

The Science behind Pocket-X® Gel

Geistlich

PRUDENTIX
Innovative dental products



leading regeneration



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The Science behind Pocket-X® Gel

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Why is scaling and root planing (SRP) with Pocket-X® Gel better than SRP alone?	What is split-mouth design?	Has Pocket-X® Gel shown safety and effectiveness in patients?
✓ Pocket-X® Gel effectively improved the clinical parameters: • Pocket Depth (PD) • Clinical Attachment Level (CAL) • Bleeding on Probing (BOP) in stage 3 periodontitis patients over a 6-month period LEARN HERE	✓ Is a popular design in oral health research. In the most common split-mouth study, each of two treatments are randomly assigned to either the right or left halves of the dentition LEARN HERE	✓ Pocket-X® Gel has been shown to be safe and effective in patients in dentistry ✓ No adverse or allergic reactions to the treatment gel were observed LEARN HERE
What are the advantages of Hyaluronic Acid?	How does Hyaluronic Acid support Periodontal Therapy?	
✓ Biocompatible and biodegradable ✓ Accelerating wound healing ✓ Stimulating tissue regeneration ✓ Having immunomodulatory functions ✓ Exceptional capacity for fluid-binding LEARN HERE	✓ Accelerating wound healing ✓ Providing a barrier for pathogen penetration and being bacteriostatic ✓ Attracting growth factors and facilitating cell migration ✓ Stimulating tissue regeneration ✓ Coordinating inflammation ✓ Promoting angiogenesis LEARN HERE	

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The Science behind Pocket-X® Gel

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What are the advantages of using Poloxamer 407 in oral gels?	Why does Pocket-X® Gel turn into gel when applied into periodontal pockets?	What are the advantages of combining Hyaluronic Acid and Poloxamer 407 in oral gels?
✓ Thermosensitivity & gel-forming properties ✓ Compatibility ✓ Good tolerability ✓ Ease of administration 	✓ When the temperature increases, the hydrogen bonds between the aqueous solvent and the hydrophilic PEO chains breaks. Desolvation induces the hydrophobic interaction among the PPO blocks, the formation of spherical micelles and, successively, the gelation process 	✓ Synergistic properties ✓ Improved elasticity ✓ Optimal viscosity ✓ Easier for administration ✓ Prolonged wound-healing effect ✓ Good tolerability 
What are the advantages of Octenidine?	Is there any clinical evidence for the effectiveness of Octenidine in dentistry?	Why is Octenidine mouthwash recommended to maintain healthy oral conditions?
✓ Broad spectrum of antimicrobial activity, acts as preservative ✓ Long term effect ✓ Very good tolerability ✓ Rapid onset of action ✓ Development of resistance unlikely ✓ Approved with no restrictions in cosmetic products 	✓ Clinical study data from 201 patients clearly demonstrated the superiority of OCT mouthwash over placebo in the inhibition of plaque re-growth over a 5-day period 	✓ Inhibited plaque formation up to 93% ✓ Eliminated atypical oral microbe species, even at 1 month after therapy 



Clinical study results

Pocket-X® Gel effectively improved the clinical parameters:

Pocket Depth (PD)

Clinical Attachment Level (CAL)

Bleeding on Probing (BOP)

in stage 3 periodontitis patients over a 6-month period.



Why is scaling and root planing (SRP) with Pocket-X® Gel better than SRP alone?

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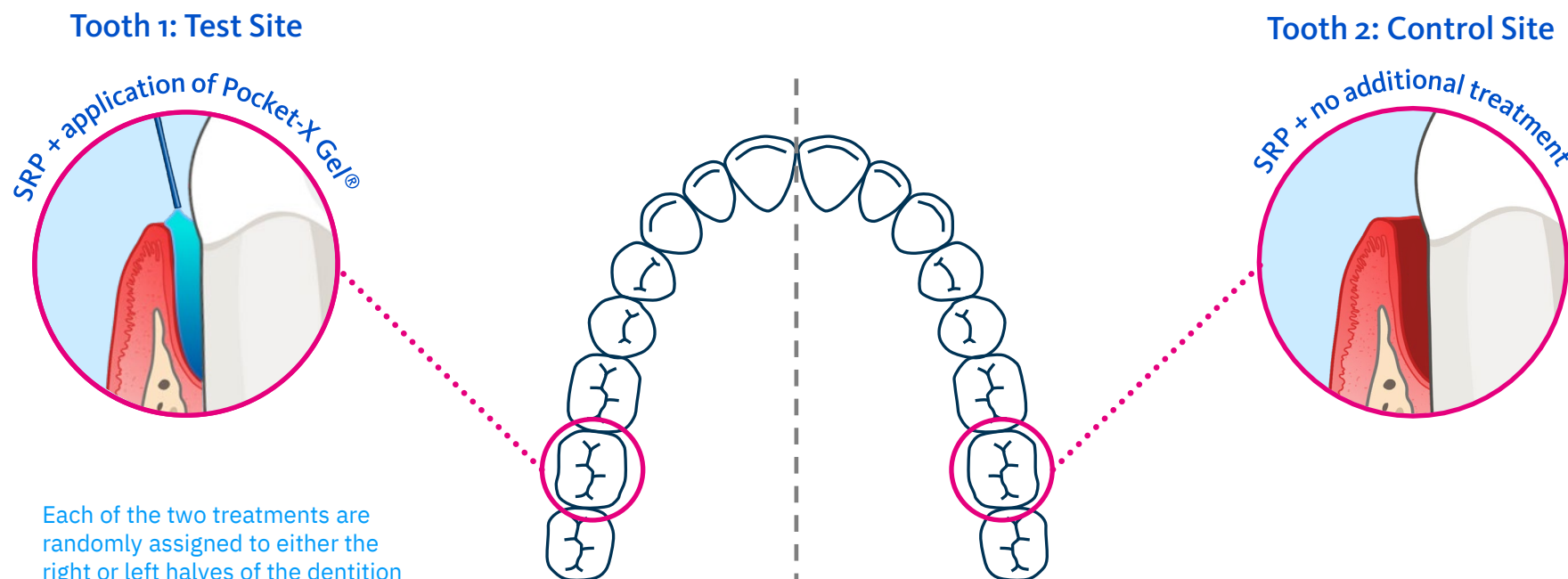
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Split-mouth design



What is split-mouth design?



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- Full-mouth **scaling and root planing (SRP)** performed in all residual pockets ≥ 5 mm, with no suppuration. Treatment by means of ultrasonic and hand instruments.
- Pocket-X® Gel applied subgingivally in the test sites immediately after SRP (baseline) and 1 month later.

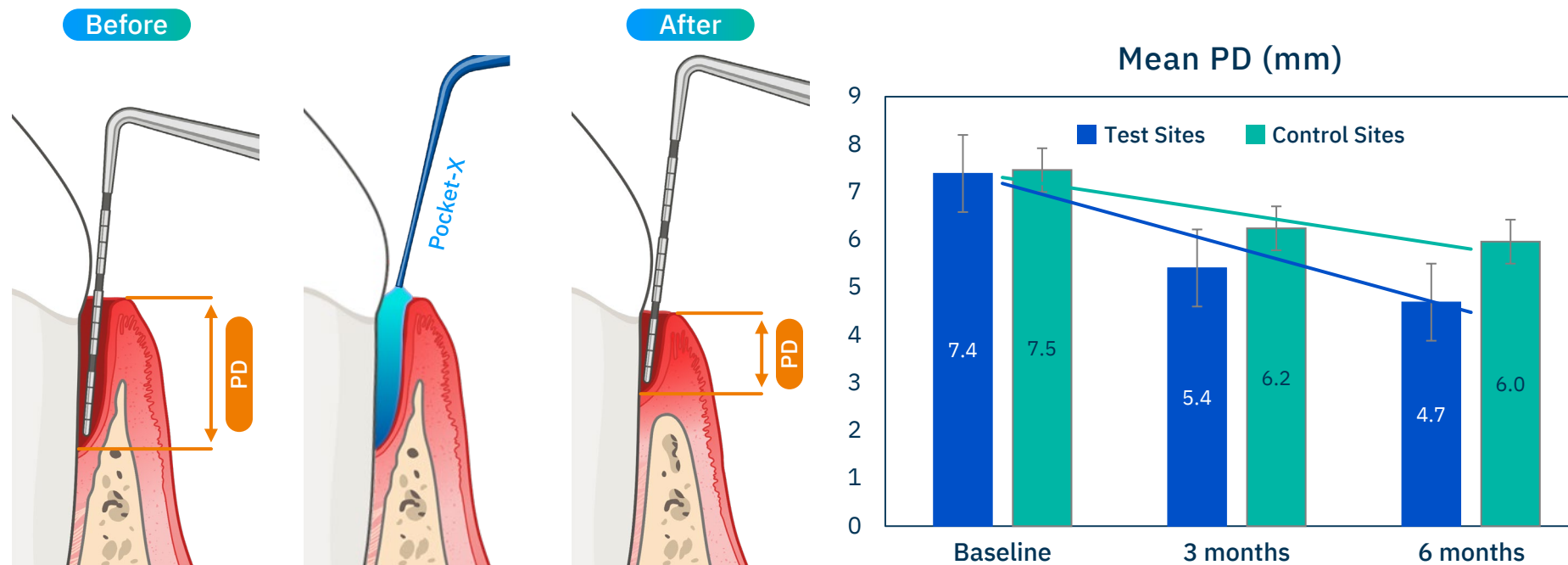
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Greater reduction of pocket depth (PD) implies a clinical benefit of the Pocket-X® Gel treatment



Why is scaling and root planing (SRP) with Pocket-X® Gel better than SRP alone?



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- Pocket-X® Gel treatment resulted in > 1 mm additional reduction of mean pocket depth, nearly 1.8 times more than scaling and root planing alone at 6 months after treatment.

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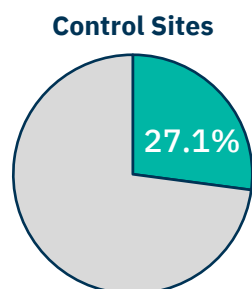
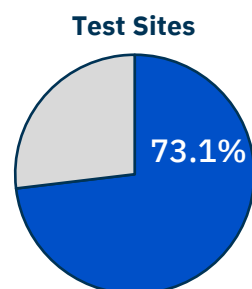
Percentage of closed pockets at 6 months was significantly higher at test sites



Why is scaling and root planing (SRP) with Pocket-X® Gel better than SRP alone?

Percentage of **closed pockets** at 6 months grouped by initial pocket depth

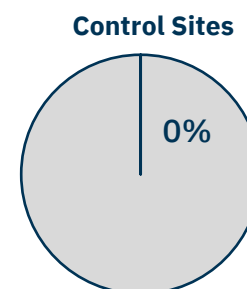
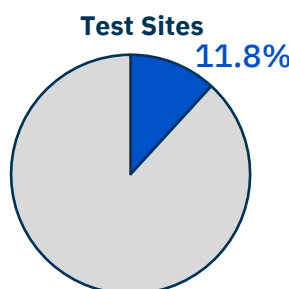
Initially shallow pockets (5–6 mm)



■ Closed pockets
■ Open pockets

Closed pockets:
PPD ≤ 4 mm with no bleeding

Initially deeper pockets (≥ 7 mm)



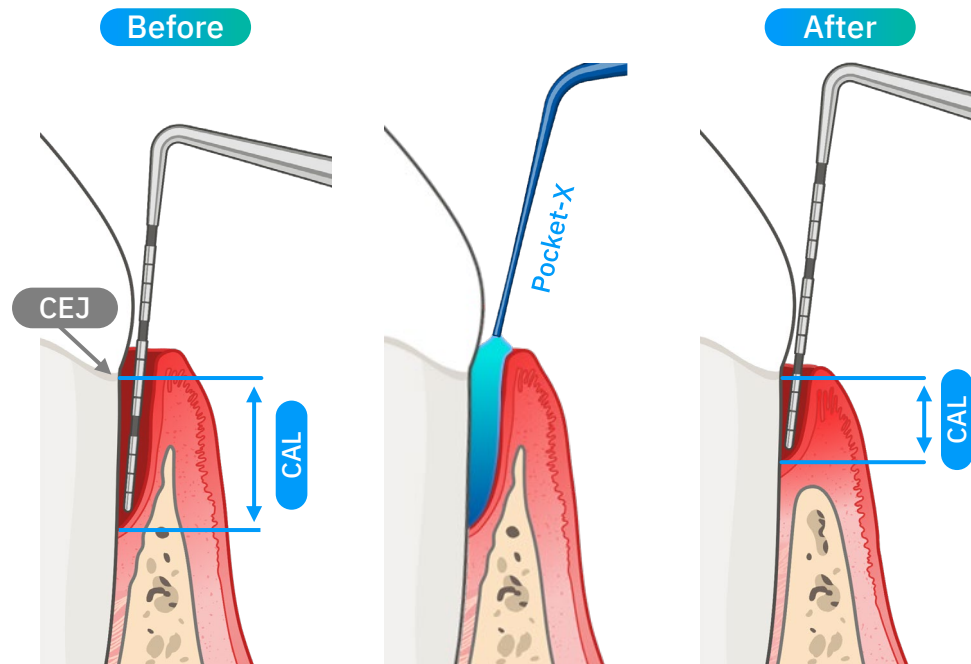
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- Pocket-X® Gel promoted statistically significant superior results: **46%** more pockets of initial depths of 5–6 mm healed with Pocket-X® Gel than pockets treated with scaling and root planing only.

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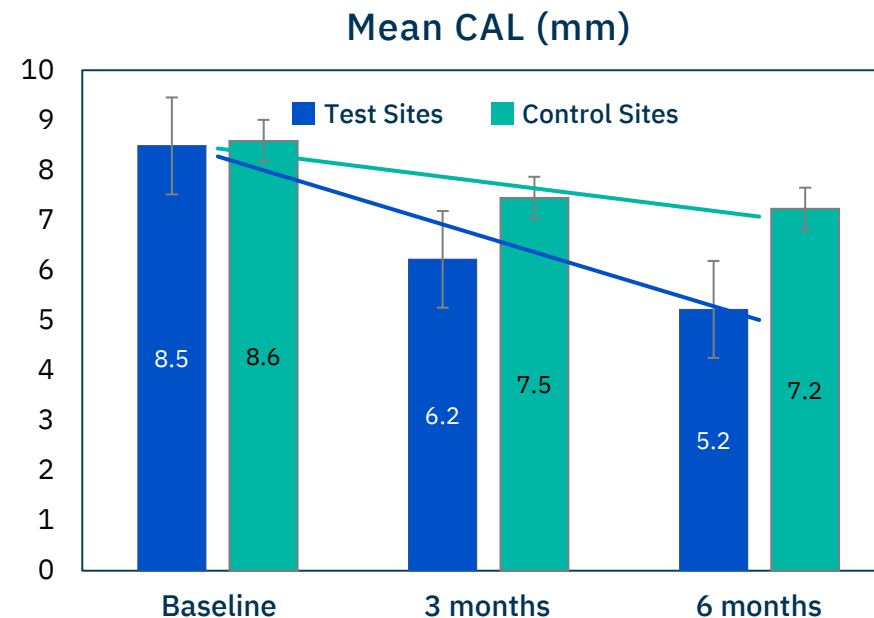


Greater reduction of CAL implies a clinical benefit of the Pocket-X® Gel treatment



Clinical attachment level (CAL)

distance in mm from the cemento-enamel junction (CEJ) to the bottom of the probable periodontal pocket



Why is scaling and root planing (SRP) with Pocket-X® Gel better than SRP alone?

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- Scaling and root planing (SRP) + Pocket-X® Gel yielded statistically significant higher CAL reductions compared to SRP alone.
- Pocket-X® Gel resulted in 1.5 times more gain of clinical attachment than SRP alone at 6 months after treatment.

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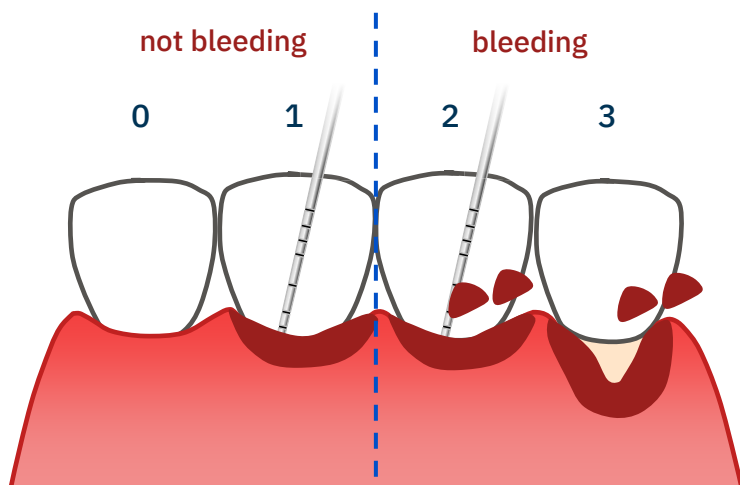


Greater reduction of bleeding on probing (BOP) implies a clinical benefit of the Pocket-X® Gel treatment



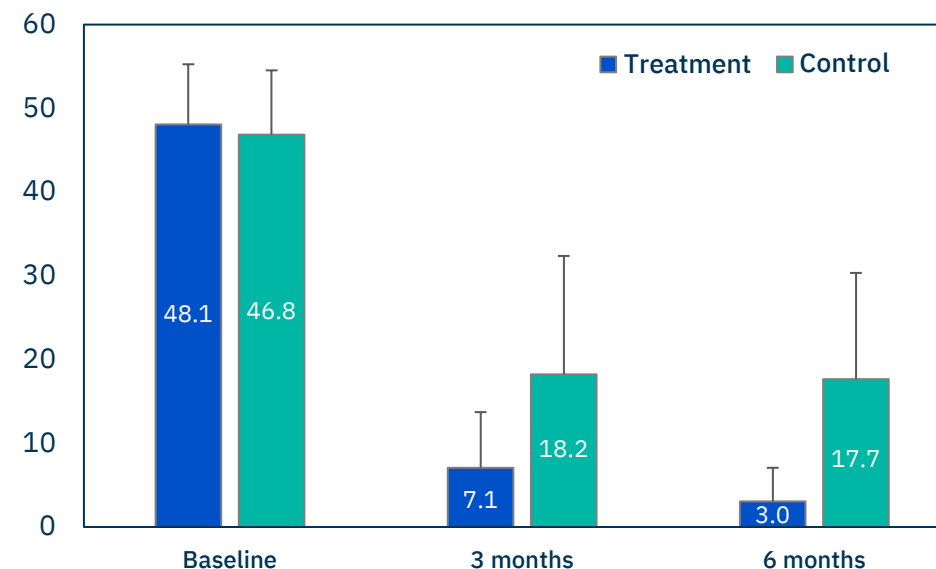
Why is scaling and root planing (SRP) with Pocket-X® Gel better than SRP alone?

BOP



- 0 > Normal gingiva/absence of inflammation.
- 1 > Mild inflammation: Slight change in color, slight edema. No bleeding on probing.
- 2 > Moderate inflammation: Redness edema and glazing. Bleeding on probing.
- 3 > Severe inflammation: Marked redness and edema. Ulceration and a tendency for spontaneous bleeding.

BOP (% of bleeding teeth per subject)



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- Both groups showed significantly reduced BOP at 3 months compared with the baseline values. Less BOP was observed in the treatment group than in the control group at 3 and 6 months.

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Pocket-X® Gel Clinical Study Summary



Why is scaling and root planing (SRP) with Pocket-X® Gel better than SRP alone?

- Pocket-X® Gel effectively prevented repopulation of periodontal pockets, and enhanced improvements of clinical parameters in chronic adult periodontitis patients over a six months period.
- PPD, CAL and BOP measurements showed distinctly better results when using Pocket-X® Gel with SRP than SRP alone.
- Pocket-X® Gel has been shown to be safe and effective in patients in dentistry.



→ **Subgingival application of Pocket-X® Gel provided clinically significant better results compared to SRP alone.**





Clinical study results

Pocket-X® Gel has been shown to be safe and effective in patients in dentistry.

No adverse or allergic reactions to the treatment gel were observed.



Has Pocket-X® Gel shown safety and effectiveness in patients?

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Hyaluronic Acid overview

BIOCOMPATIBLE AND BIODEGRADABLE

Well-tolerated by most individuals¹⁻⁴

NATURALLY FOUND IN THE HUMAN BODY

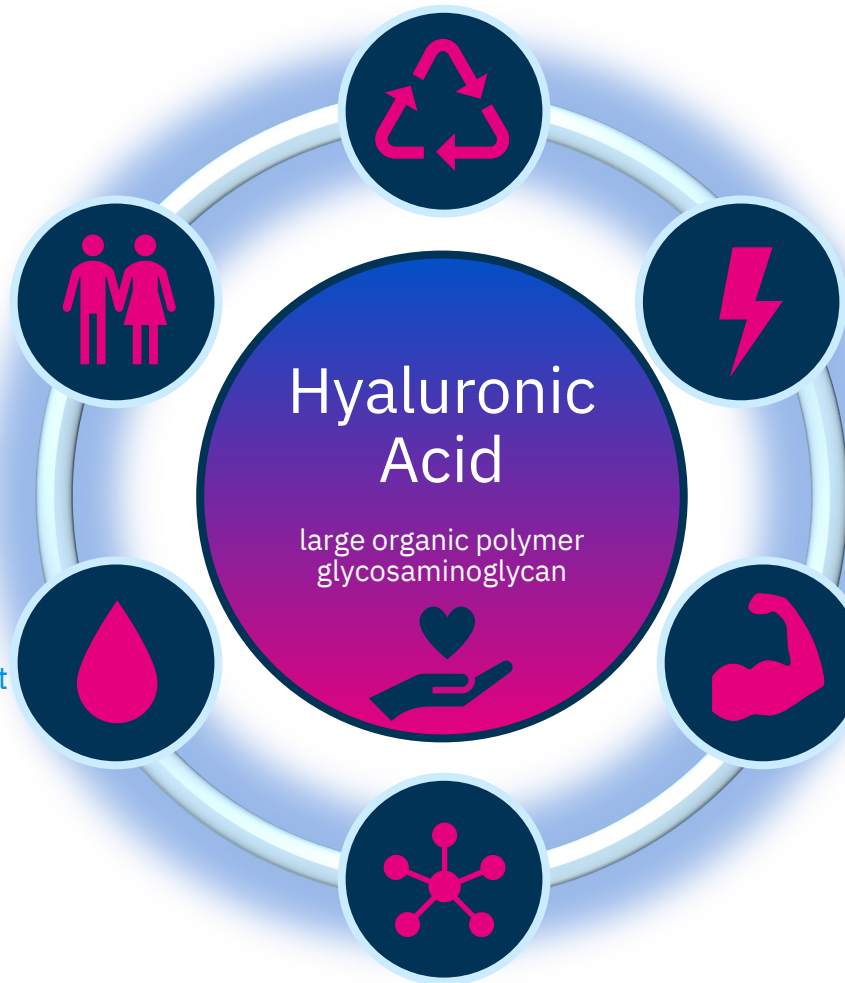
Distributed widely throughout connective, epithelial, and neural tissues, found in gingiva and periodontal ligament¹⁴⁻¹⁵

EXCEPTIONAL CAPACITY FOR FLUID-BINDING

Hygroscopic properties; can absorb huge amount of fluid; allowing it to retain moisture and enhances lubrication^{4, 13}

HAVING IMMUNOMODULATORY FUNCTIONS

Anti-inflammatory properties¹¹⁻¹²



ACCELERATING WOUND HEALING

Providing a barrier for pathogen penetration; being bacteriostatic; facilitating cell migration⁵⁻⁸

STIMULATING TISSUE REGENERATION

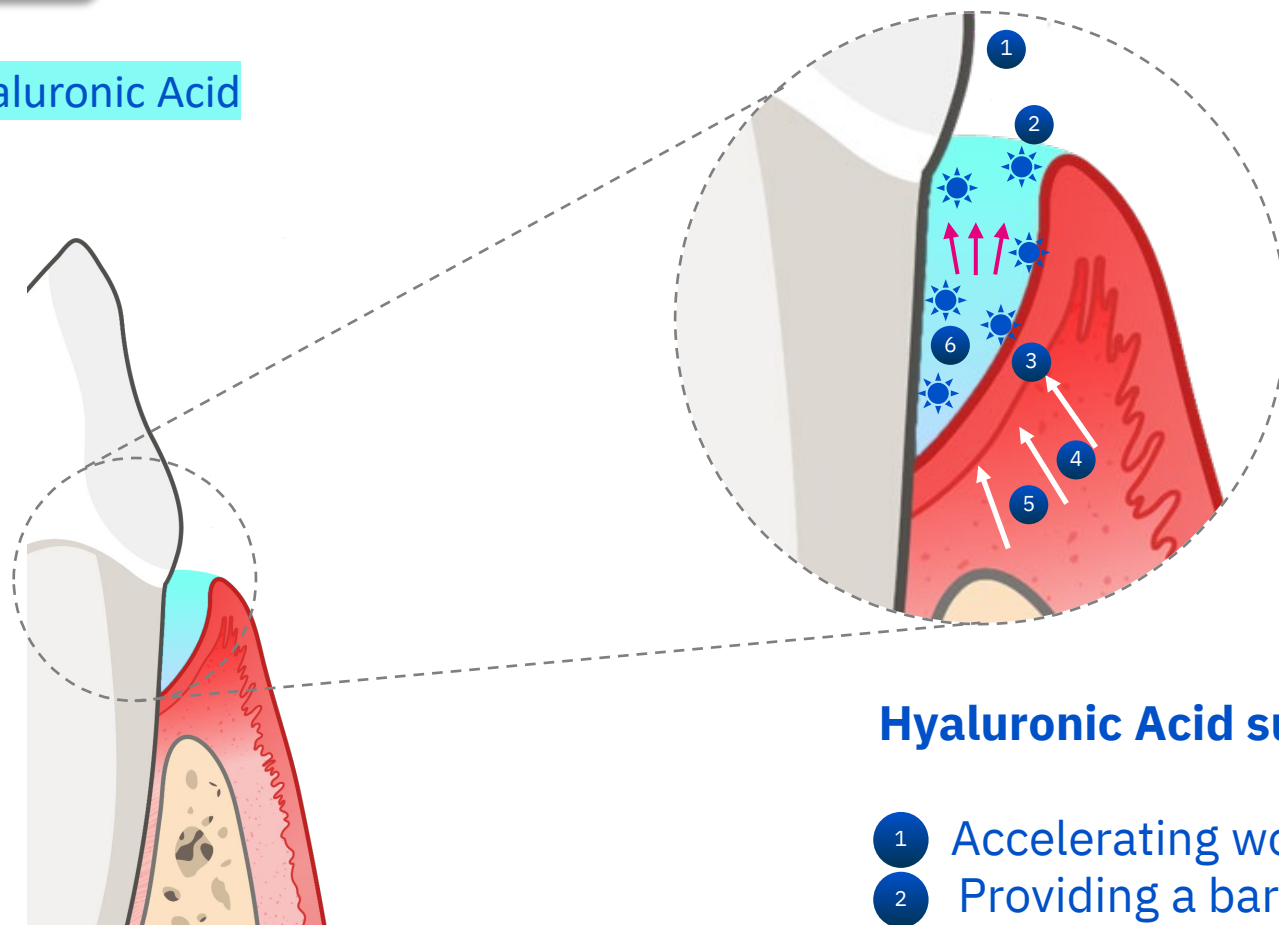
Accelerating new blood vessels formation & collagen production; promoting fibroblast proliferation; supporting the wound healing process⁷⁻¹⁰

What are the advantages of Hyaluronic Acid?

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Hyaluronic Acid



How does
Hyaluronic Acid
support Periodontal
Therapy?

Hyaluronic Acid supports Periodontal Therapy by:

- 1 Accelerating wound healing
- 2 Providing a barrier for pathogen penetration and being bacteriostatic
- 3 Attracting growth factors and facilitating cell migration
- 4 Stimulating tissue regeneration
- 5 Coordinating inflammation
- 6 Promoting angiogenesis

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THERMOSENSITIVITY & GEL-FORMING PROPERTIES

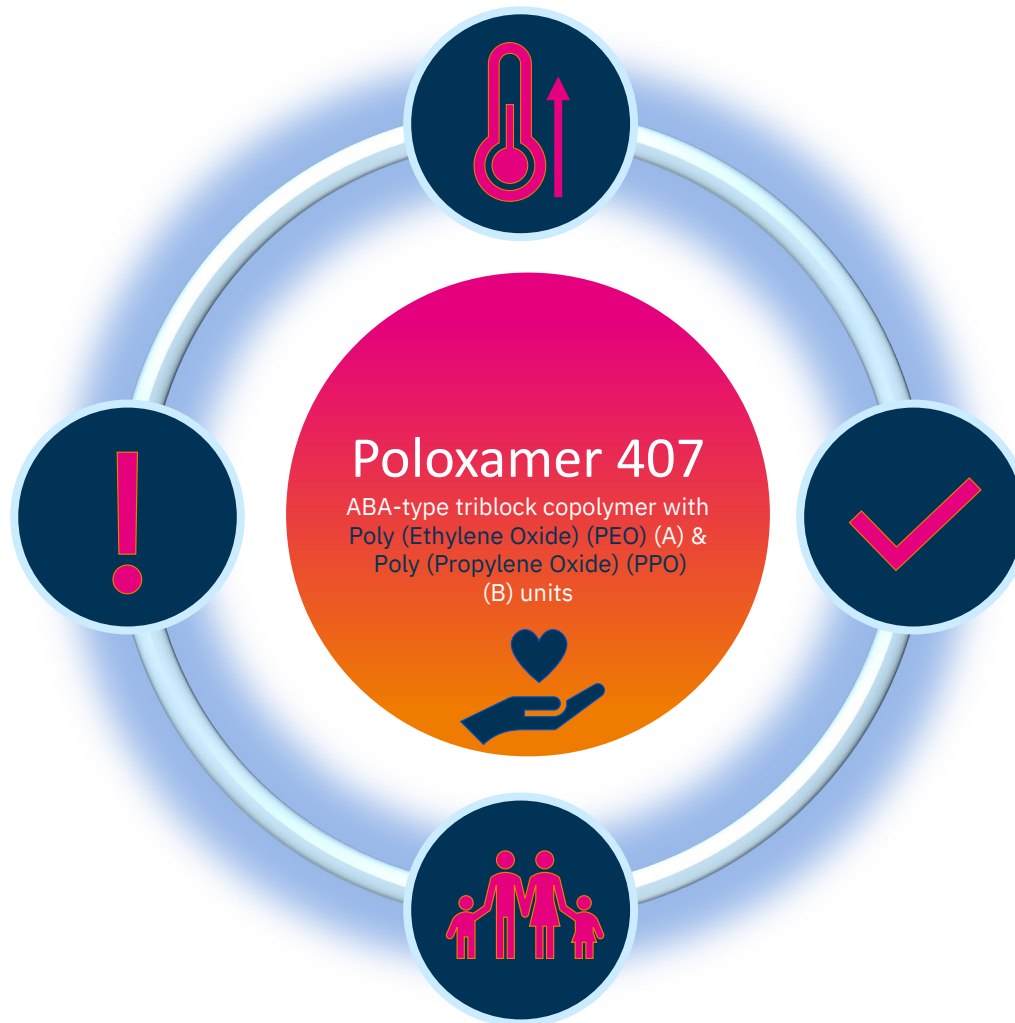
Its aqueous solution is liquid at room temperature but transforms to a gel at body temperature.¹⁻⁴



What are the advantages of using Poloxamer 407 in oral gels?

EASE OF ADMINISTRATION

Oral gels formulated with Poloxamer 407 offer ease of administration, as they can be easily dispensed and spread in the oral cavity.¹



GOOD TOLERABILITY

Recognized as safe owing to low toxicity⁹⁻¹²

COMPATIBILITY

Due to good solubilizing capacity and its compatibility with numerous biomolecules and chemicals, it is widely used in the field of biomedicine in a wide-range of applications¹⁻⁹

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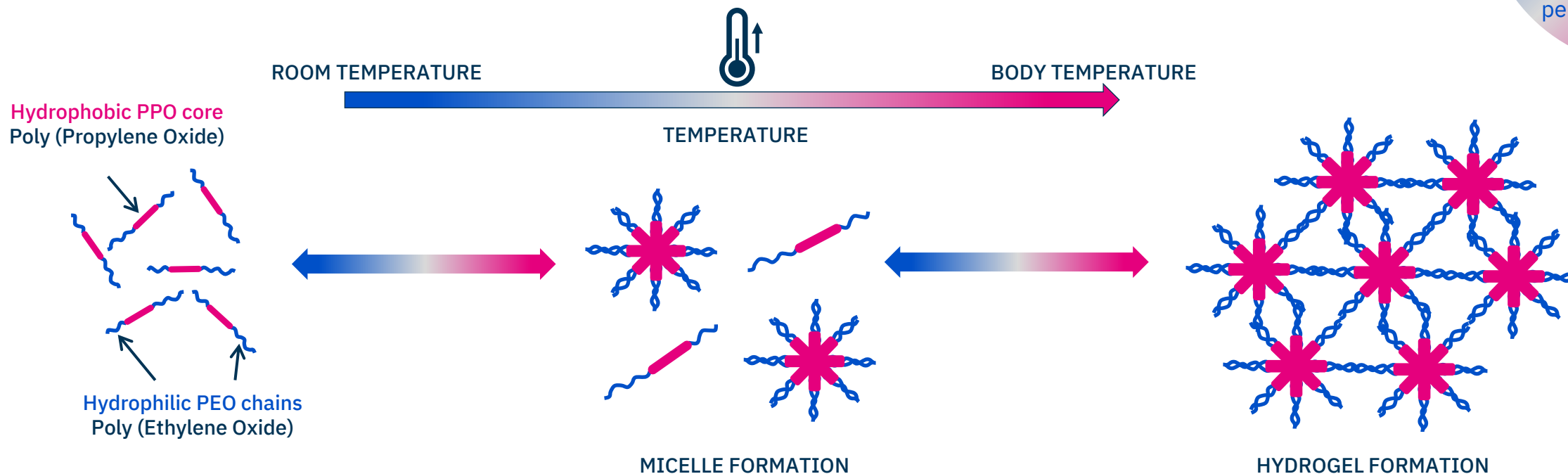
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P407 aqueous solution exhibits thermo-reversible gelation



Why does Pocket-X® Gel turn into gel when applied into periodontal pockets?



When the temperature increases, the hydrogen bonds between the aqueous solvent and the hydrophilic PEO chains break. Desolvation induces the hydrophobic interaction among the PPO blocks, the formation of spherical micelles and, successively, the gelation process.

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What are the advantages of combining HA and Poloxamer 407 in oral gels?

SYNERGISTIC PROPERTIES

Improved gel performance.¹⁻⁴



GOOD TOLERABILITY

Recognized as safe owing to low toxicity.⁷⁻⁸



PROLONGED WOUND-HEALING EFFECT

By forming a mechanical barrier, it protects the pockets from bacterial recolonization and improves healing of the gingiva.⁶⁻⁷



Poloxamer 407 + Hyaluronic Acid



IMPROVED ELASTICITY

Hyaluronic Acid contributes to elasticity and moisturizing effects improving mucoadhesive properties.³⁻⁴



EXCELLENT VISCOSITY

Stabilization inside the defect and withstanding the washout effect of the gingival crevicular fluid.⁵⁻⁶



EASIER FOR ADMINISTRATION

Easy to apply inside the periodontal pockets. Targeting and filling even hard-to-reach ones.⁵⁻⁶

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What are the advantages of Octenidine?

BROAD SPECTRUM OF ANTIMICROBIAL ACTIVITY

Effectively targets a broad spectrum of microorganisms including a variety of bacteria, fungi and enveloped viruses.¹⁻⁵

DEVELOPMENT OF RESISTANCE UNLIKELY

Nonspecific mechanism of action.¹⁵⁻¹⁶

VERY GOOD TOLERABILITY AND EXTREMELY LOW ALLERGIC POTENTIAL

Well-tolerated by most individuals.⁷⁻¹³

Does not absorb into the body following oral and dermal use.¹⁴

Octenidine
cationic surfactant

LONG TERM EFFECT

48-hours remanence.⁶

STABILITY AND ANTIMICROBIAL ACTIVITY WITHIN A BROAD pH RANGE (pH 1.6-12.2)

Suitable for all wounds with different pH values during the healing phase.⁷

RAPID ONSET OF ACTION

From 1 minute onwards¹⁻⁵

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References on advantages of Octenidine

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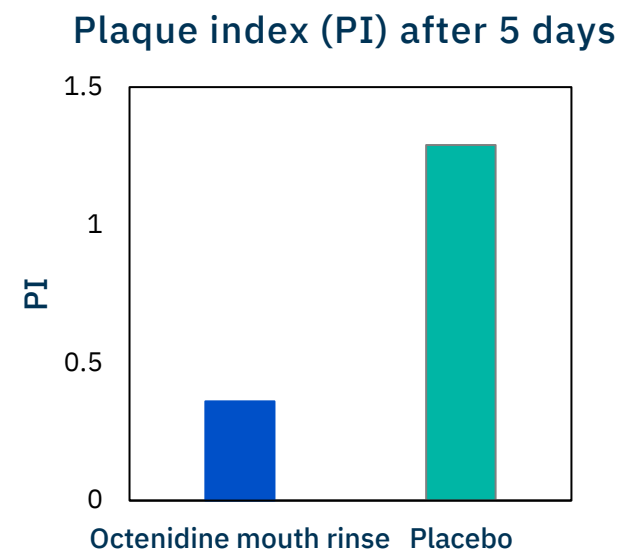
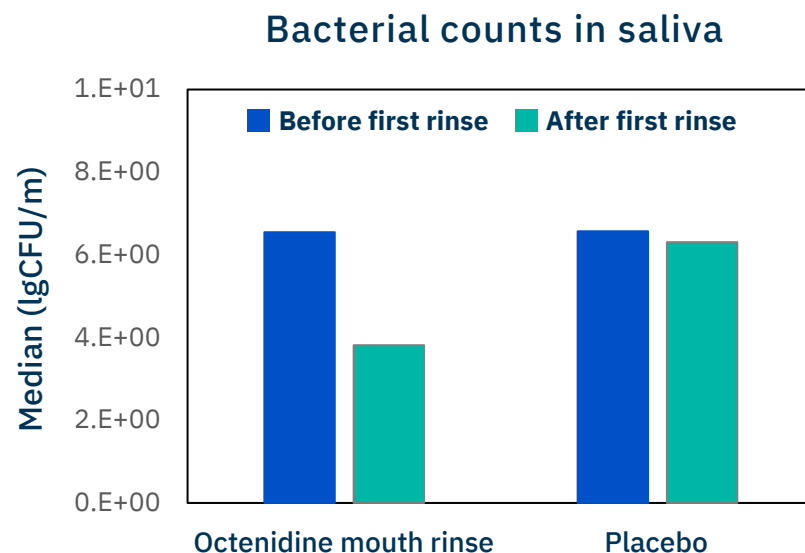
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Octenidine mouthwash is recommended to maintain healthy oral conditions



Is there any clinical evidence for the effectiveness of Octenidine in dentistry?



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- A single rinse with the 0.1% OCT mouthwash reduced salivary bacterial counts significantly stronger than the placebo.
- The 0.1% OCT mouthwash demonstrated superiority over the placebo in inhibiting plaque re-growth over a 5-day period in the absence of mechanical plaque control.

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Octenidine mouthwash is recommended to maintain healthy oral conditions



Why is Octenidine mouthwash recommended to maintain healthy oral conditions?

The use of 0.1% OCT mouthwash:

- inhibited plaque formation up to 93% and gingivitis up to 68% versus placebo and was either superior or comparable to chlorhexidine.
- significantly reduced the number of bleeding sites, papilla bleeding index, sulcus bleeding index, and gingival fluid flow.
- eliminated atypical oral microbe species, even at 1 month after therapy.
- well-tolerated and safe and can be an effective alternative to CHX and other contemporary mouthwashes.

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