

## Drinking water hygiene – an urgent problem for outpatient treatment services

Patients in clinics have to be protected against contamination with pathogenic bacteria in water, such as pseudomonades, legionella, mycobacteria, chlamydia and aspergillus among others. High-risk patients also need this protection when they are in the outpatient and private home environment, due to the fact that growing numbers of seriously ill patients with a high risk of infection are being treated as outpatients. Such patients are often in medical care for a year or more, whereby the recurring in-patient stays are of short duration only (e.g. courses of therapy). High-risk patients include immuno-suppressed patients (chemotherapy, radiotherapy), patients who have undergone organ transplant surgery (e.g. bone marrow and blood stem cell transplant following leukaemia) as well as patients with HIV, intensive care patients, premature babies and cystic fibrosis patients.

The data collected by a company that operates nationwide, monitoring the microbiological quality of drinking water for its clients in accordance with §5(2) German Drinking Water Ordinance 2001, shows how seriously the problem of the domestic environment has to be taken. Of 90,000 drinking water samples taken from domestic fittings examined in the last three years, 40% showed numbers of bacteria in excess of the limits. This shows that the risk of infection in the private and outpatient area has to be included in the hygiene measures for high-risk patients. Accordingly, in the case of high-risk patients, clinics should point out the risk of infection through drinking water in the domestic area and offer assistance in minimising risks.

The Community Acquired Pneumonia Network, (CAP-Network) records the frequency of lung infections (pneumonia) caused by atypical pathogens such as legionella, mycobacteria and chlamydia. These records show that about 4% of cases of pneumonia were caused by legionella. That means that annually around 10,000 cases of pneumonia treated in hospital are caused by legionella – yet only several hundred of these cases were notified, and this despite the fact that patients with a legionella-pneumonia are particularly at risk.

In fact, in many cases, water is not actually safe for delivery to the public (patients, residents, visitors, tenants)! Persons who nevertheless deliver such water, intentionally or negligently, are not merely committing an administrative offence, but a criminal offence pursuant to §24(1) Drinking Water Ordinance 2001.

This is nothing new – domestic installations are almost as a rule contaminated with gram-negative bacteria such as *pseudomonas aeruginosa*; thus, drinking water can show high

concentrations of endotoxins – up to 4 ng/l (BGFA Info 2003). When showering, endotoxins can also be inhaled with respirable aerosols. The possible effects on health of such exposure to endotoxins are currently being discussed internationally (Liebers V, Brüning T, Raulf-Heimsoth M: Occupational endotoxin-exposure and possible health effects on humans. Am J Ind Med 2006; 49: 474 -491).

With domestic installations in modern houses, humans created a new and varied habitat for micro-organisms. The micro-organisms were quick to make use of this; we, however, are still learning how to deal with the problems this brings. In domestic installations, the biofilm created by the micro-organisms constitutes the most important bacterial reservoir. Particular attention should therefore be paid to its removal during remedial measures. It is generally known that conventional chlorination is not of any use here. There are however new procedures (membrane cell electrolysis), which the Federal Environment Agency (Umweltbundesamt, UBA) has now also added to the “list” pursuant to §11 Drinking Water Ordinance 2001. The market is now providing solutions.

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