Hygiene for the World

Cutting-edge expertise in hygiene and infection control

Issue 4 / November 2014

EDITORIAL

First discovered in 1976, Ebola has always seemed like a disease that affected other people – but not us. At least until a few weeks ago. Now the images broadcast of the disease and its effects send a shiver down our spines. In the past, Ebola had emerged from the darkness of the African bush at long intervals, cruelly swept away a few unlucky victims, and then disappeared again.

Even earlier this year, when the epidemic was steadily gaining ground in West Africa, the world continued to stubbornly regard it as a regional problem. But now Ebola has become a virus that affects us all, because it is mobile. Just as we ourselves are more mobile in the 21st century, so too are diseases. Ebola causes irrational fears and panicked reactions, and it evokes the language of infection rates, mortality, lethality, isolation wards, quarantine, hygiene and disinfection. Those terms are now on everyone's lips. So the world is finally ready to talk about infection and how to prevent it. And it's about time.

Of course fear rarely offers the best counsel. But it does light the spark we need to see clearly. It shows us that there are numerous experienced experts, infection control professionals, microbiologists, specialists in infectious diseases and internal medicine, and qualified care staff who know how to tackle this situation – as well as many courageous volunteers working in the field. Those who inspire the most confidence are the ones who clearly tell us that they know what needs to be done. But we also know that people make mistakes. Especially when they're dealing with matters of life and death, and when expertise and training come up against instinctive, human behaviours. So, yes, someone ends up touching their face. And in that millisecond of wiping away a drop of sweat, they forget everything they know about infection and contamination.

That's why it's so important for us to keep our feet firmly on the ground. Panicking never helped anyone. Ebola is similar to many other infections, even though its effects are so terrible. Comparing the number of deaths from Ebola with those from influenza may seem tenuous, but it does help to rationalise and relativise the discussion and avoid exaggerations and scaremongering.

We need to sharpen our senses. Not just now, in the middle of the Ebola crisis, when people are discussing terrible pandemic scenarios, but all the rest of the time, too. Viruses and bacteria are ubiquitous. And they are constantly changing their behaviour in ways that we don't expect.
Once upon a time we believed that deadly infections like Ebola would stay confined to the areas that they ravaged. And we hoped that antibiotics would protect us against virtually all bacterial infections. But mutations, resistance and human shortcomings have taught us that our beliefs and hopes are not enough. Now is the time to act prudently – but never to drop our guard. We should learn from this new understanding of how fragile our defences are when it comes to deadly viruses such as Ebola. And once this terrible outbreak comes to an end, we should take this greater awareness of hygiene and infection control into what will hopefully be a better future!

Very best regards, Markus Braun

Ebola
What you need to know

The Ebola outbreak in West Africa has had alarm bells ringing for months. Worries persist about how the disease is transmitted and what safety precautions can be taken. Photo: fotolia.com

What kind of virus is Ebola?

Ebola virus disease is caused by ebolaviruses, which are members of the Filoviridae family. Ebolaviruses are enveloped, single-stranded RNA viruses which are filamentous (U-shaped and 6-shaped) – hence the name Filoviridae, which is derived from the Latin noun filum. Ebolavirions are 80 nanometres in width and may be as long as 14,000 nanometres. Together with the Marburg virus, Ebola is one of the most commonly known RNA viruses and is large enough to be visible under an optical microscope.

Ebola was first identified in 1976 in Yambuku, a small village in the Democratic Republic of the Congo (then known as Zaire). The virus was named after the Congolese River Ebola. There is still some uncertainty as to Ebola's primary host and natural reservoir, though evidence is mounting that fruit bats, which are widespread in Africa, can transmit the infection without succumbing to it themselves. The WHO has stated that the virus can also be transmitted through people having direct contact with infected animals such as monkeys, forest antelopes and fruit bats. In Africa it is common practice to hunt reservoir species and even eat them (bushmeat).

What is the difference between enveloped and non-enveloped viruses?

One important difference for all of us working in the field of infection control is the fact that enveloped viruses such as Ebola and hepatitis A are much easier to tackle with disinfectants and are unable to survive in the environment for long periods. Non-enveloped viruses such as the polio virus and norovirus are far less sensitive to disinfectants and can survive much longer in their surroundings.
Many non-enveloped viruses are spread by faecal-oral transmission in hospitals where care utensils are not properly cleaned or are spread via water which is contaminated with faeces.

How does the fact that Ebola is an enveloped virus affect how dangerous it is and how long it can survive in the environment?

Loss of the viral envelope or removal of the envelope's lipid components prevent the enveloped virus from infecting the host cell. This fact is exploited to inactivate enveloped viruses in order to stop the virus from spreading. The most sensitive component of the viral envelope, the lipid bilayer, can be destroyed using alcohol-based lipid solvents such as ethanol and 2-propanol. [1]

How do people get infected with Ebola?

Ebola can be transmitted through direct contact with an infected person. Blood and bodily fluids such as urine, vomit, excreta and even sweat and sperm are all infectious. Transmission through sexual contact has been recorded, but is not regarded as a primary mode of transmission. Germany's Robert Koch Institute (RKI) has stated that there is currently no evidence that the disease can be spread through the air. Nonetheless, the RKI stresses that there is a risk of infection for anyone who comes into contact with Ebola patients, such as medical staff, unless they wear protective clothing such as a face shield or mouth mask, goggles, a head cover and a water-repellent gown.
The disease can also be spread via contaminated objects, since the virus can survive for several days at temperatures of up to 4°C. At –70° C it can even survive

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Questions & Answers

Question:
What has happened to the United Nations Millennium Development Goals which included targets such as reducing child mortality and combating HIV/AIDS, malaria, and other diseases?

Answer:
By the end of 2012, 89 percent of the world's population had access to clean drinking water, as compared to just 76 percent in 1990. This is actually higher than the figure originally set in the Millennium Goals. Progress has also been made in regard to basic hygiene. In 1990, only 49 percent of people worldwide had access to a hygienic toilet, but by 2012 this figure had climbed to 64 percent. That still leaves 2.5 billion people who still have no access to hygienic toilets, however. A total of 69 countries failed to meet the Millennium Goal of ensuring that 75 percent of the population have proper toilets.
People in rural areas are particularly disadvantaged in this respect, with only 47 percent having access to clean and hygienic toilets as opposed to some 80 percent of city dwellers. One billion people still relieve themselves in the open air. The WHO estimates that almost 850,000 people are killed by diarrhoea-related diseases every year – and contaminated water is one of the main routes of transmission.

Continued from page 1

indefinitely. Medical devices such as sprays that are not replaced or disinfected can spread the disease through smear infection.

Does a cleaning and disinfection appliance decontaminate care utensils to a sufficient degree?

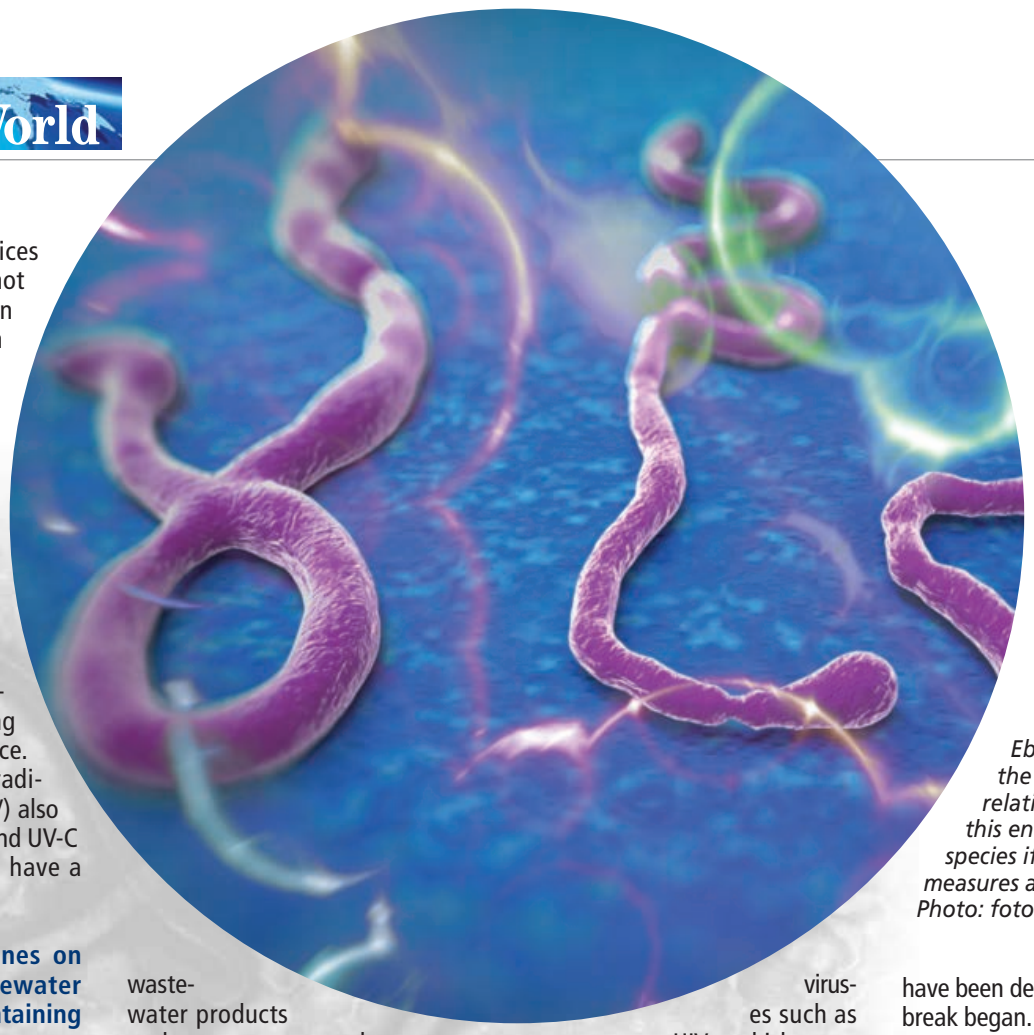
Yes. Ebola is thermosensitive and is inactivated by temperatures of 60°C or higher and by thermodisinfection in a cleaning and disinfection appliance. Hard radiation (X-ray radiation greater than 100 kV) also renders Ebola harmless, and UV-C has also been shown to have a moderate effect. [2]

Are there any guidelines on how to handle wastewater from special wards containing Ebola patients?

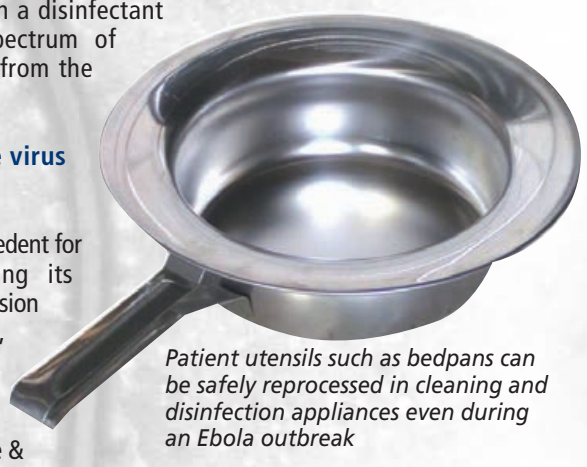
Standard practice varies from country to country. Jim Gauthier reports that there are no recommendations for disinfecting patient excreta in Ontario, Canada, for example. He notes that flushing human excreta infected with the Ebola virus does not pose any risk to the sewage system: "The fact that Ebola is an enveloped virus means that it cannot thrive in that environment."
The U.S. Center for Disease Control and Prevention (CDC) has also advised that Ebola patients do not have to worry about using bathrooms and toilets because sewage treatment plants in the United States are perfectly capable of inactivating those kinds of viruses. [3]

What happens to other waste from Ebola isolation wards?

Germany's Robert Koch Institute has the following to say: Any waste that arises during the treatment of a patient who is suspected of suffering from Ebola virus disease should be professionally inactivated before leaving its place of origin. Alternatively it should be collected in tear-proof, moisture-proof and water-tight containers and forwarded for incineration in suitable, tightly-sealed containers for infectious materials without at any point being sorted or moved from one container to another.
Outside of special isolation wards, wastewater products such as excreta and urine can be disposed of in toilets and through the sewage system. No prior disinfection of wastewater products is required. Should it be necessary to use a commode or bedpan for patients with limited mobility, the use of disposable items is preferred. The contents can be disposed of in the patient's toilet. If no disposable bedpans or commodes are available, then whatever care utensils are used must first be emptied in the patient's toilet in the same room and then forwarded in a suitable container for initial wipe or immersion disinfection with a disinfectant with an AB spectrum of action selected from the RKI list. [4]



Ebolavirus under the microscope. It is relatively easy to tackle this enveloped virus species if the right hygiene measures are in place. Photo: fotolia.com



Patient utensils such as bedpans can be safely reprocessed in cleaning and disinfection appliances even during an Ebola outbreak

How might the virus mutate?

"There is no precedent for a virus changing its mode of transmission so drastically", insists Prof. Dr. Peter Piot from the London School of Hygiene & Tropical Medicine at the Science Media Centre (Science Media Centre: "Expert reaction to media coverage questioning whether Ebola could become airborne", 2 October 2014 http://www.sciencemediacentre.org/expert-reaction-to-media-coverage-questioning-whether-ebola-could-become-airborne). "Other viruses such as HIV – which transmit in the same way, have passed through millions of humans, and are known to mutate more than Ebola – have not become airborne," noted the co-discoverer of the Ebola virus.
On the same forum, Dr. Mike Skinner from Imperial College London comments: "Without gain-of-function experiments of the type that have provoked some considerable controversy in recent influenza virus studies, it is impossible for virologists to establish whether viruses are inherently incapable of adopting a new mode of transmission or to assess the likelihood should it indeed prove possible." Gain-of-function experiments change the gene product so that it gains a new function, for example enabling it to bind to a receptor with which it was previously incompatible.

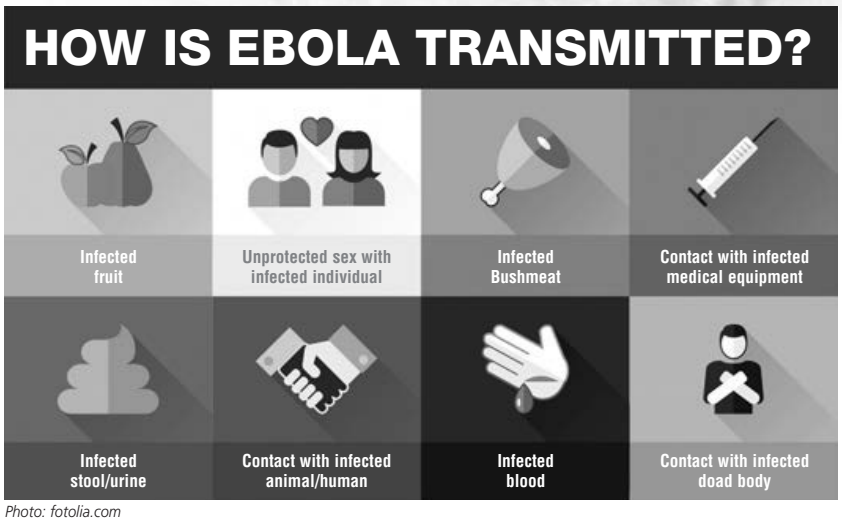


Photo: fotolia.com

How stable is the Ebola virus in the air?

The virus is stable in bodily fluids and in patient excreta. Experts have largely ruled out the possibility of airborne transmission, although they do not yet know which molecular factors are responsible for this aspect. There is also uncertainty as to whether Ebola could bind to receptors of the respiratory tract and ultimately cause infections through the airways.
Researchers have been tracking the genetic mutations of the virus ever since it was discovered. Some 300 mutations were already known before the start of the recent outbreak, and approximately 50 more have been described since the outbreak began. The jury is still out as to whether these mutations have led to any changes in the relevant properties of the virus.
Genetic differences allow scientists to distinguish different strains in order to clarify, for example, whether an outbreak in one region is related to cases in a different region. That enabled researchers to show that there was no epidemiological link between the outbreak in West Africa and the outbreak in the Democratic Republic of the Congo in central Africa. The results of this study were published in the New England Journal of Medicine (Maganga GD, et al: NEJM (online) 14 October 2014. [5]

Researchers have been tracking the mutations of the Ebola virus since it was discovered.

Sources:
[1] Wikipedia
50 W. R. Moorer: Antiviral activity of alcohol for surface disinfection. Int. J. Dent. Hyg. (2003) 1(3): pp. 138-142 (Review) PMID 16451513

[2] Sagripanti, J. L., & Lytle, C. D. (2011). Sensitivity to ultraviolet radiation of Lassa, vaccinia, and Ebola viruses dried on surfaces. Archives of virology, 156(3), 489-494.

[3] http://www.cdc.gov/vhf/ebola/hcp/environmental-infection-control-in-hospitals.html
Jim Gauthier is an Infection Control Practitioner at Providence Care in Kingston, Ontario (Canada), where he is responsible for training and development, surveillance and outbreak management. He has also taught at Queen's University since 2007.

[4] http://www.rki.de/DE/Content/InfAZ/E/Ebola/Desinfektion_bei_begruendetem_Ebolaverdacht.pdf?__blob=publicationFile

[5] http://dx.doi.org/10.1056/NEJMoa1411109).

A tool de of patien

The gastrointestinal tract is a key reservoir for bacteria that play a role in hospital-acquired infections, so it understandably gets a lot of attention from experts. Yet the topic of how best to handle the human excreta that come from the gastrointestinal tract continues to inspire lukewarm interest. Anne Lory, an operating theatre nurse with a degree in infection control, works as an infection control specialist at the Hôpital Sainte Marguerite in Marseille. After studying this topic in detail, she developed a method which makes it relatively easy to judge whether hospitals and care homes are dealing with patient excreta properly. We asked Anne Lory what motivated her to take this step and how her colleagues and hospital managers had reacted.

Question:
Why is it so important for hospitals and care homes to pay more attention to how they handle human excreta?

Anne Lory:
With the numerous cases of gastroenteritis and recent outbreaks of highly resistant bacteria such as glycopeptide-resistant enterococci, Carbapenemase-producing enterobacteria and Clostridium difficile infections, healthcare facilities are clearly facing a serious risk of epidemics. This situation is a priority on both a national and international level.

These microorganisms which carry an easily transferable resistance mechanism are found in the human digestive tract. They are therefore readily spread by patients – and by care personnel, too – in their immediate environment, either through direct or indirect contact with contaminated surfaces or through droplets dispersed in the air. Transmission frequently occurs when staff handle patients' laundry, assist them with personal hygiene, or dispose of patient excreta. The microorganisms are resistant to numerous agents including antiseptics, detergents, disinfectants and antibiotics. Depending on the type of virus, they can survive in their environment for a considerable amount of time:

signed to ensure proper handling t excreta

Anne Lory is an infection control specialist at the Hôpital Sainte Marguerite in Marseille

• Noroviruses can survive for 120 hours at 37° and for 15 days on contaminated surfaces
• Clostridium difficile can survive for several months in its sporulated form

Patients gathered together in healthcare units are typically in close physical proximity, often sharing both living facilities and care facilities. This situation – compounded by interactions with healthcare specialists and other professionals working in the care environment – can lead to cross-transmission if people fail to observe infection control guidelines and best practice in care. Multiple factors play a role in these cross-transmission mechanisms, including a lack of knowledge of infection control guidelines among care personnel, the elaborate care required by older patients (some of whom may be suffering from varying degrees of dementia), and equipment and materials that are inadequate or that are deployed without monitoring or maintenance.
To minimize the risks associated with these epidemics, three basic principles need to be applied: the correct use of antibiotics, proper adherence to standard precautionary measures – including hand hygiene by rubbing with an aqueous alcohol solution (after simple handwashing in the case of Clostridium difficile) – and a rigorous approach to handling excreta.
Of all the tasks carried out by infection control teams, finding suitable ways to dispose of excreta is a crucial one, because excreta contains large quantities of microorganisms. The risk of cross-transmission is high, and it's often far from easy to implement the recommendations of the relevant national bodies in existing wards.
The key point for infection control practitioners is to ensure that people follow basic infection control procedures and adhere to standard precautionary measures, especially when it comes to disposing of excreta.

The tool was developed to address a rise in epidemics

Question:
What prompted you to develop an IT-based tool?

Anne Lory:
Epidemics were on the rise due to failures to comply with proper procedures for handling excreta. Drawing on the collaboration and support of their ARLIN* and CCLIN**centres, several teams decided to investigate this issue in various healthcare facilities and produce booklets and datasheets to encourage best practice. The results from the healthcare facilities and discussions at training events showed us that different care teams deal with excreta in hugely varying ways. It also revealed that some teams were taking risks such as using hand-held shower sprays and broken or damaged bedpans and failing to ensure that disposable bedpans were used only once, as well as using reusable toiletry products.
Some healthcare facilities have a bedpan washer-disinfector in a utility room, but care personnel never go there because it's too far away! We've also seen instances where the personnel using the bedpan washer lacked the basic knowledge of how to use it properly, for example wrongly believing that "you have to empty a bedpan before putting it in the washer-disinfector".
So we needed a tool that was as comprehensive as possible. We wanted it to give people pause for thought and help them do a stock-taking of their equipment, organisation and procedures. We developed the diagnostic tool by analysing the existing literature and recommended guidelines. It's designed as a risk management tool, and it enables infection control teams to supply objective evidence of deviations in discussions with managers and building services departments.

Question:
How have nurses, doctors and hospital management teams reacted to the tool?

Anne Lory:
We began by asking care personnel to volunteer for a test phase. They reacted well to the tool and said it was easy to use and covered all the bases. But we still don't know exactly how the tool will affect day-to-day practice, organisation and equipment. We recently published the tool online and now we're seeing how a topic that had been neglected is getting more and more attention. The infection control experts who created this diagnostic tool are delighted because it offers valuable and validated assistance in determining the areas in which care personnel need more training.

Question:
How does this method work?

Anne Lory:
The tool offers a means of carrying out a stock-taking of a facility and of its departments and utility rooms.
The goal is to produce a list of key points showing how the general management of bedpan cleaning and disinfection appliances should be reviewed throughout the facility.
The second step is to take stock of the equipment, organisation and day-to-day practices within the department under review.
Gathering this data takes between 30 and 35 minutes. The infection control practitioner can help fill out the information but it's important that the data is compiled by an in-house expert who is familiar with how the department works.
An Excel® sheet can be used to compile and analyse the data if you're dealing with a large number of departments.
The answers for the various points that need to be filled out work on a binary system, with "yes" for "expected" and "no" for "not expected". That makes it easier to quickly carry out manual or automated analysis.

The tool developed by Anne Lory helps staff conduct a stock-taking of the organisational processes and equipment used in handling patient excreta.

It quickly becomes clear which measures should be given priority. The team identifies the improvements that should be suggested and can easily present them to the care personnel and the teams.

The tool, which can be used without any preliminary training, provides an assessment of the current situation. And if a training session has been carried out, it offers a means of checking the organisation and day-to-day practices of the staff.

By rallying together the various partners working in the facility with the infection control team and, above all, the management and technical services department and focusing their attention on the best method of handling patient excreta, you raise people's awareness of hygiene issues and ultimately have a positive impact on capital investments and equipment acquisitions.
The practical day-to-day organization can then be reviewed in collaboration with the care personnel, supervisors, management, and the infection control team.

Question:
What conclusions do you draw from this process?

Anne Lory:
Documentation of the overall healthcare structure. By ensuring its widespread distribution you can raise the teams' awareness and enhance the expertise of the care personnel. By carrying out the analysis and survey process within a unit we can now help teams understand how important it is to handle patient excreta in the correct way. Previously this was seen as a kind of secondary task, it was undervalued and not given the importance it deserves by supervisors and management.

A subsequent drop in the spread of epidemics suggests that care personnel's expertise has improved and that the facilities have been upgraded to meet requirements.
Sensible use of antibiotics, adherence to hand hygiene regulations, and rigorously applied systems for handling excreta are an effective combination for tackling the risk of infection.

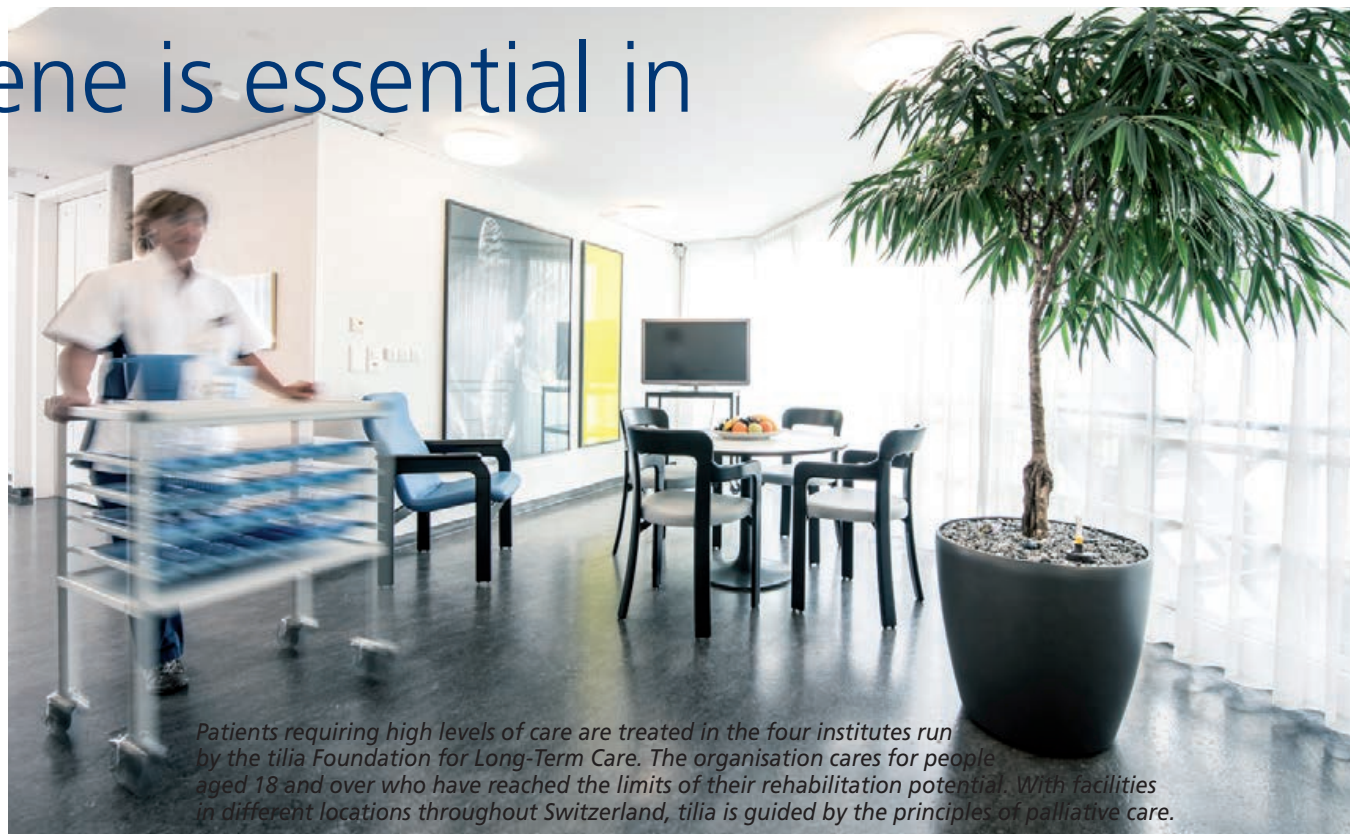
Information on acquiring the "Excellence excréta" tool can be found on the CCLIN South-East website:
http://cclin-sudest.chu-lyon.fr/enquete/excreta/index.html

Further information:
NosoB@se website: http://nosobase.chu-lyon.fr/index.htm
CCLIN ARLIN websites for all French regions: http://www.cclin-arlin.fr/

*ARLIN = Antenne régionale de lutte contre les infections nosocomiales = regional unit for nosocomial infection control

** CCLIN = Centre de coordination de la lutte contre les infections nosocomiales = regional infection control coordinating centre

"Maximum hygiene is essential in these situations"



Patients requiring high levels of care are treated in the four institutes run by the tilia Foundation for Long-Term Care. The organisation cares for people aged 18 and over who have reached the limits of their rehabilitation potential. With facilities in different locations throughout Switzerland, tilia is guided by the principles of palliative care.

Ursula Hafed hates the way patients are told they have "exhausted all their treatment options". To her the term "exhausted" means everything is over and there's nothing left to do. But in reality there is always something left to do. That's why Hafed prefers to talk about patients reaching the limits of their rehabilitation potential. Often the people involved in these situations are exhausted with the process themselves. Hafed has been caring for these kinds of patients for the past 23 years. Employed by the tilia Foundation for Long-Term Care (tilia Stiftung für Langzeitpflege) which oversees all the tilia centres, she is based at the tilia Ittigen centre not far from the Swiss capital of Bern. "Gut umsorgt " ("Well cared for") is the simple and striking phrase that appears beneath the title of all tilia brochures. And that's exactly how patients feel at tilia. In Ittigen, one of the four tilia centres, there are 106 residents who require long-term care. And Hafed's commitment to the cause is clear: "Long-term care is a type of nursing care that calls for creativity!"

That's what the patients at the tilia centres in Ittigen, Köniz, Ostermundigen and Wittigkofen get, because, as Hafed emphasises, "at tilia, the managers manage things and give people like me the time to design good care plans." That means creating care strategies based on concepts such as palliative care, which the World Health Organization defines as "an approach that improves the quality of life of patients and their families facing the problem associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual".

Ursula Hafed has been working at tilia for 23 years. Her responsibilities include hygiene and infection control.

Staff members at tilia also take the Primary Nursing approach, in which one Primary Nurse accepts responsibility for a specific patient. "That enables us to quickly detect changes, for example if somebody's hearing deteriorates, if they show signs of an additional disorder, or if their families are going through changes," says Hafed. So what are the effects of this kind of approach? "We don't really have any residents who develop bedsores because we observe them so carefully and work so closely with them." Almost apologetically, Hafed adds: "The only times we treat bedsores are when patients come to us from other facilities."

Whenever that happens, Hafed is typically on the front line as a qualified care professional who has particular expertise in treating wounds and sores. Hafed is also the coordinating infection control specialist for all the tilia institutes, and she ensures that every patient with bedsores is screened for MRSA. "In Switzerland we don't have any binding regulations such as the ones in the German Protection against Infection Act," Hafed says regretfully. Instead, experts in Switzerland use the guidelines issued by Germany's Robert Koch Institute (RKI) and develop their own in-house infection control strategies. As tilia's infection control specialist, Hafed would at least like to see binding regulations introduced for the canton, and preferably for Switzerland as a whole. She forms part of her organization's Hygiene Commission, which also includes a doctor, a kitchen manager, the quality coordinator, the head of material procurement and a colleague from the technical services department. This Commission has overall responsibility for all the tilia institutes, and it works on the assumption that hygiene and infection control play a critical role when it comes to patients who need high levels of care: "We have so many patients who require invasive treatment using methods such as catheters and mechanical ventilation, and maximum hygiene is obviously essential in those kinds of situations." This is compounded by the fact that the majority of the Ittigen residents are suffering from dementia. As a result, staff members make frequent use of care utensils such as urine bottles and bedpans as well as commodes for patients who need them during the night. To make sure these care utensils are reprocessed properly and safely, all the tilia institutes rely on cleaning and disinfection appliances from MEIKO. These also have the benefit of giving staff more time to spend on the residents' needs rather than worrying about dirty care utensils.

Many tilia patients are confined to bed or accommodated in protected facilities due to dementia.

At all four tilia locations, having time for the residents is the most important part of the job for the 600-plus employees. The specialist living facility for residents with dementia in Ittigen and the "Respiration" department in Wittigkofen – with its special infrastructure for people who rely on breathing support systems – have one key thing in common: they apply targeted strategies that place a firm focus on residents' well-being and on achieving the best possible living conditions. Yet they still face up to the reality of the situation: "Palliative care accepts that life naturally comes to an end. But everyone has the right to have clear information on their disease and the different treatment options," says Hafed. With organisations such as Dignitas and Exit, Switzerland offers seriously ill patients the ability to decide themselves when their life should come to an end. This has led to much discussion in the tilia institutes, with the conclusion that it is always possible to find a solution and accompany patients through to their final moments in the best way possible. Because in reality options are never exhausted – and there is always something left to be done.

tilia Foundation for Long-Term Care

All the tilia institutes belong to the tilia Foundation for Long-Term Care in Ostermundigen. It offers a range of services, including providing support and assistance to carers of people who require high levels of care at home (heimex) and offering lunch facilities to non-residents, meal delivery services and day-centre services. It also provides inpatient care to seriously ill people aged 18 and over. In addition, the assisted living organisation "atria – sicher wohnen" offers rented accommodation that includes 24-hour emergency call systems and the option of choosing a customised package of services from one of the tilia centres.

CALENDAR

12–15 November 2014
Medica, Düsseldorf, DE

16–18 November 2014
HIS Conference, Lyon, FR

24–26 November 2014
Freiburg Congress of Infectious Diseases and Hygiene, Freiburg, DE

14–16 January 2014
ICICAS, Singapore, SG

26–29 January 2014
Arab Health, Dubai, UAE

18–20 March 2015
Zorgtotaal Utrecht, Utrecht, NL

21–24 March 2015
IFIC, New Delhi, IND

24–26 March 2015
Altenpflege (care sector), Nuremberg, DE

26–29 March 2015
APSIC, Taiwan

MASTHEAD (IMPRESSUM):

MEIKO Maschinenbau GmbH & Co. KG
Englerstrasse 3, 77652 Offenburg, Germany
Phone: +49 781 203 1204
Fax: +49 781 203 1356
E-mail: hygieneworld@meiko.de

Represented by:
MEIKO Beteiligungs GmbH
Managing Director:
Dr.-Ing. Stefan Scheringer
Court of registry: 79098 Freiburg i. Br.
Reg. no.: HRB 471532

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German Trade Register
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