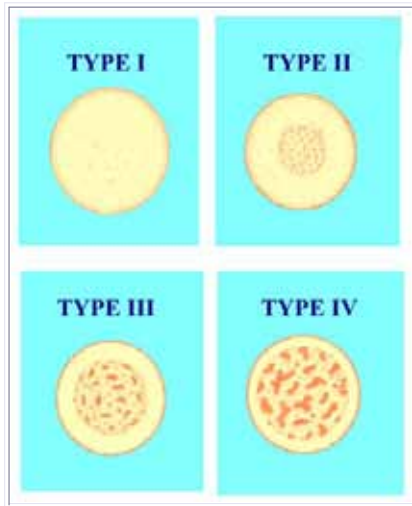


Bone Types

There are four types of bone in the human face and the length of treatment for placing and restoring implants with a “tooth” and crown depends on which type of bone the implant is placed in. Implants have to integrate with the surrounding bone before a tooth and crown is placed on it.



Type I bone is comparable to oak wood, which is very hard and dense. This type of bone has less blood supply than all of the rest of the types of bone. The blood supply is required for the bone to harden or calcify the bone next to the implant. Therefore, it takes approximately 5 months for this type to integrate with an implant as opposed to 4 months for type II bone.

Type II bone is comparable to pine wood, which isn't as hard as type I. This type of bone usually takes 4 months to integrate with an implant.

Type III bone is like balsa wood, which isn't as dense as type II. Since the density isn't as great as type II, it takes more time to “fill in” and integrate with an implant. 6 months time is suggested before loading an implant placed in this type of bone. Extended gradual loading of the implant can, however, improve the bone density.

Type IV bone is comparable to styrofoam, which is the least dense of all of the bone types. This type takes the longest length of time to integrate with the implant after placement, which is usually 8 months. Additional implants should be placed to improve implant/bone loading distribution. Incremental loading of the implants over time will improve bone density. Bone grafting or augmentation of bone are often required. Bone expansion and or bone manipulation can improve initial implant fixation.

Bone Types and Locations

Lekholm and Zarb explain the classification system of bone as follows⁴: Based on its radiographic appearance and the resistance at drilling, bone quality has been classified in four categories: Type 1 bone in which almost the entire bone is composed of homogenous compact bone; Type 2 bone in which a thick layer of compact bone surrounds a core of dense trabecular bone; Type 3 bone in which a thin layer of cortical bone surrounds a core of dense trabecular bone; and Type 4 bone characterized as a thin layer of cortical bone surrounding a core of low density trabecular bone of poor strength. These differences in bone quality can be associated with different areas of anatomy in the upper and lower jaw. Mandibles generally are more densely corticated than maxillas and both jaws tend to decrease in their cortical thickness and increase in their trabecular porosity as they move posteriorly. It has been shown, although there are have been some studies that argue the point that there is a decrease in success rates as the bone type increase. There have been a range of statistics that have been reported from a 2% difference from type 1 (98% in 36 months) to type 4 (96% in 36 months) and a 14% difference in another group (90% type 1 vs. 76% type 4 in 36 months). These are important statistics as it indicates firstly that the bone quality is significant when considering an implant placement site, and secondly that there appears to be other factors in the success rates of implants as one considers the vast discrepancy between the results.

⁴ Lekholm U, Zarb GA, Albrektsson T. Patient selectino and preparation. Tissue integrated prostheses. Chicago: Quintessence Publishing Co. Inc., 1985;199-209.