Good Practice in Non-surgical Periodontal Therapy

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COMBI *touch*: Operational protocols

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Foreword

Advancements in scientific evidence guide clinical approaches and, in the case of **GOOD PRACTICE IN NON-SURGICAL PERIODONTAL THERAPY**, the key words are **oral cavity eubiosis, minimally invasive**, and **high-performance technologies** that ensure that the patient's clinical needs are met.

Customisation of clinical dental treatment is the foundation for good clinical practice, and advanced technologies must facilitate an approach that we consider to be **tailor-made** (Nardi et al. 2016. *J Biomed 2016; 1:26-31*).

Choosing the appropriate technology for each clinical situation is the first goal of the **tailor-made** approach, leading the practitioner to carefully examine the anatomical features and tissues, checking for any pathology, prosthetic artefacts or current rehabilitative therapies and the characteristics of the surface to be treated. This degree of attention focused on clinical observation enables operative protocols that are effective, minimally invasive and can be shared with the person involved so they can actively participate in making an informed choice of therapy.

Gianna Maria Nardi - Roberta Grassi

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1. Non-Surgical Periodontal Therapy

The procedure for non-surgical periodontal treatment is indispensable for decontaminating the oral cavity. In dentistry, it forms the basis of any primary, secondary or tertiary prevention procedure. In the case of palliative supportive therapies, this procedure ensures the survival of compromised natural tooth elements or implants and prosthetic components which, for various reasons, cannot be treated.

Non-Surgical Periodontal Therapy seeks to prevent and/or eliminate supragingival and subgingival inflammation and its recurrence.

It is essential that the practitioner check the risk factors for periodontal disease through good control of the bacterial biofilm, at-home and professionally. The choice of sophisticated technologies that ensure efficient, effective periodontal deplaquing and debridement procedures is a must, and, since 1984, debridement with piezoelectric technology has been deemed an ideal system for mechanically removing bacterial biofilm and pigmentation from dental and root surfaces.

Periodontal deplaquing and debridement procedure

COMBI *touch* device ideal for Non-Surgical Periodontal Therapy

2. COMBI *touch* Technology

COMBI *touch* merges a multifunctional piezoelectric scaler and an air-polisher into a single device for complete supragingival and subgingival deplaquing and debridement.

Air-polishing can be performed using two different types of powder, depending on the type of treatment being performed.

The operating principle behind air-polishing is based on the mechanical action achieved by a jet of different types of crystals accelerated by a stream of compressed air. The kinetic energy imparted to the particles is nearly completely dissipated upon impact with the enamel surface, thus producing a gentle but effective cleansing action. The action is completed by a jet of water which spread out in a bell shape around the main flow because of the vacuum created around the nozzle, producing a dual effect: it prevents most of the powder from rebounding and escaping in a cloud, and it continuously washes out the treated area by dissolving the powder into a solution. The unit is equipped with 3 different air-polishing handpieces with different angles and special subgingival perio tips.

The ultrasonic part features a piezoelectric system with an oscillation frequency of around 28,500 Hz (range: 24,000-36,000 Hz). It has 2 irrigation lines — water mains or independent line from a convenient 500-ml bottle, which is easy to remove and safe thanks to a system that prevents leaks. The ultrasonic handpiece weighs only 55 g and has an annular LED light, ideal for maximum visibility during treatment. There are 30 different inserts available for a variety of clinical applications in periodontal, endodontic and prosthetic therapy.

The COMBI *touch* device also features the unique SOFT MODE function, ideal for the most sensitive patients, because it lowers the amplitude of the ultrasonic oscillations to make insert movements gentler yet still effective. Another important function is PULSE MODE, featuring specific peaks of power that impart a hammering movement on the insert, ensuring maximum performance in prosthetic therapies.

3. Air-Polishing

High-velocity powder particles combined with a very fine, uniform, duly focused, spray of heated water ensure effective de-plaquing

3.1 Introduction

The air-polishing technique can be applied during deplaquing to eliminate acquired discoloration (from tea, coffee, red wine, tobacco and other substances that stain). This operative phase of Non-Surgical Periodontal Therapy enables effective mechanical control of the bacterial biofilm, needed to maintain oral cavity eubiosis and thus limit the risk of diseases of great epidemiological significance (caries, gingivitis and periodontitis). Air-polishing has proven to be effective in removing supragingival and subgingival biofilm and acquired discoloration.

3.2 Air-polishing systems

Air-polishing systems use compressed air, water, and various types of powders with different particle sizes, specifically designed to render the procedure effective, and so the various treatments can be customised to meet different anatomical and clinical situations.

The abrasive flow is composed of:

- Water
- Compressed air
- Special powders with controlled particle sizes

In addition, the structure and design of the air-polishing terminal nozzle are important features that can affect the abrasive properties of the powders used. Small differences in nozzle size — e.g. opening diameter, tube length, or curvature — can influence the effectiveness of the clinical operation.

It must be emphasized that thorough knowledge of the technology is required, as this ensures the effectiveness of deplaquing on any tooth or root surface. It is important for the operator to evaluate and analyse the choice of powder to use according to the clinical situation at the time air-polishing is performed, for example not pointing the jet directly at the gingival margin, exposed tooth collars or mucous membranes when using bicarbonate powders.

4. Ultrasound

4.1 Introduction

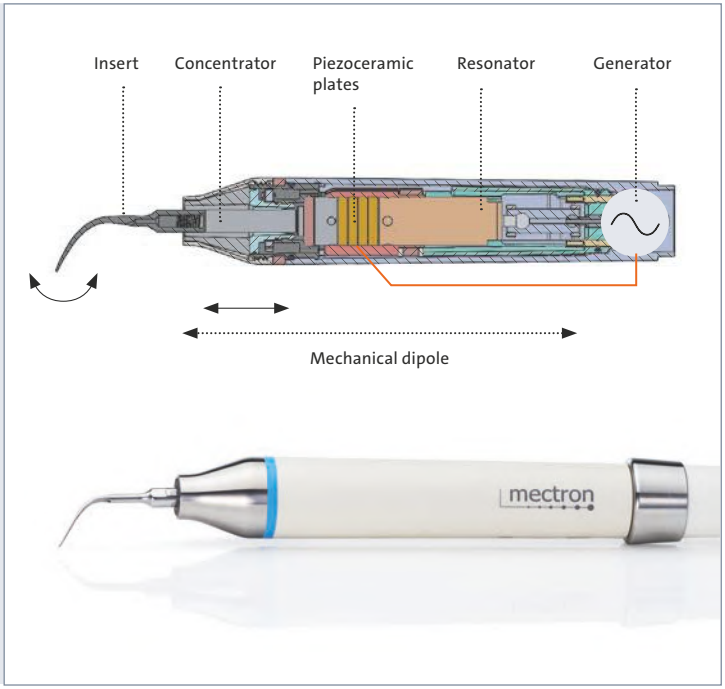
Periodontal debridement is an important clinical operation that enables effective Non-Surgical Periodontal Therapy and can be performed with manual or mechanical instruments. The scientific literature has proven the efficacy of utilizing ultrasonic instrumentation combined with manual instruments. The effectiveness of debridement is assured by enabling the operator to perform services that meet the highest criteria in terms of quality and timing.

Ultrasonic instruments can be magnetostrictive or piezoelectric. The magnetostrictive system features application of an alternating magnetic field that produces a double energy conversion — from electrical to magnetic and then from magnetic to mechanical — in which some efficiency is lost with each conversion. The insert moves in an elliptical pattern, and the oscillation frequency is about 28,500 Hz.

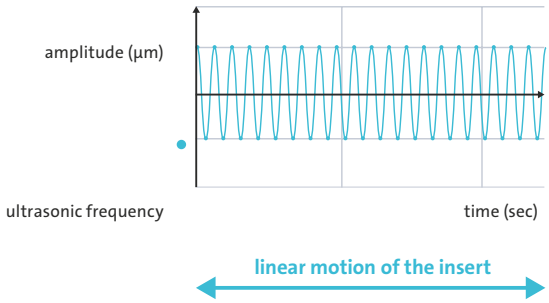
4.2 The piezoelectric system

In 1982, Mectron invented the first titanium ultrasonic transducer — currently the global standard. The piezoelectric transducer is a special electronic device designed to transform electrical energy into mechanical vibrational energy or vice versa. Ceramic materials that exhibit piezoelectricity — that is, materials capable of translating changes in the electric field into changes in thickness or length — are used in piezoelectric transducers. The generator provides a voltage with a sine wave-like waveform. The voltage alternately changes from positive to negative, depending on system frequency. The piezoelectric material — composed of 4 piezoceramic plates — is affected by this variation, lengthening in the positive range or, conversely, shortening in the negative range.

The piezoelectric ultrasonic handpiece



Ultrasonic frequency - waveform generated



The main feature of piezoelectric technology is the vibration amplitude it produces, which is rather small, so it is generally expressed in microns, with typical values of between 0.006 and 0.1 µm.

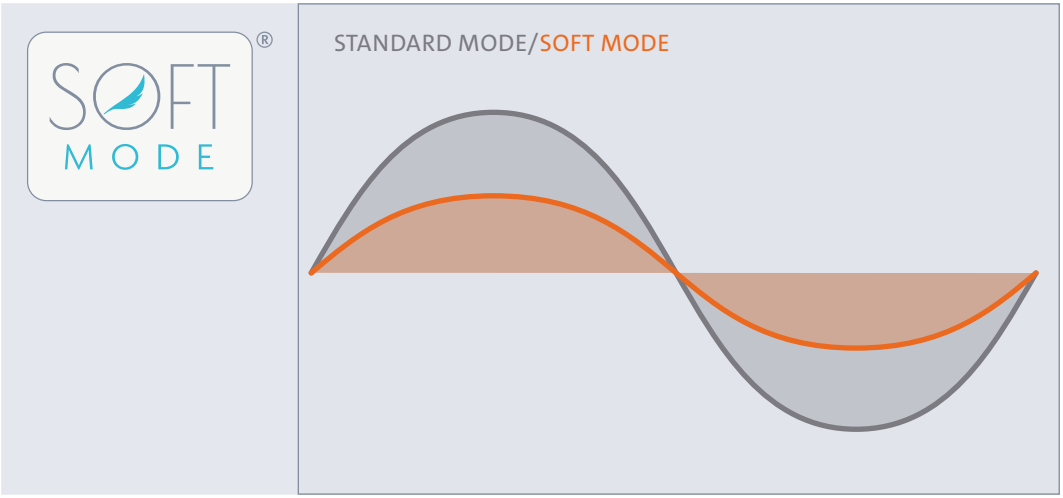
The oscillation frequency is around 28,500 Hz (range 24,000-36,000 Hz). The vibration amplitude is also related to the device setting, the degree of flexibility of the metal used in the insert, insert morphology and the irrigational flow. Modern devices (such as COMBI *touch*) enable the control electronics to act on the amplitude of the ultrasonic vibration.

Ensuring the optimal relationship between power and safety is one of the keys to success for any clinical treatment. Thanks to the intelligent electronic feedback system, Mectron technology provides optimal power for consistently effective treatment. This system automatically controls all major device functions, thus always ensuring optimal tuning between the handpiece and the insert based on the clinical situation.

4.2.1 The advantages of the piezoelectric system

The piezoelectric system has many advantages over other systems:

- Suitability for numerous clinical indications given the morphology of the special inserts: scaling, perio, endo, conservative, prosthetic
- Maximum respect for soft tissues
- Increased visibility during the clinical procedure
- Disinfectant and bactericidal action in root canal cleansing
- Greater patient comfort during treatment
- Easier operation for the practitioner



SOFT MODE - for gentle, minimally invasive scaling

The unique SOFT MODE function lowers the amplitude of the ultrasonic oscillation by a certain percentage based on the morphology of the insert, thus allowing gentle yet effective movement, enabling the clinician to perform treatments that are pain free and more comfortable.

Patients with dentine hypersensitivity can face the treatments they undergo with greater serenity.

PULSE MODE

PULSE MODE is a pulsed power mode dedicated to prosthetic applications. It is achieved by selecting "restorative 5" from the COMBI *touch* keyboard. This transforms the usual sine wave created by the ultrasound oscillation (standard function) to produce specific power peaks that prove optimal in prosthetic preparations.

The cavitation effect facilitates biofilm breakdown and bacterial dispersion and promotes detoxification of periodontal pockets through the oxygen supplied

ULTRASONIC CAVITATION

Ultrasonic cavitation is a physical phenomenon in which a liquid subjected to ultrasound forms vapour or gas bubbles that then implode.

This occurs due to the local pressure drop — generated by the acoustic (ultrasound) wave — to below the vapour pressure of the liquid itself, thus producing a change in phase (from liquid to gas). This forms cavities containing vapour that increase in size until they implode.

Cavitation facilitates the disintegration of bacterial biofilm and also has a hemostatic effect on the blood vessels, thus reducing bleeding and exerting a bactericidal effect in root canal cleansing.

5. Operational procedure

Patient rehabilitated by Toronto Bridge implant therapy

Bacterial biofilm topography highlighted by the plaque detector (The Dental BIOfilm Detection TECHnique (D-BioTECH): A Proof of Concept of a Patient-Based Oral Hygiene. Roberta Grassi, Gianna Maria Nardi, Marta Mazur, Roberto Di Giorgio, Livia Ottolenghi, Fabrizio Guerra, 2016)

Age:	72 years
Sex:	Female
Systemic diseases:	High blood pressure
Drug therapy:	Medications to control blood pressure
Food habits:	Frequent use of breath mints to control breath
Family history of periodontal disease:	Yes
Smoking:	< 10 cigarettes per day
Clinical check-up:	Mechanical control of bacterial biofilm with Sonicare sensitive toothbrush and advance interdental pick
At-home oral hygiene:	At-home ozone therapy - ozonated oil, ialozon blue mouthwash, ialozon blue gel toothpaste
Reason for visit:	Check-up

For patients who have undergone rehabilitation through implant therapies, at-home and professional management of oral hygiene requires special attention to preserving the tissues in the oral cavity and the prosthetic implant, adopting a minimally invasive, **tailor-made** clinical approach. The combined technology used by COMBI *touch* enables the operator to overcome the anatomical difficulties objectively present.

Clinical observation of the characteristics of the surface being treated — anatomical particularities, evaluation of periodontal phenotype, presence of inflammation, oral pathology and careful observation of the sites that most retain bacterial biofilm — must be kept on file so as to follow its evolution and must be shared with the patient to motivate their adopting correct at-home lifestyles.

It is useful to have the help of:

- photographic documentation
- pictures taken with intraoral cameras
- plaque detectors

Each clinical picture should guide the operator in performing Non-Surgical Periodontal Therapy with a **tailor-made** approach, choosing the appropriate minimally invasive technologies to ensure an effective outcome.

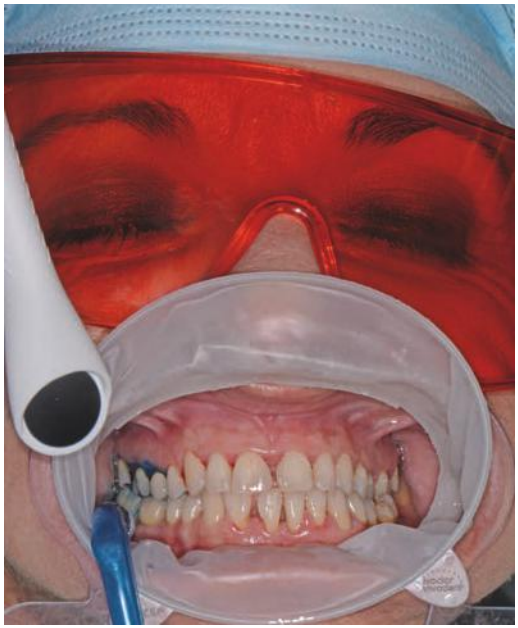
5.1 Patient and operator safety

The operational guidelines for dental work during the COVID-19 pandemic should be carefully followed and attention should be paid to any subsequent updates.

For the operator:

Wear:

- Mask
- Visor/glasses and/or magnifiers
- Bandana/cap
- Gloves



Operative deplaquing with double suction

For the patient:

- Preoperative rinse with antibacterial and antiviral mouthwash to lower the bioburden and lower the risk for possible carry-over of bacteria and viruses via aerosols.*1 The rinse time depends on the molecule used in the mouthwash chosen.
- Take care to preserve the lingual mucosa and parotid salivary gland ducts.
- Apply lubricant on the lips to prevent the sodium bicarbonate from causing dehydration and abrasion during the procedure.
- Take special care to prevent irritation to the floor of the mouth, soft palate and pharynx.
- Fine dust particles can get into the eyes and under contact lenses; therefore, the patient should wear protective goggles during treatment.
- Use retractor to ensure better operator visibility.
- Use double suction.*2

*1 Scientific evidence has shown that the delivery of powders by supragingival and subgingival air-polishing devices produces an abundant stream of water and powder containing microorganisms and oral debris; therefore, as with all aerosols, it increases the risk of contamination.

*2 A study, conducted at Baylor College of Dentistry in 2004 by Harrel and Molinari demonstrated the importance of using high-speed suction with a large nozzle and positioned in the direction opposite that of the spray, set as close to the nozzle as possible. The suction is insufficient to reduce the number of bacteria in the aerosol (Harrel & Molinari, 2004).

Observation of bacterial biofilm topography and sharing this with the patient

5.2 D-BIOTECH Clinical Approach (Dental Biofilm Detection Topographic technique)

The D-BioTECH clinical approach is a breakthrough in oral hygiene practice for the patient and the clinician.

To perform the D-BioTECH approach, the operator must observe the topography of the bacterial biofilm — evidenced by the plaque detector, which visually displays the sites most at risk of inflammation — and share this information with the patient to motivate them and improve the effectiveness of at-home oral hygiene. (Nardi G.M., Sabatini S., Guerra F., Tatullo M., Ottolenghi L, Tailored Brushing Method (TBM): an innovative simple protocol to improve the oral care. J Biomed 2016; 1:26-31)

The D-BioTECH method is applicable in Non-Surgical Periodontal Therapy, as a mechanical or manual clinical approach to deplaquing and debridement (The Dental BIOfilm Detection TECHnique (D-BioTECH): A Proof of Concept of a Patient-Based Oral Hygiene. Roberta Grassi, Gianna Maria Nardi, Marta Mazur, Roberto Di Giorgio, Livia Ottolenghi, Fabrizio Guerra, 2016).

This method ensures efficient, minimally invasive operation, as it makes it possible to use instruments — selective polishing, air-polishing, manual and/or mechanical debridement — in the sites that retain bacterial biofilm the most, following the topography indicated by the plaque detector.

The efficiency and effectiveness of the D-BioTECH-guided procedure to remove bacterial biofilm allows for quick, painless, ergonomic decontamination, leaving the operator time to perform a risk assessment and motivate the patient and verify appropriate lifestyle.

Observation of the bacterial biofilm topography is useful as it helps reinforce patient motivation, prompting greater attention to monitoring those points deemed most retentive and thus the effectiveness of at-home oral hygiene. The operator shares the most appropriate choice of technologies and clinical approaches with the patient, prompting them to visually intercept the sites presenting the greatest risk of inflammation. The D-BioTECH technique enables the patient to take on greater responsibility in the success of the treatment.

Motivational approach to proper at-home oral hygiene with ultrasoft sonic toothbrush (GUM) and advance rubber interdental pick (GUM).

A sophisticated, ergonomic combination scaler-air-polishing device, COMBI *touch* can be used to perform Non-Surgical Periodontal Therapy. In the deplaquing procedure, the availability of handpieces oriented at 90° or 120° makes the device effective, even in the most difficult-to-reach areas, while still respecting the delicate mucogingival tissues, with a minimally invasive clinical procedure.

For the clinical air-polishing procedure, it is advisable for the operator to evaluate and choose the most appropriate powders, applying a **tailor-made** approach, personalised according to the clinical situation in the oral cavity. After having detected and recorded the clinical oral hygiene indices, the air-polishing deplaquing procedure is performed. For patients with prosthetic implants, the modified plaque index (mPI) should be detected and bacterial biofilm formation in the marginal area around transmucosal implants checked to prevent peri-implantitis. The COMBI *touch* unit uses an operating water pressure from 1 to 6 bar and an air inlet pressure from 4 to 8 bar ("prophy" function = 3.5 bar; "perio" function = 2.7 bar). The direct jet should not be aimed at the gingiva. Instead, when using glycine powder, the peripheral jet can approach the gingival margin.

COMBI *touch* air-polishing allows for minimally invasive clinical operation while respecting the health of dental enamel and still maintaining quick, safe, effective removal of stubborn extrinsic discolorations. Subgingival air-polishing can be performed in the periodontal and peri-implant pockets with the special tip.

In the supragingival technique, the air-polishing handpiece should be maintained under a constant circular motion at a distance of 4-5 mm from the surface and for about 5 seconds per tooth.

For maintenance therapy, the work must be performed using an incidence angle between powder jet and tooth axis of between 30 and 60 degrees. The correct handpiece angle is essential to prevent soft tissue trauma and to reduce the amount of aerosol emitted.

Mectron technology has created 3 handpieces with different angles to enable the operator to apply a tailor-made approach to customise operating protocols according to clinical need.

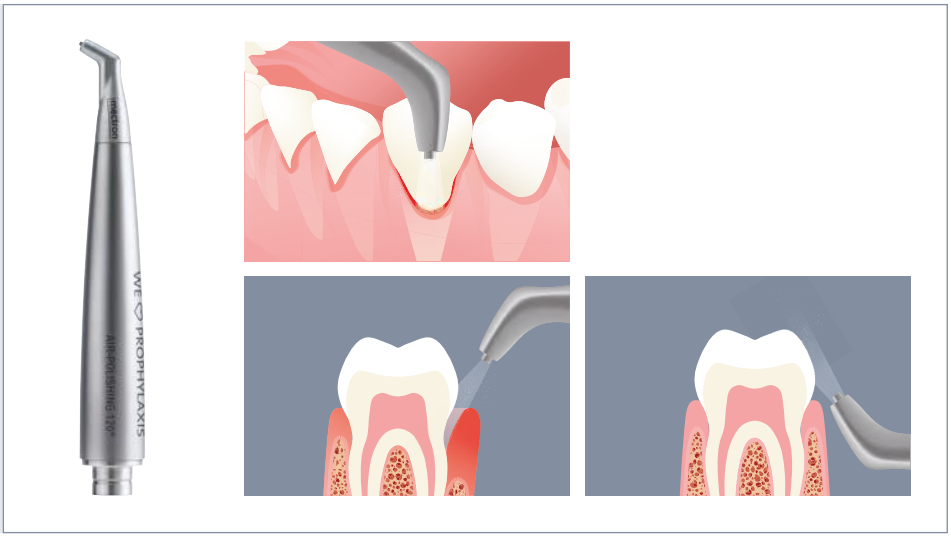
5.3 Air-polishing handpieces

5.3.1 120° air-polishing handpiece

Using the handpiece with this angle generally allows for effective deplaquing, especially in cases where the operator encounters difficulties due to particular anatomical soft tissue structures and the placement of teeth or prosthetic components that are difficult to access. In the case of healthy gingival tissue and particularly stubborn pigments, sodium bicarbonate powder should be used. With metal-free prosthetic components, implants, exposed root surfaces and when the oral cavity presents thin biotype tissue, glycine powder should be used.

The 120° handpiece has universal application and can be used with sodium bicarbonate for supragingival areas or with glycine for supragingival and subgingival areas.

120°



5.3.2 90° air-polishing handpiece

Dedicated to deplaquing the anterior surfaces of the teeth using sodium bicarbonate or glycine powder, the advantage being the ability to preserve the soft tissues of the gingiva throughout the clinical procedure. It allows effective deplaquing of occlusal surfaces with bicarbonate powder. The surfaces of deciduous molars are best decontaminated with glycine powder. The 90° orientation makes it possible to safely and effectively remove particularly stubborn acquired discoloration (e.g. from tobacco) near the gingival collars.

90°

5.3.3 PERIO air-polishing handpiece

Ideal for effective detoxification of periodontal pockets measuring more than 5 mm with the use of the sterile, disposable perio subgingival air-polishing tip that allows minimally invasive entry into the pocket. In addition, the 120° angle enables the operator to work ergonomically with the appropriate support points and thus without carpal tunnel strain.

The tip does not spray the jet in the apical direction. Rather, it directs it laterally toward the root surface and periodontal pocket wall, thus preserving epithelium junction integrity.

After detecting clinical indices, if probing intercepts a site with a pocket greater than 5 mm, the perio subgingival tip should be inserted into the PERIO air-polishing handpiece, ensuring that it is properly inserted all the way. The two pieces should be in contact.

When decontaminating the periodontal pocket with glycine powder, the tip should be gently inserted into the pocket, perfectly adhering to the surface of the root being decontaminated, making very slight, continuous back and forth movements. It takes only a few seconds to sufficiently detoxify a periodontal pocket (mesial, distal, buccal and lingual surfaces). Use only glycine powder for subgingival air-polishing.

PERIO

5.4 Prophylaxis powders

Sodium bicarbonate and glycine are the powders most commonly used. Different powders varying in composition, particle size and usage are available. The choice depends on the equipment used, operator preference, type of deposit and any medical contraindications.

5.4.1 Sodium bicarbonate

Sodium bicarbonate is a sodium salt of carbonic acid, which is a white crystalline powder at room temperature. Given that it can react with acids, sodium bicarbonate can be used in pharmaceutical preparations as a modest antacid. It is also used in the formulation of toothpastes for its abrasive whitening action. Sodium bicarbonate powders have been used in dentistry since 1980 to remove bacterial biofilm and extrinsic discolorations. Sodium bicarbonate particles can have a particle size < 150 µm, and the crystals themselves have a chiselled rectangular and/or square shape.

Bicarbonate crystals, 100x magnification (image provided courtesy of 3M Espe)

Sodium bicarbonate effectively removes supragingival bacterial biofilm and discoloration from the enamel surface without any significant change or substance loss. However, it is important to consider that, in cases of enamel demineralisation, sodium bicarbonate should be used with caution on dentine and root cementum as it can result in significant abrasion and loss of healthy tissue. Decontamination

treatment with bicarbonate powders should be customised according to the anatomical structure of the dental arch and clinical requirements.

5.4.2 Glycine

Glycine is an amino acid, isolated from sugar cane by Braconnot in 1820. Glycine can also be obtained by the hydrolysis of isinglass, gelatin, or silk fibrin. Given its properties, glycine is used during oral hygiene treatments with supragingival and subgingival air-polishing devices to remove bacterial biofilm, mild extrinsic discolorations and for the detoxification of periodontal pockets. Glycine powders have a particle size of less than 25 µm (D50).

This powder is also indicated for patients with systemic diseases who are on low-salt diets, such as patients with hypertension and renal failure, where the use of sodium bicarbonate would be contraindicated. It is also minimally invasive on root cementum, enamel, dentine and exposed implants and on deciduous dentition, where the use of natural glycine powder with low particle size (d50 = 25 µm) is advisable.

Decontamination treatment with glycine powder should be tailored to each patient's needs and clinical type, the advantage being that it can be used for frequent repeat treatments.

Bicarbonate crystals, 100x magnification (image provided courtesy of 3M Espe)

5.4.3 The use of prophylaxis powders according to clinical needs

DIRECTIONS		BICARBONATE	GLYCINE
Removal of supragingival biofilm		●	●
Removal of extrinsic staining		●	○
Removal of subgingival biofilm		○	●
Periodontal pocket detoxification		○	●
Implant maintenance		○	●

DIRECTIONS		BICARBONATE	GLYCINE
Treatment of peri-implantitis		○	●
Treatment of orthodontic brackets		●	●
Application to fixed and restorative devices		○	●
Maintenance of composite fillings		○	●

5.5 Debridement with ultrasonic instruments

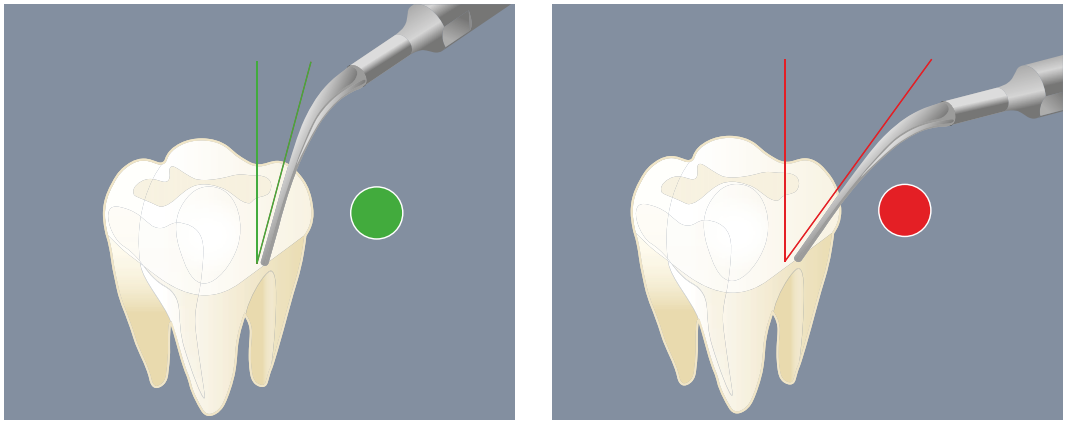
The ultrasonic vibrations and cavitation effect produced by the scaler effectively remove tartar and also disrupt and eliminate bacterial biofilm.

The insert makes a linear motion that preserves the soft tissue and the gingival margin. The force applied by the tip on the tooth should be minimal. The power should be set to a low level, with medium irrigation, activating the SOFT MODE function, where available, as this lowers the amplitude of the ultrasonic oscillation for gentle but effective movement.

The linear movement of the insert combined with the SOFT MODE function enables ultra-gentle treatment

This function is a valuable aid to the clinician, as it enables patients with dentine hypersensitivity to face their clinical procedures with much greater peace of mind.

In scaling, the insert must be set parallel to the surface of the tooth, applying a back-and-forth motion, taking care not to face the insert toward the enamel and never use the tip of the insert directly on the surface of the tooth.



Correct use of inserts

Perio inserts should be used in contact with the surface of the root, exerting gentle pressure with back-and-forth motions from the root access point to the apical position.

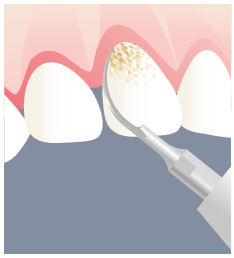
5.5.1 Scaling

Dedicated inserts for the clinical scaling procedure are effective for the removal of supragingival tartar. The ability to choose between different shapes designed for each type of deposit and each clinical situation enables **tailor-made** treatment to achieve effective results while respecting operator and patient comfort.

Debridement performed with scaling inserts

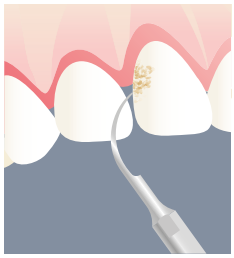
S1

- Ideal for removal of large supra-gingival tartar deposits.
- Similar shape to universal curette with semicircular cross-section.



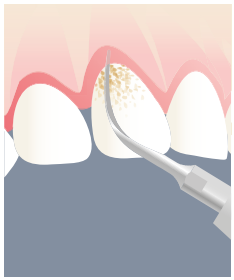
S2

- Ideal for decontamination of interproximal surfaces and retromolar areas.
- Shape similar to universal curette with triangular cross-section and rounded surface.



S1-S

- Thanks to its slim shape and sharp sides, it enables effective interproximal work.
- Designed to remove supragingival tartar as well as bacterial biofilm and subgingival deposits.

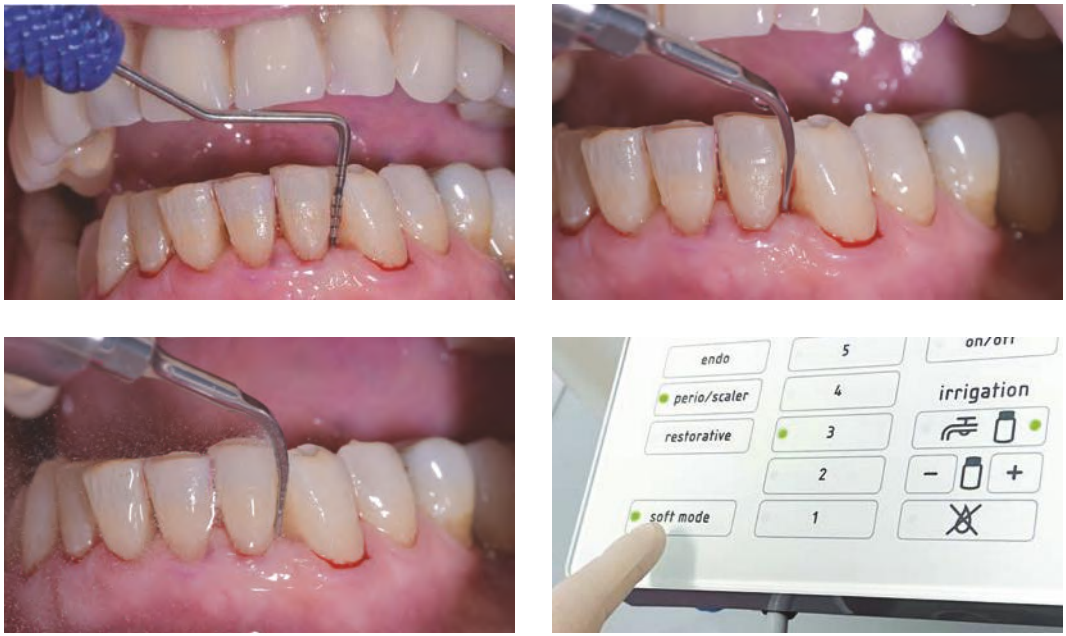


5.5.2 Perio Applications

Periodontal inserts are designed for gentle, effective removal of supragingival and subgingival bacterial biofilm. The shapes available allow for easy access inside periodontal pockets and interproximal spaces in all dental quadrants.

The linear movement of the tip makes them gentle on soft tissue, minimally invasive on the root cementum, thus making it possible to preserve the epithelium. They offer the clinician excellent intraoperative control and interproximal precision, supragingival as well as subgingival. The clinical procedure is delivered gently, offering patient comfort thanks to the SOFT MODE function.

Periodontal probing and debridement performed in SOFT MODE

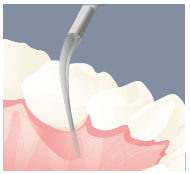
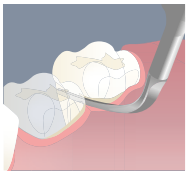




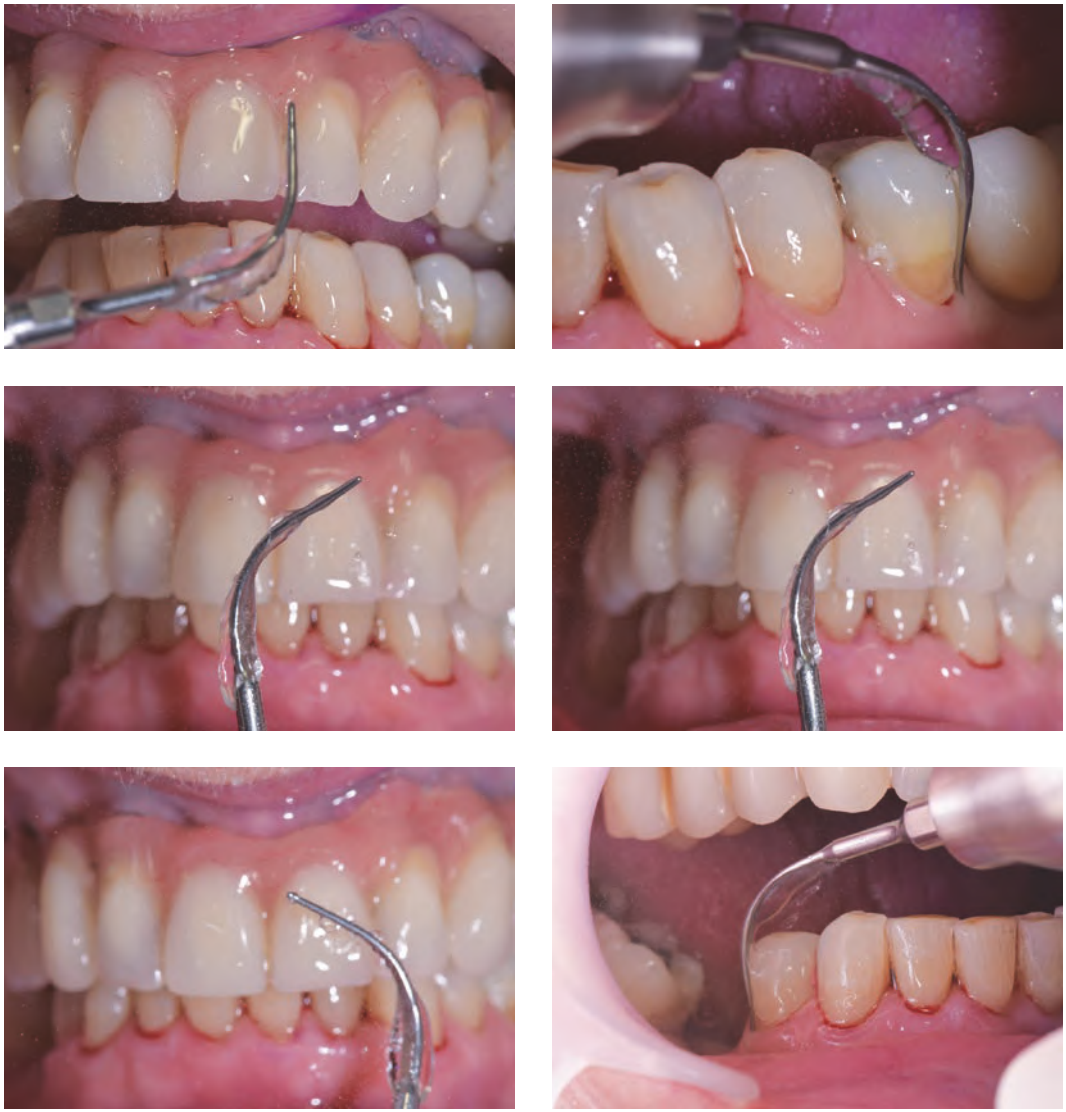

Use of the P3 insert which allows for a minimally invasive approach

P3

- Ideal for gentle, effective removal of supra-gingival and subgingival bacterial biofilm.
- Slim shape similar to a periodontal explorer.
- Enables easy access inside periodontal pockets and interproximal spaces.
- Excellent for subgingival and interdental cleaning.

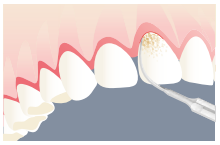



Use of perio inserts with different angles for optimal access to all areas to undergo prosthetic and dental treatment



P10

- Provides optimal access to root surfaces.
- Ideal for removing tartar deposits and bacterial biofilm from deep periodontal pockets.
- Slim shape and very long, slightly curved tip with rounded surface.



P11

- Designed to delicately remove tartar deposits and bacterial biofilm from deep periodontal pockets.
- Tip curved to the right (15° angle) with rounded surface.

P12

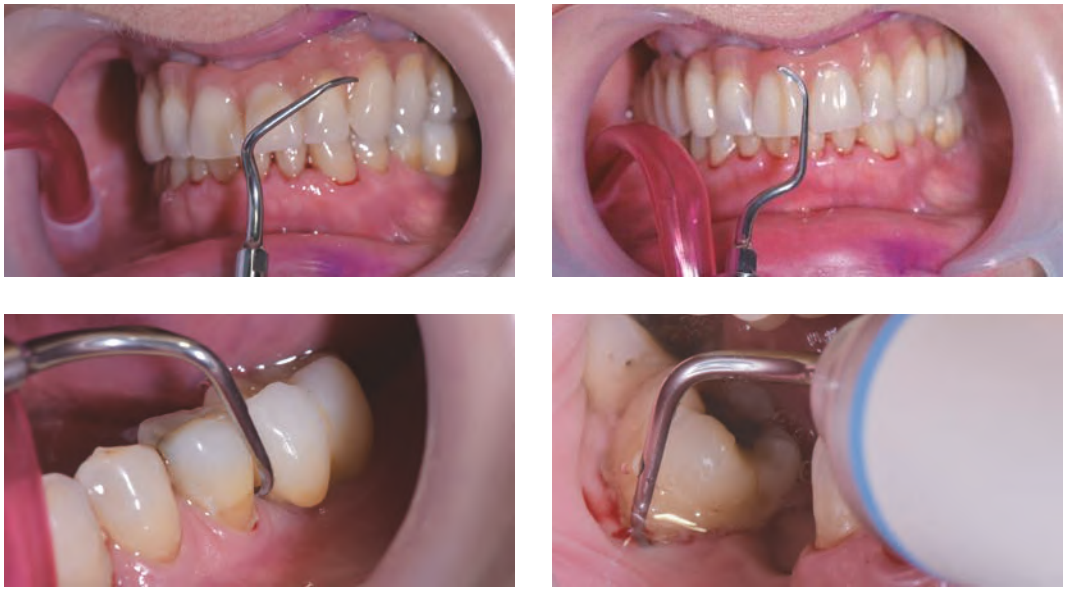
- Designed to delicately remove tartar deposits and bacterial biofilm from deep periodontal pockets.
- Tip curved to the left (15° angle) with rounded surface.

Perio anatomic inserts are ideal for safe, thorough periodontal scaling. They provide maximum efficacy with the least soft tissue and periodontal ligament invasiveness.

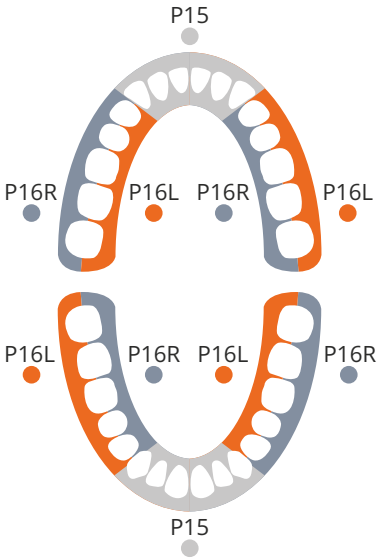
The minimal invasiveness of these sophisticated inserts promotes the formation of the new clinical tissue attachment. Besides facilitating biofilm breakdown, bacterial dispersion and the elimination of toxins and necrotic cementum, the cavitation effect promotes detoxification of periodontal pockets through the oxygen supplied.

The shape of these inserts provides optimal access to hard-to-reach areas with deep periodontal pockets or particular anatomical features such as furcations, root surfaces and concavities.

Use of perio anatomic inserts for minimally invasive periodontal scaling



P15
P16R
P16L



● P15

Anterior sector

Easy access in the anterior and canine areas. It replaces manual curettes nos. 1-2, 3-4, 5-6, 7-8

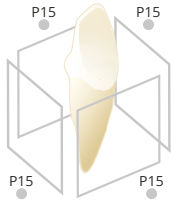
● P16R – ● P16L

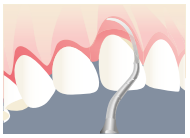
Premolar and molar sectors angled to the right and left

Ideal for root polishing of molar and premolar sectors. They replace manual curettes nos. 11-12, 13-14, 15-16, 17-18

P15

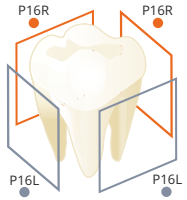
- Insert with rounded surface similar in shape to Gracey curettes nos. 1-2, 3-4, 5-6, 7-8.
- Indicated for supragingival and subgingival removal of tartar and bacterial biofilm and for debridement of deeper pockets.
- Indicated for use in the anterior and canine areas





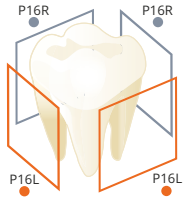
P16R

- Insert angled to the right, similar to Gracey curettes nos. 11-12, 13-14, 15-16, 17-18.
- Indicated for removal of subgingival deposits and bacterial biofilm in the deepest pockets and furcations and for treatment of supragingival and sub-gingival interdental spaces.
- Suitable for molar and premolar sectors.



P16L

- Insert angled to the left, similar to Gracey curettes nos. 11-12, 13-14, 15-16, 17-18.
- Indicated for removal of subgingival deposits and bacterial biofilm in the deepest pockets and furcations and for treatment of supragingival and sub-gingival interdental spaces.
- Suitable for molar and premolar sectors.



5.5.3 Implant debridement and restorations

The ICS base insert and the IC1 terminal provide optimal access to the surface of the implant being treated for gentle plaque removal. The special shape of the base insert significantly facilitates access to retromolar areas, making maintenance treatments easier.

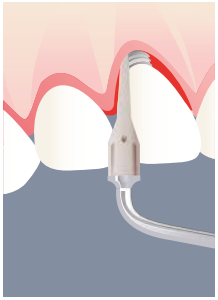
The 100% PEEK IC1 terminal allows the operator to decontaminate implant abutments and restorations. The linear oscillation smoothly and precisely disrupts bacterial biofilm and tartar.

Thanks to its smooth coating and gentle tip movement, the effectiveness of implant maintenance is ensured by a minimally invasive approach.

Debridement with insert with PEEK tip

ICS + IC1

- The IC1 terminal is easily screwed onto the ICS base insert.
- Base insert with 102° angle.
- Tapered PEEK terminal with 10 mm operating length.
- Fully autoclavable



6. Conclusions

The COMBI *touch* technology enables good clinical practice in Non-Surgical Periodontal Therapy, allowing the practitioner to perform excellent clinical work, shortening the procedure, an advantage that is highly appreciated by patients.

Thanks to the availability of oriented handpieces in combination with a piezoelectric ultrasonic scaler equipped with inserts of various shapes, the highly sophisticated technique of supragingival and subgingival air-polishing enables the operator to perform a procedure that is comprehensive, effective, minimally invasive and repeatable over time, without compromising the health of the hard and soft oral cavity tissues.

The guidelines for the all-in-one air-polishing and ultrasound clinical procedure encourage a **tailor-made** approach that can be personalised for and shared with the patient. Successful therapy is ensured through an ergonomic approach to the services delivered. The expertise of the operator is crucial because, following a precise diagnosis, they must establish the timing and which sophisticated technologies and innovative clinical approaches are most appropriate.

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7. Bibliography

Al Ghazal, L., O'Sullivan, J., Claffey, N., Polyzois, I. (2017).
Comparison of two different techniques used for the maintenance of peri-implant soft tissue health: a pilot randomized clinical trial.
Acta Odontologica Scandinavica, 75(7), 542–549. https://doi.org/10.1080/00016357.2017.1352101

Barnes, C. M., Covey, D., Watanabe, H., Simetich, B., Schulte, J. R., Chen, H. (2014).
An in vitro comparison of the effects of various air polishing powders on enamel and selected esthetic restorative materials
The Journal of Clinical Dentistry, 25(4), 76–87.

Basheer, S. A., Govind, R. J., Daniel, A., Sam, G., Adarsh, V. J., Rao, A. (2017).
Comparative Study of Piezoelectric and Rotary Osteotomy Technique for Third Molar Impaction.
The Journal of Contemporary Dental Practice, 18(1), 60–64. https://doi.org/10.5005/jp-journals-10024-1990.

Bühler, J., Amato, M., Weiger, R., Walter, C. (2016).
A systematic review on the effects of air polishing devices on oral tissues.
International Journal of Dental Hygiene, 14(1), 15–28. https://doi.org/10.1111/idh.12120

Bühler J, Amato M, Weiger R, Walter C.
A systematic review on the patient perception of periodontal treatment using air polishing devices.
Int J Dent Hyg. 2016 Feb;14(1):4-14

Cafiero C, Aglietta M, Iorio-Siciliano V, Salvi GE, Blasi A, Matarasso S.
Implant surface roughness alterations induced by different prophylactic procedures: an in vitro study.
Clin Oral Implants Res. 2017 Jul;28(7):e16-e20

Caygur, A., Albaba, M. R., Berberoglu, A., Yilmaz, H. G. (2017).
Efficacy of glycine powder air-polishing combined with scaling and root planing in the treatment of periodontitis and halitosis: A randomised clinical study.
The Journal of International Medical Research, 45(3), 1168–1174. https://doi.org/10.1177/0300060517705540

Checchi L, Montevecchi M, Moreschi A, Graziosi F, Taddei P, Violante FS.
Efficacy of three face masks in preventing inhalation of airborne contaminants in dental practice.
J Am Dent Assoc. 2005; 136(7): 877-882.

Colombari B, Blasi E, Bellini P, De Pol A, Consolo U, Carnevale G.
Evaluation of biological response of STRO-1/c-Kit enriched human dental pulp stem cells to titanium surfaces treated with two different cleaning systems.
Int J Mol Sci. 2019 Apr 16;20(8).

Conserva E, Pisciotta A, Bertoni L, Bertani G, Meto A, Lupi SM, Granati M, Butera A, Collesano V, Rodriguez Y, Baena R.
Air-abrasive debridement with glycine powder versus manual debridement and chlorhexidine administration for the maintenance of peri-implant healthstatus: a six-month randomized clinical trial.
Int J Dent Hyg. 2017 Nov;15(4):287-294.

Daly, S., Newcombe, R. G., Claydon, N., Seong, J., Davies, M., West, N. X. (2020).
A randomised controlled trial to determine patient experience of a magnetostrictive stack scaler as compared to a piezoelectric scaler, in supportive periodontal therapy.
Journal of Dentistry, 93, 103279.
https://doi.org/10.1016/j.jdent.2020.103279

Daubert, D. M., Weinstein, B. F. (2019).
Biofilm as a risk factor in implant treatment.
Periodontology 2000, 81(1), 29–40.
https://doi.org/10.1111/prd.12280

David K, Katrin N, Bettina D, Christoph R, Peter E, Hari P.
In vitro efficacy of three different implant surface decontamination methods in three different defect configurations.
Clin Oral Implants Res. 2019 Jun;30(6):550-558.

De Siena F, Corbella S, Taschieri S, Del Fabbro M, Francetti L.
Adjunctive glycine powder air-polishing for the treatment of peri-implant mucositis: an observational clinical trial.
Int J Dent Hyg. 2015 Aug;13(3):170-6.

De Tapia B, Mozas C, Valles C, Nart J, Sanz M, Herrera D.
Adjunctive effect of modifying the implant-supported prosthesis in the treatment of peri-implant mucositis.
J Clin Periodontol. 2019 Oct;46(10):1050-1060

Diane M. Daubert, Bradley F. Weinstein.
Biofilm as a risk factor in implant treatment.
Periodontol 2000. 2019 Oct;81(1):29-40.

Dutil S, Meriaux A, de Latremoille MC, Lazure L, Barbeau J, Duchaine C.
Measurement of airborne bacteria and endotoxin generated during dental cleaning.
J Occup Environ Hyg 2009; 6: 121-130.

Finlayson RS, Stevens FD.
Subcutaneous facial emphysema secondary to use of the Cavi-Jet.
J Periodontol 1988 May; 59(5): 315-317.

Flury, S., Peutzfeldt, A., Schmidlin, P. R., Lussi, A. (2017).
Exposed Dentin: Influence of Cleaning Procedures and Simulated Pulpal Pressure on Bond Strength of a Universal Adhesive System.
PloS one, 12(1), e0169680.
https://doi.org/10.1371/journal.pone.0169680.

Genovesi A, Savina C, Nardi G.
Manuale pratico per l'igienista dentale.
Firenze: Ed. SEE; 2004. Pg. 191 - 200.

Graetz C, Plaumann A, Wittich R, Springer C, Kahl M, Dörfer CE, El-Sayed KF.
Removal of simulated biofilm: an evaluation of the effect on root surfaces roughness after scaling.
Clin Oral Investig. 2017 May;21(4):1021-1028.

Grassi R, Nardi GM, Mazur M, Di Giorgio R, Ottolenghi L, Guerra F.
The Dental-Biofilm Detection Technique (D-BioTech):
A Proof of Concept of a Patient-Based Oral Hygiene.
Published online 2022 Apr 13. doi: 10.3390/medicina58040537

Guerra F, Mazur M, Rinaldo F, Corridore D, Pasqualotto D, Nardi GM, Ottolenghi L.
Clinical procedure in sealing pit and fissure using technological aids: VistaCam iX Proof and Combi.
senses and sciences. 3.10.14616/sands-2016-1-157162.

Hegde, M. N., Honap, M. N., Narayanan, S. (2019).
Evaluation of surface integrity of root end cavities prepared using conventional and piezoelectric devices: A scanning electron microscopy study.
Indian Journal of Dental Research : official publication of Indian Society for Dental Research, 30(5),772–776. https://doi.org/10.4103/ijdr.IJDR_237_18

Heitz-Mayfield, L., Salvi, G. E., Mombelli, A., Loup, P. J., Heitz, F., Kruger, E., Lang, N. P. (2018).
Supportive peri-implant therapy following anti-infective surgical peri-implantitis treatment: 5-year survival and success.
Clinical Oral Implants Research 29(1), 1–6. https://doi.org/10.1111/clr.12910

Hongsathavij, R., Kuphasuk, Y., Rattanasuwan, K. (2017).
Clinical comparison of the stain removal efficacy of two air polishing powders.
European Journal of Dentistry, 11(3), 370–375. https://doi.org/10.4103/ejd.ejd_152_17

Ji YJ, Tang ZH, Wang R, Cao J, Cao CF, Jin LJ.
Effect of glycine powder air-polishing as an adjunct in the treatment of peri-implant mucositis: a pilot clinical trial.
Clin Oral Implants Res. 2014 Jun;25(6):683-9.

Kontturi-Narhi V, Markkanen S, Markkanen H.
Effects of airpolishing on dental plaque removal and hard tissues as evaluated by scanning electron microscopy.
J Periodontol 1990; 61: 334–338.

Kozlovsky A, Soldinger M, Sperling I.
The effectiness of the air powder abrasive device on the tooth and periodontium: an overview.
Clin Prev Dent 1989; 114; 7-11.

Lee ST, Subu MG, Kwon TG.
Emphysema following air-powder abrasive treatment for peri-implantitis.
Maxillofac Plast Reconstr Surg. 2018 May 13;40(1):12

Leite Bdos S, Fagundes NC, Aragón ML, Dias CG, Normando D.
Cleansing orthodontic brackets with air-powder polishing: effects on frictional force and degree of debris.
Dental Press J Orthod. 2016 Jul-Aug;21(4):60-5.

Momber A, Kovacevic R.
Principles of abrasive water jet machining.
London: Springer; 1998.

Nardi GM et al.
No compliance ma concordance tecnica di spazzolamento tailoring personalizzata e condivisa.
Minerva Stomatologica 2014; 63(1-4): 557.

Nardi GM, Di Giorgio R, Sabatini S.
Effectiveness of tips for delicate micro-ultrasonic root planing comparing to tips for traditional ultrasonic root planing.
Ann Stomatol (Roma). 2012 Jul-Dec; 3(3-4):90–94.

Nardi GM., Sabatini S., Guerra F., Tatullo M., Ottolenghi L.
Tailored Brushing Method (TBM): an innovative simple protocol to improve the oral care.
J Biomed 2016; 1:26-31

Ng, E., Byun, R., Spahr, A., Divnic-Resnik, T. (2018).
The efficacy of air polishing devices in supportive periodontal therapy: A systematic review and meta-analysis.
Quintessence International (Berlin, Germany : 1985, 49(6), 453–467. https://doi.org/10.3290/j.qi.a40341

Petersilka GJ.
Subgingival air-polishing in the treatment of periodontal biofilm infections.
Periodontology 2000, 2011; 55; 124- 142.

Petersilka GJ, Tunkel J, Barakos K, Heinecke A, Häberlein I, Flemmig TF.
Subgingival plaque removal at interdental sites using a low-abrasive air polishing powder.
J Periodontol. 2003 Mar;74(3):307-11.

Riben-Grundstrom, C., Norderyd, O., André, U., Renvert, S. (2015).
Treatment of peri-implant mucositis using a glycine powder air-polishing or ultrasonic device: a randomized clinical trial.
Journal of Clinical Perio-dontology, 42(5), 462–469. https://doi.org/10.1111/jcpe.12395

Sarri S, Bontà G, Boldi M, Rossini M, Nardi G.
Risultati dell'utilizzo della glicina su impianti con sondaggio. Implantologia dentale e parodontologia 2006; 14(4): 168-170.

Schwarz F, Becker K, Renvert S.
Efficacy of air polishing for the non-surgical treatment of peri-implant diseases: a systematic review.
J Clin Periodontol. 2015 Oct;42(10):951-9. 9

Sculean A, Hägi T, Hofmänner P, Eick S, Salvi E, Ramseier C.
Evaluation of a new polishing powder in supportive periodontal therapy.
International Association for Dental Research (IADR), 2013 March.

Steiger-Ronay, V., Merlini, A., Wiedemeier, D.B., Schmidlin, P., Attin, T., Sahrmann, P. (2017).
Location of unaccessible implant surface areas during debridement in simulated peri-implantitis therapy.
BMC Oral Health 17, 137 https://doi.org/10.1186/s12903-017-0428-8

Tsang, Y. C., Corbet, E. F., & Jin, L. J. (2018).
Subgingival glycine powder air-polishing as an additional approach to nonsurgical periodontal therapy in subjects with untreated chronic periodontitis.
Journal of Periodontal Research, 53(3), 440–445. https://doi.org/10.1111/jre.12532

Wei, M., Tran, C., Meredith, N., Walsh, L. J. (2017).
Effectiveness of implant surface debridement using particle beams at differing air pressures.
Clinical and Experimental Dental Research, 3(4), 148–153. https://doi.org/10.1002/cre2.74

Wilkins EM.
La pratica clinica dell'igienista dentale.
Padova: Piccin Ed. 1999. Page 439 – 466 – 683 - 715.

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