Fast, efficient disinfection in Caries, Endodontics, Perio and Peri-Implantitis

Aseptim/Photo-Activated Oral Disinfection

The Aseptim Plus™ system utilises Photo-Activated Disinfection to eliminate bacteria in the treatment of root canals, periodontal disease, peri-implantitis and caries by eliminating all species of oral bacteria on demand. The Aseptim technology is supported by an extensive list of peer-reviewed, published, microbiological and clinical studies.

Designed for today’s dental practice

Aseptim Plus represents a genuine advance in minimal invasive dental treatment. It provides consistent, fast, effective and simple disinfection, with no side effects, of the following:
- root canals
- periodontal pockets
- peri-implantitis
- carious lesions

For the practitioner there are four important benefits to using Aseptim Plus:
- Saving time – reduced treatment and single visit treatment possible
- Saving supporting tissue in periodontal disease without antibiotics
- Saving expensive implants by total disinfection of the implant site prior to placement and also of the implant and surrounding tissue in case of infection
- Saving hard tissue with minimally invasive procedures and encouraging the process of natural remineralisation

As such it is a real practice builder. In addition, the low treatment cost of Aseptim is acceptable to patients and generates additional practice income. Indeed, the initial outlay for an Aseptim Plus unit can normally be recovered within months of purchase.

Unique benefits to the general dentist

- Aseptim Plus kills all bacteria associated with all types of oral lesions
- Aseptim Plus saves time and enables endo treatment in a single visit
- Aseptim Plus works only at the infection site, reducing the need for other local and systemic antimicrobials
- Aseptim Plus compliments minimally invasive treatment as a simple, adjunct to your usual restorative procedure
- Aseptim Plus improves and speeds up the healing process
- Aseptim Plus is painless and welcomed by patients especially children
- Aseptim Plus is safe, with no known side-effects
- The Aseptim Plus unit is small and portable for maximum flexibility and convenience
How does Aseptim technology work?

Aseptim technology is based on two components: a solution of dilute, pharmaceutical grade tolonium chloride (a vital stain) and light of a specific wavelength (635 nm) to activate the Aseptim solution.

Introduced into dental hard or soft tissue, the Aseptim solution selectively targets and tags all bacteria. When the solution is activated by the Aseptim light it releases singlet oxygen which ruptures the cell walls of bacteria, killing them in seconds\(^1,2,3,5\).

Aseptim solution selectively eliminates all bacteria and, unlike other methods of disinfection, does not affect the healthy surrounding tissue, nor does it stain soft tissue or tooth coloured restoration.

What does Aseptim Plus treat?

Aseptim Plus is equally effective on the bacteria found in root canals, periodontal pockets, peri-implantitis and carious teeth.

Aseptim Plus kills all bacteria including:

- Streptococcus mutans
- Total streptococcus
- Streptococcus sobrinus
- Streptococcus intermedius
- Actinomyces
- Lactobacillus
- Veillonella
- Prevotella intermedia
- Peptostreptococcus micros
- Fusobacterium nucleatum
- Porphyromonas gingivalis
- Staphaloccoccus aureus
- E.faecalis

Aseptim Plus also kills Candida Albicans.

And significant benefits for patients

- Less time to complete root canal treatment
- Less likelihood of failed root canal treatment
- Less complex treatment of periodontal pockets
- Less likelihood of implant failure
- Less need for aggressive antimicrobials and systemic antibiotics
- Less invasive cavity prep
- Less risk of pulpal exposure in treating deep decay
- Less risk of losing teeth
- Less trauma for children and dental phobics

Aseptim Plus disposable tips designed for the treatment of periodontal pockets and for endodontics.

E.faecalis with simulated P.A.D. Solution
Aseptim Plus – application in Endodontics

Disinfection of root canals is vital for long-term restorative success. Indeed, inability to guarantee disinfection is a very significant factor in the high level of endodontic treatment failure.\textsuperscript{10,11}

Aseptim Plus is particularly useful in endodontics.\textsuperscript{7,8,9} It simplifies the process and is more effective in disinfecting the complex anatomy of root canals. Also, if the apex is breached, treatment may continue, as Aseptim solution is completely benign, unlike more aggressive conventional agents such as hypochlorite.

Standard procedure – without sodium hypochlorite (if preferred)

1. Isolate tooth and apply rubber dam.
2. Disinfect tooth and surfaces as normal or with Aseptim as for treating caries (see pages 8 and 9).
3. Access pulp chamber and locate entry to root canals as normal.
4. Thoroughly dry canal with paper points.
5. Fill canal and pulp chamber with Aseptim solution. Agitate solution for 60 seconds with a file one size smaller than canal to remove any air bubbles.
6. Activate red light for 120 seconds in each canal.
Complete canal preparation using sterile water and 20% citric acid solution as irrigant.

After preparation flush out canal with suitable agent to disrupt any biofilm e.g 20% citric acid solution and finally flush with sterile water.

User comment:

“According to my clinical experience, the Aseptim Photo Activated Disinfection process is an effective technology to achieve consistent disinfection in root canal therapy. Marrying the PAD technology with state of the art mechanical and chemical root canal preparation and disinfection technologies may raise the predictability of one session treatments even in CAP cases.”

Professor Liviu Steier
Aseptim Plus – application in Periodontal Therapy

The cleaning of periodontal pockets and the elimination of periodontal pathogens is particularly difficult as mechanical debridement cannot guarantee complete removal of bacterial contaminants. The activation of photosensitisers by red light has been shown to eliminate the pathogens more successfully than the use of local and systemic antimicrobials. The process is simple to carry out and in conjunction with scaling and root planning offers long term success.

User comment:

“Aseptim is a cost effective and profitable way to treat periodontal disease. It has revolutionized the way the practice works and has enabled us to achieve highly predictable results even in previously unsuccessful or complex cases. In my opinion it works better than any other antimicrobial adjunct currently available.”

Phil Lucas
Senior Hygienist, Liverpool, Merseyside

Standard procedure

1. Thoroughly debride the site [SRP] using preferred technique
2. Following control of the bleeding from instrumentation, insert the photosensitiser solution into the pocket ensuring that it penetrates to the base of the pocket. Retain the solution in the pocket for 60 seconds.
3. Attach perio tip to the light guide of the Aseptim Plus handpiece. Insert the perio tip so that it is in contact with the bottom of the pocket. Then activate the light for 60 seconds.
4. Review status after four weeks. The process may be repeated if necessary.
Application in Peri-implantitis

Peri-implantitis compromises the integrity of dental implants. The bacterial load can be reduced with the Aseptim Plus technique such that normal healing may occur and help secure the stability of the implant.

1. Mechanically clean the implant body. Apply Aseptim solution liberally around (1) and throughout (2) the implant. Leave for 60 seconds and activate the Aseptim light for 120 seconds.

2. If necessary, augmentation can be done during the same session. Aseptim Plus may be used prior to implant placement to disinfect the prepared site.
Aseptim Plus – application in Caries Treatment

Aseptim Plus can be used in all carious lesions and during fissure sealing and crown preparations. Aseptim Plus is versatile and cost effective compared to other techniques.

1 Isolate from saliva with cotton wool rolls and high speed aspiration or rubber dam. Remove only sufficient enamel to access the carious lesion.

2 With excavator or slow running dental handpiece and round bur, remove only infected tissue. Stop immediately when resistance is felt.

3 Apply Aseptim solution to the whole lesion with brush. Work into surface of infected tissue and cover the whole cavity. Continue for 60 seconds.
4 Place Aseptim Plus handpiece tip over the site of the lesion and hold just above the cusps on the occlusal surface of the tooth.

5 Activate red light for 60 seconds and hold the tip centred on the lesion. Light penetrates through the surrounding tissue to activate the Aseptim solution and disinfects the remaining lesion. If two interproximal surfaces are involved, disinfect each surface separately.

6 After disinfection, either; a) fill cavity immediately with suitable restorative or b) before final filling, treat remaining softened tissue with remineralising agent. Note: glass ionomers are particularly appropriate to seal and assist in remineralisation of deep cavities.

User comment:

“I am a dentist practicing in Dubai with 30 years experience and I have used Aseptim for around two years and treated around 1500 patients with it. I have noticed that the patients were very comfortable and did not go through any pain while being treated by Aseptim. I also assured the patients that there would be no post-operative pain. I feel very confident with this product and impressed by the results.

I follow up most of the cases every three months and most of the cases are deep caries and a few root canals. This product is a great benefit to my clinic and I am a very proud user of Aseptim technology.

Doctor Zeinab Tawfik"
User comments

Professor Paul Lambrechts DDS. MScD. PhD. Head of Restorative Dentistry Department Catholic University of Leuven, Belgium

“There is the impression of faster healing and less post-operative pain after endodontic treatment of apical periodontitis with Aseptim. Scientific study is ongoing.”

Dr Herbert Betke DDS Dentist, Göttingen, Germany

“Aseptim is a genuine scientific innovation. It provides the dentist with greater confidence of a successful treatment outcome and patients appreciate the enhanced level of care with reduction in pain.”

Dr Armin Beck MSC. NATO Dentist. AWAC Surveillance planes. Flying Staff. Geilenkirchen, Germany

“Gives more security in root canal treatment. Disinfection of the root canal with Aseptim now enables the flight crew to be back in the air on the day of treatment; this was not previously possible due to the risk of re-infection.”

Dr Jan Dethloff. Warsaw, Poland

“Aseptim is used routinely in our practice to ensure better outcomes for endodontic, prosthetic, implant and conservative treatment. We have found it particularly useful for patients in pain where our experience has shown a remarkably rapid reduction in such symptoms after endodontic treatment. We also use Aseptim prophylactically on high risk patients prior to complex restorative treatment and have had very positive results.”

Dr Helen Harrison, BDS MFB DP UK Cambridgeshire, UK

“Aseptim provides us at Granta Dental with a rare opportunity to offer patients a technological innovation of elegant simplicity and staggeringly little side effects. It is a reassuring value added technique to improve our clinical outcomes in dental conditions where infection control is the primary objective of treatment. Photo Activated Disinfection is the type of responsible clinical solution that the 21st century patients are seeking for their dental care.”

Professor Antoni J España Tost Oral Surgery and Implantology, Faculty of Dentistry, University of Barcelona, Spain

“With Aseptim, we obtain a field of high level disinfection throughout the root canal without the potential risks inherent in the use of hypochlorite irrigations, and this is achieved safely and comfortably for both the patient and the clinician.”

Dr I Wright
Gwent

“Speeds up the process of root canal treatment. A totally different way to treat caries. Patients love it!”

Dr A Davenport
Warwicks

“Great publicity benefits to the practice”

Dr J Rawcliffe
North Yorks

“Re-treatment of endo cases with resolution. No need for sodium hypochlorite. Closing of deep pockets.”

Dr S Bonsor
Aberdeenshire

“The confidence of complete disinfection.”
Summaries of scientific evidence

Burns T, Wilson M, Pearson G J

Summary:
Suspensions of the cariogenic bacteria Streptococcus mutans, S. sobrinus, Lactobacillus casei and Actinomyces viscosus were exposed to light from a 7.3mW helium-neon laser in the presence of toluidine blue O. A substantial killing rate (c. 106 cfu) of all four species was achieved with a dye concentration of 50µg/ml and a light energy does of 33.6J/cm². This was achieved in 60s, an exposure time that is clinically acceptable. Exposure to laser light in the absence of the dye did not significantly affect the viability of any of the organisms. This approach may be useful in dentistry to sterilise a carious lesion prior to its repair.

Burns T, Wilson M, Pearson G J

Conclusion:
Suspensions of S mutans, S sobrinus, L casei and A viscosus were exposed to light from a GaAlAs laser in the presence of Aluminium disulphonated phthalocyanine and numbers of survivors determined. The kills attributed to lethal photosensitisation amounted to approximately 106 cfu for each organism. These kills were achieved within clinically acceptable time implying that lethal photosensitisation may be a useful technique in eliminating bacteria from a carious lesion prior to restoration.

Burns T, Wilson M, Pearson G J

Conclusion:
Effective killing of 107 cfu S mutans was achieved with a range of energy densities using both HeNe and GaAlAs lasers after passage of the light through demineralised dentine discs using two photosensitisers Toluidine Blue O and AlPcS. Similar kill levels were observed when S mutans was suspended in a collagen matrix prior to exposure to the photosensitiser and light. The results imply that lethal photosensitisation may be effective at killing S mutans in a carious lesion even when the organism is suspended in demineralised dentine.

Wilson M, Burns T, Pratten J, Pearson G J
Bacteria in supragingival plaque samples can be killed by low-power laser light in the presence of a photosensitiser. Journal of Applied Bacteriology 1995; 78: 569-574

Conclusion:
Samples of dental plaque were treated with either Toluidine Blue O or AlPcS and irradiated with various energy densities of light from HeNe or GaAlAs laser respectively. The HeNe/Toluidine Blue O combination appeared to be more effective producing a log10 reduction of 2.95, 5.4 and 3.34 in total anaerobic counts, Streptococci and Actinomyces respectively. This suggests that, if effective in vivo, photosensitisation may be useful as a means of eliminating plaque bacteria from a carious lesion.

Komerik N, Nakashishi H, MacRobert A J, Henderson B, Speight P and Wilson M

Conclusion:
In an animal model, periodontal pockets were inoculated with P gingivalis and exposed to laser light at 633nm in the presence of Toluidine Blue O. The number of surviving bacteria was determined and the structure of periodontium examined for damage. No viable bacteria were found after the exposure and there was no damage to the supporting structures. In a further group of animals, after time had been allowed after inoculation of the bacterial strain for the development of periodontal disease, the bone loss in those sites treated with the light/photosensitiser combination was significantly less than in the control. The results indicate that this combination would be useful as an alternative approach for antimicrobial treatment of periodontal disease.


Summary:
The study examined the effect of variable energy doses of light at 635nm from a novel delivery system using a 100mW diode laser and a photosensitiser. The system killed up to 109cfu/ml S mutans in planktonic solution. The antibacterial action was directly proportional to the energy doses rather than power output. Energy dose of 1.8J killed 10% of bacteria present. Bacteria could be killed to significant levels within 30 seconds.

Lee M T, Bird P S, Walsh L J

Conclusion:
In vitro studies of the use of low level laser light in conjunction with a photosensitiser to kill oral bacteria in the root canal have been encouraging. The utility of PAD in contemporary endodontics related to its potential for one step high level disinfection of the root canal space, as a prelude to single visit endodontics or as a refractory
Conclusion:
In vitro studies of the use of low level laser light in conjunction with a photosensitiser to kill oral bacteria in the root canal have been encouraging. The utility of PAD in contemporary endodontics related to its potential for one step high level disinfection of the root canal space, as a prelude to single visit endodontics or as a refractory treatment of root canal infection. In the latter PAD could be used as an additional regimen in the eradication of persistent endodontic infection for which conventional methods have been unsuccessful. Clinical trials underway will determine whether PAD is useful in these applications. The use of low level laser therapy has advantages in that the bactericidal effect of PAD can be achieved without damage to the host tissue and with little optical danger to operator and patient. Additionally the hardware is inexpensive compared with high power lasers. The PAD technique is simple to undertake since the photosensitiser solution can be applied directly into the root canal system and the laser energy delivered using an optical fibre with a diffuser.


Summary:
Effective killing of S mutans imbedded in a collagen matrix was achieved using a photosensitiser TBO [10µg/ml] in conjunction with a 100mW 635nm diode laser with the light delivered via an isotropic tip. The results showed that Photo-Activated Disinfection can achieve appreciable kills of oral bacteria including S mutans when the organisms are embedded in a collagen gel or present in carious teeth.

Pearson G J, Bonsor S J
Improved Restoration in Caries and root canals using a novel disinfection technique. As published in Dentistry, Oct. 2004, revised March 2005 to include most recent information

Conclusion:
In dental caries the use of PAD can eliminate residual bacteria in softened dentine and provide an environment which encourages rapid healing. This has led to its use in minimally invasive techniques in endodontics, despite following clinical “best practice,” 20% of canals remained infected after conventional chemo-mechanical treatment.

The use of PAD as the disinfectant in conjunction with a cleanser such as citric acid rendered these canals bacteria free. Early indications of follow ups are favourable with strong evidence of peri-radicular healing in all cases.


Conclusion:
PAD killed endodontic bacteria at statistically significant levels compared to controls. Kills varied with bacterial species.

Bonsor S J, Nichol R, Reid T M S, Pearson G J
Microbiological evaluation of Photo-Activated Disinfection in endodontics (An in vivo study). British Dental Journal 2006; 200: 337-341

Conclusion:
The results of the study show that the PAD technique was successful in eliminating all the culturable bacteria when the correct combination of photosensitiser and energy dose are used and where both the light and the photosensitiser reach the bacteria. It highlighted the need for care in the use of the emitter to ensure that it is not bent too tightly or trapped in the canal.

Bonsor S J, Nichol R, Reid T M S, Pearson G J
An alternative regimen for root canal disinfection. British Dental Journal 2006; 201: 101-105

Conclusion:
Within the limits of the current study, the use of an alternative means of root canal disinfection to sodium hypochlorite has been shown to be more effective at reducing or eliminating bacterial load in the canals.

Bonsor S J, Pearson G J
Current clinical applications of Photo-Activated Disinfection in restorative dentistry. Dental Update 2006; 33(3): 143-153

Summary:
Photo-Activated Disinfection has been successfully used in operative dentistry as a means of disinfecting residual softened caries where exposure is likely. This results in the removal of less tooth tissue and may improve the prognosis of treatment. In endodontics, PAD provides a means whereby canals can be effectively disinfected.

This suggests that the dental surgeon can be confident that micro-organisms can be effectively killed prior to obturation and restoration. PAD has other potential applications and further ongoing research work is currently being conducted prior to its extrapolation to the clinical situation.

Vlacic J, Meyers I.A, Walsh L.J.
Combined CPP-ACP and photoactivated disinfection (PAD) therapy in arresting root surface caries; a case report.

Conclusion:
In light of the above findings we propose that PAD therapy enhances the effectiveness of CPP-ACP by removing the cariogenic bacteria. The combination of CPP-ACP and PAD proved to be very effective and holds great potential as a recommended treatment for stabilising root surface caries in the clinical practice.
Bibliography


Aseptim system – technical data and specifications

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Aseptim Plus unit             SCP-7058
Aseptim Plus Starter Kit      SC-7070

Treatment Packs

SciCan Aseptim Plus Caries Solution Pack order code SCP-7052
1 x Dropper Bottle containing 1.3ml Aseptim solution
Application Accessories: 1 brush handle, 3 wells, 25 brush tips

25 SciCan Aseptim Plus Endo Tips order code SCP-7053

SciCan Aseptim Plus Endo Solution Pack order code SCP-7054
5 Syringes each containing 0.6ml Aseptim solution

SciCan Aseptim Citric Acid Pack order code SC-7055
1 bottle containing 100 ml; 20% solution

SciCan Aseptim Plus Viscous Solution Pack order code SCP-7056
5 Syringes each containing 0.6ml Aseptim viscous solution

25 SciCan Aseptim Plus Perio Tips order code SCP-7057
The SciCan range of products

- Statim® 2000S cassette autoclave
- Statim 5000S cassette autoclave
- Statim 7000 cassette autoclave
- Bravo® chamber autoclave
- Hydrim® C51 wd washer disinfector
- Hydrim M2 washer disinfector
- Aquastat™ water distillation unit
- Aseptim™ Plus
- Statis™ turbines and handpieces
- Statmatic™ lubrication unit
- Optim® 33TB

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**CE0297: STATIS instruments

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