BCCOHP | British Columbia College of Oral Health Professionals

Mailing Address
110 - 1765 8th Ave W
Vancouver, BC V6J 5C6

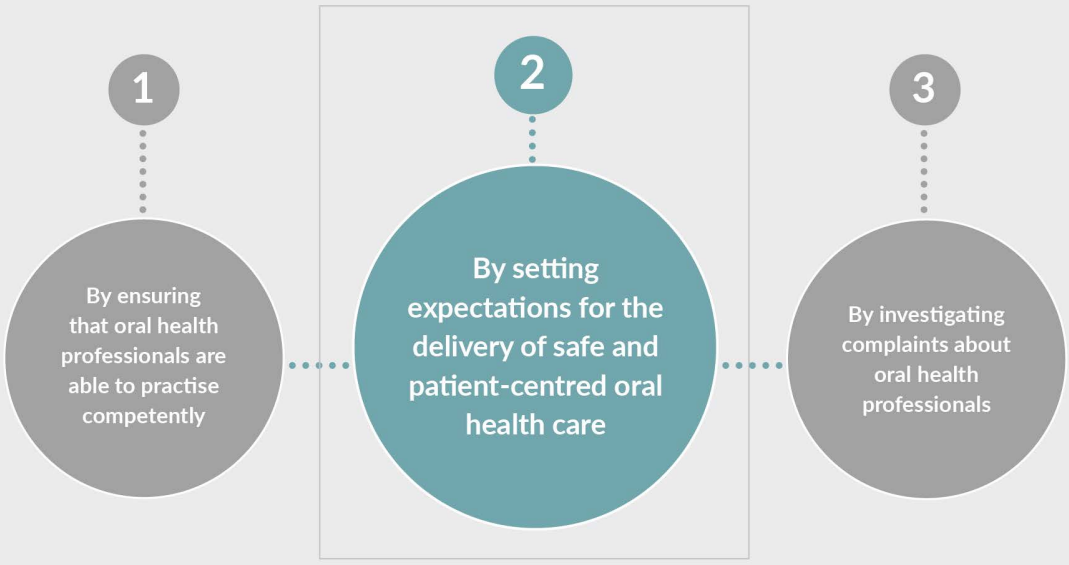
Phone: 672.202.0448
Toll free: 1.888.202.0448
info@oralhealthbc.ca
www.oralhealthbc.ca

Expectations for clinical and ethical practice

Interpretation Guidelines: Implanted Cardiac Devices

Applies to Dental Hygienists

There are three main ways that the BC College of Oral Health Professionals protects the public:



The British Columbia College of Oral Health Professionals (BCCOHP) was created on September 1, 2022 through the amalgamation of four health regulatory colleges: the College of Dental Hygienists of BC, the College of Dental Surgeons of BC, the College of Dental Technicians of BC, and the College of Denturists of BC. All current requirements for standards of clinical and ethical practice issued by the four colleges remain in place upon amalgamation. This document was created by the College of Dental Hygienists of British Columbia and will be updated to reflect the amalgamation.

Implanted Cardiac Devices

May 5, 2020 Update: The CDHBC Interpretation Guidelines are under review. The content of these guidelines remains in place at this time; however, they need to be applied in the context of the new Dental Hygienists Regulation and CDHBC Bylaws. Readers are welcome to contact the CDHBC office if they have questions about the application of these guidelines in the interim time.

PURPOSE

To provide current guidelines for dental hygiene clients with implanted cardiac devices: cardiac resynchronization therapy devices (CRTs and/or pacemakers) and implantable cardioverter defibrillators (ICDs).

BACKGROUND

In recent years there have been advances in the technology and the function of implanted cardiac devices. These devices are being implanted to improve the function of the heart, thus improving the quality of life for those suffering with heart failure and ventricular dyssynchrony. Those with heart failure may be treated with implantable cardioverter defibrillators (ICDs) or cardiac resynchronization therapy devices (CRTs). ICD and CRT devices are small computers or microprocessors implanted subcutaneously, most commonly near the clavicle in adults. However, in children the device may also be implanted in the abdomen. Often, one or more of these implanted device's features can be present in a single or combination type device.

A CRT is a pacemaker that re-synchronizes the heart's contractions caused by arrhythmias, by essentially "re-tuning" the heart's electrical conduction. They are most commonly used to treat bradycardia (slow heart rate). The pacemaker sends low energy electrical impulses to the heart, via a small insulated lead/wire. This ensures that the heart beats at the appropriate rate so that adequate blood and oxygen are delivered to the brain and other parts of the body.

Implantable cardioverter defibrillators (ICDs) are used to treat tachyarrhythmia (abnormally high heart rate). The ICD will continuously monitor the heart rhythm and deliver a low energy electrical pulse if an abnormal heart rate is detected. If this does not restore normal rhythm, newer generation ICD combination units, will then defibrillate the heart by sending higher energy life-saving electrical pulses to stimulate a normal heart rate.

Pacemakers and ICDs are sensitive to strong electromagnetic signals that may temporarily interfere with their function. Most devices are designed with safeguards that include electronic filters or insulators to ensure proper operation and reduce electromagnetic interference (EMI). The terms shielded or non-shielded are no longer referred to when discussing safeguards

incorporated in the implanted devices. ICD's and pacemakers use the terminology and technology referring to unipolar or bipolar devices. ICDs on the market today are bipolar, whereas pacemakers may be either unipolar or bipolar. ICD's and pacemakers that are bipolar provide improved protection and filtering against EMI. Unipolar pacemakers provide less safeguards or filtering against EMI.

Most dental hygiene/dental procedures do not involve strong electromagnetic signals and therefore are unlikely to interfere with a pacemaker or ICD. This includes dental radiographs, dental handpieces, ultrasonic instruments (including piezoelectric, magnetostrictive, and sonic), curing lights and Transcutaneous Electrical Nerve Stimulators (TENS), provided the equipment is not placed directly over the implant site.

St. Jude Medical, Biotronik and Metronic are manufactures of commonly implanted pacemakers and ICD's in North America. Each company states on their respective website that there are no adverse effects when using newer ultrasonic instruments on clients who have the newer bipolar implanted cardiac devices. Older ferromagnetic ultrasonic scalers may cause single beat inhibition on unipolar pacemakers. Information provided from St. Jude Medical and Boston Scientific indicates that this inhibition is not considered clinically significant. However, Boston Scientific recommends caution when using ultrasonic scalers, and discontinuing use in the event that a client with an implanted cardiac device feels lightheaded or experiences an irregular heartbeat.

It was formerly thought that additional protection for a client with a pacemaker or ICD could be achieved by covering the client with a lead apron, such as an apron used for protection when exposing radiographs. However, while consulting with Boston Scientific, information provided clarified the fact that covering pacemakers and ICD's with a lead apron offers protection from ionizing radiation only and will not provide protection against EMI.

Dentsply, the manufacturer of the Cavitron® magnetostrictive power scaler, provides warnings in each service manual that accompanies all Cavitron® units. Examples of this are the Dentsply Cavitron® SPS™ and the Cavitron® Jet Plus™. Warnings indicate that the unit cords should be kept 6-9 inches away from the implanted cardiac device and the device leads.

Clients are often provided with a device identification card. This card identifies the model number, manufacturer of the device, date the device was implanted and medical contacts. This information will assist in identifying any contraindications for proceeding with dental hygiene treatment.

POLICY

If a client reports having a pacemaker, or any other implanted cardiac device, dental hygienists need to recognize that the presence of this device indicates a medically compromised heart condition that could require treatment modifications, including stress reduction protocols. A thorough health history should be completed to obtain information provided on the ICD identification card along with the reason for the placement of the ICD. This will assist in informing the dental hygiene process of care.

Magnetostrictive ultrasonic instruments are not contraindicated for use on clients with an ICD or bipolar pacemaker. However, caution should always be given to ensure ultrasonic cords are kept a minimum of 6 inches away from the implanted device. If interference with the implanted device occurs, use of the ultrasonic unit should be discontinued. Once use is discontinued the implanted device should return to normal function. Additionally, covering unshielded pacemakers with a lead apron will not offer additional protection from EMI.

Magnetostrictive (Cavitron®) instruments may affect unipolar pacemakers, thus contraindicating their use. If the use of a magnetostrictive ultrasonic is prohibited, a sonic or piezoelectric instrument may be used as an adjunct to hand debridement. If uncertain of any contradictions when using an ultrasonic scaler, the manufacturer of the implanted cardiac device should be contacted to determine compatibility or possible contraindications.

Antibiotic prophylaxis is NOT recommended for cardiac pacemakers (intravascular and epicardial) or implanted cardioverter defibrillators.

In the event of a cardiovascular emergency, for a client with an ICD or CRT, there may be the possibility that the use of an automated external defibrillator (AED) may be required. The following considerations should be kept in mind:

- Position defibrillator pads as far away from the implanted device as possible (13cm at a minimum)
- Recommend that the client have an evaluation of the implanted device by their physician to ensure that damage has not occurred.

New technologies and the rate of replacement (every 6-9 years for some ICD's and CRT) suggest frequent review of the implanted cardiac devices.

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Added to Handbook: Prior to June 2004
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