



CPD4dentalhygienists

YOUR FUTURE IN YOUR HANDS

Disinfection and Decontamination: Infection Prevention and Control in Dental Practice

Aims: To refresh the dental professional's knowledge of disinfection and decontamination guidelines and how to apply them to practice.

Objectives: On completion of this verifiable CPD article the participant will be able to demonstrate, through completion of a questionnaire, the ability to:

- Demonstrate a basic knowledge of HTM 01-05 and related guidance.
- Understand the different roles and responsibilities in disinfection and decontamination procedures.
- Understand the difference between Essential Quality Requirements and Best Practice in disinfection and decontamination.
- Demonstrate an understanding of Personal Protective Equipment.
- Demonstrate knowledge of waste disposal including segregation.
- Demonstrate an understanding of instrument decontamination and the decontamination cycle including the use of ultrasonic baths, washer-disinfectors, and sterilisers.
- Know how to store and package instruments.
- Know the definition of sterilisation and disinfection.
- Demonstrate knowledge of surface cleaning.
- Demonstrate knowledge of dental disinfection and decontamination guidelines relevant to England, Northern Ireland, Scotland, and Wales.

Introduction



Patients reserve the right to be treated in a surgery environment that is clean and sterile.¹ Decontamination is “the process by which reusable items are rendered safe for further use and for staff to handle.”¹ The decontamination of instruments is a necessary requirement to reduce the risk of cross-infection from patient to patient and also between patients and staff. As part of their registration, dental professionals have

a responsibility to demonstrate competence in all aspects of their work² and take actions to protect patients. This includes ensuring that the decontamination of instruments is conducted to recommended standards.

This article will outline some of the essential quality requirements and best practice requirements of HTM 01-05 (WHTM 01-05 in Wales). Although HTM 01-05 does not apply in Scotland, the general principles in the equivalent Scottish guidance are identical although it is mandatory in Northern Ireland and Scotland for dental practices to have a separate decontamination room and washer disinfectant.

Infection Control and COVID-19 Guidance



Since the start of the COVID-19 pandemic, dental professionals followed guidance from the Chief Dental Officer. In addition, the Faculty of General Dental Practice had COVID related guidance for the UK in their document, “Implications of COVID-19 for the safe management of general dental practice. A practical guide.”

On 20th August 2020, updated infection prevention and control recommendations for COVID-19 guidance was issued for the remobilisation of services within health and care settings. The guidance was issued jointly by the Department of Health and Social Care (DHSC), Public Health Wales (PHW), Public Health Agency (PHA) Northern Ireland, Health Protection Scotland (HPS)/National Services Scotland, Public Health England (PHE) and NHS England as official guidance. This guidance was withdrawn on 27th May 2022.

In June 1st 2022, the next steps for infection prevention control were set out. Dental practices had to make their own decisions about how and when patients are treated and what PPE may be required, having completed their own risk assessment.³

As of April 2023, all COVID-19 guidance was removed, however, the latest March 2023 Gov UK document on Managing healthcare staff with symptoms of a respiratory infection or a positive COVID-19 test result, can be accessed from the further reading section of the website.

National Quality Standards



The Care Quality Commission (CQC) inspects health and social care providers in England. Infection control within healthcare is the subject of continued debate.⁴ From April 2011, all dental practices were required to register with the Care Quality Commission (CQC). Part of the requirements for registration with the CQC is to ensure that there is the provision of a “safe, clean environment and appropriate decontamination of dental equipment.”¹ In adhering to this, the aim is to achieve a re-processed dental instrument that is compliant with the Essential Requirements of the Medical Devices Regulations 2002.^{1,5} If your practice complies with HTM01-05 EQR and has a detailed plan showing how your practice will work towards implementing best practice, your practice should be able to meet outcome 8 (regulation 12) of CQC.

The intention of the Health and Social Care Act 2008 (Regulated Activities) Regulations 2014 Regulation 12, is “to prevent people from receiving unsafe care and treatment and prevent avoidable harm or risk of harm.” Furthermore, it states that “Providers must prevent and control the spread of infection.” The CQC state that, “The CQC understands that there may be inherent risks in carrying out care and treatment, and we will not consider it to be unsafe if providers can demonstrate that they have taken all reasonable steps to ensure the health and safety of people using their services and to manage risks that may arise during care and treatment.”⁶

EQR had to be in place in all dental practices by December 2010. In England, there is no time frame set for practices to reach best practice standard. A study that was carried out in 2010 found that one third of practices would be unable to install a decontamination room due to space constraints. Imposing best practice on England would be a considerable undertaking and a lengthy phasing in period would be required.⁷

The Regulation and Quality Improvement Authority inspects health and social care providers in Northern Ireland, and the Healthcare Inspectorate Wales will undertake the inspections in Wales.

Roles and Responsibilities

Every dental practice is required to have the roles and responsibilities defined so that each person carrying out decontamination can be fully trained to carry out their duties correctly and safely. The following roles are specified in HTM 01-05:

- Registered Manager
- **Decontamination Lead**
- Designated Person
- **User**
- **Operator**
- Authorised Engineer (Decontamination)
- Competent Person (Pressure Vessels)
- Competent Person (Decontamination)
- **Service Engineer/Test Person**
- Infection Control Nurse
- Microbiologist¹

Key personnel could be considered to be:

1) The Decontamination lead: Responsible for the overall decontamination procedures within a practice and reports to the general manager.

2) The User: This person has day-to-day responsibility for the management of the decontamination equipment and processes and ensures the operators are trained to carry out decontamination procedures. They may also double as the decontamination lead.

3) Operator: The person who uses the equipment on a day-to-day basis and also carries out the daily and weekly tests.

4) Service engineer/Test person. Responsible for ensuring that the machines being used are functioning adequately and that validations are carried out in accordance with the manufacturer's instructions.

Essential Quality Requirements

The December 2010 deadline means that all practices must now have EQR in place. The following are EQR taken from HTM 01-05:¹

- Instruments should be reprocessed using a validated steam steriliser and at the end of the process the instruments should be in a sterilised state.
- The practice should have an up-to-date infection control policy which should be updated as per the Code of Practice or at two-year intervals, whichever is the shorter.
- Within the infection control policy there should be detailed procedures for the decontamination of instruments.

- The practice should have a nominated lead responsible for decontamination and infection control.
- Storage of chemicals should fall within Control of Substances Hazardous to Health (COSHH) guidance.
- There should be a clear procedure for the management of single use and re-usable instruments. Prior to cleaning, instruments that can be sterilised should be segregated from items that are to be disposed of. Figure 1 shows the sign used to denote instruments that are single use. Instruments that are in packaging with this symbol must not be reprocessed and should be segregated and disposed of in clinical waste.



Fig.1 Sign denoting single use instruments

- Reprocessing of instruments should be undertaken using dedicated equipment. A full article on reprocessing instruments is available on the website.
- There should be provision of dedicated hand washing facilities. In order to be compliant with HTM 01-05, hand wash basins should have sensor or lever operated taps (fig.2) and should not have a plug or an overflow. In addition, taps should not discharge directly into the drain aperture as this may generate aerosols. A full article on hand washing is available on the website.



Fig 2. Hand wash sinks should be lever or sensor operated and not have a plug or an overflow

- There needs to be a cleaning and inspection process to ensure cleaning is achieved. Manual cleaning is the least preferred method of cleaning instruments as there is an increased risk of a sharps injury and also the process cannot be validated. Prior to sterilisation, all instruments should be checked for debris by using a magnified inspection light.

- There should be separation of instrument reprocessing procedures from other activities. The surgery or decontamination room should have clear 'dirty' to 'clean' areas.
- Equipment used to decontaminate should be fit for purpose and maintained, periodically tested by a competent person.
- There should be appropriate and controlled disposal of waste.
- There should be documented training protocols and records for those staff engaged in instrument decontamination.
- Staff involved with decontamination should demonstrate current immunisation for hepatitis B and subject to local policy, tetanus.
- There should be effective cleaning of hand pieces in accordance with manufacturers guidelines.
- Washing and rinsing of instruments can be achieved by:
 - Two dedicated sinks.
 - One sink with a removable bowl (which can be contained within the sink that can accommodate the instruments for rinsing). This is the least preferred option as it requires lifting and moving bowls of contaminated water with associated spillage risks. The practice should have clear processes and protocols in place to ensure that the removable bowl is not used for the washing of instruments.

The practice needs to carry out an assessment to identify changes needed to move from 'essential' to 'best practice' requirements. Best practice requirements are that:

-  A cleaning process that should be carried out using a validated automated washer-disinfector.
-  The environment in which decontamination is carried out should be such as to minimise the risk of recontamination of instruments and the possibility of generating aerosols, which may reach patients or unprotected staff. For best practice, the decontamination facilities should be clearly separate from the clinical treatment area. This implies the use of a separate room or rooms for the accommodation of clean (output) and dirty (input) work.
-  The storage of reprocessed dental instruments in a simple but carefully designed facility clearly separate from the clinical treatment area is an important best practice improvement.

Further information on best practice can be found in HTM 01-05 which can be downloaded from the link at the bottom of this article. It is mandatory in Northern

fig.3 Protocol for decontamination of instruments¹

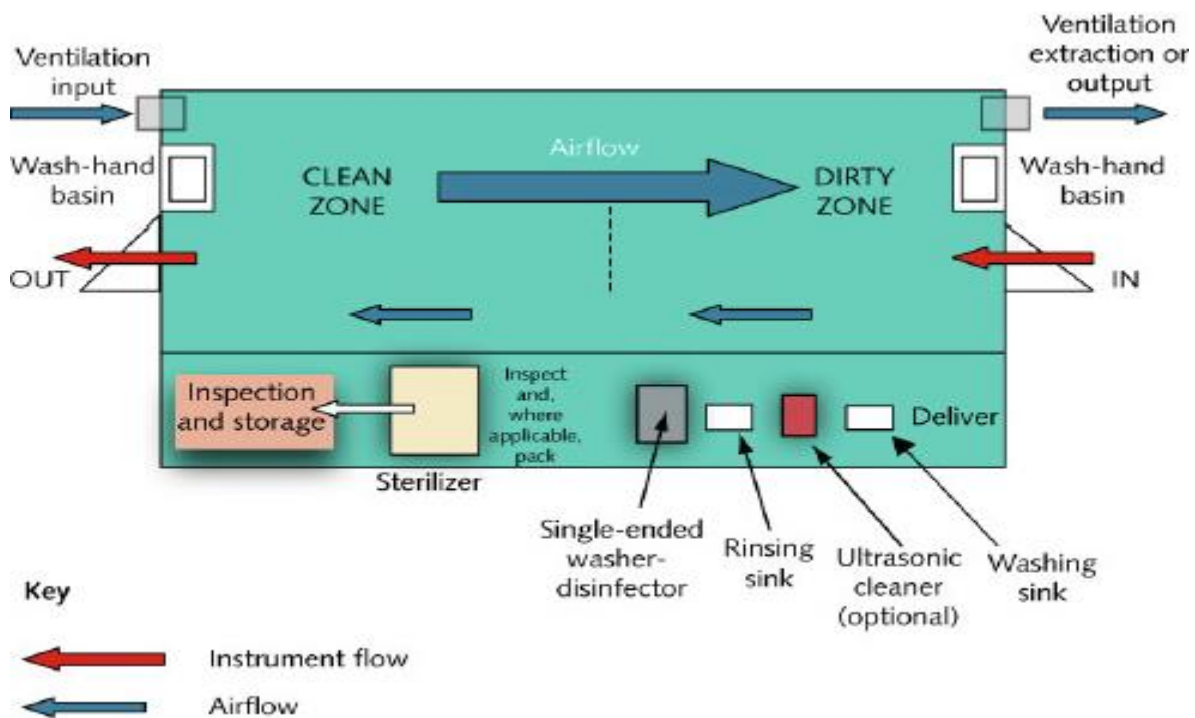


fig 4. Example decontamination room¹

Instruments are first segregated into those that can be re processed and those that need to be disposed of. A full article on waste segregation is available on the website

If instruments are being transported to a decontamination room, they need to be transported in a suitable container which should be:

- Rigid
- Easy to clean
- Able to be closed securely

The practice should have a policy for the safe transfer of instruments to the decontamination room.¹

Once the instruments have been segregated, the decontamination of the instruments involves the following process:

- Stage one- Pre-sterilisation cleaning
- Stage two- Sterilisation
- Stage three- Storage

Stage one- Pre-sterilisation Cleaning

Manufacturers are required to provide instructions on how to decontaminate their instrument and these instructions should be adhered to. Some instruments may need to be dismantled prior to cleaning.¹ Before purchasing instruments it is recommended that consideration should be given to the methods of decontamination that are applied within the practice.

1) Manual cleaning



Although acceptable under the essential quality requirements, under best practice recommendations, manual cleaning alone is only acceptable for those instruments that cannot be initially cleaned using an automated process.¹ In Northern Ireland, the Department of Health, Social Services and Public Safety and, in Scotland, the Dental Clinical Effectiveness Programme, do not accept manual cleaning as a validated process, and practices must be working at best practice standards.

When manual cleaning is necessary, the instruments should be immersed in warm water and detergent and scrubbed with a long-handled kitchen-type brush. Thick, waterproof household gloves and protective eye wear should be worn to protect against accidental injury and instruments should be inspected afterwards. A disadvantage of the manual cleaning method is the increased risk of inoculation compared to other methods of cleaning. It is also difficult to validate this method as it is difficult to ensure that it is carried out effectively on every occasion.¹

2) Ultrasonic cleaning



Under best practice recommendations, ultrasonic baths may be used to enhance the removal of debris and may be utilised as an optional part of the cleaning process before the instruments are placed in the washer-disinfector.¹ It is important that the ultrasonic bath is tested to manufacturer's instructions and that the water and fluid is maintained, cleaned, and changed as recommended. Cleaning instructions relating to

each instrument should be followed as some instruments may need to be disassembled before being immersed in the ultrasonic bath solution. The instrument basket should not be overloaded.

After cleaning, the instruments should be rinsed in the designated rinsing sink or bowl.

3) Washer-disinfector

If working under best practice recommendations, the designated decontamination room will contain a washer-disinfector which should be used on all instruments that are able to be cleaned in this way. This is the preferred method of cleaning as it offers the best method of being able to control, reproduce and validate the cleaning process. A typical disinfectant cycle includes the following stages:

- Flush
- Wash
- Rinse
- Thermal disinfection
- Drying¹

Washer-disinfectors must not be used as a substitute for sterilisation and the manufacturer's instructions must be followed. Staff should be appropriately trained in its use and the records of this should be maintained. Washer-disinfector logbooks and records should be kept by the operator and maintained for not less than two years.¹

Stage two- Sterilisation

Prior to sterilisation all instruments should be inspected to ensure that they are 'clean, functional and in good condition'. It is recommended that an illuminated magnifier is used to aid the process of inspection.¹

The following sterilisers are used within health care:

Type N (fig. 5) - non-vacuum sterilisers designed for unwrapped, non-hollow and non-air retentive instruments. With this method of sterilisation, instruments may be wrapped immediately after sterilisation after being dried with a disposable non-linting cloth.



Fig. 5 A type N steriliser

Type B (fig. 6) - Vacuum sterilisers used to process hollow, air-retentive, and packaged loads, including handpieces. With this method instruments need to be dried with a disposable non-linting cloth prior to wrapping. Manufacturers prefer vacuum autoclaves to sterilise hand pieces as the steam can penetrate up through the lumen using the vacuum. However, HTM 01-05 has refrained from making this a regulation.



Fig 6: A type B steriliser

Type S (fig. 7) - Sterilisers designed to reprocess specific load types, which may include hand pieces.



Fig 7. A type S steriliser

The most frequently used sterilisers in dental practice are type N and type B.

Validation of Decontamination Equipment

In all cases, it is important that the manufacturer's instructions are followed for the use and servicing of the steriliser used to ensure that it performs to the correct standard. The process should be validated, and records kept for not less than two years. If automatic records are not produced, then manual record keeping is required.¹

The daily tests should be completed by the operator or user and usually consist of:

A steam penetration test- Helix or Bowie Dick test (S & B vacuum only)

An automatic control test (all benchtop sterilisers) in line with manufacturer's instructions. The use of automated data-loggers or interfaced computer-based recording systems is acceptable, but printouts should be photocopied as they may fade over time the print-out should be retained or copied to a permanent record. If the steriliser does not have a printer, the user will have to manually record the following information in the process log:

- Date
- Satisfactory completion of the cycle (absence of failure light)
- Temperature/pressure achieved
- Signature of the operator

If an error code occurs then this should be noted, along with the action you took and confirmation that the instruments in that cycle at that time were reprocessed. At the end of each day the reservoir should be emptied and cleaned. Door seals also need to be checked. If the surgery is not in use on a particular day you should record this on your log so that it does not appear that the log was simply not completed on that particular day.

The CQC consider validation of decontamination equipment when they review if the practice is safe. This relates to regulation 15 (premises and equipment) and regulation 12 (safe care and treatment).

The CQC state the following as mandatory requirements:

“Professional guidelines: Pressure Systems Safety Regulations 2000

Sterilisers are maintained by an appropriate and competent person. As sterilisers are pressure vessels, a suitable written scheme of examination needs to be in place for each one. Once in place, sterilisers need to be examined in accordance with the written scheme of examination. The maximum interval between these safety inspections is 14 months. Current certification must be available for inspection.

Professional guidelines: HTM 01-05: Decontamination in primary care dental practices

All decontamination equipment should be validated, tested, maintained and serviced as recommended by the manufacturer. Validation is needed for new decontamination equipment at installation and annually thereafter.

A record of every single sterilisation cycle should be made. This record should demonstrate that the steriliser is working within validated parameters such as time, temperature, and pressure, using the machine's own indicated measurements on the display. Records need to be kept for a minimum of two years.”⁸

Stage three- Storage

Pouched instruments can be stored for the following times:

Wrapped Instruments

Wrapped instruments can be stored for 1 year. They should be date stamped. The steriliser used determines when the instruments should be wrapped.

Type N (displacement): dried instruments can be wrapped after sterilisation. If you store instruments in trays, the entire tray should be placed in a sealed pack

Type B (vacuum): dried instruments can be pre-wrapped

Type S (vacuum): manufacturer's guidance should be followed

Unwrapped Instruments

HTM 01-05 (England and Northern Ireland) recommends that instruments stored away from the surgery (in a separate decontamination room, for example) should be used within one week.

Unwrapped instruments in the clinical area may be stored for up to a day. They should be stored dry and protected from contamination.

It is important that practices have well developed protocols and procedures in place to prevent contamination of these instruments by ensuring that those required for a particular patient are removed from their protected environment before treatment commences.

Surface Decontamination



Sterilisation is a process “intended to kill all microorganisms and is the highest level of microbial kill that can be achieved.”¹⁰

Disinfection is “a less lethal process than sterilisation and is intended to kill disease-producing microorganisms but not bacterial endospores. Disinfection usually refers to the use of liquid chemicals to kill microorganisms at room temperature on surfaces.” It is important to realise that the manufacturer's instructions need to be followed as disinfectants need to have the appropriate contact time to be effective.¹⁰ Disinfectant products should be allowed to air dry to allow maximum contact with the surface.

Detergents are cleaning solutions which increase the contact between the water, the surface and the soil (for example blood, dirt and proteins). In contrast to using a disinfectant, when using a detergent product, the surface should be dried after cleaning.

Disinfectants should not be used as cleaning solutions. Surface decontamination is most commonly achieved with approved disinfectant and detergent combinations. Manufacturers' advice should be sought in terms of the compatibility of detergents and disinfectants with the surface materials used. The products used should be risk assessed and staff should be trained in their use.

When cleaning surfaces, spray bottles, whether supplied prefilled or empty, should be single use. This is due to the risk of bacterial contamination of the bottles which may become adapted to the solutions and multiply in the spray mechanisms. Wipes are increasingly being used to clean and/or disinfect surfaces and equipment. Disinfection only wipes, such as alcohol wipes, are now rarely used. HTM and WHTM 01-05 states that "alcohol has been shown to bind blood and protein to stainless steel. The use of alcohol with dental instruments should therefore be avoided." In addition, HTM 01-05 states that, "the use of disinfectant or detergent will reduce contamination on surfaces. If there is obvious blood contamination, the presence of protein will compromise the efficacy of alcohol-based wipes."¹

HTM 01-05 states that "Surfaces and equipment used in the decontamination of dental instruments should be cleaned carefully before and after each decontamination process cycle. The procedure used should comply with local policies." The dental practice should have a local protocol which should outline the surface and cleaning schedules. In addition, records should be kept as per the code of practice.¹

All surfaces should be designed to aid in successful cleaning. This means that, wherever possible, surfaces (including walls) should be continuous and free from damage and abrasion. They should be free from dust and visible dirt. In addition, all clinical work surfaces, and surface where decontamination takes place should be:

- Impervious and easily cleanable;
- Jointless as far as is reasonable; and,
- Where jointed, such joints should be welded or sealed.

Flooring should be:

- Impervious
- Welded or sealed if joints are unavoidable
- Easily cleanable
- Coved to the wall to prevent accumulation of dirt where the floor meets the wall

Carpets should **NOT** be used.

Decontamination of treatment areas

After each session, the treatment area should be cleaned using disposable cloths or a clean microfibre cloth.

Between patients, the following areas should be cleaned:

- Local work surfaces
- Dental chairs (which should be free of visible damage, for example rips and tears)
- Curing lamps
- Overhead lights and handles
- Hand controls
- Trolleys/delivery units
- Spittoons
- Aspirators
- X-ray units

Disposable, single use covers are available for many of the above areas, and whilst their use is encouraged, they are not a substitute for regular cleaning.

After each session, the items that should be cleaned include:

- Taps
- Drainage pipes
- Splashbacks
- Sinks
- Cupboard doors
- Other exposed surfaces such as dental lights and fittings
- Floor surfaces¹

A disinfectant agent such as a solution of chlorine at 0.1% or 1000ppm or an equivalent disinfectant effective against viruses, bacteria and fungi to EN standard 14476 for viricidal activity should be used.

For floor and general surface cleaning, the national colour coding scheme for cleaning materials and equipment in primary care medical and dental premises can be utilised:



Personal Protective Equipment (PPE)



The local infection control policy should specify when personal protective equipment (PPE) is to be worn and changed. PPE training should be incorporated into staff induction programmes. PPE is there to protect **YOU** and **YOUR PATIENTS**. PPE Includes:

- Disposable clinical gloves (non latex, powder free, well fitting).
- Household gloves and plastic disposable aprons (which should be used for decontamination procedures).
- Face masks which should be disposed of after every patient.
- Eye protection to protect against contaminated aerosol and debris.

During the COVID-19 pandemic, additional PPE included gowns, FFP3 masks and PAPR hoods, hair covers and foot covers.

HTM 01-05 guidelines advise that PPE should be removed in the following order.

- 1) Gloves- Roll up inside out and then wash hands.
- 2) Plastic disposable apron- Break neck straps and only touch inside of the apron.
- 3) Face mask- Break straps or lift over the ears. Avoid touching outer surface of mask.
- 4) Face and eye protection- Take care not to touch outer surfaces.¹

Safe Management of Linen

Uniforms and scrubs should be laundered separately and washed at the highest temperature setting for the fabric.

Infection Prevention and Control Audit

Clinical audit and quality improvement form part of the practice's quality improvement and risk management. Complying with national guidance shows that you have valid quality assurance systems in place for infection prevention and control. As a minimum, decontamination processes should be audited every six months, with an appropriate review dependent on audit outcomes.¹¹

Conclusion

Patients reserve the right to be treated in a surgery environment that is clean and sterile.¹ As part of the registration with the CQC, dental practices need to demonstrate that they meet the essential quality requirements outlined in HTM 01-05 and are working towards a best practice standard of decontamination. CQC will want to see that your practice is striving to make improvements. The process is discussed in more detail in the HTM 01-05 (2013) document which is available from the link below. It is recommended that members keep themselves up to date with any changes to the guidelines and consult guidelines relevant to other areas of the UK as necessary.

Personal Development Plan and Reflective Learning

This CPD is linked to the following GDC Enhanced CPD Development Outcomes:

C. Maintenance and development of knowledge and skill within your field of practice.

Reflective learning is now a requirement of the GDC Enhanced Professional Development Scheme. As such, you will have the opportunity to provide reflection after completing the exam.

Further Reading

[England](#)

[Northern Ireland](#)

[Scotland](#)

[Wales](#)

COVID 19

[Latest Guidance on Managing healthcare staff with symptoms of a respiratory infection or a positive COVID-19 test result \(released March 2023\)](#)

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