



# Decontamination Guide

Preventing contamination and infection in your clinic

# An introduction to decontamination

The information in this guide aims to complement your knowledge of the decontamination of podiatry instruments and keep your patients safe in the everyday clinical practice.

As 10% of the 2.9 million people living with diabetes will have a diabetic foot ulcer at some point in their lives\*, it is essential to adhere to these guidelines to keep patients safe from contamination and infection. Failing to comply may result in litigation and loss of license. These guidelines are based on the standards for decontamination of reusable podiatry instruments gathered by The Society of Chiropodists and Podiatrists, the College of Podiatrists, and the Institute of Chiropodists and Podiatrists in the UK. The UK government provides sterilisation and infection control guidance via the Medicines & Healthcare Products Regulatory Agency (MHRA).

Decontamination is a combination of processes - cleaning, disinfection and sterilisation - required to remove and/or destroy contamination and prevent micro-organisms or other contaminants reaching a susceptible site in sufficient quantities to cause infection or other undesirable responses.

Thorough cleaning is a prerequisite for disinfection and sterilisation, as residual tissue and other deposits can protect infective organisms from destruction by the disinfectant or the sterilisation process. Manual cleaning is less effective than mechanical processes, which therefore, are preferred and recommended by the mentioned organisations. This guide will help you choose the right equipment for your needs.

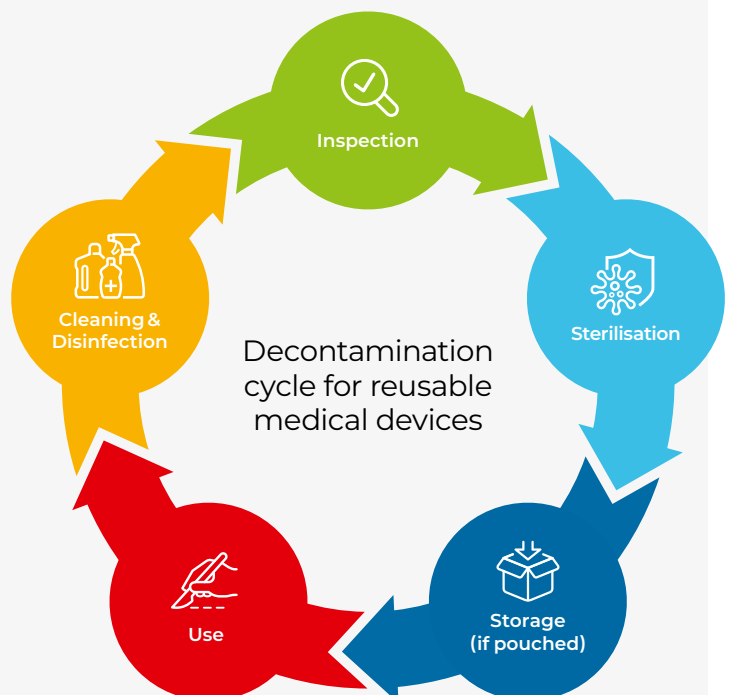


Above: Thorough cleaning and disinfection of instruments, whether manual or mechanical, is required prior to the sterilisation process.

## Decontamination process

The Society of Chiropodists and Podiatrists recommend the following process as the standard for decontamination. The process should be reviewed and documented periodically to ensure its continued effectiveness. The person with overall managerial authority for the practice is responsible for all matters concerning decontamination of reusable medical devices and their traceability. The following details should be recorded: operator's name, date, time, clinic information, type of material sterilised, temperature, pressure, length of time the load is sterilised, and biological indicators tests results. Instruments should be inspected for residual debris after cleaning and the process repeated if necessary. Operators must always wear PPE when using equipment (e.g. lab coat, eye protection, closed-toe shoes, heat-resistant gloves, etc.).

Podiatrists must perform and document the results of periodic equipment testing or servicing/repairs in accordance with HTM 2030 and the manufacturer's instructions. This should include checking the power output of the transducer.



\*Source: NICE guidelines 2013 figures.



## Maintaining a safe and hygienic clinic

UK Studies have shown that a large amount of dust becomes airborne during the nail drilling procedure and can be present in the air for up to 10 hours, increasing the risk of respiratory tract infections. Additionally, known pathogens like fungus and molds can be present in the air for up to 16 hours, and have been found in the nasal cavities of almost 50% of podiatrists. Non-use of masks, or the use of unsuitable masks, is an occupational hazard to the health and wellbeing of podiatrists.\*\* The use of the correct PPE as well as air treatment management is advised to minimise harm to the practitioners and patients.

### General hygiene

A wide range of consumable hygiene products are available that offer effective protection for hands, surfaces, and equipment in your clinic or on domiciliary duties. Algeos distributes a range of disinfectant surface sprays and multi-purpose wipes. The Clinell range of wipes contain a unique patented antimicrobial formula that kills at least 99.99% of pathogens including the Covid 19 virus, and can be used as a disinfectant and detergent for surfaces and hands.



### PPE

The Royal College of Podiatry reminds its members that when using a nail drill, an FFP mask type must be worn. Other recommended equipment includes aprons, gloves, and eye protection. Employees and associates in the independent sector should check with their employer workplace protocols. A legal change which means that from 6 April 2022, businesses with workers must provide PPE free of charge. This includes podiatrists who may work within your clinic, even if they are self-employed.



## Air treatment systems

There are different types of air purifiers in the market. The most common mechanical air filters are the HEPA, which use a fan to pull air into a dense filter and claim to remove most large pollutants from the air. However, they are extremely expensive to run and the filters need to be replaced at least every six months.

An alternative solution is Sterilair PRO - a system for sterilising air that protects your patients *and* staff, thereby reducing the risk of contamination in your working environment and loss of profit due to illness.

Unlike air purifiers, this air biological treatment system drastically reduces bacteria and viruses of up to 0.3 microns (the size of Covid 19), as well as fungi spores common with podiatry treatments.

The system works by drawing air into its internal chamber - in a closed loop - where it is then irradiated with high-frequency UV-C 25W lamps that remove the microbial load, providing a bacteriologically safe environment.



## Equipment

The Institute of Chiropodists and Podiatrists recommends the use of an autoclave and ultrasonic cleaner as part of the minimum equipment required for safe practice - disinfection is not the same as sterilisation.

The capacity of an ultrasonic bath or vacuum autoclave should be aligned in order to fulfil the load of instruments - larger capacities will allow you to process higher loads, saving you valuable time and effort.

When purchasing decontamination equipment, it is important that you ensure it carries the CE mark, which is the MHRA approved standard.

Essential items also include a water distiller and autoclavable instruments.

### Water distillers

We recommend water distillers that have an output rate of 1.5 litres of distilled water per hour and a capacity of around 4 litres. This ensures an efficient and cost-effective method of producing your own distilled water for use in autoclaves and ultrasonic cleaners. Choose a water distiller that has an internal boiling chamber and lid made of stainless steel, and that has been tested for electromagnetic compatibility (200/108/EC) and a low voltage rating (2006/95/EC).



### Instruments

It is essential that new instruments be compatible with existing equipment and can be decontaminated using processes aligned with your clinical activities. Check instruments regularly and replace any that are faulty or are difficult to decontaminate adequately. Choose autoclavable instruments made of high standard stainless steel (AISI-300 & 400 series) which are 100% biocompatible and 100% non-toxic. All Algeos Instruments are autoclavable and quality tested.



\*\*Source: Tinley et al 2014.

## Autoclaves

There are different types of autoclaves in the market offering various functions and capacities, as well as extras such as USB ports or an integrated printer. Always check the specification to ensure the type of performance that suits your needs. For example, wrapped, tubular, or textile items are not able to be sterilised in a non-vacuum autoclave. Only vacuum autoclaves – like the Class B autoclaves Algeos supply – are suitable to sterilise wrapped and unwrapped, solid or hollow instruments as well as porous loads. The EN 13060 certification ensures the standards for sterilisation of all load types, including free and packaged instruments, hollow equipment, hand pieces, turbines, and porous materials such as bandages/gauzes.

Class S autoclaves operate with a simple pre and post-vacuum rather than a fractionated vacuum. For clinics where narrow-bore instruments are not used simultaneously with hollow-bodied instruments, Class S autoclaves can be an alternative to Class B.

The Institute of Chiropractors and Podiatrists states that sterilisation must be carried out in a suitable steam or vacuum autoclave, and that these units are maintained and validated to ensure effectiveness. The recommended cycle is 134-137°C for a minimum holding time of three minutes.

**Right: Installation of an autoclave must be carried out by a certified engineer, and annual servicing is recommended.**



## Autoclave procedure

Sterilisation performance of your autoclave must be checked daily - this includes the steam penetration test - and weekly by the user. An annual check is required by a certified engineer.

● **Packaging & loading:** Clean the drain strainer and fill in with distilled water before loading the autoclave. Always place items in a secondary container such as an autoclavable tray. The container may be placed on its side to maximize steam penetration. Do not overload or package bags too tightly as steam needs to circulate freely. Do not allow bags to touch the interior walls of the autoclave to avoid melting of material. Select the right cycle for the material (e.g. for wrapped instruments) as per manufacturer instructions. Incorrect selection of cycle may damage the autoclave and its contents. Check chamber pressure gauge for a minimum pressure of 20 pounds per square inch (psi). Close and lock door. The temperature must be verified for every load by a printout and this should be logged. The recommended cycle is 134°C for a minimum holding time of 3.5 minutes. Do not attempt to open the door while autoclave is operating. Fill out the paperwork to ensure traceability of the process.



● **Unloading:** On cycle completion, make sure temperature and pressure have returned to a safe range. For safety, stand back from the door and carefully open no more than 1 inch, releasing residual steam and allowing pressure within liquids/containers to normalize. Let the load to stand for 10 minutes in the chamber allowing steam to clear and items to cool to room temperature. Inspect your instruments to ensure they are fit for purpose - not blunt, no rust, etc. Use a first-in first-out stock rotation system for instruments that are not sterile.

## Ultrasonic cleaners

Bench top ultrasonic cleaners are slightly larger than portable table top cleaners and can offer greater capacity and cleaning power. Check each model for different cleaning cycles, adjustable time settings, and temperature control ranging from 0°C to heated at 70°C-80°C. Some models will offer additional functionality, such as high performance transducer, degas function, user-friendly control panel, LED display, and memory function. Algeos supply ultrasonic cleaners with capacity options ranging from 1.5L to 13L. It is recommended to choose an ultrasonic cleaner with a stainless steel basket and lid included in the purchase, although polypropylene or polycarbonate trays (sold separately) may also be used.

For ultrasonic systems to provide the best cleaning results, a high-quality ultrasonic detergent must be used, such as those supplied by Algeos. The detergent reduces the surface tension in the liquid and enhances the ultrasonic activity within the tank. This aids in the loosening and removal of contamination from the surfaces of items that are being cleaned in the ultrasonic tank. Ensure you use the correct cleaning fluid depending on the materials you wish to clean. For example, plastics, glass, and certain metals will require a different type of detergent to aluminium and other soft metals. Check the detergent instructions for guidance.

**Right:** Bench top ultrasonic cleaners, like those supplied by Algeos, are an affordable and effective way to clean instrument prior to sterilisation.



## Ultrasonic cleaner procedure

● **Preparation & use:** Fill the ultrasonic cleaner tank and add a detergent solution as recommended by the manufacturer at the beginning of each session. If a new detergent isn't degassed before use it will take the instruments longer to clean while the detergent degasses itself. To de-gas new detergent, simply run the ultrasonic cleaning bath at the desired temperature for a few minutes prior to placing the basket and instruments into the tank. If the solution becomes heavily contaminated it will be necessary to empty and change the solution during the session. Ensure your instruments are dried thoroughly before placing them in an autoclave. An ultrasonic cleaner basket that stays upright while drying is recommended. Empty, clean, and dry your ultrasonic cleaner at the end of each session/day.

● **Maintaining:** To maintain your ultrasonic cleaner, drain the detergent and clean out the tank at the end of each session/day. The heavier dirt will settle at the bottom of the tank and may be too large to filter through the filtration system. This kind of debris takes up space in the bath and dampens the ultrasonic waves, which makes cleaning less effective.



To avoid this, wipe the tank bottom then rinse it with clean, cool water. Change the filters regularly to keep contaminants out of the cleaning detergent, helping the system do its job effectively. Wipe or spray down any removable parts that have heavy, greasy, or loose contamination before placing them in the ultrasonic cleaner. The cleaner will remove all the dirt, no matter how badly it is caked on, and this dirt will deposit on the filters or tank bottom, which makes cleaning less effective and adds to your maintenance frequency.



## Working safely: using and maintaining equipment

- Always follow the equipment manufacturer instructions.
- Use the correct detergent and separate instruments by metal type for cleaning/sterilisation to avoid damage.
- Autoclavable stainless steel instruments should be rinsed and soaked in distilled water at pH 7.0 only, as well as during ultrasonic cleaning and autoclave sterilisation process.
- Instruments and devices should be decontaminated immediately after use to minimise the growth of microorganisms and minimise the risk of cross-infection. Thoroughly dry the instruments after rinsing to prevent spotting. Instruments that cannot be cleaned immediately should be immersed in cold distilled water to prevent coagulation when contaminants dry on the instrument. Use of hot tap water or disinfectant can also cause protein coagulation. Coagulated protein is difficult to remove and may reduce effective decontamination of the device.
- Special attention is required for cleaning locks, teeth, hinges and other difficult access areas of the instruments. For cleaning use nylon (not steel) brushes and warm (not hot) distilled water. An eraser or buffer may be used to rub off stains. If stainless steel instruments are not cleaned properly prior to storage or inadequately packed, rust may appear. Some instruments (e.g. clippers and nippers) need lubrication (e.g. paraffin oil) before storage and use to prevent rusting. Also, if the instruments have not been cleaned properly prior to use with heated equipment, temperatures higher than 35°C may cause the organic debris to 'cook' (change composition), leaving a stain. Laser etched logos, as on Algeos instruments, will not leave marks as laser imprints do not travel from one instrument to another.
- Ensure adequate determination of the end of life of your instruments. For example, instruments with rust should be replaced as there is a risk of infection to the patient.
- Never fill with any flammable liquids. They will vaporize, and could cause a fire or explosion, or release harmful gasses into the workspace. Avoid putting chlorine bleach into the tank. Bleach does not promote good cavitation activity.
- Never put any parts of your body into an ultrasonic cleaner while it is operating without PPE protection such as thermal gloves and goggles. The detergents can cause mild skin irritation, and the cleaning action can cause discomfort. In addition, the operating temperature can cause burns.
- Keep parts off the bottom of the tank of the ultrasonic cleaner. Setting parts directly on the tank bottom increases the incident of cavitation erosion – pitting of the tank eventually causing the ultrasonic cleaner to leak. Use a basket, tray, or suspension system to hold parts in the unit.
- Make sure that the cycle of your equipment is set on the appropriate time, pressure, and temperature for the desired load of instruments/other items to maintain good condition.
- Don't open the autoclave door after the machine has been turned on. Steam or water could escape and cause severe burns. Don't spray down the outside of the tank, control box, or electrical box with water or other liquids. If the outside gets dirty, unplug the unit and wipe it down with a clean rag.
- Don't overload the autoclave, as this can prevent steam circulation and fail to properly sterilise some of the instruments buried underneath. Instead, lay them in packets in one layer on each tray with space between them.
- If the autoclave does not pass a daily/weekly test, it should not be used until a service has been conducted by a certified engineer and a validation test is successful. Never try to carry out your own repairs as you could cause damage to the equipment, invalidate the warranty, and harm yourself.
- Never autoclave: flammable, reactive, corrosive, toxic or radioactive materials, bleach, any liquid in a sealed container, any material contained in such a manner that it touches the interior surfaces of the autoclave, paraffin-embedded tissue. Incompatible materials are also: acids, bases and organic solvent, chlorides, sulphates, seawater, chlorine, non-stainless steel, polystyrene (PS), polyethylene (PE), low density (LDPE) and high-density polyethylene (HDPE), polyurethane.
- Use the troubleshooting table (opposite page) to identify and prevent/remove stains that appear on your instruments.



Above: Don't overload autoclaves! Lay packets in one layer on each tray.



Above: Use correct detergent and separate instruments by metal type.



Stain/Spot Colour	Possible Causes	Solutions
<b>Brown/Orange</b>	Bio-burden (tissue, blood, etc.) left on nipper. Detergent pH is too high (>8). Soap/detergent residue on drapes/towels used in wrapping.	Use an eraser/buffer to rub off the stain. Choose a cleaning solution with a neutral pH. Review laundry protocol to improve soap-free rinse.
<b>Rust</b>	Mixing instruments made of different metals in the same cleaning or sterilising cycle. Tap water has high mineral content.	Separate instruments by metal type for cleaning and sterilisation. Use distilled water and thoroughly dry nippers after rinsing.
<b>Black/Brown, with Pitting</b>	Cold soaking of nippers. Detergent pH is too low (<6).	Eliminate cold soaking and potential exposure to chemicals during that process. Choose cleaning solution with a neutral pH.
<b>Blue/Black</b>	Mixing instruments made of different metals in the same cleaning or sterilising cycle.	Separate instruments by metal type for cleaning and sterilisation.
<b>Blue/Grey</b>	Improper cold sterilisation. Chemical or mineral residue.	Check solution instructions and follow recommended temperature and soak times. Use distilled water and thoroughly dry nippers after rinsing.
<b>Spotting</b>	Slow or improper drying of nippers. Mineral residue.	Review autoclave manufacturer's instructions. Use distilled water and thoroughly dry nippers after rinsing.
<b>Multi/Rainbow Colour</b>	Excessive heat during sterilising cycle.	Review autoclave instructions.

**GUIDE RESOURCES:** **1)** The Institute of Chiropodists and Podiatrists - Supporting Podiatry Professionals. **2)** Public Health England - Infection Prevention and Control. **3)** Tinley PD, Eddy K, Collier P. Contaminants in human nail dust: an occupational hazard in podiatry? J Foot Ankle Res. 2014 Feb 20;7(1):15. doi: 10.1186/1757-1146-7-15. PMID: 24552311; PMCID: PMC3937521.



*Keeping People Moving*



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