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FACULTY OF PHARMACY  
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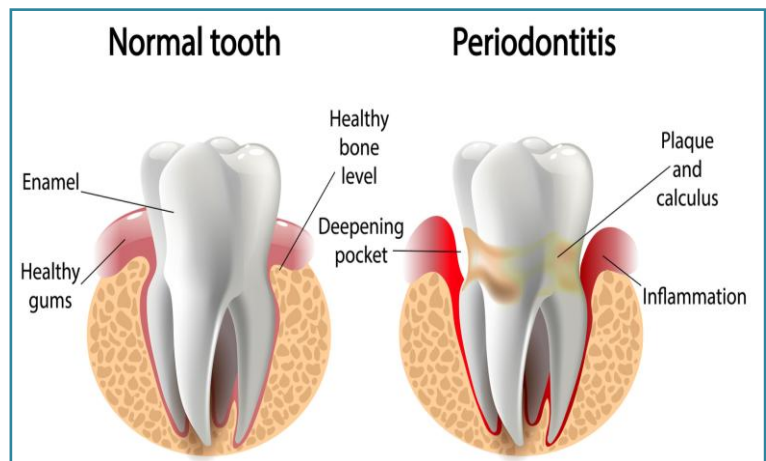
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# Periodontal (Gum) Disease

Periodontal (gum) disease is an inflammation of the tissues that supports teeth. Periodontal disease is considered a “silent” disease because it is usually painless. Our mouths are full of bacteria. These bacteria, along with mucus and other particles, constantly form a sticky, colorless “plaque” on teeth. Brushing and flossing help get rid of plaque. Plaque that is not removed causes gums to be pulled away from teeth, forming pockets. Plaque can also



harden into calculus (tartar) that brushing doesn't clean. Only a professional cleaning by a dentist can remove tartar, and a periodontal disease can develop.

Periodontal disease affects nearly half of the U.S. population. Nearly one in every two Americans over the age of 30 has periodontitis, according to a study by the Centers for Disease Control and Prevention published in the May 2015 Journal of Periodontology.

Periodontal disease is classified into 2 major stages according to the severity of the disease: GINGIVITIS and PERIODONTITIS

## GINGIVITIS

Gingivitis is the milder form that only affects the gums. Bacteria cause inflammation of the gums that can become red, swollen and bleed easily. At this stage, the disease is still reversible if caught early on and properly treated with daily brushing and flossing.

## PERIODONTITIS

If left untreated, gingivitis can turn into periodontitis, where the gums and bone that support the teeth can become seriously damaged. Gums pull away from the teeth and form spaces (called “pockets”) that become infected. The body's immune system fights the bacteria as the plaque spreads and grows below the gum line. Bacterial toxins and the body's natural response to infection start to break down the bone and connective tissue that hold teeth in place. If not treated, the bones, gums, and tissue that support the teeth are destroyed. The teeth -even healthy teeth - may eventually become loose and have to be removed.

## Risk Factors

- **Smoking** is one of the most significant risk factors associated with the development of gum disease. Additionally, smoking can lower the chances for successful treatment.
- **Hormonal changes in females** can make gums more sensitive and make it easier for gingivitis to develop.
- **Certain diseases**, such as diabetes, rheumatoid arthritis and Crohn's disease.
- **Other illnesses and their treatments**, such as AIDS and its treatments can negatively affect the health of gums, as can treatments for cancer.
- **Medications.** Hundreds of prescription and over the counter medications can reduce the flow of saliva, which has a protective effect on the mouth. Some medicines can cause abnormal overgrowth of the gum tissue; this can make it difficult to keep teeth clean.
- **Inadequate nutrition**, including vitamin C deficiency.
- **Genetic susceptibility.**

## How do I know if I have gum disease?

Symptoms of gum disease include: persistent bad breath, red or swollen gums, tender or bleeding gums, painful chewing, loose or sensitive teeth, and receding gums.

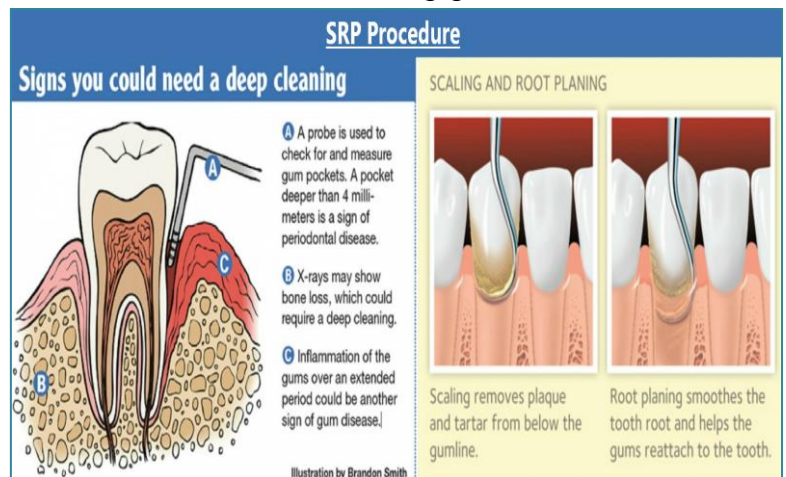
## How is gum disease treated?

The main goal of treatment is to control the infection. Types of treatment will vary, depending on the extent of the gum disease. The best chance for successful treatment is by adopting a daily routine of good oral care (brushing and flossing) and stopping tobacco use.

### Nonsurgical treatments

#### Deep Cleaning (Scaling and Root Planing)

The dentist removes the plaque through a deep-cleaning method called scaling and root planing (SRP). **Scaling** means scraping off the tartar from above and below the gum line. **Root planing** smooths rough spots on the tooth root where the germs gather, discouraging further buildup of tartar and bacteria, and removes bacterial byproducts that contribute to inflammation and delay healing or reattachment of the gum to the tooth surfaces. In some cases laser may be used to remove plaque and tartar. This procedure can result in less bleeding, swelling, and discomfort compared to traditional deep cleaning methods.



### Medications

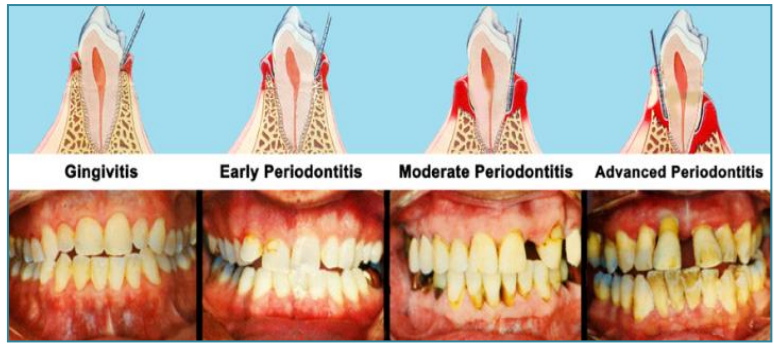
Medications may be used with SRP, but they cannot always take the place of surgery. Topical or oral antibiotics can help control bacterial infection. However, oral antibiotics may be necessary to completely eliminate infection-causing bacteria. Long-term studies are needed to find out if using medications reduces the need for surgery and whether they are effective over a long period of time.

Medications	What is it?	Why is it used?	How is it used?
<b>Prescription antimicrobial mouth rinse</b>	A prescription mouth rinse containing an antimicrobial called chlorhexidine	To control bacteria when treating gingivitis and after gum surgery	It's used like a regular mouthwash.
<b>Antiseptic chip</b>	A tiny piece of gelatin filled chlorhexidine	To control bacteria and reduce the size of periodontal pockets	After SRP, the periodontist places it in the pockets. The antibiotic is released slowly over a certain period of time.
<b>Antibiotic gel</b>	A gel that contains the antibiotic doxycycline		
<b>Antibiotic microspheres</b>	Tiny, round particles that contain the antibiotic minocycline		
<b>Enzyme suppressant</b>	A low dose of the medication doxycycline that keeps destructive enzymes in check	To hold back the body's enzyme response — If not controlled, certain enzymes can break down gum tissue	This medication is in tablet form. It is used in combination with SRP.
<b>Oral antibiotics</b>	Antibiotic tablets or capsules: amoxicillin or metronidazole	For the short term treatment of an acute or locally persistent periodontal infection	These come as tablets or capsules and are taken by mouth.

## Surgical treatments

In case of advanced periodontitis, treatment may require dental surgery, such as:

- **Flap surgery (pocket reduction surgery).** The periodontist makes tiny incisions in the gum so that a section of gum tissue can be lifted back, exposing the roots for more effective scaling and root planing. Because periodontitis often causes bone loss, the underlying bone may be recontoured before the gum tissue is sutured back in place. After healing, it's easier to clean these areas and maintain healthy gum tissue.
- **Soft tissue grafts.** When gum tissue is lost, the gumline recedes. Some of the damaged soft tissue may need to be reinforced. This is usually done by removing a small amount of tissue from the mouth palate or another donor source and attaching it to the affected site. This can help reduce further gum recession, cover exposed roots and give teeth a more pleasing appearance.
- **Bone grafting.** This procedure is performed when periodontitis has destroyed the bone surrounding the tooth root. The graft may be composed of small fragments of patient's own bone, or the bone may be synthetic or donated. It helps prevent tooth loss by holding the tooth in place. It also serves as a platform for the regrowth of natural bone.
- **Guided tissue regeneration.** This allows the regrowth of bone that was destroyed by bacteria. In one approach, the dentist places a special piece of biocompatible fabric between existing bone and the tooth. The material prevents unwanted tissue from entering the healing area, allowing bone to grow back instead.
- **Tissue-stimulating proteins.** Involves applying a special gel to a diseased tooth root. This gel contains the same proteins found in developing tooth enamel and stimulates the growth of healthy bone and tissue.



## Can Gum Disease Cause Health Problems Beyond the Mouth?

In some studies, researchers have observed that people with gum disease (compared to people without gum disease) were more likely to develop heart disease or have difficulty controlling blood sugar. Other studies showed that women with gum disease were more likely than those with healthy gums to deliver preterm, low birth weight babies. But so far, it has not been determined whether gum disease is the cause of these conditions.

More research is needed to clarify any gum disease- health related problems. In the meantime, it's a fact that controlling gum disease can save your teeth – a very good reason to take care of your teeth and gums.

## THE PHARMACY, A VITAL LINK FOR IMPROVING ORAL AND DENTAL HEALTH

Pharmacists play an essential role to improve the early diagnosis and prevention of gum disease, as well as to collaborate with dentists in monitoring its progression. They are in a crucial position to increase awareness regarding the benefits of good oral health as well as being a source of information for patients on the selection and proper use of the wide variety of OTC oral hygiene care products that help prevent periodontal diseases. Through routine monitoring, pharmacists have a vital role in recognizing patients who may be susceptible to dental problems associated with the use of some drugs and certain medical conditions. Pharmacists should always refer patients to seek professional advice when warranted.

Because many medications can cause varying degrees of adverse dental effects, such as xerostomia, tooth discoloration, abnormal bleeding, or inflammation of the gum tissue,

pharmacists also can use patient counseling sessions as an opportunity to remind patients about the importance of adhering to good daily oral hygiene practices as a means of reducing or preventing further complications and ensuring that patients understand the proper use of oral hygiene products.

**References:**

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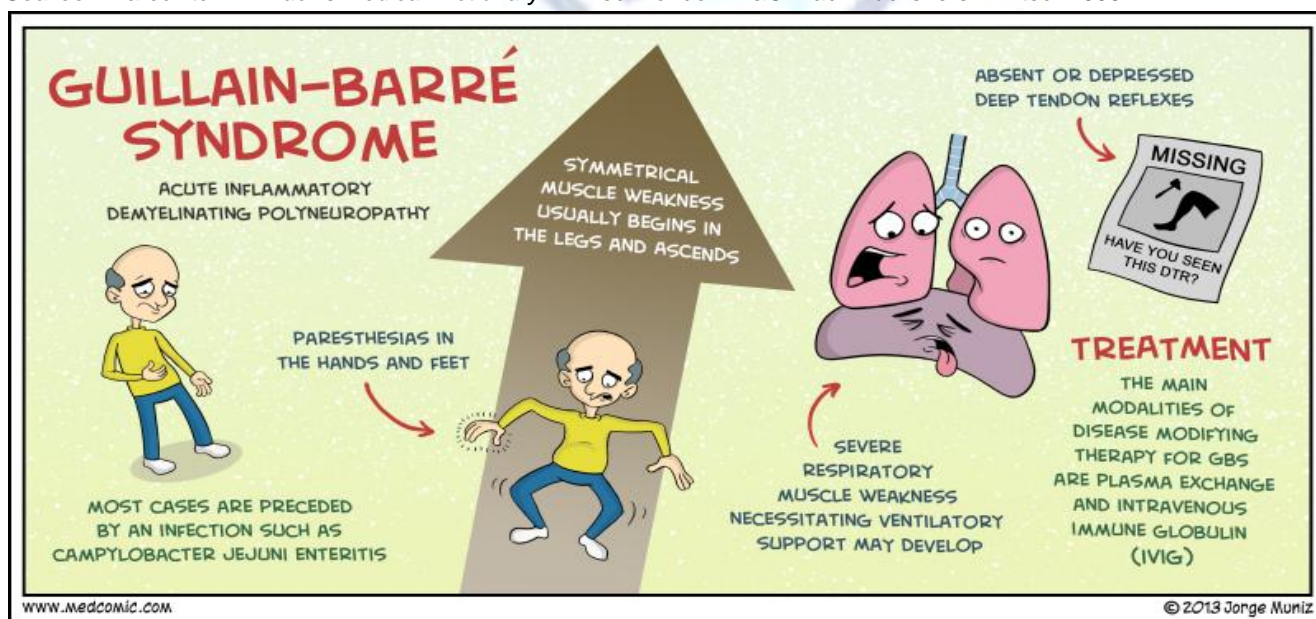
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## Terminology

### Guillain-Barré Syndrome

A disease of the peripheral nerves causing weakness and numbness in the limbs. It customarily occurs up to three weeks after an infection – for example, CAMPYLOBACTER infection of the gastrointestinal tract provoking an allergic response in the nerves. It may begin with weakness of the legs and gradually spread up the body. In the worst cases the patient may become totally paralyzed and require being artificially ventilated. Despite this, recovery is the rule.

**Source:** Marcovitch H. *Black's Medical Dictionary*. 41<sup>th</sup> ed. London: A&C Black Publishers Limited. 2005.



## Complementary Medicine

### Licorice root

**Latin Names**

Glycyrrhiza glabra, Glycyrrhiza uralensis (Chinese licorice)

- Most licorice root grows in Greece, Turkey, and Asia. Anise oil is often used instead of licorice root to flavor licorice candy.
- Centuries ago, licorice root was used in Greece, China, and Egypt for stomach inflammation and upper respiratory tract problems. Licorice root also has been used as a sweetener.

- Today, people use licorice root as a *dietary supplement* for digestive problems, menopausal symptoms, cough, and bacterial and viral infections. People also use it as a shampoo.
- Licorice is harvested from the plants' roots and underground stems. Licorice supplements are available as capsules, tablets, and liquid extracts.



### What It Is Used For

Licorice root has been used as a dietary supplement for stomach ulcers, bronchitis, and sore throat, as well as infections caused by viruses, such as hepatitis.

### What the Science Says

- Glycyrrhizin (glycyrrhizic acid)—a compound found in licorice root—has been tested in a few clinical trials in hepatitis C patients, but there's currently not enough evidence to determine if it's helpful. Laboratory studies done in Japan (where an injectable glycyrrhizin compound is used in people with chronic hepatitis C who do not respond to conventional treatment) suggest that glycyrrhizin may have some effect against hepatitis C.
- There's some evidence that topical licorice extract may improve skin rash symptoms, such as redness, swelling, and itching.
- A Finnish study of mothers and their young children suggested that eating a lot of actual licorice root during pregnancy may harm a child's developing brain, leading to reasoning and behavioral issues, such as attention problems, rule-breaking, and aggression.
- Studies of licorice root extracts in people for cavities, mouth ulcers, and oral yeast infections have returned mixed results.

### Side Effects and Cautions

- In large amounts and with long-term use, licorice root can cause high blood pressure and low potassium levels, which could lead to heart and muscle problems. Some side effects are thought to be due to glycyrrhizic acid. Deglycyrrhizinated licorice may not have the same degree of side effects.
- Taking licorice root containing glycyrrhizic acid with medications that reduce potassium levels such as diuretics might be bad for the heart.
- Pregnant women should avoid using licorice root as a supplement or consuming large amounts of it as food as some research suggests it could increase the risk of preterm labor.

### Drug-drug interactions

Co-medications that can potentially interact with licorice include prednisolone, aspirin, antibiotics, diuretics, cardiac glycosides, NSAIDs, oral contraceptives, antidiabetic drugs, antithrombotic drugs, and antidepressants.

**Sources:** 1) U.S. National Center for Complementary and Alternative Medicine. *Licorice Root*. [Internet]; 2016 Dec 01 [cited 2017 Aug 30]. Available from: <https://nccih.nih.gov/health/licoriceroot>  
 2) Aronson J K. *Meyler's Side Effects of Herbal Medicines*. Amsterdam: Elsevier; 2009.



1. Which of the following amounts of copper sulphate is required to make 400 mL of an aqueous stock solution, such that, when the stock solution is diluted 50 times with water, a final solution of 0.1% w/v copper sulphate is produced?
 

A. 0.2 g	B. 20.0 g	C. 0.4 g	D. 40.0 g	E. 50.0 g
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2. Disadvantages of the administration of corticosteroids in the eye include:
 

i. Corneal thinning	ii. Glaucoma	iii. Cataracts
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- A. i, ii and iii are correct
- C. i and iii only are correct
- E. iii only is correct

- B. i and ii only are correct
- D. i only is correct

3. If the patient has a history of gout, which of the following drugs is most likely to exacerbate this condition?

- A. Colestipol
- B. Gemfibrozil
- C. Lovastatin
- D. Nicotinic acid
- E. Simvastatin

## Real Enquiries

At the "Drug Information Center", we respond to enquiries from the professional healthteam as well as from others. Here's one of the enquiries received at the center:

**Enquiry received from:** H. A.- Assiut Governorate

**Enquiry:** Is Clomid® safe for males?

**Summary of the answer:** Clomid (clomiphene citrate) can be used to treat some cases of male infertility. These cases are considered "off-label" use. It can help increase sperm count levels and correct hormonal imbalances. It can also help to avoid in vitro fertilization (IVF) or surgical treatment. In other cases, it may help boost the odds of success after surgery or during IVF.

Unlike females, Clomid in men, is usually taken over a number of days for at least three months. Treatment usually takes at least a month before any changes in semen can be seen, and a full three months before pregnancy rates may show improvement.

Most studies on Clomid in men found no serious adverse effects. Blurred vision is a possible serious side effect as it can worsen and potentially cause permanent vision damage if left untreated. If someone experiences blurred vision or vision disturbances while taking Clomid, the doctor should be contacted as soon as possible. A recent study in 2016 characterizing the safety of clomiphene citrate in male patients have concluded that it significantly increased testosterone levels without changing prostate-specific antigen (PSA) or haematocrit (Hct) values. But because the biochemical response to Clomid can vary, scheduling laboratory evaluation at regular intervals is suggested; however, ordering routine assessment of PSA and Hct may not be necessary.

**References:** 1) [www.verywell.com/clomid-for-men-side-effects-and-success-rates-1959965](http://www.verywell.com/clomid-for-men-side-effects-and-success-rates-1959965)

- 2) Chandrapal J, et al. Characterising the safety of clomiphene citrate in male patients through prostate- specific antigen, haematocrit, and testosterone levels. *BJU Int.* 2016; 118:994-1000.
- 3) Willets A, et al. Clomiphene for the Treatment of Male Infertility. *Reproductive Sciences.* 20(7) 739-744

## Niacin and Cholesterol

Most people who have undesirable cholesterol levels and can't improve them sufficiently via diet and exercise are prescribed statin drugs. But there's also niacin (known as vitamin B<sub>3</sub>) that in very large doses can improve cholesterol levels and reduce the risk of heart attacks. In fact, when niacin's beneficial effect was discovered in 1955, it became the first treatment for high cholesterol. Who wouldn't prefer to take a vitamin over a prescription drug, you might ask. But it's not that simple.

Though classified as a dietary supplement, high-dose niacin, in effect, *is* a drug. And like any drug, it has potential side effects and should be taken under medical supervision. In addition, there are different forms of niacin, which vary in effectiveness and risks, so this can be confusing. What's more, niacin's anti-cholesterol credentials were recently tarnished when

disappointing results from a major study were released, making some people wonder if they should stop using niacin.

### What are niacin's benefits?

The main goal of cholesterol treatment is to lower LDL ("bad") cholesterol. Statins do this much better than niacin does. But niacin has the advantage of raising HDL ("good") cholesterol much more than statins do. It also lowers triglycerides in the blood that can increase the risk of heart disease.

Therefore, niacin may be a good option for people who can't tolerate statins well and for those who have very low HDL and/or high triglycerides. Moreover, niacin helps people who have elevated levels of small, dense LDL particles, which increase coronary risk.

### What are the risks of high-dose niacin?

The chief problem is that it often causes intense flushing (mostly on the face and upper body). This is not harmful or long-lasting, but many people find it hard to put up with and thus stop taking the pills. The flushing usually decreases with continued use. Niacin can, in rare cases, cause liver damage. It can raise blood sugar slightly, but is considered safe for people with diabetes. It can also increase the risk of gout and flare-ups of peptic ulcer disease.

### What are the different forms of niacin?

The form that improves cholesterol levels is called nicotinic acid. The standard dose for treating cholesterol is 1 to 3 grams daily, 50 to 150 times more than what's in a basic multivitamin. Other forms of niacin, such as niacinamide and inositol hexanicotinate, have little or no effect on cholesterol. In addition, there are 3 categories based on the rate of release:

- **Immediate-release niacin** is effective and least expensive, but causes more flushing. It has to be taken two or three times a day.
- **Sustained-release/extended-release niacin** causes less flushing. However, some over-the-counter formulations may be less effective and increase the risk of liver toxicity.
- **No-flush niacin** (inositol hexanicotinate) has no "free" nicotinic acid, so it has little or no effect on cholesterol. Still, some labels say "supports normal cholesterol."

### How can you reduce the flushing?

Besides taking an extended-release product, take niacin with food—preferably after dinner or a bedtime snack. Avoid hot drinks near the time you take niacin. Also, take aspirin (or a related drug, such as ibuprofen) before the meal; even a "baby" aspirin may help. But check with the doctor before taking aspirin regularly, since it is contraindicated for some people.

**BOTTOM LINE** Statins remain the first choice because they are most effective at lowering LDL, are proven to prevent heart attacks and rarely cause side effects. If you also have low HDL and/or high triglycerides, you and your doctor may decide to add niacin to your regimen.

**Source:** [www.berkeleywellness.com/supplements/vitamins/article/niacin-and-cholesterol](http://www.berkeleywellness.com/supplements/vitamins/article/niacin-and-cholesterol)

#### Answers:

- 1. B)** If we work backwards from the final solution, we have 0.1% w/v, which equates to 0.1 g copper sulphate in 100 mL solution. Multiplying by 50 gives the concentration of the original stock solution, which is, therefore, 5% w/v. This equates to 5.0 g in 100 mL. As we start with 400 mL stock solution, we need  $5.0 \text{ g} \times 4$ , which is equal to 20.0 g copper sulphate.
- 2. A)** Topical administration of corticosteroids in the eye is associated with thinning of the cornea and sclera, steroid glaucoma and steroid cataract. These side effects occur particularly after prolonged use. The use of a topical preparation containing only a corticosteroid in a patient presenting with a red eye may lead to aggravation of the underlying infection resulting in corneal ulceration with a possible loss of vision.
- 3. D)** Nicotinic acid has been used in the treatment of schizophrenia and hypercholesterolaemia; it has been noted to cause hyperuricaemia and occasionally gout. This effect is probably largely due to impaired excretion of uric acid, a 75% decrease in clearance following the administration of a daily dose of 4.5 g. Another possible cause is increasing the formation of uric acid.