

# Work-related dental injuries: Considerations for replacing teeth with implant-retained restorations

**D**ental injuries in the workplace are generally related to oral or facial trauma and can result in the loss of teeth. Dental implants have revolutionized the field of dentistry, offering a reliable and long-lasting solution for replacing missing teeth. Implant-retained dental restorations are now the preferred treatment option for replacing teeth in many clinical situations.

## Advantages of dental implants

Dental implants are artificial tooth roots made of titanium, a biocompatible material. They are surgically installed into the maxillary and/or mandibular dental arch to provide a foundation for replacement restorations. Once installed, a dental implant fixture fuses with the adjacent bone. This process of osseointegration typically takes 4 to 6 months to complete. Once the implant is successfully integrated, a connecting component that passes through the gingival tissue, referred to as an abutment, is screwed onto the implant fixture. The final prosthesis, which may be an individual tooth, a bridge, or a denture replacing multiple teeth, is then attached to the abutment(s).

Implant-retained restorations look and feel like natural teeth while restoring chewing and speaking abilities to re-establish overall oral function. An implant-retained restoration replacing one or more teeth provides several advantages over other tooth replacement options. For example, a tooth-supported fixed bridge is a common treatment option for replacing teeth,

but these restorations require reduction of adjacent teeth to support the cemented bridge. An implant-retained restoration replaces teeth without sacrificing the health of neighboring teeth. In addition, implant fixtures mimic natural tooth roots, stimulating adjacent bone and reducing bone loss that commonly occurs after tooth loss.

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Complete dentures supported and retained by dental implants offer superior stability for denture wearers because the implant fixtures hold a denture securely in place. Individuals with implant-retained dentures can eat, laugh, and speak without their denture slipping. Another treatment option for replacing all teeth in a dental arch is a full arch implant-retained fixed bridge restoration. Bone grafts are typically required to establish adequate bone volume for the multiple dental implant fixtures required to support these full arch fixed restorations, but this is the treatment solution that comes closest to replacing a full arch of natural teeth.

## Potential complications

Though success rates are high with implant-retained restorations, complications can arise after installing the implant, and

implant failures can occur, resulting in the loss of the implant fixture and the restoration it supports. Early implant failures are typically caused by an infection at the implant site or a failure to integrate with adjacent bone, with inadequate bone density at the implant recipient site, excessive heating of the bone during the osteotomy, or poor healing contributing to osseointegration failure. Failures that occur more than 3 months after implant placement are usually due to peri-implantitis. Peri-implantitis is an inflammatory reaction in the tissues surrounding the implant fixture, with resulting loss of supporting bone. Peri-implantitis is typically progressive and not self-arresting, and responsiveness to treatment is often not ideal. Peri-implant bone loss can result in the loss of an implant-retained restoration that was initially successful.

Today, achieving successful integration of a dental implant fixture with the surrounding bone is highly predictable, and a strong focus is placed on the long-term maintenance of peri-implant hard and soft tissues. Individuals can expect long-term service from a dental implant if the implant fixture is placed well, maintained with an adequate level of personal daily oral hygiene, and supported by regularly scheduled professional dental maintenance.

## Patients who have damaged their teeth at work

When workers damage their teeth or dentures because of a workplace incident, dentists are among the first health care professionals they see. WorkSafeBC works closely with members of the dental profession. If you see a patient with a work-related

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next-generation sequencing method. In both cases, turnaround time for results has been dramatically reduced, to the benefit of patient care.

These genomic innovations are also transforming population care. With pathogen genomics, highly refined cluster detection for outbreak investigations is made possible through development of bioinformatic tools. The ability of PulseNet Canada to respond to enteric illness outbreaks has been advanced significantly with genomics, resulting in a decreased burden of illness and even food industry changes. Pathogen genomics has become an essential tool for managing antimicrobial-resistant organisms, such as carbapenemase-producing organisms, *Clostridioides difficile*, and methicillin-resistant *Staphylococcus aureus*, in health care facilities across BC. Along with infection prevention and control measures, the discriminatory power of pathogen genomics is essential for resolving outbreaks of health care-associated infections in acute care settings. Pathogen genomics also plays a significant role in quality assurance by enabling monitoring of validated assays to detect new variants of organisms with mutations that may impact assay performance, an essential function of a public health laboratory. Finally, the BCCDC PHL is positioned to be even more responsive to emerging zoonotic threats through a partnership with the BC Ministry of Agriculture's Animal Health Centre, where pathogen surveillance data is shared using a "One Health" approach. By sharing animal and human pathogen genomics information, we can monitor and respond to threats such as avian influenza (H5N1) in BC. Genomics can also inform rapid test development for novel pathogens so scale-up can occur to meet testing demands.

### Pathogen genomics of tomorrow

In the future, pathogen genomics and DNA sequencing technologies will be increasingly woven into all areas of public health and the health care system for

patient care, population safety, and threat response. Sequencing can replace a range of traditional testing—from diagnostics to fingerprinting to treatment susceptibility. A single genomics test can replace multiple traditional tests.

While much of this work is invisible to the general health care system and to most health care providers, its ongoing application and support are important. It provides continuously innovative approaches and operational advancement along with the capacity to understand communicable disease transmission dynamics through routine surveillance activities. Genomics informs preparedness activities and, ultimately, prevention and control measures. ■

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dental injury—whether at your medical clinic or in an emergency room—please submit a Physician's First Report (Form 8) to WorkSafeBC. Encourage the patient to file a claim with WorkSafeBC and consult with their dentist or a community dentist of their choice.

If you would like additional information or assistance for a patient with a work-related dental injury, contact the WorkSafeBC dental consultant through a medical advisor in your nearest WorkSafeBC office or through a RACE request ([www.raceconnect.ca](http://www.raceconnect.ca)). ■

—Alison Kaplen, DMD  
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