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01. Infection control in dentistry



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Criticalities in dentistry

Staff and patients alike may be exposed to infectious risk

Endogenous Infections or Self-Infections

Transmission of microorganisms present in particular areas of the body to other anatomical areas of the same individual

Exogenous or Cross-Infections

Transmission of microorganisms between different subjects

Patient		Patient
Doctor	\longleftrightarrow	Patient
Staff		Patient

Cut\puncture from surgical instruments





Infection control in dentistry

multiplicity of 02 resistance to microbial agents, Waterborne common variety of Variety of both pathogenic prevalence of infections disinfectants of transmission possible infection and HIV, HBV and many opportunistic, routes HCV infections 03 sources pathogenic potentially Preventing microbial species involved contamination of the water line 04 IGN[®] CALBENIUM[®] 05 simultaneous Built-in & Retrofit invasiveness of presence of Airel-Quetin solutions type of rapid patient operative patients, instruments used turnover techniques caregivers and 06 companions

Criticalities in dentistry

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Mode of spread

bloodborne infections

Microorganisms transmitted through blood and/or secretions



contactborne infections

direct contact from the source of infection to the receptive host

waterborne infections

Microorganisms from water and spread through the air



airborne infections

Microorganisms from human secretions and spread through the air



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Contamination exposure

Instruments

In the dental office, they are constantly exposed to different ways of contamination:



Surfaces





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$Level \ of \ infection \ risk \ ({\rm Spaulding \ risk \ classification})$

Devices and supplies to be disinfected can be divided into groups according to the level **of risk of infection** they may pose in use



Critical

Semi-critical

intended to come into contact with intact membranes and mucous membranes.



Non-critical

Not intended for contact with the body or intended for contact with intact skin.





Waterbone infections



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Dental Unit

What is the dental unit?

The dental unit is a complex device with mechanical, electrical, electronic and pneumatic components.





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The water line in the dental unit

Is the water line a critical component for hygiene and safety?

The water line that feeds the instruments is a critical point for infection control.

The water line is a system with little-used pipe runs branches that are exposed to electrical overheating.





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The quality of water

The international guidelines

Internationally, all states follow the regulations governing the quality of drinking water for use in dental units, defining the following parameters as acceptable standards:

a maximum of 500 CFU/mL, with coliforms (such as E.coli) less than 1 CFU/100 mL. Standard dialysis water has less than 200 CFU/mL. Water leaving the DUWL has been measured up to 18,000,000 CFU/mL, with variations depending on the type and age of the unit and the use of biofilm reduction measures.

While recognising the risks represented by DUWLs to workers, no country has yet developed specific technical guidance on water quality.

However, there are a few countries such as Sweden, the Netherlands, Germany, Ireland, Greece, Hungary, Italy, Spain, Australia, England and Saudi Arabia that have adopted guidelines that contain references on water management in DUWLs with the mandatory use of sterile water for dental treatment, or the application of continuous or shock chemical treatment and the use of filtration systems to reduce the risk of contamination, especially with regard to controlling the development of legionellosis.





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Water in the water lines

Water flowing within the water line of the dental unit is subject to:

- To relatively long dwell times inside the pipes;
- to temperatures ranging from 22° to 37° C due to the electrical and electronic equipment inside the dental unit and the backflow of handpieces.

These factors promote the growth of bacteria and fungi, which can cause microbial contamination of processed water.

In addition, the large surface area of the pipe system and the plastic they are made facilitate the rapid growth of bacteria, which begin to accumulate deposits on the walls of the pipe system after a few days.





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The biofilm

Biofilms are a natural phenomenon in aquatic environments. The interior of small-diameter pipes of dental unit water lines (DUWLs) are also sites of biofilm growth.

Genesis - Overgrowth - Contamination

- 1. In the pipe lumen the flow is minimal, water becomes stagnant when the unit is not in use.
- 2. Molecules precipitate from water onto the inner wall and promote the adherence of planktonic microorganisms from the water.
- 3. During the adhesion and growth phase, these microorganisms coat the inner walls with a layer of slime.
- 4. After the adherence and growth phase, a detachment phase occurs in the form of "swarms" of cells that are then washed into the oral cavity through the spray of dynamic instruments, creating the condition of possible infection of the patient, the dental team and the environment.







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The overgrowth

Dental processing water shows massive contamination after long stagnation phases.

With 1 bacteria, 64 000 bacteria are formed after 13 hours if the temperature is 28°C and nutrients are present. It means that if there is Log 1 (10 bacteria), the colony becomes 640 000 bacteria after 13 hours.

Dripping instruments or unpleasantly smelling water are usually the first signs that something is wrong with the dental unit piping.

The most common cause is the presence of biofilms on the inner surfaces of the pipe system that contaminate the water of the dental process.





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Contamination

Areosols and splashes generated during dental treatment create areas of High, Medium and Low contamination potential in the practice.

These areas require different actions to prevent the risk of infection in order to protect the health of patients and staff.

Personal protection equipment PPE

Prevention of blood-borne pathogen transmission and work-related exposure.

Device disinfection and sterilisation

Treatment and management of the dental practice room









Preventing contamination of the water line



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The Basis of Prevention

Dental process water shows massive contamination after long periods of stagnation. Basic prevention suggests:

Utilizzare acqua con le qualità dell'acqua potabile (-< 500 cFU /ml).

After each patient, flush water and air for at least 20-30 seconds for each dental instrument that comes into contact with the patient's mouth and is connected to the water circuit (e.g. air-water syringe, handpieces, drills).

Consult the user manual of each dental unit to determine appropriate methods and tools to achieve the recommended water quality, methods for monitoring water to ensure that quality is maintained.

Contact the dental unit technical service for periodic maintenance of backflow preventers and water components inside the dental unit.

This protocol alone, however, is not sufficient to provide hygienically clean process water at all times.



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The effectiveness of decontamination

Independent water supply unit with internal disinfectant tank



HIGH EFFECTIVENESS





MEDIUM EFFECTIVENESS





LOW EFFECTIVENESS



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Comparison of decontamination protocols

Daily Protocol	Start of day	After each patient	End of day
Direct water supply	• H2 ₀ fluxing for 2 min.	 H2₀ fluxing for 2 min. Surface decontamination 	 2-minute flushing; cleaning and decontamination of surfaces; cleaning and disinfection of surgical suction system; draining and cleaning the suction system filter; cleaning the drain filter of the basin.
Independent Water Tank	• H2 ₀ fluxing for 2 min.	 H2₀ fluxing for 2 min. Surface decontamination 	 2-minute flushing; cleaning and decontamination of surfaces; cleaning and disinfection of surgical suction system; draining and cleaning the suction system filter; cleaning the drain filter of the basin.
Independent tank + Disinfectant	 chemical washing and disinfection of water pipes for 30 sec.(*) 	 fast automatic cycle with high-level disinfectant; Surface decontamination 	 chemical washing and disinfection of water pipes for 30 sec.(*) cleaning and decontamination of surfaces cleaning and disinfection of surgical suction system; draining and cleaning the suction system filter; cleaning of the basin drain filter.
Weekly Protocol	Lubrication of the seals of the quick couplings of dynamic instruments, syringe couplings, cannulae couplings;		

(*) The indicated times refer to the IGN[®] system, other types and products may require longer times.



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The decontamination

systems

A dental unit with an independent water system equipped with water circuit decontamination and disinfection has the following advantages

- Bacteriological water reset
- Reduction of infection risk
- Constant and continuous control of process water quality
- Reduction of preparation time between one patient and the next
- Reduction in dental room clean-up time
- Reduction in dental unit maintenance costs
- Extension of dental unit service life







04. IGN® CALBENIUM®



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Hygiene, our priority

In a dental practice, contamination risks are numerous: equipment, patients, operators.

A forerunner in decontamination for more than 35 years, we have created the integrated and automated IGN[®]-CALBENIUM[®] decontamination system for dental unit disinfection and water treatment to achieve germ-free water, spray and aerosol disinfection.

This world-renowned system prevents viral and bacterial contamination, post-operative or cross-contamination and protects the patient, the dentist and his assistant from pathogens in the water and aerosol.

Adaptable to any dental unit, this system ensures disconnection between incoming water and water in the dental unit water circuit in accordance with NF EN 1717 (protection against drinking water pollution).





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IGN® Infection General Neutralizer

The IGN[®] is a device that allows the dental unit to be supplied with a continuous flow of uncontaminated water laden with active disinfectant.

IGN[®] makes it easy to solve the problem of water-borne pathogens in dental lines.

IGN[®] connects directly to the general water line, acting as an independent supply tank for the dental unit water lines without any need for water pre-treatment.

IGN[®] is equipped with a filter cartridge that removes some of the inorganic residue from the incoming water, and an automatic mechanical pump that adds CALBENIUM[®] disinfectant directly from the integrated tank.

IGN[®] combined with CALBENIUM[®] effectively, ergonomically and economically provides clean, decontaminated water for high-speed handpieces and other instruments, keeping the dental unit water circuit in biological reset.





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CALBENIUM[®] benefits

- **DECALCIFICATION power:** Chelates calcium in the water preventing calcium deposits within the circuits
- **DISINFECTING and VIRUCIDAL power:** disinfects water circuits and valves, dynamic instruments, removes and neutralises biofilm, provides spray mist with disinfectant power, protecting the patient and staff from possible cross-infection.
- **DETERGENT and TENSIOACTIVE power:** Cleaning of organic and inorganic residues, cleaning of surgical suction, cleaning of internal dental unit components.
 - Allowing the surgical film to be preserved while preventing the mucosa from drying
 - Improves the quality of silicone and alginate impressions
 - It improves etch removal and composite fixation.
- **THERAPEUTIC ACTION:** desensitising, topical effect, improved healing of injured tissue by promoting elimination of post-operative infection
- **PERCEPTION OF TASTE:** increased patient comfort by sweetening and flavouring the water without lowering or nullifying the decontamination and disinfection effects of the water.



MEDICAL DEVICE DISINFECTANT



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CALBENIUM[®] in dental treatments

DESCALING – CALBENIUM[®] is essential as a descaling action. In dislodging periodontal tissue, it can be useful as it cleanses surfaces allowing the antiseptic and healing properties to penetrate deeper allowing tissue regeneration to take place more quickly. The cleansing action will cause the surface to appear whiter. The asepsis and curettage of periodontal pockets is greatly improved due to the excellent levels of neutralisation of aerobic germs present in periodontal disease.

PREVENTION – The presence of CALBENIUM[®] in the water prevents corrosion, algae formation, and infection by pathogenic germs or viruses. Treatment units using the ING[®] CALBENIUM[®] system have internal components that are as good as new after 5 years (tubes, valves, etc.), the same effect can be seen on instruments, handpieces and surgical suction.

SURGERY - The disinfectant action of CALBENIUM[®] is an excellent adjunct to irrigation of the site with physiological solutions. Irrigating the surgical site with the syringe will form microbubbles that facilitate the release of intercellular toxins released during the surgical trauma, helping to maintain a high degree of aseptic protection.

PERIO TREATMENTS - The disinfectant action of CALBENIUM[®] during curettage of periodontal pockets allows excellent levels of cleanliness and asepsis of epithelial tissues. The elimination of anaerobic germs is total and rinsing with CALBENIUM[®] solution facilitates periodontal wall reattachment.



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CALBENIUM[®] in dental treatments

ENDODONTICS ROOT CANAL TREATMENT - CALBENIUM[®] thanks to its surface-active cleansing and disinfecting action allows an aseptic tooth canal and avoids the risk of hyperesthesia.

IMPRESSION TAKING AND DISINFECTION - Thanks to its components, the tooth surface sprayed with CALBENIUM[®] obtains a thin film with surface-active properties that help better definition when taking silicone, hydrocolloid, hydroalginate or alginate impressions. The impression can also be rinsed and disinfected using the syringe on the dental unit before being sent to the laboratory.

COMPOSITE GRIP - CALBENIUM[®] facilitates the grip of composites and improves the removal of phosphoric acid. CALBENIUM[®] is fully suitable for use with all types of phosphoric acid.

DENTIST-PATIENT COMMUNICATION - The presence of a certificate of conformity, the sight of the IGN[®] system and the pleasant effects given by CALBENIUM[®] during treatments allows the patient to appreciate how important it is for the dental practice to ensure a high standard of safety and quality.



Built-in - Retrofit le soluzioni Airel-Quetin



IGN®-CALBENIUM® Airel Quetin built-in

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pump and the CALBENIUM® tank that automatically continuously dispenses decontaminated water

IGN®

Hygiene in the dental unit | 29

Rinse



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Built-in Dayly Protoco

In the Full-Digital versions of Airel Quetin dental units (NEO.2* and EVO.2**) **IGN®** ensures continuous decontamination of the dental unit water lines and is equipped with automatic management for daily and intensive decontamination PROTOCOL.

The Start and End of Day protocol ensures daily bacteriological reset after prolonged non-use of the dental unit. The duration is 30 seconds, reducing operator time to a minimum. Choice of Protocol "Start of Day" or "End of Day

Starting decontamination

Decontamination in progress duration 30 sec.

Fine Decontamination



*One and NEO.2 versions the IGN® system including ASPISEPT® - CALBEPULS® is present as an option instead of the independent water tank, which can be used with a 2% mixture of water and CALBENIUM®

** EVO.2 version the IGN® system including ASPISEPT® - CALBEPULS® is standard.



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Built-in Stronger Protocol

In the Full-Digital versions of Airel Quetin dental units (NEO.2* and EVO.2**) **IGN®** ensures continuous decontamination of the dental unit water lines and is equipped with automatic management for daily and intensive decontamination PROTOCOL.

The protocol guarantees a

bacteriological reset after a

prolonged period of non-use

of the dental unit (e.g. after

holiday periods when the

recommended biweekly.

The process duration is 32

surgery is closed) or

min. + 30 sec.

Choice Intensive Protocol

Start of decontamination 30 sec

Ongoing contact time duration 30 min.

Rinse in progress duration 2 min.

Fine Decontamination







*One and NEO.2 versions the IGN® system including ASPISEPT® - CALBEPULS® is present as an option instead of the independent water tank, which can be used with a 2% mixture of water and CALBENIUM®

** EVO.2 version the IGN® system including ASPISEPT® - CALBEPULS® is standard.



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Preventing contamination of the water line **IGN® EVO**

automated

pre-treatment.

IGN[®] EVO is a fully

decontamination system for

sprays, requiring no water

CALBENIUM[®] SPRAY

CALBENIUM[®] SPRAY is an

alcohol-free, ready-to-use

spray solution for cleaning

and disinfecting surfaces.

Non-corrosive, it can be used on all types of surfaces.

04

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IGN[®] MAG

IGN[®] MAG is a fully mechanical and automated water decontamination system connected to the public water supply. It does not require pre-treatment of the water.



IGN[®] CARTRIDGE

In combination with the IGN[®] system and the CALBENIUM[®] product, the IGN[®] CARTRIDGE cartridge is designed to continuously filter water for dental unit sprays.



CALBENIUM® 1L

IGN[®]-CALBENIUM[®] retrofit

Combined with the IGN® system or used independently of the water supply, CALBENIUM® is a descaling disinfectant that treats water in dental unit circuits (including sprays and aerosols). CALBENIUM® is a class Ila medical device.





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Retro-fit Protocol

In the retrofit **IGN®** versions, the **IGN®** system ensures continuous decontamination of the dental unit's water lines; daily and intensive decontamination PROTOCOLS are managed independently by the operator.

Daily Protocol:

- 1. Start of day flush each instrument for 1 minute.
- 2. End of day flush each instrument for 1 minute.

Intensive Protocol (recommended fortnightly):

- 1. Remove instruments from cords;
- 2. Open spray taps;
- 3. Place cords in a minimum 1.5l container;
- 4. Flush syringe for 1 minute
- 5. Flush instrument spray for at least 5 minutes.

Every year, replace the filter cartridge.





IGN[®]-CALBENIUM[®] conformity certificate

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CERTIFICATE OF APPROVAL

This dental practice is equipped with water decontamination system IGN[®] | CALBENIUM[®]

The total decontamination of dental unit waterlines and sprays of dynamic instruments in contact with the oral cavity environment is integrated into the dental unit by the IGN® system (Continuous water disinfection systems) coupled with the liquid disinfectant concentrate CALBENIUM®. It ensures the elimination of all types of germs and disconnection of the incoming water with the water from the sprays in accordance with standard NF EN 1717 (Protection against pollution of potable water in water installations and general requirements of devices to prevent pollution by backflow). The validity of the IGN certificate is linked to the standards of use described in the protocol established by the company Airel - Quetin.

CALBENIUM® conforms to standards

EN 14476 (virucidal activity - against Coronavirus, in the medical area) - EN 13727 (bactericidal activity in the medical area - EN 13624 (fungicidal or yeasticidal activity in the medical area) - EN 17126 (sporicidal activity in the medical area)







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de Nice



Over dealers throughout France and all over the world, we have an established presence in Europe with excellent distributors in most countries.





Tell us about yourself; we have the solution you need