

OCCUPATIONAL HAZARDS

What do we mean by hazard? And what do we mean by risk?

When you start to work in any place you have to identify the hazards; things that cause harms, to identify if there is a chance to be harmed by this risk.

Steps or “cycle” of dealing with hazards:

1. identifying the hazard
2. rate them which is the most frequent, which is the most severe
3. identify how can I control this hazard
 - a. ad ministerial and work practice control
 - b. PPE; personal protective equipment: gloves, mask, goggles ...etc
4. After applying these principles I reevaluate the hazards (feedback). Very important; that’s why we call it a cycle.

Now, as dentists, what hazards are we exposed to?

1. the patients
2. machines and equipments
3. dental materials that we use
4. radiographs that we take
5. stress of work
6. posture

Hazards can be classified into:

1. physical
2. chemical
3. biological
4. Ergonomic.
5. Psychological.

Physical hazards

1. Cuts with sharp medical instruments like scissors, here we’re talking about sterile instruments that haven’t been in contact with anything yet. How can we avoid such hazard? a suggestion is keeping this kind of instruments away when not needed like

keeping them in a box for the time to be used, and when that time comes we handle them carefully.

2. Fire: we use it in the lab and also in the clinic and it's of course a source of physical hazard.
3. Projectiles: objects that fly to a high distance, how can we have such thing in our clinic? A perfect example would be a bur flying out of the hand piece because of the high rotary speed or because of improper handling.
4. Compressed gas: sometimes we use this in surgeries. If it was mishandled it'll hurt you. How can I prevent getting harmed by compressed gas? If I have a cylinder in the clinic then its cap has to be much secured so it doesn't open by accident. Secured in a certain corner not in the middle of the way. Follow the manufacturer instructions; educate yourself and your co-workers as well. Protective foot wear for the one to handle a large cylinder of the gas, make sure to wear something heavy in your feet so if the cylinder dropped by accident it won't be able to hurt you.
5. Vibration and noise: caused by rotary instruments and the suction sound especially the high volume suction, and anything that you can imagine that makes noise at the clinic. Noisy environment, source of energy that travels through our body. It travels in higher speed in solid materials than in liquids or gases. So you're holding the hand piece and drilling inside the patient's mouth, all those vibrations and noises are travelling through your body right into your ears; it doesn't need to travel through air. you're exposed \pm 5 days a week, but the patient is only exposed for a few times throughout his life so basically it's you who are being exposed to this cumulatively How to reduce all this? The doctor said the following: organize the patient so it doesn't have to be rotary instruments all the time. You can have rests to make basic examination, impressions ... etc
6. UV light: we use it to cure certain materials as you know. It can damage the retina if the eye is exposed to it too much. How to reduce this? Area design, so the light is not close to you or your patient. Blue light filters; can be equipped to the light cure itself, or it can be in the form of glasses, one for you, and one for the patient, and you ask the patient to close his eyes for more protection. Worker education; you should educate your co-workers about the risks.
7. Recently sterilized instruments (they are very hot). How can this happen? If you have a busy clinic and a limited number of instrument kits that have to be sterilized after each patient, so you get them just right out of the autoclave, they're very, very hot; you could harm yourself or your patient. So you need to inform your nurse that you are having a big number of patients so she can manage it. the doctor said sometimes

we put them in water before we use them to cool them down; I'm not sure if this is a good behavior, because to my knowledge once they're in water they're not sterile any more.

Safety considerations while working in a dental clinic to avoid radiations as much as possible

1. Work area design. You, your co-workers and the patients in the waiting room have to be away from where patients take radiographs.
2. to have the proper shielding or filters
3. equipment design with minimal scatter
4. exposure monitoring patch: a patch that can be worn for a long time (a month) to monitor how much radiations are you exposed to during all that month, and then evaluate your safety measures if they are good enough or not.
5. replacement of older dental machines (the newer ones are more safe)
6. Proper education about the risk of the radiographs for you, the co-workers and the patients.
7. Use of lead gloves as an extra safety measure.

Another physical hazard:

8. slip, trip, falls

The floor has to be straight and flat. Sometimes there are wires or such things on the floor that you can stumble with.

Avoid all this by:

Using flooring that resists slipping

Proper lighting system

Proper maintenance of flooring of the hallways, stairs...etc, you have to maintain it regularly so it doesn't have any hazard.

Proper education.

If any spillage happens, you have to have certain guidelines, which are: immediate clean up procedure, put a sign that says wet floor, remove the sign after you make sure it's safe.

Chemical hazards.

Mainly from the materials we use.

MMA; used in many dental material, as a filler in composites. Very dangerous material, if it touched the skin you could get contact dermatitis. If you inhale it you could get asthma, drowsiness, anorexia, headache, loss of appetite. All these

symptoms can happen only from the exposure to the material doesn't have to be a long life exposure.

Prevention: using alternative materials if we can. If not, we should have good ventilation in our work place, which means there is always air coming in and out of the clinic. Education of the workers should be also taken in consideration. Annual checkup.

*Using gloves when handling the material.

Silica: hazardous, dangerous material, which can accumulate in the body.

Silicosis → cancer → death

Prevention: alternatives. If there is no any → proper ventilation. And

You have to use it wet so its vapor doesn't effuse in the air.

Mercury: we all know that it's a major constituent of dental amalgam. Can be accumulated in the body. If you inhale its vapor 80% of it will accumulate in your body. If you have a proper coolant system you won't have the vapor op it in the air. So basically anything that contains mercury shouldn't be exposed to heat.

Sensitivity to mercury is very rare

The scientific literature fails to identify a causal relationship between dental amalgam and adverse health effects.

Highest organs of mercury accumulation are: liver and kidney.

- Prevention: alternatives.
- proper ventilation
- proper use of the high volume suction
- education
- monitoring the workers
- proper mixing of amalgam capsules

Mercury spillage immediate clean up procedure. Effective technique; we have at our clinics something called low volume aspirator; we can use very efficiently to clean amalgam spillage. If we don't have it, we can use hand filled bumps; something that you can squeeze then get it close to the amalgam and then you release it, it should absorb all the amalgam.

DON'T use a sponge.

DON'T use household vacuum, because it'll turn it into vapor and spread it in the air.

There are spill cleanup kits that are available at the market. We can use them; it's good to keep one at our clinic.

Latex: gloves, rubber dam

We are very exposed to it

Irritation, non allergic condition, skin becomes dry, removing the latex subsides the symptoms.

Allergic reaction: we have two types of allergy to latex; delayed and immediate.

the delayed reaction (6-48 hours) is less dangerous, symptoms include: dry skin, lathery, pustules, eruptions, sores, blisters → the reaction goes on and on but it's very much confined to the area that's been exposed → there are certain creams to treat it.

the immediate reaction (hypersensitivity reaction) within minutes, more dangerous, symptoms are not confined to the exposed area, involving parts of the body other than the skin like the retina of the eye, dizziness, hypotension, nausea, shock → if it wasn't early identified and treated it may lead to death.

Prevention: latex free gloves.

BIOLOGICAL HAZARD

Biological refers to human beings (patients / co-worker such as the assistant) or any biological specimen.

In this kind of hazards, we worry about anything that is contagious; you worry about yourself or about your next patient from the contagious instruments.

-universal precautions say that you should deal with any patient as a contagious person until proven otherwise ... why???

1) The patient is really contagious and he doesn't have any idea that he has contagious disease ((there are a lot of hepatitis B carriers or HIV + patients that they don't know that they have the disease)) Also as dentists, we may go to different countries (different environments) which have diff kinds of bacteria, viruses, parasites and fungi ... so you should deal with all the patients as they are contagious

2) The second reason which is less common ... the patient consciously decided not to tell his dentist that he has a contagious disease, and his dentist will discover it accidentally by taking a good history. It is a partially mistake done by the health care provider; because there are many dentists when they know that the patient has a contagious disease. They will not accept to deal with him which is unethical thing to do.

* in your clinic ,,you will deal with many sharp instruments such as needles & burs ,, and all of us as dentist we may have needle stick injury .. You will mostly be in the safe side if you follow all these things:

1) History / clinical examination: you should know all the information about your patient that you are going to deal with

2) You should avoid to close your needle or any sharp instrument in a wrong way or while you're talking with others. Most dentists get injured from a needle stick, so efficient management in such cases is extremely important.

3) Sterilization and disinfection efficiently.

4) Immunization (like Hepatitis B vaccination)

5) Special care should be taken with high risk patient (with HIV, HEPATITIS B)this patient should be treated last one in your clinic (needs a special sterilization technique).

Ergonomic Hazards:

It revolves around the general environment, level of stress and posture. This ensures looking into facilitating a good working environment to achieve optimal

results. Enthusiasm may lead to repetitive movements and wrong postures that may hurt dentists in the long run. Some patients require long procedures to be done.

Psychological Hazards:

Stress:

Dentists are proved to have more than one psychological problem... we have more incidence to have more type A personality people,,,,, dentists in general they are perfectionist they are very competitive we want things to be better and every time it gets better u want it to be much and much better ...that's why the UK & USA have the largest no. of suicide ...

So we have to think about the effects physical and emotional to all the requirements of the job that do not match capabilities or resources or the need of that worker.

Psychological effects:

- Anxiety
- Tension
- Irritability
- Depression
- Boredom
- Inability to concentrate
- Low scheme

They are all linked to each other and very complicated, but it happens to some people and if you are aware of that you will avoid all that sort of complicated problems just by understanding that some stress is normal and some stress is helping you in the work environment because if you are stress then you care to attend and come to work