

# Dental Implants

## Evaluating Your Options for Replacing Missing Teeth

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Pick up most magazines or newspapers these days and you're likely to see an ad about dental implants. A clear understanding of the increasing options available for implant treatment is a good place to start together with alternative replacements for missing teeth and their economic impact. This article will educate you about the problems associated with tooth loss and why implants are considered the state-of-the-art tooth replacement system. Implants provide virtually the same function as natural teeth roots.

### **Dental Implants: The Optimal Tooth Replacement**

Let's begin by taking a look at what makes implants the most optimal tooth replacement system today. An implant connection to the bone is different than how a tooth connects to the bone but it performs the same function. Dental implants act as substitute tooth roots in a unique way.

Implants actually stabilize bone and prevent the inevitable bone loss that occurs when teeth are lost. Commercially pure titanium, of which almost all current implant surfaces are made, has the unique property of being “osteophilic” (osseo-bone, philic – loving), thus joining biochemically to bone. Osseo-integration (osseo – bone, integrate – to join or fuse with) was discovered quite by chance and has revolutionized dentistry. The fusion is almost like a pillar in concrete, allowing no movement at all. Stresses of biting forces are transmitted directly through implants to the bone — which they allow for very well. They provide virtually the same function as natural

teeth roots, including stimulating the bone, thereby stabilizing it and preventing its loss.

### **Consequences of Tooth Loss — Believe It or Not, It's All About Bone**

The bone that encases the teeth known as “alveolar” bone, (from alveolus – sac, an extension of the jaw bone), is the special bone that surrounds and supports the teeth. It develops with the teeth as they erupt into the mouth, accompanies the teeth in life and is lost when the teeth are removed. As one famous scientist put it, “Alveolar bone is like any other bone in the body, it just lives more dangerously,” said Dr. Harry Sicher. When teeth are lost or removed the alveolar bone, which is fragile in structure like an ice cream cone, “resorbs” or melts away. What complicates matters is the “pattern” of resorption or the melting away process. Where the bone is thinnest, it resorbs more quickly. This is particularly true for the upper front teeth where bone, gum and even the lips can appear to cave in or collapse. The dental literature indicates that 79% of the population has a smile line that will not cover these types of “defects.” This is very noticeable when smiling and many people become quite self-conscious about their appearance as a result.

### **It Ain't Necessarily So!**

Bone resorption always occurs naturally when teeth are lost, unless measures are taken to prevent it. We are fortunate to live in an era when this melting away process can be compensated for by grafting techniques — which can work well in experienced hands. Although bone can now be restored by grafting techniques, it's preferable and easier to prevent its loss from occurring. Bone maintained in both sufficient volume and position will allow for proper implant positioning, which in turn will stabilize the bone and prevent further resorption. The desired end result — completely natural looking teeth.

### **Keys to Implant Success**

In the hands of an experienced “team,” implants placed surgically in the right position not only allow for the fabrication of implant-crowns that look natural, but also function properly and are maintainable — indistinguishable from real teeth. In the wrong position or without proper forethought implants can create a nightmare for the restorative dentist and dental technician who make the crowns.

The key to implant success — can be summarized by answering two questions:

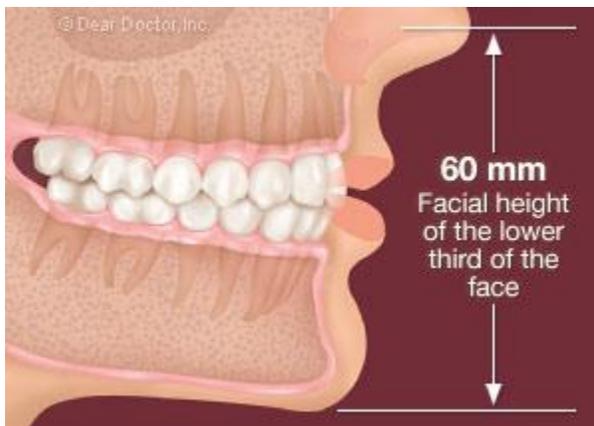
- Can an implant be placed in correct position to allow for natural aesthetics and proper tooth function?

- Is there enough bone and is it in the right place to allow tooth replacement with an implant?

Implant placement and positioning is dependent upon adequate bone volume and density, which are therefore critical to success. In experienced hands, implants are extremely successful. Documented research and clinical studies indicate success rates of over 95% — which is higher than any other tooth replacement option. Even in areas of low bone density success is quite common. Once integrated and functional, implant restorations can last a lifetime.

### Form and Function — Consequences of Tooth Loss

We tend to think about teeth as individual units, your dentist even gives each tooth a name and number, but in fact they make up a complete system, each one adding to its neighbor to function as one. Think about how the keystone in an arch holds all the other stones or bricks in place. For purposes of description we can think about the human dentition (full complement of teeth) as being composed of the anterior (front teeth) and posterior (back) teeth. The anterior teeth (the canines and incisors) are used for cutting and tearing food, and the posterior teeth (the premolars and molars) are used for grinding and chewing



**Figure 1:** The back teeth and the front teeth work in harmony. The back teeth support facial height and chew food while the front teeth cut food, protect the back teeth in lateral jaw movements and provide your smile.

### Form and Function —

Importantly, the posterior teeth also support the vertical height of the face. If they are lost, the face tends to lose height and close down; this is called “posterior bite collapse”



**Figure 2:** The loss of the back teeth place excessive pressure on the front teeth causing subtle shifting of teeth and slight loss of facial height.

Unlike implants, teeth move; not only do changes occur to the remaining back teeth affecting their spacing and biting function, these changes also put pressure on the front teeth which tend to move or splay forward



**Figure 3:** Without replacement of the back teeth, the teeth start to shift and excessive pressure causes the front teeth to spread forward. Loss of facial height occurs.

All of these changes have implications for normal form (aesthetics) and function (bite). They also have ramifications for other facial and jaw structures which can affect anything from the skin to muscles and jaw joints. Appearance begins to change as the height of the jaw decreases, wrinkles increase and the corners of the mouth droop. Additionally, it can become difficult to eat food because the front teeth were not designed for chewing. This is to say nothing of the social consequences of tooth loss; smiling, talking, singing, laughing and enjoying a nutritionally sound diet — all leading to both poor general and mental health.

### **Traditional Tooth Replacement — Not So Traditional Any More**

Dental implants are a relative “new kid on the block” for replacing missing teeth, but how do they really compare to other more traditional systems?

**Removable options** — Past methods of removable tooth replacement have included plastic “flippers” (non-precision, simple, temporary in nature and relatively inexpensive) and precision made metal based partial dentures, which are more expensive. Both can replace individual or groups of teeth. A fundamental problem with removable prostheses (replacements) is that for stability they rest on the teeth and gums tending to cause further problems all related inevitably to their design.

These include tooth decay and periodontal (gum) disease and hastening the loss of bone and teeth through pressure transmitted through the gums upon which they rest. They constitute short term options with documented studies indicating that removable partial dentures are replaced about every 5 years.

For total tooth replacement whether in the upper or lower jaw full dentures (plates) have been the only option. Since they are kept in only by pressing on the gum tissues they transmit force to the underlying bone which accelerates its loss even more quickly. They also compromise the facial structures. As they continue to collapse, full dentures must be relined (made thicker) to compensate for additional bone loss and facial sagging. They also become particularly problematic in the lower jaw where there is no palate for suction and in addition tongue forces tend to destabilize them.

**Non-removable options** — Fixed bridges are non-removable prostheses (tooth replacements) which are attached to the natural teeth. They act by joining other teeth together with a false tooth or teeth between them “bridging” the gap. But the biggest disadvantage; these “abutment” or adjoining teeth are cut down into small peg shapes which compromises their long term health. As well as carrying the additional load of the missing teeth they replace, they become more prone to bacterial plaque accumulation, decay, root canal problems and periodontal (gum) disease. Bridges do not have a long life span therefore they will eventually need to be replaced. Studies indicate that bridges are only 67% successful at 15 years.

### **Economic aspects: Comparing the Cost of Implants to Fixed Bridgework**

Consider this scenario: if you lose a single tooth, the two most common methods of tooth replacement are a tooth supported bridge or an implant supported crown. The American Dental Association (ADA) reports that bridges last an average of 10 years. Clinical studies indicate that implants are over 95% successful for 20+ years. Therefore, a conservative cost breakdown over 20-25 years may look like the chart below.

	<b>TOOTH SUPPORTED BRIDGE</b>
	Initial cost of bridge (3-unit) = \$3,000 - \$3,600 +
	Replacement cost at 10 years = \$3,000 - \$3,600 +
	Replacement cost at 20 years = \$3,000 - \$3,600 +
	<b>Total cost = \$9,000 - \$10,800 +</b>
	<b>IMPLANT SUPPORTED CROWN</b>
	Implant placement = \$2,000 - \$3,000
	Implant crown = \$1,500 - \$2,500
	Replacement cost at 20 years = \$0
	<b>Total cost = \$3,500 - \$5,500</b>

Even with partial insurance reimbursement, the cost of a tooth supported bridge is more expensive long term. The total cost over 20-25 years or more could be significantly higher than shown above. And with an implant supported crown, the adjacent teeth are not compromised so that additional treatment is not necessary. Consider too, the concept of amortization — the process of decreasing or accounting for the cost over the period of time they are likely to last. Implants may seem more expensive initially. But for patients who are candidates, not only are they a better treatment choice, they will last longer, possibly a lifetime, thereby making them the ideal choice and most cost effective option long term.

### **Benefits of Dental Implant Treatment**

1. Enhanced quality of life
2. Integrity of the facial structures is preserved
3. The smile is restored as close as possible to its natural state
4. Long term health of adjacent teeth is not compromised
5. Replacement teeth that look, feel and function like natural teeth
6. Increased stability
7. Improved health due to improved nutrition and proper digestion
8. Renewed self-confidence
9. Improved appearance
10. Improved ability to taste foods
11. Increased convenience of hygiene and maintenance