Infectious Diseases at Dental Clinics

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Dental Clinics

Infectious Diseases at Dental Clinics

A dental clinic is a place where dental services are rendered. These services include diagnoses, treatment, and management of your overall oral health. Treatment rendered by a dental team consists of :

1. Assessment
2. Diagnosis
3. Planning
4. Intervention
5. Evaluation
6. Documentation

- The dental team includes: dentists, dental hygienists, dental assistants, dental laboratory technicians.
- It is important to visit a Dental Clinic in order to maintain your oral health.
- Even though a dental clinic is a place of healing, it is still possible to come across infectious diseases.

"A person can't have good general health without good oral health"
Former Surgeon General C. Everett Koop

"We're all connected"
NY Telephone

The Mouth-Body Connection

- The mouth is the upper opening of the body's digestive tract. The anatomy of the mouth includes lips, teeth, gums, and tongue.
- They all have important functions:
  - Lips- opening of the mouth, protects teeth.
  - Teeth- Mastication and speech
  - Gums- Protect the roots of teeth.
  - Tongue- Self-cleansing mechanism of oral cavity, taste, and speech.
- What goes on in your mouth will affect the rest of your body and vise versa:
  - A weakened immune system will increase risk of bacterial infections and diseases that manifest within the mouth.
  - Medications for overall health can have effects in the mouth such as dry mouth (xerostomia) which can also lead to halitosis (bad breath).
  - Dental decay can have effects in taste variations.
  - Bacterial infections of the mouth can directly affect blood-sugar levels for a diabetic.

Microbiota of the Mouth

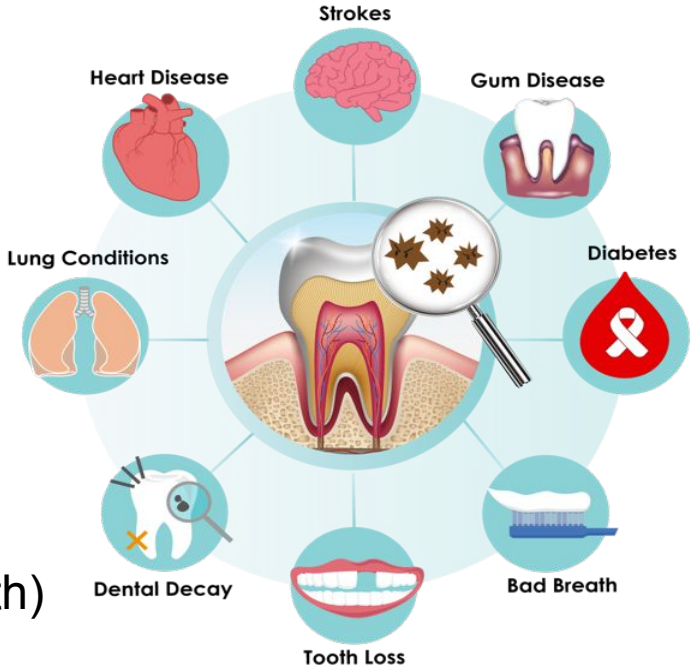
- **Microbiota** = Microbes that live/reside inside and on the human body
- The mouth may contain both **normal** microbiota and **infectious** bacteria
- Microbes may enter the body through the respiratory system and digestive tract.
- The mouth makes for an **ideal environment** for the growth of large and diverse microbial populations on the tongue, gums, teeth, and cheeks - mainly due to abundant moisture, warmth, and constant presence of food.
- **Normal Microbiota** of the Mouth includes:
  - Streptococcus
  - Lactobacillus
  - Actinomyces
  - Bacteroides
  - Veillonella
  - Neisseria
  - Haemophilus
  - Fusobacterium
  - Treponema
  - Staphylococcus

Oral Bacteria and Disease

Oral microbiota consists of beneficial and harmful bacteria.

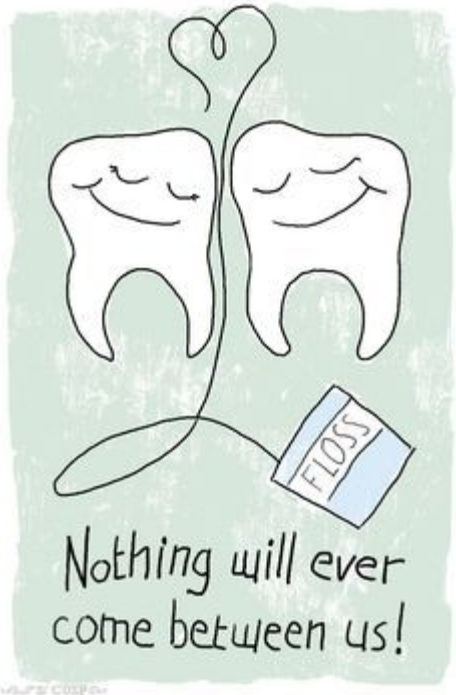
Harmful bacteria such as *Porphyromonas gingivalis, P. gingivalis,* have been linked to many oral and systemic diseases such as:

- Heart Disease
- Strokes
- Lung Conditions
- Caries (Dental Decay)
- Esophageal cancer
- Gingivitis (Gum Disease)
- Halitosis (bad breath)
- Diabetes
- Periodontitis, which leads to bone and tooth loss.



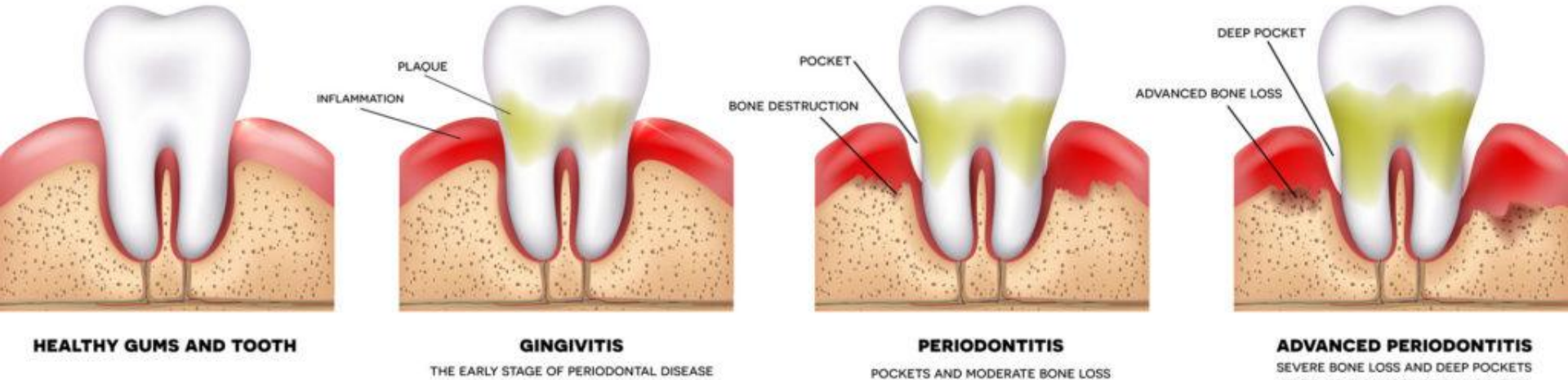
Dental Diseases of the Mouth

- ## Dental Caries (Cavities)
  - Microbes such as S. Mutans grow and accumulate on the surface of teeth making Dextran, a product that causes the formation of biofilm, also called dental plaque. When this plaque is not removed, it can cause tooth decay and result in further infectious growth. Prevention of dental caries would involve brushing daily for a minimum of 2 min, flossing, and decreasing dietary sucrose.
- ## Gingivitis (Gum Disease)
  - The toxins in plaque irritate the gums, causing inflammation, bleeding, and discomfort known as gingivitis. The bacteria responsible for gingivitis are Streptococcus mutans, Bacteroidetes: Porphyromonas gingivalis, and Actinomycetes. Gingivitis is reversible by following the same method as prevention. Prevention would include regular visits to the dental office for plaque removal in combination with the same proper homecare of preventing caries.
- ## Periodontitis
  - Periodontitis is a chronic gum disease that can cause bone destruction and possibly loss of teeth altogether. A patient would experience bleeding gums as well as pus pockets up to 15mm deep, subgingivally. Periodontitis is not reversible, but with proper home care, you can keep it from progressing.



Regular Dental Visits

- It is the responsibility of every patient to visit the dentist regularly for check-ups and follow-ups .
- Dental visits should occur minimally twice a year to assure proper oral health, but the appropriate amount of visits depends on your oral health status and susceptibility to oral and systemic diseases.



What Happens During A Dental Visit?

First, you see the dental hygienist. The hygienist will assess your oral health status by doing the following:

- EO/IO-Oral cancer screening
- Dental Charting
- Periodontal Exam
- Calculus Detection
- Scaling/Root Planing
- Fluoride Treatment
- Polishing

If the hygienist finds any abnormalities or suspicious lesions (suspected caries, ulcers,etc.), he/she will refer you to the dentist for further assessment and treatment.

What Happens During A Dental Visit?

Next, you will see the dentist. The dentist will look over the hygienists notes to determine what the next steps are. If treatment is needed, possible procedures include:

- Filling a cavity
- Root canal
- Crown Placement
- Extractions
- Implants
- Gingival Grafts (Reconstructive surgery)
- Dentures

If there is anything that is out of the scope of practice of the hygienist and dentist, the dentist will refer the patient to the appropriate specialist.

Infection Control

As medical professionals, we need to do everything we can to protect ourselves and the patient. We do this by following Infection Control Procedures:

- Also known as the "Exposure Control Plan"
- Dental professionals are required by OSHA to guard themselves and their patients from cross-contamination and lower risks of exposure to infection by:
  - Wearing Personal Protective Equipment:
    - Face Masks / Protective Eyewear
    - Gloves
    - Overgown
    - Scrubs
  - Disinfecting and Sterilizing:
    - Using antimicrobial soap and a -septic spray.
    - Sterilizing with an autoclave (Steam under Pressure System)

Health Risks at the Dental Office

Infectious diseases can be contracted from the dental office through:

1. Dental work/cleanings i.e. septicemia
2. Direct Contact: i.e. contaminated instruments
3. Air-borne infections: i.e. inhaling aerosols
4. Water-borne infections: i.e. using waterlines that haven't been purged.

Dental Work/Cleanings

- Dental work/cleanings can be invasive or non-invasive.
- If bleeding occurs during dental work, doesn't matter how minimal, there is now a path into the bloodstream.
- Oral bacteria and bacteria from contaminated instruments can now enter the bloodstream, this is known as septicemia or a bacteremia.
- When oral bacteria enters the bloodstream, chances of contracting a major or lethal disease increases greatly.
    - *Streptococcus viridans & Staphs*-Endocarditis
    - *Streptococcus*-Pericarditis
    - *Oral Streptococcus*-Osteomyelitis (bone infection after endodontic treatment)
- An extra step clinicians take to try and minimize the patient's risk is a pre-procedural rinse with an antiseptic mouthwash such as Listerine.

Direct Contact With Contaminated Instruments

What qualifies as contaminated?

- Non-sterilized instruments
- Instruments that have come in contact with biohazard materials such as blood and saliva.
- Instruments that have come in contact with surfaces that potentially contain pathogenic microbes.
- Instruments that have been dropped.
- Instruments that ARE sterilized but have been touched by an ungloved hand.
- Sterilized instruments coming into contact with the air when package is opened.
- Improper sealing of the sterilization bag.
- Instruments that are not being sterilized in between patients.

Direct Contact With Contaminated Instruments

What infectious diseases can you contract from contaminated instruments?

Bacterial Diseases

- Tuberculosis
- Strep throat
- Bronchitis
- Pneumonia
- Meningitis
- Encephalitis
- Conjunctivitis
- Dental Caries
- Septicemia

Viral Diseases

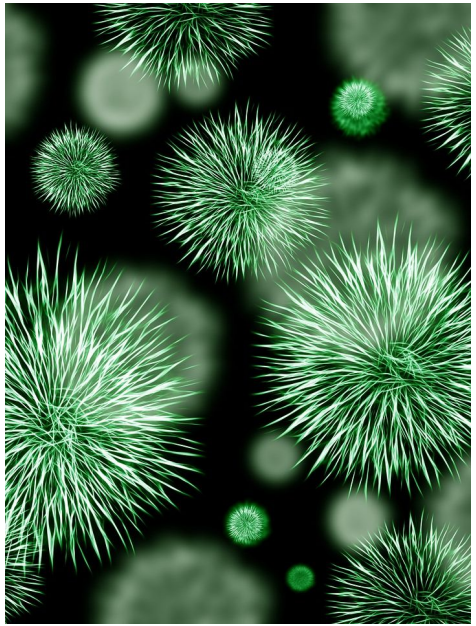
- Periodontal Disease
- Acute Necrotizing Ulcerative Gingivitis
- Hepatitis Viruses (A, B, & C)
- HIV
- Herpes
- HPV
- Flu/Common Cold Virus
- Mumps

Fungal Diseases

- Mouth Thrush
  - Candida Albicans

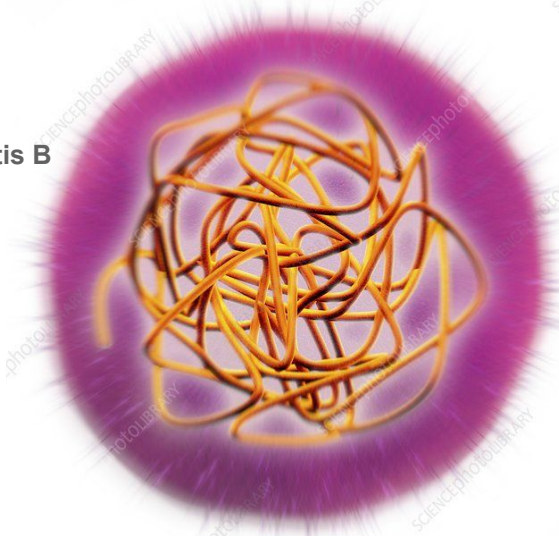
Bacterial Diseases

- Tuberculosis
  - Cause: Mycobacterium tuberculosis, characterized by weight loss, coughing, and loss of energy.
  - Treatment: BCG vaccine, a live avirulent culture of M. bovis. Antibiotics: Rifampicin.
- Strep throat
  - Cause: Group A beta-hemolytic streptococci (GAS), the group that consists of Streptococcus pyogenes (bacteria that are also present in skin.)
  - Treatment: Antibiotics.
- Pneumonia
  - Cause: by encapsulated Streptococcus pneumoniae.
  - Treatment: Vaccine that consists of purified capsular material from 23 serotypes of S. pneumoniae. Antibiotics.
- Meningitis
  - Cause: S. pneumoniae, commonly found in the nasopharynx.
  - Treatment:Untreated, it has a high mortality rate. A conjugated vaccine is available.
- Conjunctivitis
  - Cause: infection of the conjunctiva caused by Chlamydia trachomatis.
  - Treatment:Antibiotics, eye drops.
- Dental Caries
  - Cause: S.Mutans
  - Treatment: Homecare and dental intervention.
- Septicemia
  - Cause: Bacteria proliferate in the blood and accumulate their toxins.
  - Treatment: Antibiotics. Pre-medication.
- Endocarditis
  - Cause: A focus of infection, such as a tooth extraction, or tonsillectomy (removal of tonsils).
  - Treatment: Antibiotics



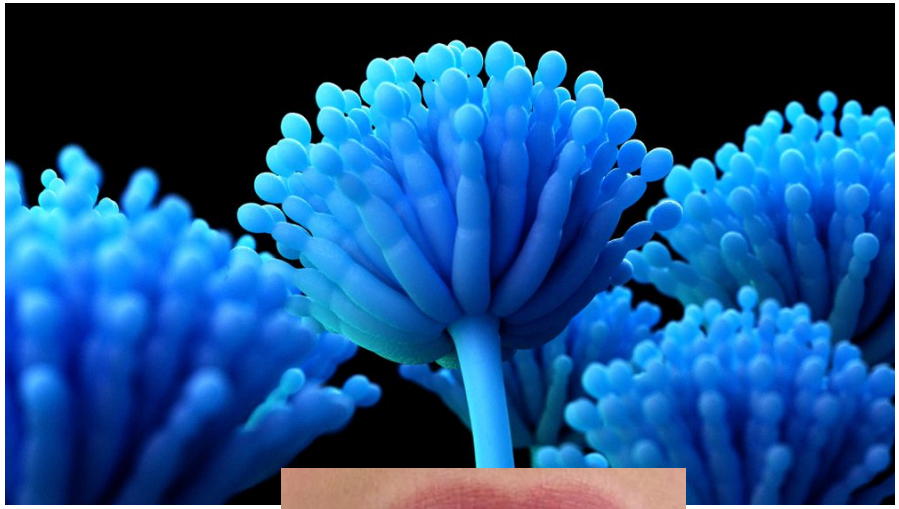
Viral Diseases

- Periodontal Disease
  - Cause: Bacteroidetes: Prevotella intermedia, Porphyromonas spp. characterized by bleeding gums and pus pockets.
  - Treatment: Antibiotics, remove damaged area, continued plaque removal.
- Acute Necrotizing Ulcerative Gingivitis
  - Cause: Prevotella intermedia, characterized by pain chewing and halitosis.
  - Treatment: Metronidazole, remove damaged area, oral hygiene instruction.
- Hepatitis Viruses (A, B, & C)
  - Cause: Ingestion or contact with pathogens: Hepatitis A Virus, Picornaviridae, Hepatitis B Virus, Hepadnaviridae, Hepatitis C Virus, Flaviviridae.
  - Treatment: Vaccine available for Hepatitis A and B, none for C.
- HIV
  - Cause: HIV Virus.
  - Treatment: None, Antiretroviral therapy to slow disease progression.
- Herpes
  - Cause: Transmitted through oral and respiratory routes resulting in cold sores and occasionally encephalitis (Brain infection).
  - Treatment: Can become inactivated through antibiotics (Acyclovir)
- HPV
  - Cause: Human Papillomaviruses: characterized by warts in genital area.
  - Treatment: Podofilox, imiquimod, preventive vaccine
- Flu/Common Cold Virus
  - Cause: Rhinoviruses (about 50% of all common colds), and Coronaviruses. Symptoms include sneezing, nasal secretions, and congestion.
  - Treatment: Antibiotics.
- Mumps
  - Cause: Mumps virus, Paramyxoviridae, painful swelling of parotid glands
  - Treatment: Preventative vaccine.



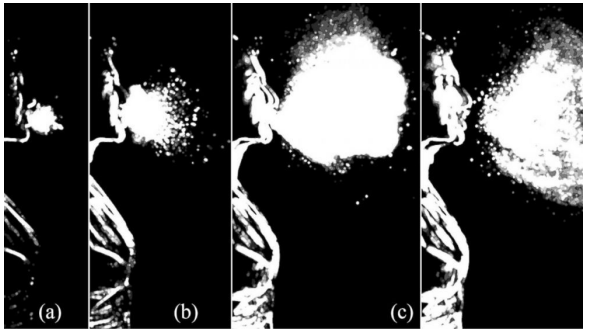
Fungal Diseases

- Thrush
  - Cause: Candida albicans.
  - Treatment: Topical antifungal chemicals.



Airborne Infections

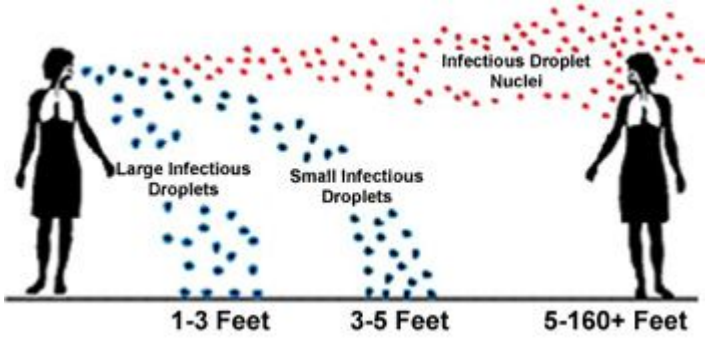
Airborne Infections can be transferred through aerosols, also known as infectious droplets.



Aerosols are created when:

- Using an air-water syringe
- Using an ultrasonic
- Sneezing
- Coughing

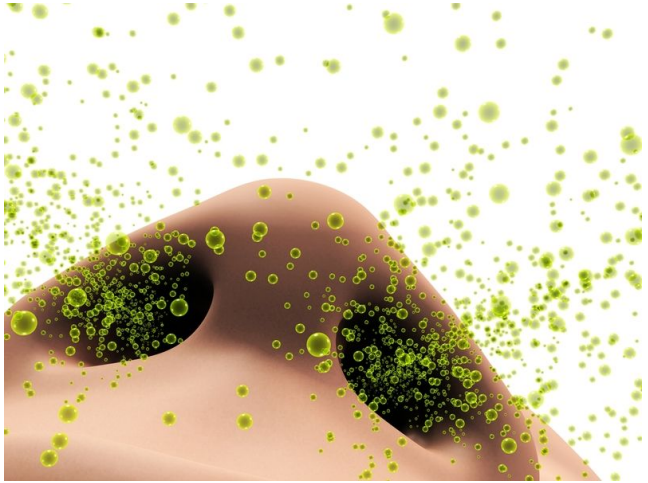
The smaller the aerosols, the farther they travel and the longer they linger in the air.



Airborne Infections

Infections that can be spread by aerosols include:

- Tuberculosis
- Strep- throat
- Bronchitis
- Pneumonia
- Flu/common cold
- Mumps



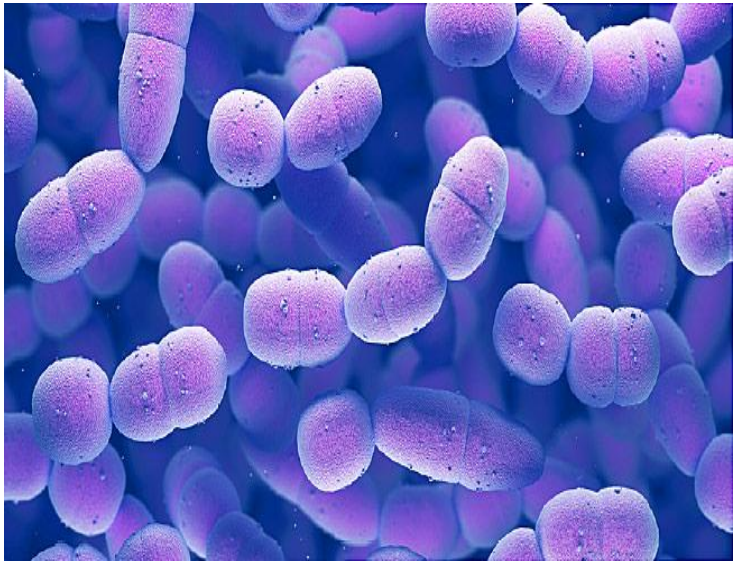
Clinicians have patients do a pre-procedural rinse in order to reduce the number of microbes spread by aerosols.

Water-borne Infections

- Water-borne infections can be transmitted in the dental clinic when proper water-purging protocol is not implemented.
- Water is needed in order to drain out the blood and dirt from the mouth, and therefore should not be contaminated.
    - *Fusobacterium neonatorum*-Colon cancer
    - *Porphyromonas gingivalis*-Esophageal cancer
    - *Prevotella intermedia*-Lung infections
- Be sure to ask your dental professional if a proper purging of the water is done for a minimum of 2 minutes to remove any bacteria left idle in the pipes.
- Clinicians use saliva ejectors and/or high-speed suction to eliminate contaminated water and saliva from pooling in your mouth.

Protozoan Diseases

- Cryptosporidiosis
  - Cause: Contaminated water containing Cryptosporidium hominis, characterized by diarrhea, but life threatening in immunosuppressed patients (AIDS patients)
  - Treatment: Oral rehydration
- Giardiasis
  - Cause: Giardia Lamblia growing in the intestines of humans from contaminated water, characterized by nausea, weakness, prolonged diarrhea, abdominal cramps, odor in breath or stools.
  - Treatment: Metronidazole or Quinacrine Hydrochloride
- Amoebic Dysentery
  - Cause: Entamoeba Histolytica growing in the large intestines, water contaminated with cysts.
  - Treatment: Metronidazole, Iodoquinol.



Viral Diseases

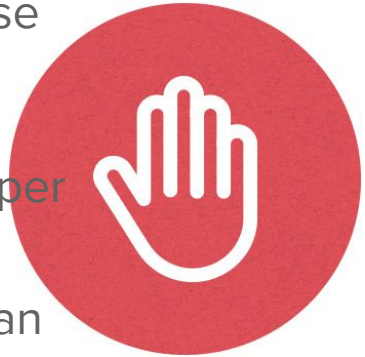
- Hepatitis A Virus
  - Cause: A RNA virus by ingestion of contaminated water, grows in the cells of the intestinal mucosa and spreads to the liver, kidneys, and spleen.
  - Treatment: Passive immunization, vaccine.

Bacterial Diseases

- Cholera - *Vibrio Cholerae*
- Campylobacter Gastroenteritis - *C. jejuni*
- Pseudomonads Infection - *Pseudomonas Aeruginosa*
- Salmonella and Typhoid Fever - *Salmonella Typhi*
- Bacterial Pneumoniae/Legionellosis - *Legionella-pneumophila*

Prevention in the Dental Clinic

Not only should the healthcare provider assume responsibility for proper infection control; but you, the patient, can have an active role in disease prevention as well:



- Make sure to research the dentist before your visit to confirm proper qualifications and rapport with other patients.
- Make sure that the dentist is using proper protective equipment: an overgrown, face mask, gloves, and glasses to stop saliva/aerosols from being transferred.
- Make sure that the gloves/mask are new and not previously worn/used on any patients/unclean surfaces before you.
- Check with your provider if you need premedication (antibiotics) before your regular dental visits to prevent infections in high risk patients.

Major Infection After Dental Visit

What should you do if you contract a major infection as a result of a dental visit?

Dentists and hygienists are required to keep detailed records of patients' health status as well as any treatment rendered including planned treatments.

If you can prove that your infection is a result of malpractice at the office and the notes, or lack of, can support your claims; you can sue and possibly win the case!

As stated in the beginning of the presentation, our mouth is connected to the rest of our body. It is your right as a patient to make sure it is treated with the care and attention, just like the rest of your body.

Conclusion

- Dental clinics present a risk of contracting infectious diseases.
- Our mouth is connected to the rest of our body, that is why infectious diseases at dental clinics are a serious risk.
- Both the clinicians and the patient need to take certain steps in order to aid in preventing the spread of infectious diseases.
- If you are sick, call and cancel your appointment. It is better for everyone if you stay home and rest. Remember: Doctors can get sick too!
- When you are sick, prevent the creation of aerosols by covering your nose AND your mouth by coughing/sneezing into your elbow. This also includes yawning!
- Stopping the spread of infection starts with you!

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