

FORUM

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How to control the threat of multidrug-resistant pathogens

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So-called hospital germs worry many patients. Do I have to expect to become even sicker in hospital instead of healthy? Can I also be infected with multidrug-resistant pathogens in everyday life? Topics about which a lot of half-knowledge is in circulation. All the more interesting was a lecture by Christian Fischer at Stieglmeyer headquarters in Herford. Mr. Fischer is a hygiene specialist at the Klinikum Lippe and has managed, together with his colleagues, to significantly reduce the number of hospital infections.

How to control the threat of multidrug-resistant pathogens

In conversation with hygiene specialist Christian Fischer from the German hospital Klinikum Lippe

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Multidrug-resistant pathogens are bacteria that have become resistant to more than two types of antibiotics through gene mutations. Such pathogens develop where antibiotics are commonly used – for example in factory farming. In chicken breeding, even the antibiotic of last resort colistin is used, which is held back in Germany as a means of emergency in humans, explains Mr. Fischer. The well-known methicillin-resistant *Staphylococcus aureus* (MRSA) was also produced in pig or cattle breeding. People who often come into contact with livestock are more settled with these bacteria than others.



Professional hand hygiene according to the recommendations of the World Health Organization is crucial in the fight against multidrug-resistant pathogens. Photo: Klinikum Lippe

In everyday life, we are well protected

"Settled" is indeed the right word – not "infected". Because the everyday contact with multidrug-resistant pathogens is usually just as unspectacular and harmless as with non-mutated bacteria. They reach the skin or mouth by touching or food ingestion. As a rule, however, they cannot do much there, because healthy people are protected by several layers of endogenous bacteria, the so-called resident flora, the microbiome. Foreign bacteria do not penetrate through these layers, find no habitat and die after some time. They can enter through wounds or through medical "devices", such as syringes, that are pricked through an imperfectly disinfected piece of skin. But even then, the body's defense usually copes with them.

Why are these germs so dangerous at the hospital? An aughts' estimate suggests that between 400,000 and 600,000 nosocomial infections (NI) per year were contracted by people during medical treatments in Germany. Christian Fischer lists factors that favour contagion: prolonged hospitalisation, intensive care stays, surgery and prolonged antibiotic therapy.



The hygiene specialists at Klinikum Lippe persuade their colleagues to work safely with good arguments. Photo: Klinikum Lippe

Danger for people with weakened immune systems

Taking antibiotics in the hospital often causes not only the targeted bacteria, but also the microbiome on the skin. Multidrug-resistant bacteria that survive the antibiotic can now more easily fill in the gaps and accelerate their colonisation rapidly. A bacterial colony needs only 20 minutes to double. If these pathogens get into the bloodstream through a wound or a device, very old or sick people are in danger. If their weakened immune system cannot defeat the resistant invaders, there are few treatment options. Up to 30,000 deaths from nosocomial infections per year are reported in Germany. This number sounds dramatic, but according to Mr. Fischer it is also related to the advancement of medicine: more and more people are getting very old or are surviving longer with serious illnesses, so that the risk group for NI has grown in recent decades. Experts believe that only a third of infections could be avoided.

The hygiene specialists at Klinikum Lippe work on this day after day. Each patient is scanned for MRSA before admission. If the test is positive and the patient is not an emergency, he or she will first receive a "clean-up kit" and can treat the germ at home – with a nasal ointment, a pharynx douche, and antiseptic soap. This procedure is successful and more cost effective for the hospital than housing on an isolation

ward.



Hygiene specialist Christian Fischer.

The five indications of hand disinfection

In the hospital, MRSA is most commonly transmitted through the hands of the staff. "That's why we make sure that the five indications of hand disinfection set by the World Health Organization are respected in our facilities," explains Mr. Fischer. "You have to disinfect your hands before contact with the patient, before starting an aseptic task, after patient contact, after contact with potentially infectious material (even after disposing of disposable gloves) and after leaving the patient-side." The hygienist knows the reservations that many colleagues have regarding frequent disinfection: It dries out the skin on your hands and, above all, the skin between your fingers. In fact, however, all disinfectants contain small fat globules to prevent this. To properly disinfect the hands, rub them thoroughly up to the wrists for 30 seconds until the liquid evaporates, then knead the skin again. That way the fat spreads and protects against dehydration.

What significance does a thorough bed reprocessing have for the hygiene specialist? "It's of great importance; the bed can certainly play a role as a transmission path," says Mr. Fischer. He is a supporter of automated bed reprocessing and sees it as a good advertising argument for hospitals. The Klinikum Lippe is currently reprocessing beds manually, while the hygiene team regularly checks the quality. The beds are sprayed with a fluorescent control spray before cleaning, especially the heads and side panels. If the reprocessing is thorough, the spray disappears without a trace. If not everything is cleaned, you can see the residues glow under black light. The cleaning personnel perform the light test themselves – this increases their motivation without feeling attacked.



The modern hospital bed Evario by Stiegemeyer can be easily and thoroughly cleaned.

Antibacterial surfaces have no use

Which properties of a bed help in the treatment, which are more critical? "Ion-emitting surfaces, where supposedly fewer germs are growing, are completely overrated," says Mr. Fischer. Coating with copper or silver, for example, belonged to this category. "I'd rather have a smooth surface without niches and cables that withstands many disinfections than a coated one that breaks after three to five years," the expert says. For example, germs actually stay shorter on copper, so that after a certain time only 70% of the original germs are detectable. But a minus of 30% hardly weighs in the unimaginably high number of pathogens in

our environment. Even common household disinfectants from the supermarket get rid of 99.9% of the germs, but the remaining 0.1% is still a very large amount. In the jargon of hygiene, 99.9% correspond to three so-called log levels, each additional nine behind the comma adds a log level. Sterilisation of contaminated objects is achieved in Log 6 (99.9999% killed germs).

Challenging areas in bed reprocessing are scissor joints and spiral cables, for example. But dirt on the chassis, outside the contact area of ??the patient, are a little less critical. "Bacteria do not move on their own, and on macroscopically clean surfaces, such as a table top, they also have no breeding ground for propagation," explains Mr. Fischer.

In his work as a hygiene specialist, he relies on regular inspections, but also on a collegial approach to employees: "We are not the hygiene police, but advisory colleagues. If you say, 'Imagine that your wife, child, or father is lying in that bed', you can reach people much better."