



Guidelines for Dental Care Onboard Merchant Ships

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iswan@iswan.org.uk
www.seafarershealth.org

1. Introduction

The International Seafarers' Welfare and Assistance Network has launched DENTAL CARE as one of the topics in the Seafarers' Health and Information Programme (SHIP).

Toothache may range from a distressing inconvenience to intense, miserable pain, that is difficult to treat with only the medication and instruments in the ship's medical chest.

Toothache may adversely affect a seafarer's performance, up-set their concentration and generally present a risk to safety.

Consequently, the importance of good dental care and regular checkups at the dentist, cannot be overestimated, especially before embarkation.

Prevention of tooth decay can indeed prevent a lot of pain and suffering while onboard.

It should also be remembered that dental care systems and the quality of care in ports may be very different from what the seafarer is used to. In some cases, treatment in ports may have to be carried out very quickly because of the fast turn-around times of today's ships. This may lead to hasty decisions and treatments such as an extraction, where other measures could have saved the tooth.

Dental care may be expensive in ports and treatments are not always covered by the seafarer's company or medical insurance especially when crowns, bridges or dentures are needed.

2. Risks for Seafarers

Modern dentistry has succeeded in reducing the incidence of dental caries through water fluoridation, oral hygiene education, and preventive dental care.

Cavities are far less prevalent than they were several decades ago and may now be managed by advanced technology.

However, the risk of dental problems is increased for seafarers because of their limited access to advanced dental care and regular control whilst at sea.

Some of the most frequent Dental Problems are:

Tooth Decay (dental "caries") which is the decomposition of tooth structure caused by the destructive toxins created by Plaque, a combination of natural bacteria and food debris left on the teeth by inadequate oral hygiene.

Dental caries has been described as a "disease of civilization," especially in relation to the last hundred years, as man has strayed from a diet rich in fruit and vegetables to one with a high intake of refined sugars.

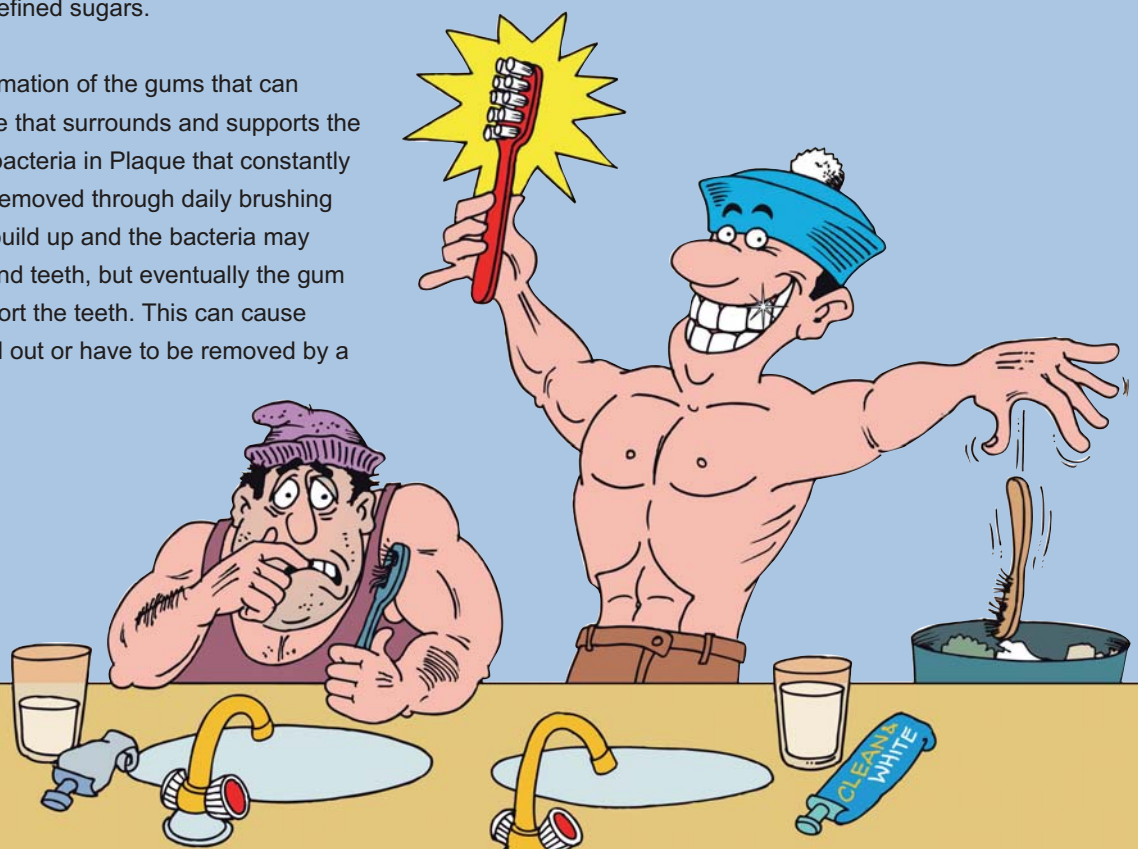
Gum Disease is an inflammation of the gums that can progress to affect the bone that surrounds and supports the teeth. It is caused by the bacteria in Plaque that constantly forms on the teeth. If not removed through daily brushing and flossing, plaque can build up and the bacteria may infect not only the gums and teeth, but eventually the gum tissue and bone that support the teeth. This can cause teeth to become loose, fall out or have to be removed by a dentist.

Root Canal Problems occur when the tooth's pulp, a small, thread-like tissue in the centre of the tooth is damaged or diseased. The most common causes of pulp damage or disease are:

- a cracked tooth
- a deep cavity
- an injury, such as a severe knock to the tooth, either recently or in the past

Once the pulp is infected or dead, if left untreated, pus can build up at the root tip in the jawbone, forming an abscess. An abscess can destroy the bone surrounding the tooth and cause pain.

Severe, emergency dental pain may be as unrelenting as kidney stones or even labour contractions. Onboard, pain treatment is limited and therefore prevention is most important!



3. Tooth Anatomy

Different Parts of a Tooth

Crown: the top part of the tooth, and the only part which can normally be seen. The shape of the crown determines the tooth's function. For example, front teeth are sharp and chisel-shaped for cutting, while molars have flat surfaces for grinding.

Gumline: where the tooth and the gums meet. Without proper brushing and flossing, plaque and tartar can build up at the gumline, leading to gingivitis and gum disease.

Root: the part of the tooth that is embedded in the jawbone. The root makes up about two-thirds of the tooth and holds it in place.

Enamel: the outermost layer of the tooth. Enamel is the hardest, most mineralized tissue in the body - yet it can be damaged by decay if teeth are not cared for properly.

Dentine: the layer of the tooth under the enamel. If decay is able to make its way through the enamel, it next attacks the dentine - where millions of tiny tubes lead directly to the dental pulp.

Pulp: the soft tissue found in the centre of all teeth, where the nerve tissue and blood vessels are. If tooth decay reaches the pulp, it usually causes pain.

Different Types of Teeth

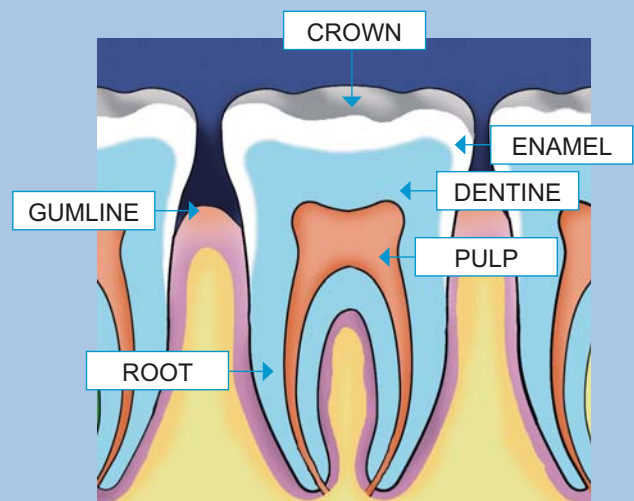
Every tooth has a specific job or function (the dental diagram at the end of this section may help to locate and identify each type of tooth)

Incisors: the sharp, chisel-shaped front teeth (four upper, four lower) used for cutting food.

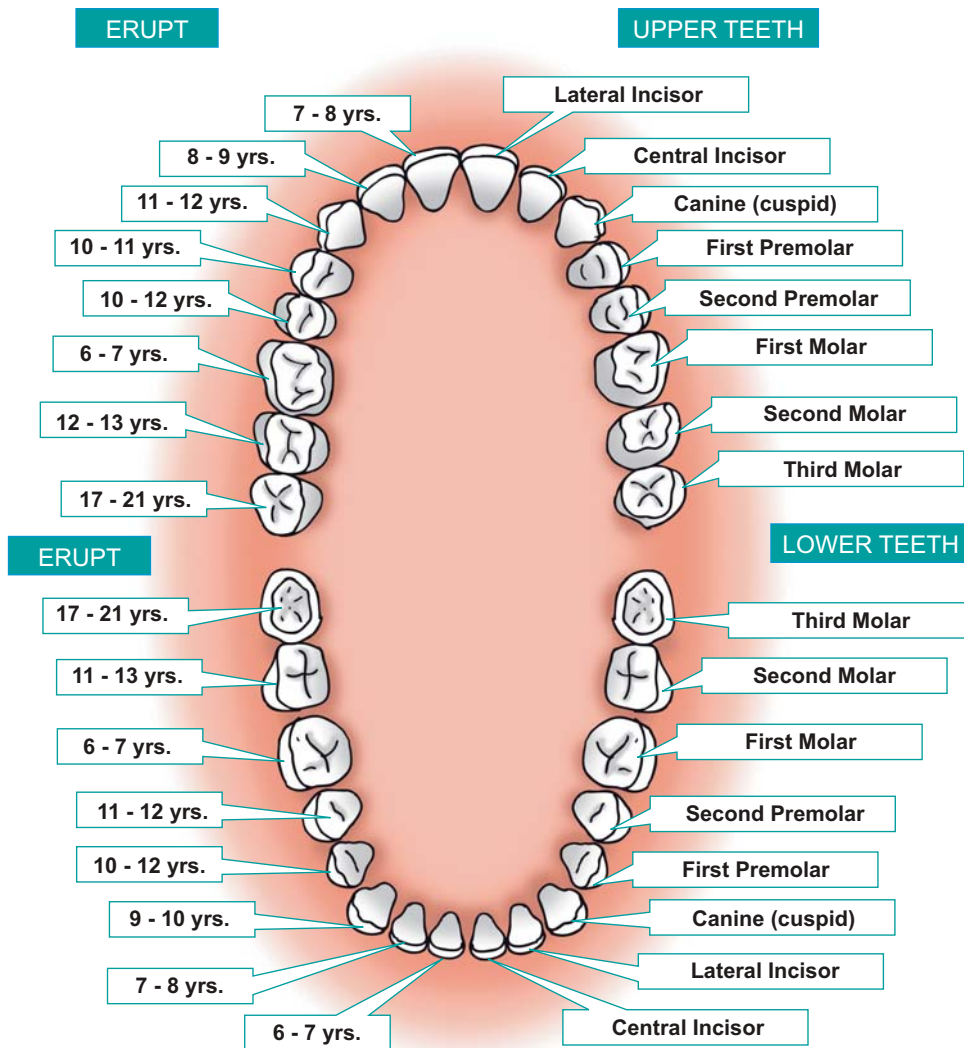
Canines: sometimes called cuspids, these teeth are shaped like points (or cusps) and are used for tearing food.

Premolars: these teeth have two pointed cusps on their biting surface and are sometimes referred to as bicuspid. The premolars are for crushing and tearing.

Molars: used for grinding, these teeth have several cusps on the biting surface.



TOOTH DEVELOPMENT : Permanent Teeth



4. The Right Way to Brush

Proper brushing takes at least two minutes, but no more! However, most seafarers (and other people) do not brush for nearly that long. To get a feel for the time involved, a stopwatch can be used. For the teeth to be brushed properly, short, gentle strokes should be used, paying extra attention to the gumline, hard-to-reach back teeth, and areas around fillings, crowns or other restoration work. Each section should be thoroughly cleaned as follows:

- first the outer surfaces of the upper teeth, then the lower teeth
- next the inner surfaces of the upper teeth, then the lower teeth
- finally the chewing surfaces should be brushed
- for fresher breath, the tongue should be brushed too

Toothbrush

Most dental professionals agree that a soft-bristled brush is best for removing plaque and debris from the teeth. Small-headed brushes are also preferable, since they can better reach all areas of the mouth, including hard-to-reach back teeth. For many, a powered toothbrush is a good alternative. It can do a better job of cleaning teeth, particularly for those who have difficulty brushing or who have limited manual dexterity.

Toothpaste

It is important that an appropriate toothpaste is used. Today there is a wide variety of toothpaste designed for many conditions, including cavities, gingivitis, tartar, stained teeth and sensitivity. The dentist or hygienist can advise on the most suitable one.

Replace Toothbrush

A toothbrush should be replaced when it begins to show wear, or every three months, whichever comes first. It is also very important to change toothbrushes after having a cold, since the bristles can collect germs that can lead to reinfection.



The outside, inside and chewing surface of each tooth should be gently brushed using short back-and-forth strokes.



The tongue should be gently brushed to remove bacteria and freshen breath.

5. Fluorides

Fluor is a so-called trace element, necessary for the growth and normal function of the body. Only small quantities are needed; larger doses may be harmful to health.

Fluor does not exist as a free molecule in nature, it is linked to other elements to form Fluorides. Fluorides are found in fish, bones and tea, and sometimes also in drinking water.

The bacteria in tooth plaque metabolise the sugar we eat to form acids. These acids may demineralise the teeth and cause cavities if remineralisation is slow or insufficient. Fluorides slow down demineralisation and make remineralisation faster. Tooth tissue that has incorporated Fluor is more resistant to acidity. Fluor in the saliva makes teeth stronger to resist the negative effects of sugars.

Since the effect of Fluor is local, it is advisable to have a small quantity of Fluoride in the saliva about three times per day. This can be done by brushing the teeth three times a day with a toothpaste containing Fluoride.

Too much Fluor can cause white spots and stripes on the teeth, so Fluoride drops or tablets should only be taken on the recommendation of a dentist!



6. Emergency Toothache

If there is a lost filling or defect in the enamel (surface of the tooth), oil of cloves should be applied to the tooth surface.

If there is a large defect in the tooth, a temporary dressing should be inserted into the cavity as follows:

- the tooth should be isolated by putting a 5X5 cm piece of gauze on each side of it
- the cavity should be dried with a cotton bud or pellet
- a drop of oil of cloves on cotton wool should be gently pressed into the cavity and left in place
- the isolating gauze should then be removed

This procedure may be repeated two to three times a day as necessary

To relieve the pain, 1000mg paracetamol may be taken orally to start with.

If a stronger analgesic is necessary, which is often the case, the paracetamol may be replaced with tramadol 50 mg orally, or an equivalent analgesic in the medical chest, twice a day.

The patients should rinse out their mouth with warm saline solution for five minutes every waking hour, until they can see a dentist.

If infection or abscess formation is suspected, amoxicillin/clavulanate 875/125 mg orally, should be taken three times a day for seven days, after the patient has been checked for allergies.

Medical advice should be sought urgently if there is:

- difficulty opening the mouth
- difficulty swallowing
- drooling
- difficulty breathing
- swelling in the neck
- pain much beyond the area of the infected tooth

If a crew member loses a tooth after a blow to the face or jaw, emergency dental care may not only relieve unnecessary suffering, but may actually save teeth, such as those which are partially, or totally dislodged. Should a tooth be knocked out, it should be handled only by the crown, rinsed with tap water (not scrubbed) and an attempt made to place it back in its socket; the patient should keep it in place with a finger or by biting it. If this is unsuccessful, the tooth should be placed in milk or water. Medical advice and dental care should then be sought urgently!



7. Tooth Filling

A filling is a way to restore a tooth damaged by decay back to its normal function and shape. The dentist removes the decayed tooth material, cleans the affected area, and then fills the cavity with a filling material.

By closing off spaces where bacteria can enter, a filling helps prevent further decay. Materials used for fillings include gold, porcelain, a composite resin (tooth-colored fillings), and an amalgam (an alloy of mercury, silver, copper, tin and sometimes zinc).

The type of filling that is best is determined by the extent of the repair; potential allergies to certain materials; where in the mouth the filling is needed; and the cost.

If decay or a fracture has damaged a large portion of the tooth, a crown or cap may be recommended. Decay that has reached the nerve may be treated in two ways: through root canal therapy (in which damaged nerve is removed) or through a procedure called pulp capping (which attempts to keep the nerve alive).

If the dentist decides to fill a cavity, he or she will first remove the decay and clean the affected area. The cleaned-out cavity will then be filled with any of the variety of materials described above.

Only the dentist can detect whether a cavity needs to be filled. During a checkup, the dentist will use a small mirror to examine the surfaces of each tooth.

Anything that looks abnormal will then be closely checked. The dentist may also X-ray the entire mouth or a section of it. The type of treatment the dentist chooses will depend on the extent of damage caused by decay.

8. Tooth Extraction

Teeth are extracted for a variety of reasons:

- decay has reached deep into the tooth
- infection has destroyed a large portion of the tooth or surrounding bone
- there is not enough room for all the teeth in the mouth

Many dentists recommend extracting impacted teeth that are only partially erupted. Impacted teeth continue trying to break through the gum tissue even if there is not enough room to accommodate them. Removing a tooth that is impacted can often prevent infection, damage to adjacent teeth and bone, and save pain in the future.

Before a tooth is removed, the dentist will review the patient's medical and dental history and take the appropriate X-rays.

X-rays reveal the length, shape, and position of the tooth and surrounding bone.

Before removal, the dentist uses a local anesthetic to numb the area of the mouth where the extraction will take place.

For a simple extraction, once the area is anaesthetized, the tooth is loosened with the help of a tool called an elevator, then extracted with dental forceps.

It is critical to keep the area clean and prevent infection immediately following the removal of a tooth. The dentist will ask the patient to bite down on a piece of dry, sterile gauze to limit bleeding while clotting takes place. For the next 24 hours, smoking or vigorous rinsing of the mouth should be avoided.

A certain amount of pain and discomfort may be expected following an extraction. In some cases, the dentist will recommend a pain killer. An ice pack to the face for 15 minutes at a time, may help. Strenuous activity should be limited, and hot liquids avoided; use of a straw may help with drinking. The day after the extraction, the dentist may suggest that the mouth may be gently rinsed with warm salt water (which should not be swallowed). If there is prolonged or severe pain, swelling, bleeding or fever, medical advice should be sought.

9. Root Canal Treatment

Root canal treatment involves several procedures that may require a number of dental appointments, depending on the situation. These procedures are as follows:

- First an opening is made through the back of a front tooth or the crown of a molar or pre-molar.
- After the diseased pulp is removed (a pulpectomy), the pulp chamber and root canals are cleaned, enlarged and shaped in preparation for being filled.
- If more than one visit is needed, a temporary filling is placed in the crown opening to protect the tooth between dental visits.
- The temporary filling is removed and the pulp chamber and root canal permanently filled. A tapered, rubbery material called gutta-percha is inserted into each of the canals and is often sealed into place with cement. Sometimes a metal or plastic rod is placed in the canal for structural support.
- In the final step, a crown is usually placed over the tooth to restore its natural shape and appearance. If the tooth is very broken down, a post may be required to build it up prior to fitting a crown.

A treated and restored tooth/teeth can last a lifetime with proper care. However, as tooth decay can still occur in treated teeth, good oral hygiene and regular dental exams are still necessary to prevent further problems.

10. Crowns and Bridges

Unlike removable devices such as dentures, which can be taken out and cleaned daily, crowns and bridges are cemented onto existing teeth or implants, and can only be removed by a dentist.

A crown is used to entirely cover or “cap” a damaged tooth. Besides strengthening a damaged tooth, a crown can be used to improve its appearance, shape or alignment. A crown can also be placed on top of an implant to provide a tooth-like shape and functional structure.

Porcelain or ceramic crowns can be matched to the colour of the natural teeth. Other materials include gold and metal alloys, acrylic and ceramic.

A **crown** is recommended to:

- replace a large filling when there isn't enough tooth remaining
- protect a weak tooth from fracturing
- restore a fractured tooth
- attach a bridge
- cover a dental implant
- cover a discoloured or poorly shaped tooth
- cover a tooth that has had root canal treatment

A **bridge** may be recommended if one or more teeth are missing. Gaps left by missing teeth eventually cause the remaining teeth to rotate or shift, resulting in a bad bite.

Bridges span the space where the teeth are missing and are cemented to the natural teeth or implants.

As with crowns, there is a choice of materials for bridges. The dentist can advise which to use, based on the location of the missing tooth (or teeth), its function, aesthetic considerations and cost.

Before either a crown or a bridge can be made, the tooth (or teeth) must be reduced in size so that the crown or bridge will fit over it properly. After reducing the tooth/teeth, the dentist will take an impression to provide an exact mould for the crown or bridge.

Using this impression, the crown or bridge is then made by a dental lab. A temporary crown or bridge will be put in place to cover the prepared tooth while the permanent one is being made. When it is ready, the new crown or bridge is cemented over the prepared tooth or teeth.

While crowns and bridges can last a lifetime, they do sometimes become loose or fall out. The most important step which can be taken to keep them as long as possible is to practice good oral hygiene.

A bridge can lose its support if the teeth or bone holding it in place are damaged by dental disease. Gums and teeth should therefore be kept healthy by brushing with Fluoride toothpaste twice a day and flossing daily.



11. Bleaching, Whitening and Bonding

Some people are born with teeth that are more yellow than others. Others have teeth that yellow with age. The natural tooth colour can also be affected by many factors such as:

- tobacco (whether smoked or chewed)
- coffee, tea, or red wine
- highly pigmented foods such as cherries and blueberries
- accumulation of tartar, resulting from plaque

But also:

- treatment with the antibiotic tetracycline in childhood, when the teeth are forming
- yellowing or greying of the teeth as part of the aging process
- trauma to the teeth resulting in the death of the tooth's nerve, giving the tooth a brown, grey or black colour

Thorough cleaning by a dental professional will remove most external staining caused by food and tobacco. Using a whitening toothpaste can also help remove these surface stains between dental visits. If stains have been present for years, teeth may need to be professionally whitened to remove these more stubborn external stains. Internal stains can be bleached, bonded or capped (crowned). While each of these methods is safe and effective, the dentist will recommend which treatment is appropriate depending on the state of the teeth and the desired results. Bonding uses composite resins or porcelain/composite veneers to cover the surface of stained teeth and give a good, even appearance to broken or misshapen teeth. To help prevent stains from coming back, smoking and consumption of coffee, tea, red wine and heavily coloured foods should be avoided. Teeth should also be brushed twice a day with a whitening toothpaste.

12. Dry mouth

Everyone has a dry mouth once in a while, especially when they are nervous, upset or under stress. But a dry mouth all or most of the time, can be uncomfortable and can lead to further health problems or indicate that a more serious medical condition may exist.

Symptoms of dry mouth include:

- a sticky, dry feeling in the mouth
- trouble swallowing
- a burning sensation on the tongue
- a dry feeling in the throat
- cracked lips
- reduced ability to taste things or a metallic taste in the mouth
- mouth sores
- frequent bad breath
- difficulty chewing/speaking

There are several reasons why the glands that produce saliva, called the salivary glands, might not function properly, resulting in a dry mouth. These include:

- the side effects of over 400 medicines, including antihistamines, decongestants, pain killers, diuretics and medicines for high blood pressure and depression
- diseases such as diabetes, Hodgkin's, Parkinson's disease, HIV / AIDS and Sjogren's syndrome,
- menopause- changing hormone levels affect the salivary glands
- smoking — many pipe, cigar and heavy cigarette smokers experience dry mouth.

The only permanent way to cure a dry mouth is to treat its cause. If a dry mouth is the result of medication, the patient's doctor might change their prescription or the dosage. If the salivary glands are not working properly but are still producing some saliva, the doctor might prescribe a medicine that helps the glands work better.

If the cause of a dry mouth cannot be eliminated, or until it can be, moisture can be restored to the mouth in a number of different ways. The dentist may recommend mouth moisturizers, such as a saliva substitute and rinsing with mouthwashes specially formulated to help dry mouth, may also bring relief.

In addition, the following may help:

- water or sugarless cordials should be drunk frequently
- drinks containing caffeine, such as coffee, tea and some sodas, should be avoided
- sugarless gum may be chewed or sugarless hard candy sucked to stimulate saliva flow (if some salivary gland function exists)
- tobacco or alcohol, which dry out the mouth, should be avoided
- spicy or salty foods which can cause pain in a dry mouth should be avoided
- a humidifier should be used at night



13. Bad Breath

Bad breath (Halitosis) may be caused by many factors, including certain diets and inadequate oral hygiene. If dietary adjustments do not help, the dentist should be consulted! If improved oral hygiene does not help, stomach and intestinal problems, or disorders such as diabetes may be the cause.

Poor oral hygiene, advanced tooth decay or periodontal disease may result in bad breath that may range from offensive to fetid. For many, bad breath is caused by the accumulation of bacteria lodging in the ridges of the tongue. The inclusion of a small plastic rake (tongue scraper) into a regular oral hygiene programme will prove effective for those who experience this problem. A germicidal mouth rinse, containing chlorine dioxide, may also be beneficial.

Poor dental hygiene may result in acute necrotizing ulcerative gingivitis (ANUG). Once called trench mouth, this condition is fairly uncommon in advanced countries, but may develop in teenagers and young adults. Though not contagious, it can, and should, be treated.

14. Tips for the Successful Implementation of a Dental Care Campaign

The ship, where seafarers not only work but spend all their time during a voyage, is the best place for health intervention. The following measures may therefore be considered to encourage a sensible approach to dental care.

Encourage and stimulate the crew members to prevent dental problems. Draw attention to the prevention of dental problems in meetings, at medical check-ups etc.

Use a broad approach to inform and motivate the seafarers onboard. Offer information and protection.

The whole vessel needs to support the programme: captain and officers have to show their commitment.

It is not only a matter of good policy development but also of good policy implementation. It takes time to implement a prevention programme onboard. Make sure it gets where it is needed. Behavioural changes take several months and benefits may take even longer to become measurable.

Draw up an action plan showing desired results in respect of prevention of dental problems onboard and with a timescale. Involve key persons and link to a company policy on health.

Budget the programme, make sure the activities adopted are evaluated and be prepared to adapt the plan if some initiatives are not as successful as others.

Announce the planning and changes, organise an event to celebrate the start of the plan.

Provide information (posters or leaflets) on prevention of dental problems all over the ship.

Ask crew members to participate and comment on the campaign, and encourage them to complete questionnaires. Give crew members the chance to make suggestions on prevention activities.

Link DENTAL CARE with SHIP topics on SAFE TRAVEL and HEALTHY FOOD. Provide FIT ONBOARD and other SHIP health initiatives.

15. Where to Find Advice?



International Seafarers' Welfare and Assistance Network
Seafarers' Health Information Programme
Email: iswan@iswan.org.uk

www.seafarershealth.org



If you want to do more and get more information and material to improve the condition of seafarers onboard, go to www.seafarershealth.org where you can download guidelines, posters and leaflets on other health topics for seafarers : Food Safety, Fit onboard, Safe Travel, Healthy Food, Malaria, Overweight and HIV/Aids.