Traditionally, individual brackets were applied directly to the patient’s teeth one at a time—often an uncomfortable and time-consuming process. With indirect bonding, brackets are first fitted to the impressions in a precise and controlled laboratory setting before they are put on. All the brackets are then simultaneously applied to the teeth. This technique is much faster and more precise than traditional methods, resulting in less time spent in treatment or in the waiting room. The indirect bonding technique optimises fixed appliance installation at the orthodontic office, ensuring precise bracket positioning, among other advantages.

The practice of indirect bonding starts with creating a mould of the teeth. This process only takes a few minutes and provides an exact replica of the mouth of the patient. From there, the dental technician creates a 1:1 model of the teeth. The technician then meticulously positions each bracket precisely where it should go on each tooth. For the final step, the technician creates a custom tray that allows the dentist to transfer the brackets from the laboratory model to the patient’s teeth.

In the laboratory clinical phase, the material and methods employed in creating the transfer tray are decisive for accuracy. The innovative indirect bonding system of the Italian company AGE Solutions is realised through the dedicated software Maestro 3D Ortho Studio, allowing easy positioning of the brackets and management of any customisation of the position. On the basis of bracket planning, it is possible to design a transfer bite (to be subsequently prototyped with a high precision 3-D printer in biocompatible material), for the perfect transfer of the position of the brackets from a virtual model to reality through appropriate positioners guided by the “tracks” present in the transfer bite.

![Indirect bonding technique](image)

*Fig. 1: Indirect bonding technique.*
Now let’s illustrate step by step the few and very simple operations to be carried out with Ortho Studio to create these transfer bite templates. After importing the scanned models into the software, select the brackets and the technique you want to use in the library. Choose the bracket library and wires you prefer. Ortho Studio indirect bonding automatically adjusts your patient’s malocclusion to create your ideal set-up with just a few clicks. The software automatically positions the brackets over each tooth thanks to an algorithm based on the positioning card. The software guides you through the rest based on your preferences. Any adjustments are simple, since the software automatically makes the corresponding changes in the bracket placement. It is possible to optimise the position of a single bracket by using dedicated tools made available by the software. Ortho Studio uses
only the official bracket libraries supplied by the manufacturer. The list is continuously updated. For more experienced operators, there is also the possibility of parametric customisation of the torque and of the rotation of the single bracket. After the user has traced the radiological mask boundaries and numerically set certain parameters (thickness, offset, etc.), the software draws the transfer bite and automatically eliminates the undercuts.

To aid clinics and laboratories, Ortho Studio simulates three different techniques of indirect bonding of brackets, allowing the user to freely choose what he or she considers to be the most appropriate for the individual case.

After exporting the virtual transfer bite project in STL, the transfer tray is produced from biocompatible resin by a 3-D printer. With Ortho Studio, it is possible not only to print the model with the brackets in place and then perform the thermoforming, but also to create the tray virtually in the software and then place the real brackets. You can also export a report in PDF including everything that has been done in the project: header and identification data, measurements and analysis of the arches, brand and model of brackets, and technique used.

This article has shown how in only a few steps it is possible to create the transfer templates and has therefore, demonstrated the overall advantages of indirect bonding, focusing on shorter treatment times and on reduced mistakes in positioning. To conclude, the most important benefits of indirect bonding are the following:

- more precise placement of brackets;
- faster application—less time in the chair;
- less repositioning of brackets;
- less trauma to the patient;
- more comfortable;
- better looking—high-tech appearance.

**about**

**Dr Terence Whitty** is a well-known dental technology key opinion leader and lectures nationally and internationally on a wide variety of dental technology and materials science subjects. He is the founder and owner of Fabdent, a busy dental laboratory in Sydney in Australia specialising in high-tech dental supply and manufacture, using the latest advances in intra- and extra-oral scanning and CAD/CAM. He has published articles in various international journals.