Sterilization and disinfection in a dental office

Literature, Play

There are two important things to do in a dental office in order to prevent cross infection. These two forms are sterilization and disinfection. According to the CDC and the Food and Drug Administration before either of these forms can be used you have to clean the instruments. This can be done either by hand or by using an ultrasonic cleaner. (http://www. maexamhelp. com/instru_sterilization. htm) Even though both sterilization and disinfection are both important there is a big difference between the two.

Sterilization is the process of killing all microorganisms. Where disinfection is the process of destroying pathogenic organisms or rendering them inert. The centers for disease control says there is one cardinal rule for infection control which is " Do not disinfect when you can sterilize" (http://www. maexamhelp. com/instru_sterilization. htm). I am going to start with explaining what sterilization is and giving examples of how it works.

I will then move on to disinfection, giving examples and how it is used. The sterilization procedure must kill all microorganisms present on the item being sterilized. A process cannot be called " sterilization" unless it kills all bacterial spores, the most difficult of microorganisms to kill. There are multiple ways to sterilize, but I am only going to talk about the four main ways of sterilizing in a dental office. http://www. nurseslearning.

com/courses/fice/fde0008/c7/index. htm (this is for the bio) The first way is using the autoclave, The most common source for autoclaving is heating. The autoclave must maintain a temperature of at least 246 degrees for half an hour. You can use both dry or steam heat autoclaves. For the steam heat systems, heated water vapors are used.

The dry heat system is used for moisture sensitive surgical products or instruments. http://www. surgicalsindia. com/autoclaves. html (this is for the bio) The second form of sterilization is, unsaturated chemical vapor. Chemical vapor is similar to autoclaving. The difference is chemical vapor uses a combination of chemicals (alcohol, formaldehyde, ketone, acetone, and water) where autoclaving only uses water. When using they system OSHA requires a material safety data sheet on the chemical vapor solution.

The reason behind this is because of the chemicals' toxicity. Essentials of dental assisting by Debbie S. Robinson – Doni L. Bird Fourth Edition Chapter 8 page 120. (this is for the bio) The third is dry heat. Dry heat is one of the earliest forms for sterilizing. This form is as it sounds, dry heat utilizes hot air that is either free from water vapor, or has very little of it, and where this moisture plays a minimal or no role in the process.

The way dry heat sterilizes is by coagulating the proteins in any organism, thus causing drying of cells. Dry heat can even burn them to ashes. http://en. wikipedia. org/wiki/Dry_heat_sterilization The last form of sterilization I am going to talk about is cold sterile.

The reason for cold sterile is not all items can go into heat sterilization. Liquid sterilant, such as 2% to 3. 4% glutataldehyde, must be used for this type of sterilization.

In order for the cold sterile to work the items must be fully submerged for no less than 10 hours, anything less than that would only be disinfection. This form of sterilization also requires a material safety data sheet due to it being

a chemical. Essentials of dental assisting by Debbie S. Robinson – Doni L. Bird Fourth Edition Chapter 8 page 122 Disinfection is intended to kill disease-producing microorganisms. This process does not kill spores. Disinfectant is applied to inanimate surfaces, such as countertops and other equipment in the operator that is unable to be sterilized. The EPA decides what chemicals are disinfectants.

In the dental field only products that are registered with the EPA as hospital disinfectants that include tuberculocidal, which kills the organism Mycobacterium tuberculosis, should be used. Just like sterilization there are many types of disinfectants, I am only going to talk about four. The ideal disinfectant should be one that kills pathogenic organisms, is odorless, gentle to dental equipment, nontoxic, and economical to use. Sadly there is no such disinfectant on the market, so you must make informed choices.

The first disinfectant is Iodophors. This is EPA registered and an intermediate – level hospital disinfectant which also includes tuberculocidal action. For surfaces that have been soiled with potentially infectious material iodophors are recommended to disinfect. As long as you use this product according to the manufacturers instructions, iodophors are effective with in 5 to 10 minutes. In order for iodophors to work properly you need to mix it with soft or distilled water. A down fall to iodophors is that they may corrode or discolor certain metals or temporarily cause stains on clothing.

The second is one that can also be used as a sterilant. This product is glutaraldehyde. They way this can be used as a disinfectant is to use for more than 10 minutes but less than 10 hours. Just like any other chemical

make sure you read the manufacturers recommendations. The third is chlorine dioxide. This is classified as a high level disinfectant. Chlorine dioxide is another chemical that can be used for both disinfectant and as a sterilant. This can be used as a 3 minute effective, rapid-acting, environmental surface disinfectant or as a 6 hour chemical sterilant.

The down fall to this product is that it does not penetrate organic debris and has to be used with another cleaner. There are other disadvantages to this product. It has to be made daily, will corrode aluminum containers and has to be used in a well vented area. The fourth and last form of disinfection is ortho – phthalaldehyde.

This chemical is effective in achieving high level disinfection within 12 minutes at room temperature. If you are allergic to OPA a good alternative is glutaraldehyde. It also has very little odor and you do not have to activate or mix it. The only draw backs are it is more expensive, it can only be used for half the time that glutaraldehydes, it can stain skin and fabrics, if proteins have not been removed it will turn plastics a blue-green color, and it can not be used as a sterilization. Essentials of dental assisting by Debbie S. Robinson – Doni L.

Bird Fourth Edition Chapter 7 pages 101-105 Personally prefer sterilization. I own a floor and a hand held sterilizer. I do have to use both forms. Some of my daughters toys can not be sterilized so I use house hold bleach to disinfect them