

## POWDER THERAPY GUIDE

Create it 

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Are you delivering  
"Powder Therapy" correctly  
whilst maintaining healthy  
and attractive teeth?

A patient's daily dental care routine is vital for maintaining healthy teeth, but regular professional care is also essential. "Powder Therapy" has already gained an excellent reputation as a suitable and popular treatment option.

"Powder Therapy" is very effective in removing the deposits that cause periodontal disease. But it is not without risks which is why it hasn't been widely adopted. Read about the risk on p5 onwards in this booklet. However, "Powder Therapy" is a more effective method of removing deposits than traditional methods so long as it is performed correctly.

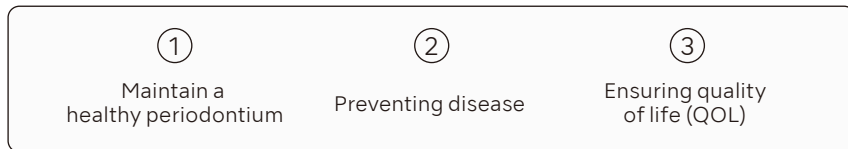
Full understanding of the effects, usage and precautions required to perform "Powder Therapy" safely will allow you to experience a new era of professional care and comfort for you and your patients.

\* "Powder Therapy" refers to air polishing with powder products.

## Why do we need to maintain teeth?

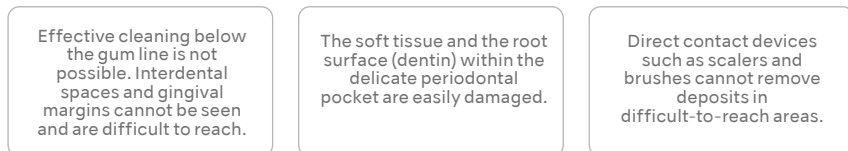
The most important factor for the maintenance of patient's natural teeth and dental implants in good condition over the long term is the patient's own oral hygiene routine. However, professional care involving regular maintenance and supportive periodontal therapy, SPT, also plays a major role. A patient's own oral hygiene routine will almost certainly leave some issues undetected.

## The main purpose of maintenance

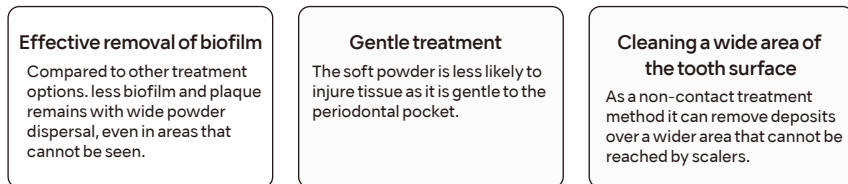


## Why is Powder Therapy the best treatment option?

Issues with conventional perio maintenance are:



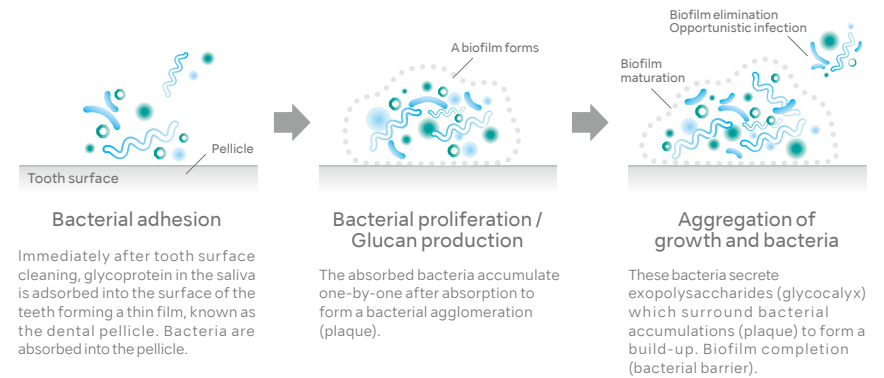
But with Powder Therapy removal of biofilm can be achieved effectively.



This is a professional method for removing biofilm from inside the periodontal pocket and removing stains and plaque from other tooth surfaces more comfortably than conventional methods for both patient and operator.

## What is biofilm?

Biofilm is a thin layer of micro-organisms that forms on the surface such as teeth. The bacteria extrude exopolysaccharide (glycocalyx), which forms a layer on the teeth. The accumulation of bacteria protected by this barrier exists alongside other types of bacteria that cannot attach directly to the tooth surface, besides other bacteria species as well. Interaction and antagonism between nutrients and adhering material creates stable conditions for bacterial colonies. As long as they are within this barrier, the bacteria are protected from attack by the host's immune system using white blood cells and antibodies. This structure is the biofilm.



## Why this needs to be removed?

Once the biofilm has formed on the surface of the teeth, the cleaning action of saliva is lost as it cannot reach the enamel. This creates an environment where bacteria can proliferate easily as they are protected inside the biofilm. This results in dental caries and periodontal disease. White blood cells and antibodies arrive when biofilm grows inside the periodontal pocket but bacteria protected by a barrier of biofilm are not affected by these attacks. Conversely, pathogenic factors and endotoxins produced by the white blood cells damage the gums and increase inflammation.

## How can this be eliminated?

Since biofilm has a high resistance to chemotherapies such as antibacterial agents, mechanical destruction and removal with a toothbrush or an ultrasonic scaler is necessary. However, as a tooth brush does not reach inside the periodontal pocket, patients cannot remove biofilm themselves. For this, a mechanical instrument is needed to reach inside the pocket and professional treatment performed by specialists is vitally important. Subgingival airpolishing has gained attention as an effective method.

## What you need to know to perform subgingival airpolishing therapy with confidence

When performed correctly, subgingival airpolishing is an effective and comfortable professional treatment. If used incorrectly however, the risk of the following diseases cannot be totally discounted. To carry out treatments with additional safety considerations, please be fully aware of the risks of powder maintenance.

### Subcutaneous Emphysema

It is the introduction of air or other gases into soft tissues when using air pressure instruments, which may result in swelling. If this does not become infected it will heal naturally. Treatment with antibiotics may however be an option in certain circumstances.

\*Loose connective tissue: the tissues of various structures connected loosely to the body. Structures widely distributed throughout the body such as peripheral glands, surrounding blood vessels and nerves located under the skin or mucous membranes.

**Causes** Entry of pressurised air from air syringes or turbines. The use of hydrogen peroxide during root canal cleaning.  
Air in the nasal cavity, maxillary sinus, or oral cavity from changes in expiratory pressure.

**Symptoms** Sudden and unexpected symptoms around treatment area, diffuse swelling and dull pain, ear discomfort and so on.

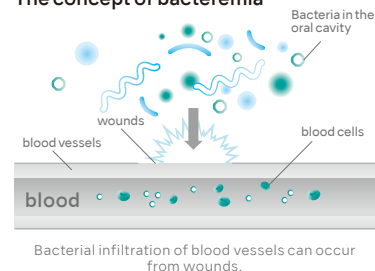
### Bacteremia

Situations where bacteria have entered the previously sterile peripheral blood vessels are called bacteraemia. Bacteraemia associated with dental treatment such as tooth extraction and scaling (SRP), is a temporary condition involving bacterial invasion into the blood vessels around wounds when performing invasive treatment which are then circulated around the whole body. Bacteria are rapidly circulated throughout the system and are mostly removed by the liver so are unlikely to cause infection. However, it is important to gain an understanding of the patient's medical history as patients with systemic disease or who are immunocompromised or those with artificial heart valves and prosthetic joints are at a slight risk of complications such as bacterial meningitis and infectious endocarditis.

**Causes** For dentistry, this can occur when brushing, scaling and performing invasive treatment such as tooth extraction.

**Symptoms** Shivering, chills, fever and weakness.

#### The concept of bacteremia



## Inflammation around implants and treatments

Master of Oral Science, Dental Hygienist **Nobuko Kashiwai**

Conventional dental treatment involved the resection of the affected area to eliminate the problem but current implant treatment now prefers surgical or prosthetic replacement of lost teeth followed by maintenance therapy. The two greatest issues with the long-term success of an implant are the peri-implant disease named "peri-implant mucositis" where inflammation is localised only in the peri-implant mucosa and "Peri-implantitis" where inflammation has spread to the supporting bone. This may cause infection by periodontal bacteria such as *Porphyromonas gingivalis*.<sup>\*1</sup> At this stage the inflammation is localised in the mucosa and is reversible if treated by removing the biofilm that acts as a "nest" for pathogens and substances causing inflammation but if the inflammation spreads to the bone, recovery is not expected. Hardt et al. conducted a study of patients grouped into those with and without a history of periodontal disease and investigated implants embedded in the maxillary molar region over a period of five years. The conclusion was that the group with a prior history were at a disadvantage in terms of the rate of implant loss and the amount of bone resorption.<sup>\*2</sup> In other words, if a patient has lost a tooth due to periodontal disease they are at risk from the start and treatment should focus on suppressing the formation of biofilm which is the underlying cause in order to control the activity of periodontal pathogens prior to surgery.

Actual treatment requires a communication environment that has been created over a long period of dental appointments. Patients must be proactive in their own personal dental care routine, in addition to understanding the risks associated with biofilm and conditions in their own oral cavity, and we as dental health care professionals must practice professional treatment with reliable results. It is possible to conduct ongoing maintenance therapy in a short time and with minimum discomfort to achieve this, instead of the "long", "painful", "difficult" treatments that have been performed up to now. Biofilm is regenerated in a three to four month period.<sup>\*3</sup> Powder polishing enable to maintain "more reliable" cleanliness of tooth surface by breaking deposition of biofilm apart rather than pressuring by rotary vibration of instrument. Air ablation used in conjunction with debridement and fine water particle dispersal using hand instruments can be used to physically destroy biofilm, while ultrasonic scaling using the cavitation effect is an effective approach towards anaerobic bacteria.

Differing results in terms of efficient use of time and comfort can be obtained, from evidence based steps when they are followed one by one.



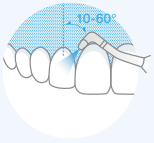
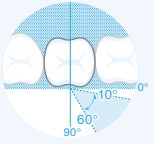



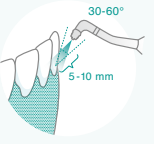
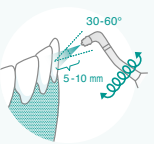



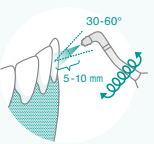
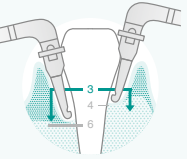
#### Bibliography

- \*1 Hultin M, Gustafsson A, Hallonström H, Johansson LA, Ekfeldt A, Klinge B Microbiological findings and host response in patients with peri-implantitis Clinical Oral Implant research 13, 2002
- \*2 Hardt CRE, Gröndahl K, Lekholm U, Wenneström JL Outcome of implant therapy in relation to experienced loss of periodontal bone support A retrospective 5 years study Clinical Oral Implant research 13, 2002
- \*3 OKUDA K., Biofilm: Dental Plaque, Ishiyaku Pub, Inc., 2007

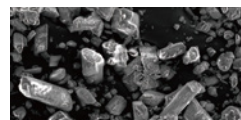


Implant case

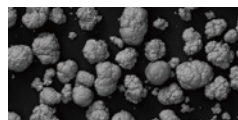
# POWDER THERAPY

	Solution	For	At	By	With
PROPHY   09-10	 <b>Prophy-Mate neo</b>	Natural tooth	 Supragingival	 	 <b>FLASH pearl</b>
PERIO   11-14	 <b>Varios Combi Pro</b>	Natural tooth	 Supragingival (Gingival margin)	 	 <b>Perio Mate Powder</b>
	 <b>Perio-Mate</b>	Prosthetic tooth	 Subgingival	 	

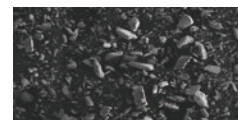
## Powder particle comparison



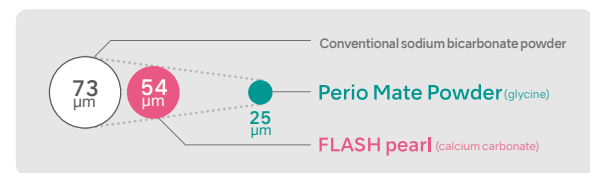
Conventional sodium bicarbonate powder  
average particle diameter **73 µm**  
SEM image (x150)



**FLASH pearl** (calcium carbonate)  
average particle diameter **54 µm**  
SEM image (x150)



**Perio Mate Powder** (glycine)  
average particle diameter **25 µm**  
SEM image (x150)





## Powder therapy for prophy (Supragingival)

### Powerful and continuous powder spraying

Fluid analysis developed through our turbine development technology has resulted in powerful yet stable jetting, with minimal powder loss. Enables a reduction in treatment time due to high-powered continuous jetting and polishing capabilities.



Before



After

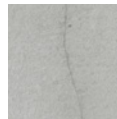
■ Results may vary from patient to patient.

### The powder consists of spherical particles which are kind to the tooth surface

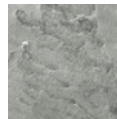
The Supragingival powder consists of tiny spherical particles that roll across the tooth surface gently and quickly removing stains and plaque. Also as the powder is composed of 94% calcium carbonate, your patients will not experience an unpleasant salty taste. Peace of mind for patients on restricted salt diets.



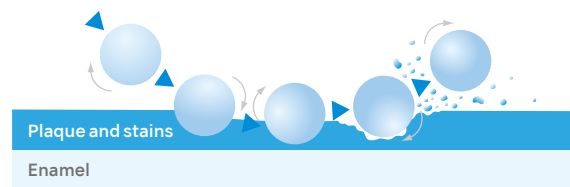
FLASH  
pearl



Conventional  
sodium  
bicarbonate  
powder



The surface of the tooth after powder polishing under an electron microscope.



### A reliable design that is resistant to powder clogging

Users can easily disassemble the nozzle, handpiece and powder chamber/case. On-site maintenance is possible by using the special Auto-cleaning function\* which easily ejects any residual powder and water from inside the handpiece. Clogging is reduced as the powder particles are extremely fine and don't dissolve easily in water. This reduction in internal powder clogging significantly improves reliability.

\*For maintenance with a Prophy-Mate neo use the blower nozzle included in the box.

## Guide for using prophy (when using FLASH pearl)

● Please refer to the user manual for details on usage.

### Before use

Protect the face of patients with a towel or alike, and make sure that the operator is also wearing a mask and goggles before use.

### Suggestions for more comfortable treatment

- Apply vaseline to the patient's lips to prevent drying or cracking during treatment.
- Patient comfort can be improved by placing gauze or cotton roll between the cheeks, lips, tongue and gums to prevent the Powder from spreading.
- Use a cheek retractor to increase the field of view and facilitate smoother nozzle manoeuvrability.

### ⚠ Precautions for use

- Use high volume suction and if necessary additionally a saliva ejector to prevent the patient from ingesting large amounts of powder.
- Never aim to point towards any parts of soft tissue or the subgingival area.
- Do not spray directly onto the cement in the root canal, decalcified enamel, fillings, margins between tooth and fillings/prosthesis.

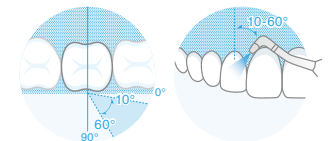
### How to hold

Hold the handpiece firmly so that it can be turned using the fingertips.



### Usage

Perform the spray so that the spherical particle powder rolls over the tooth surface at the angle shown in the diagram of the nozzle in relation to the tooth surface.



### Removal of extensive stain and plaque

Move the nozzle slowly at a distance of between 5 mm to 10 mm so that the spray can cover the entire tooth surface.

### Removal of localised stains and plaque

Perform pinpoint spraying with the nozzle at a distance of between 3 mm to 5 mm.



## Powder therapy for perio

### NSK provides a more efficient "Powder Therapy" method

- Designed to achieve optimum powder flow rate for subgingival air polishing. A gentle powder flow rate setting, reduced to about 70% of that of Prophy-Mate neo (NSK's air-polishing device).
- Provides a powder flow rate and ejection pressure adjustment control, allowing accurate adjustment to suit the treatment needs.
- A limit can be set for cases treated (number of periodontal pockets, inflammation).  
\* Please refer to the user manual for details on usage.

- The nozzle tip is designed so that the powder flows over the entire subgingival surface exposed to the nozzle when used in the periodontal pocket. For this reason, the powder ejected from the nozzle is not dispersed with excessive force in only one direction. The safe design ensures powder/air does not directly make contact with the bottom of the pocket as channels for delivering powder/air and water are separate.



Direction of powder injection

Powder flow in periodontal pocket

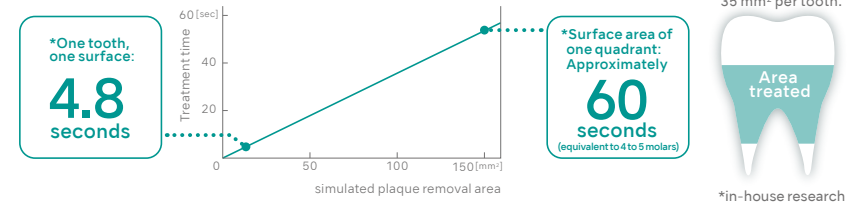
- The "Perio Mate Powder" used is highly water soluble to prevent subgingival retention and has a lower Mohs hardness than dentin.

\* Glycine ranks 2 on the Mohs hardness scale, while dentine is 2 to 2.5



## Removal Capability - A Fast and Effective SOLUTION

Biofilm in the periodontal pocket can be removed in approximately 60 seconds per quadrant.



### Extensive removal of biofilm inside and outside the periodontal pocket in only 4.8 seconds per single tooth surface.

- As the powder is ejected over a wide area, biofilm can be removed from inside the periodontal pocket in approximately 4.8 seconds per tooth surface area.
- Deposits can be removed without direct contact. The results are effective with almost none of the extensive biofilm and plaque adhesion remaining. It is possible to clean areas the tip cannot reach with the powder injection effect.
- Treats a broad spectrum from fast targeted biofilm removal to peri-implants and delicate periodontal pockets.
- By removing the Perio Mate nozzle tip, it is possible to approach the gum line and subgingival area up to 3 mm below the pocket, which are the areas requiring most frequent treatment.

#### ⚠ Precautions for use

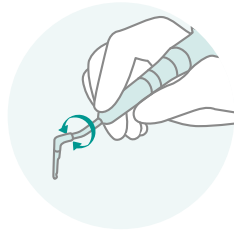
- There is a risk of emphysema occurring with excessive air delivery pressure. Please make sure to use the correct air pressure. Please set the ejection air pressure so that there is at least a slight spray out of the periodontal pocket. Also, please make adjustments to an appropriate air supply pressure while monitoring the patient's condition.
- Please do not use the Perio-Mate on root surfaces where scaling treatment has just been performed.
- Please adjust the powder ejection quantity with the flow rate control ring to suit patient and gum conditions.

# Guide for using perio

● Please refer to the user manual for details on usage.

## Before using

Protect the face of patients with a towel or alike, and make sure that the operator is also wearing a mask and goggles before use.

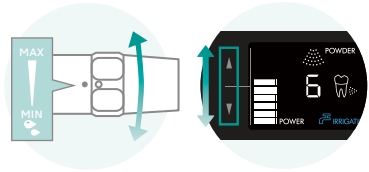


## How to hold

Hold the handpiece firmly so that it can be turned using the fingertips.

## Powder flow adjustment

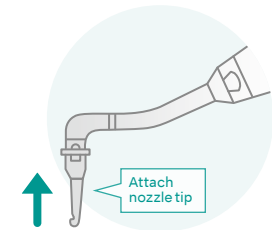
Please adjust the ejection quantity once you have observed the treatment site and the patient's condition.



### ⚠ Precautions for use

- Irrigate during treatment.
- Use of suction is recommended during treatment.
- Do not use inside a periodontal pocket without a tip nozzle.

## Subgingival



- Please use with a single-use tip attached to the end of the metal Perio-Mate handpiece nozzle.

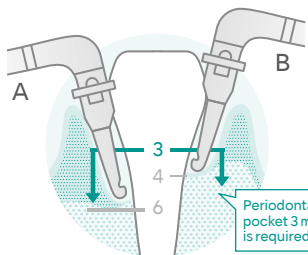
\*Ensure the nozzle tip is firmly pushed on, to avoid it accidentally coming off during treatment.

### Instruction

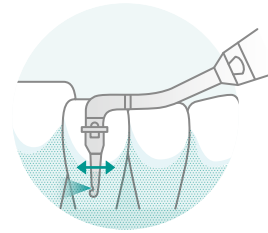
**Erasing biofilm in periodontal pocket 3 mm to 6 mm below the end of the gingival margin after basic periodontal treatment.**

- ① Slowly insert the nozzle tip 3 mm or more to the position most appropriate for treatment. Please adjust the insertion depth at this time to suit each individual patient's pocket values. Please do not insert the nozzle tip to the bottom of the periodontal pocket and carry out ejection. There is a risk of an air embolism.

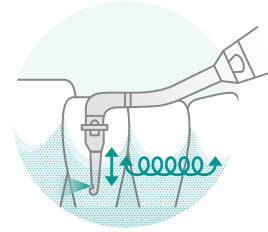
\*There have been cases where inserting the tip 3 mm into the periodontal pocket results in ineffective powder ejection.



A : if the pocket is less than 6 mm  
B : 4 mm pocket



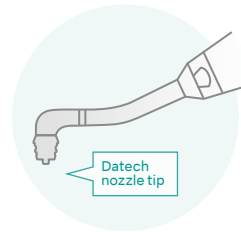
- ② Effective results can be obtained from 5 to a total of 20 seconds ejection per tooth surface.



- ③ Move as if drawing several small circles in a longitudinal direction on the tooth surface while moving the nozzle tip laterally in the direction of the powder flow.

\*There are cases where the powder is ejected when the air pressure is released in the powder case after disengaging the pedal. Please use a suction device until the powder flow has stopped so as not to inject powder into the oral cavity.

## Supragingival



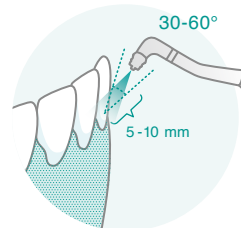
- Please use with the a metal nozzle tip remover, to take off the plastic tip from the metal nozzle of the handpiece.

### Instruction

**Removal of plaque biofilm from the gingival margin (up to approximately 3 mm inside the pocket).**

To spray, direct the nozzle toward the gingival margin at the distance and angle as shown in the diagram. Manoeuvre slowly at this time to ensure the entire tooth surface is sprayed.

\*Do not position the nozzle tip too close to the tooth surface as the removal function is reduced if the nozzle is positioned less than 2 mm from the tooth surface.



**Removal of light staining following extensive deposition.**

To spray, direct the nozzle toward the tooth surface at the distance and angle as shown in the diagram. Move as if drawing small circles.

