminating prions are the subject of research.

Ramamurti says, "Anything to do with prions, either detectors or some kind of indicators to let people know that there are prions in particular medical equipment or not, that could be helpful. Further down the line would actually be coming up with ways and means of destroying these prions."

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As always, we encourage your feedback, comments and stories for upcoming issues.

Sincerely,

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