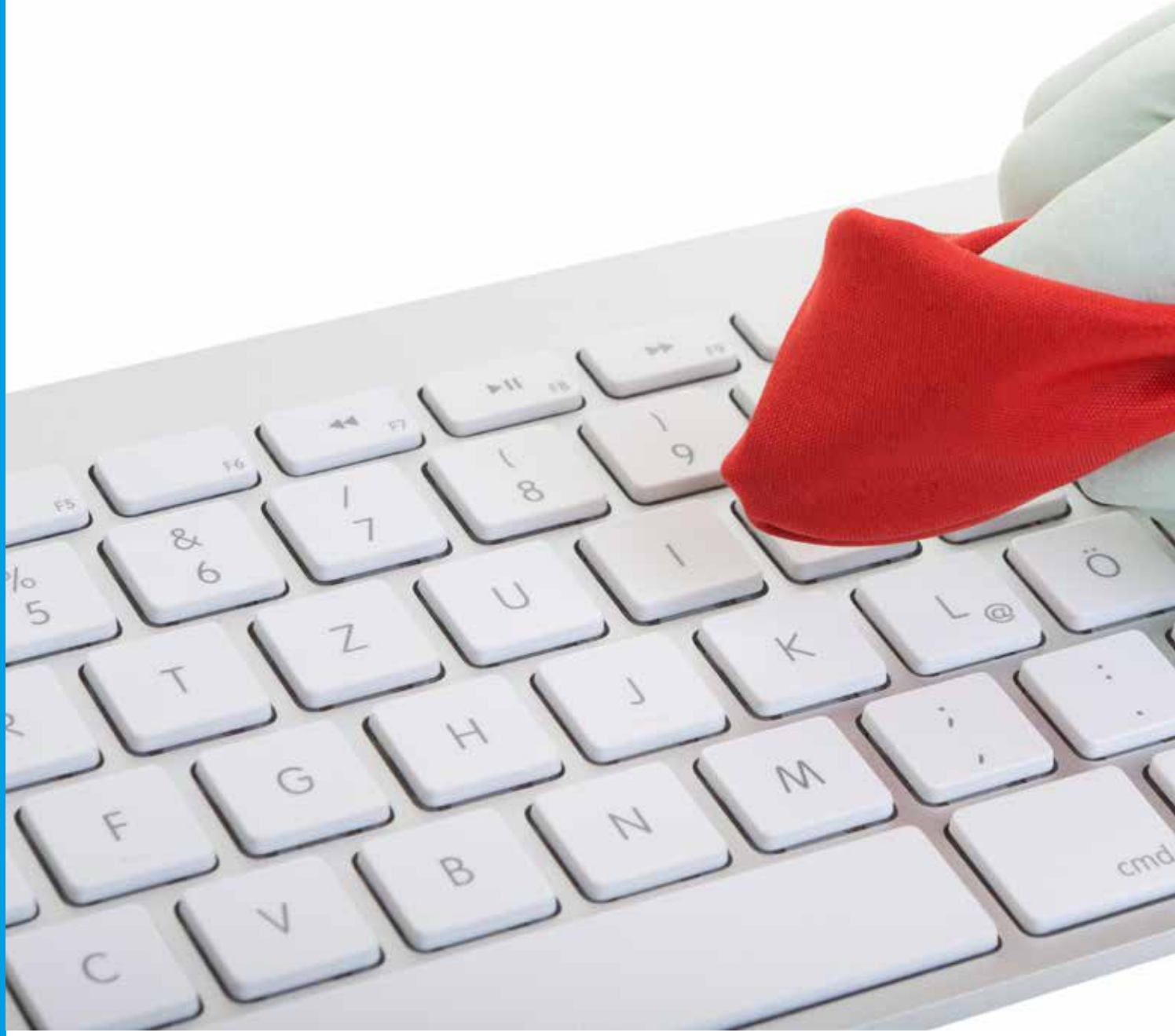

Setting standards in surface cleaning

Clare Clark considers the current guidance for infection control.

Clare Clark
is technical support manager at schülke UK.

All dental patients deserve to receive treatment in a safe and clean environment with consistently high standards of care. It is essential that the risk of person-to-person transmission of infections is minimised as much as possible. Practices need to demonstrate that they maintain a clean environment which facilitates the prevention and control of healthcare associated infections.

Infection control needs to include all aspects of the running of a dental practice: from attention to personal hygiene – hand washing, masks, protective clothing – to the cleaning and sterilisation of instruments and the maintenance of the equipment. Although significant attention is given to the cleaning of work top surfaces in the treatment room, not

so much attention is focused on other potential reservoirs of infection such as telephones, computer equipment and other furnishings. Cleaning protocols also need to take into account the increased use of high-tech dental equipment with sensitive surfaces such as digital X-ray displays, CT scanner monitors and computer monitors used to display 3D imaging technology.

A study of bacteria on mobile phones in the healthcare environment showed that 83 per cent (forty four phones) had pathogenic bacteria at initial testing as well as being contaminated with organic material. After a single disinfecting process only eight per cent had pathogenic bacteria. However, one week later 75 per cent tested positive for pathogenic bacteria, leading the researchers to recommend the frequent cleaning and disinfection of all phones used in a healthcare setting.

Computer keyboards and mice showed even higher levels of contamination. Three hundred samples were collected from different computers to isolate and identify pathogenic microorganisms. All 300 samples were found to be contaminated with pathogenic bacteria (*E.coli*, *Salmonella*, *Shigella*, and *Staphylococcus*). *E.coli* dominated the isolates. Other potential pathogens isolated from all samples included gram-positive *Staphylococcus* and *Pseudomonas* spp. as well as gram-negative bacilli. The researchers concluded that the presence of pathogenic and commensal bacteria on computers indicates "they might act as environmental vehicles for the transmission of potentially pathogenic bacteria".

Dental chairs are another potential source of pathogens. Aerosols and droplets produced by dental instruments connected to dental unit waterlines (DUWLs) during treatment may contain microorganisms that can be opportunistic pathogens. These microorganisms easily migrate to the dental chair. The pathogen *Pseudomonas aeruginosa* is frequently recovered from DUWLs and may pose a health hazard, particularly for immunocompromised patients like the elderly, smokers, HIV+ or cancer patients. *P. aeruginosa* is associated with many types of infection, including hospital-acquired pneumonia, skin infections and urinary tract infections. Dental chair units older than five years are significantly more likely to be contaminated than newer ones.

HTM01-05 sets out standards and recommendations for environmental cleaning. Section 2.6 states that all dental practices should have an infection control policy together with guidelines and procedures that contain the following information:

- The recommended disinfectants to be used within the practice, their application, storage and disposal (disinfectant guidelines).
- Local policies and procedures for environmental cleaning and maintenance. This should include, at a minimum, the methods used, the frequency of each procedure and appropriate recordkeeping practices.

The dental practice should have a local protocol clearly outlining surface and room cleaning schedules. The cleaning process will be most effective if the more contaminated areas are cleaned first. Materials and equipment used to clean clinical areas and other higher risk areas should be stored separately from those used for general and nonclinical areas.

HTM 01-05 recommends that the patient treatment area should be cleaned after every session using disposable cloths or clean microfibre materials with an appropriate disinfectant, even if the area appears to be uncontaminated.

Pathogen survival on hard surfaces

Most nosocomial pathogens can survive on inanimate surfaces for days, weeks or even months and may therefore become a continuous source of transmission if no regular preventive surface disinfection is performed. *Escherichia coli* can survive from 1.5 hours to 16 months; *Staphylococcus aureus*, including MRSA from seven days to seven months; *Clostridium difficile* (spores) for up to five months; Hepatitis B virus for up to seven days; Influenza virus for up to 48 hours; and the Herpes simplex virus, types I and II, for up to eight weeks.

Effective cleaning and disinfection of surfaces in the practice is essential to reduce the risk of transmission of nosocomial pathogens from inanimate surfaces to susceptible patients.

Cleaning between patients

Equipment and any surfaces that are within the local area of the treatment chair need to be cleaned between each patient. This includes dental chairs, local work surfaces, curing lamps, inspection lights and handles, spittoons, aspirators, trolleys/delivery units and X-ray units.➲

Cleaning after each session
Certain areas and items of equipment need to be cleaned after each session, which is likely to be every day and include drainage taps, splashbacks and sinks. In addition, cupboard doors, other exposed surfaces (such as dental inspection light fittings) and floor surfaces, including those distant from the dental chair, should also be cleaned daily.

Weekly cleaning
In section 6.64 of HTM 01-05, there is a list of furniture items which should be cleaned at weekly intervals which includes window blinds, accessible ventilation fittings and other accessible surfaces such as shelving, radiators and shelves in cupboards.

Keyboards
In clinical areas, covers should be provided over computer keyboards or conventional keyboards should be replaced with 'easy clean', waterproof keyboards as recommended in the Department of Health's (2008) 'Clean, safe care: reducing infections and saving lives'. Where covers or conventional keyboards are provided, care should be taken to ensure that covers are changed or that washing is performed at frequent intervals. Cleaning and disinfection involves using disinfectant wipes or disposable cloths and a detergent. Dry dusting should be avoided wherever possible as this may result in dust suspension.

Phones
Although HTM 01-05 does not make specific recommendations about the cleaning of phones, weekly cleaning (as a minimum) is advisable to prevent phones becoming reservoirs for pathogens.

Disinfectant selection
Where soil is present on a surface, cleaning is required prior to disinfection. This is because many disinfectants have a limited capacity to penetrate soil and make contact with the microbial cell. There are a range of different disinfectants with different active ingredients available. The choice of active ingredient affects the spectrum of kill the disinfectant possesses (the range of different microbial types that can be killed). Other factors affecting selection include safety, contact time (how long the surface needs to be left for following disinfection) and format.

One of the most widely used types of disinfectant is based on alcohol, because of its wide spectrum of microbial kill. Unlike some other types of disinfectants, alcohol based biocides can destroy the bacteria responsible for tuberculosis (*Mycobacterium tuberculosis*) and for MRSA (antibiotic resistant forms of *Staphylococcus aureus*). Alcohols are effective at eliminating vegetative bacteria and viruses from surfaces. The antimicrobial effectiveness of alcohol is through damage to bacterial cell membranes and subsequent denaturation of cellular proteins. Alcohols are effective against microorganisms associated with the skin, as well as pathogens like *Escherichia coli* and *M. tuberculosis*.

There are a range of different types of alcohol based disinfectants, with different concentrations of alcohol depending on the type of surface to be cleaned. Ideally, a product should have a dual action for cleaning and disinfection in one. If surfactants are added, this reduces the surface tension allowing the disinfectant to make contact with the microorganisms. The selected disinfectant should be fast acting to facilitate use between patients. It should also be quick drying and residue free in a ready to use solution or wipe.

A high performing disinfectant based on two alcohols for efficacy against viruses, bacteria and yeast is ideal for the rapid disinfection of medical devices in all areas with an increased risk of infection. This is relevant particularly where short contact times are required, such as patient treatment units and nearby work surfaces which need to be cleaned and disinfected between patients.

A ready to use, low alcohol liquid formulation with added surfactants is ideal for use on sensitive surfaces like mobile phone screens, touchscreen displays, keyboards, leatherette and perspex. Depending on the surface, a disposable wipe or trigger spray may be used. An alcohol free disinfectant may be the most suitable for surfaces which are sensitive to alcohol, such as leather, PVC and acrylic glass.

Having practice policies and procedures for cleaning and disinfecting all surfaces in the dental practice – not just those in the treatment area – will substantially help lower the risk of the transmission of microorganisms. These policies should undergo regular monitoring and be subject to revision whenever necessary.

References available on request.