

# A Simplified Approach That Yields Maximum Results

**IF SPENDING EIGHT MINUTES READING AN ARTICLE COULD CHANGE THE WAY YOU PRACTICE DENTISTRY FOR THE REST OF YOUR LIFE, WOULD YOU INVEST THE TIME?**

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The last decade has brought about dramatic changes in how we view and perceive beauty. There have been a variety of makeover shows such as “Extreme Makeover” that take average people and transform them into what society believes to be beautiful. Weekly, dramatic programmes such as “Nip/Tuck” make plastic surgery seem simple, painless, and instant. At the same time these types of shows exemplify the many benefits beauty can bring to one’s life. We have become a society obsessed with beauty.

When it comes to dental restorations, we look for nothing short of aesthetic perfection. The art and science behind the making of life-like restorations has been obtained by most dental laboratories and clinicians. Beautiful and natural looking reproductions of teeth can be created with a variety of different techniques and materials.

So vast is the potential of the dental industry, that dental manufacturers have spent millions of dollars in the hopes of persuading you and I that their restorations and materials will look and function better than the rest. When in reality, applied with the knowledgeable skill and dedication of today’s technologists and clinicians, shape, shade, and texture can all be applied to create beautiful smiles with a wide variety of restorative materials.

The real question is how will these beautiful smiles we create today hold up to the rigors of mastication and occlusal forces? When fixed restorations break, removable appliances do not function properly, and splints fail to alleviate pain, do we immediately blame the material or do we choose to look deeper into ourselves? Do we dare question the process we use and search for a more predictable one?

One of the most overlooked and a misunderstood aspect in modern dentistry is the concept of “Occlusion”. In dental schools across the continent, occlusion was taught to be confusing, indefinable, and in terms that were difficult to memorize and easy to forget. With the movement over the past decade of “Cosmetic Dentistry” the concepts of occlusion were put on the back burner.

Today, many clinicians confident with their cosmetic successes, are now taking a closer look at “Occlusal Concepts” and seeking procedures that can provide for better function and long term clinical success. Teeth need to work and function in harmony with each other.<sup>1</sup> They must provide for maximum interdigitation in function and working contacts.<sup>2</sup> At the same time they must allow for the free range of motion provided by the reduction of interferences in movement.<sup>3,4</sup>

Simple solutions to complex procedures were developed to increase productivity as well as decrease costs. Plastic, disposable hinges (Figures 1 & 2) have provided for the simple mounting of casts together, however they do nothing to relate the dentition to the patient’s condyles or to the base of the skull, and thus provide none of the information needed to create free function. They are a simple and inexpensive alternative and they do have their place in straightforward one to two tooth reconstructions. However, they lack the necessary information that is needed to ensure interferences are not inadvertently built into our restorations. Unfortunately, with these types of articulators, corrections of occlusion are left to the restorative dentists to waste valuable chair time with adjustments and re-polishing of restorations.

In the past, there were many manufacturers who made attempts to resolve occlusal concerns. They created awkward articulators that were difficult to work with and complex facebow procedures which required additional assistance and cumbersome tools to use.<sup>5</sup> Their attempts focused solely on the apparatus and provided for less than satisfactory results.

With greater research has come more accurate and efficient articulator systems. These ad-

vanced pieces of equipment allow for simpler procedures, making them more readily accepted by dentists, staff, and patients.<sup>6</sup> The newer earbow style of facebows such as the Arcus by Kavo (Kavo Canada 1-800-324-6055/www.kavousa.com) effectively records the position of the upper jaw in relation to the individual's hinge axis. With its simple design and ease of use, without the need for tools or additional assistance, the Arcus earbow can take less than two minutes to accurately record the maxilla position.

The procedure is straight forward. A bite fork is covered with bite registration material and inserted into the mouth having the patient close down gently to hold the fork in position while the bite

registration material sets. A single operator now begins by first placing the earbow extensions into the patient's ears (Figure 3). After gently closing the bow arms together, a single lever is raised to secure the position. Next, the anterior plunger arm is extended forwards to the glabella region of the nose (Figure 4). While applying pressure to the plunger arm another single lever is engaged. If enough pressure is applied, the earbow should be able to support itself on the patient's face without the need for anyone to hold it (Figure 5). The final step is to connect the earbow with the bite fork using the bite fork assembly. Once again two simple thumb screws are turned until tight, thus locking the pieces together (Figure 6). The earbow registration is now

complete (Figure 7). All that remains is the removal of the apparatus from the patient's face.

Articulators such as the Kavo Protar evo (Kavo Canada 1-800-324-6055/www.kavousa.com) allow for greater accuracy and control (Figure 8). These types of semi-adjustable articulators can be programmed with information provided through the use of the earbow and various check bites to more accurately mimic the jaw movements. By providing such bite registrations as Centric Occlusion (Figure 9), Protrusive (Figure 10), Left and Right Lateral Check Bites (Figures 11 & 12), settings of the Condylar Inclination, the Bennett Angle, Side Shift, and Retrusion can be recorded (Figure 13). These measurements pro-



FIGURE 1



FIGURE 2



FIGURE 3



FIGURE 4



FIGURE 5



FIGURE 6



FIGURE 7



FIGURE 8



FIGURE 9



FIGURE 10



FIGURE 11



FIGURE 12



FIGURE 13



FIGURE 14

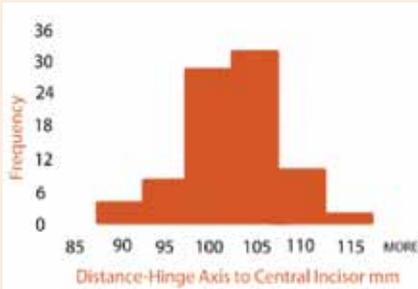


FIGURE 15

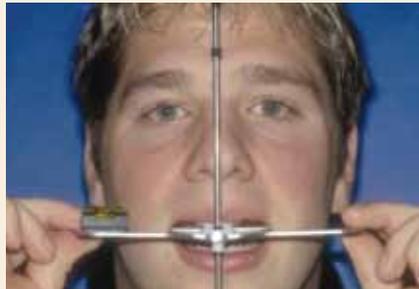


FIGURE 16



FIGURE 17

grammed into the articulator can also be recorded and stored for later use (Figure 14).

Recently introduced is the Kois Dento-Facial Analyzer System (Panadent Corporation 1-800-368-9777/www.panadent.com). This system measures the cant or tilts of the patient's occlusal plane in three planes of space and transfers this information to the articulator. Based on Dr. Kois's<sup>7</sup> research revealing an average axis-incisal edge distance of 100mm (Figure 15), this unique concept is supported by Bonwill's Equilateral Triangle, Monson's Spherical Theory,<sup>8</sup> and Weinberg's Studies.<sup>9,10,11</sup> The Vertical Indicator Rod is aligned to the patient's facial midline for aesthetics while the wall on the Index Tray is aligned to the central incisors to relate to an aver-

age 100mm axis-incisal distance for function. The procedure is simple. The Index Tray is secured to the Analyzer Bow, which resemble a Fox Plane. With bite registration material applied, the Index Tray is inserted much like a standard bite fork. After making sure the maxillary incisors contact the incisal line/wall marked on the Index Tray, align the vertical Rod to the patient's mid-sagittal in the frontal plane (Figure 16) and adjust the Analyzer Bow to the horizontal in the sagittal plane from the profile view (Figure 17).

The main benefit of this system is that it is not based on the external soft tissue characteristics of the patient. It is not fooled into providing an inaccurate horizontal plane based on the unevenness of the patient's ears or eyes.

Another unique and equally useful tool in the evaluation and diagnosis of dental occlusion is the Accu-Liner Instrument (Figure 18) (Accu-Liner Products 1-800-458-6627/www.acculiner.com). The name Accu-Liner refers to the accurate alignment and measurement of study models, dental prostheses, and restorations with reference to cranial landmarks and sagittal, transverse, and horizontal planes of the skull. Brought to the dental market place by Dr. James Carlson, the fabrication of the instrument came from his desire to precisely diagnose and treat occlusion. He wanted a scientific instrument that could provide accurate measurements which would aid in his ability to analyze and treat his patients.

The Accu-Liner does not require any condylar elements as it subscribes to the theory that border movements



FIGURE 18

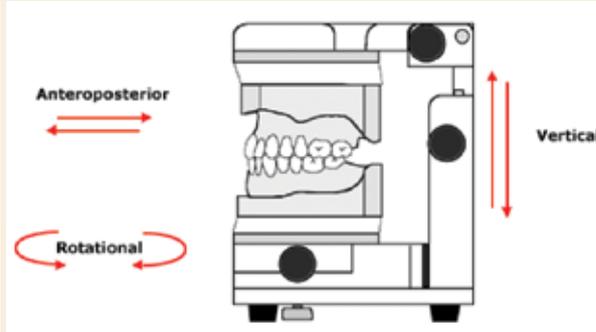


FIGURE 19

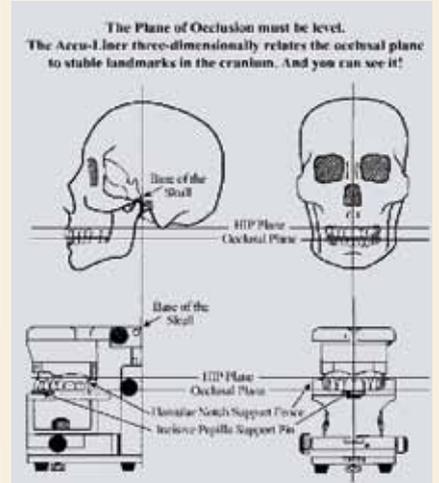


FIGURE 20

of the mandible do not occur during function. Research has shown that the primary criteria for successful orthodontics,<sup>12</sup> fixed and removable prosthetics,<sup>13</sup> or dental orthotics is the precise construction of the plane of occlusion and interdigitation of the teeth to the optimal neuromuscular position of the mandible.<sup>14</sup>

The Accu-Liner goes beyond any previous Class II articulator in that it is capable of closely simulating the individual movements of the temporomandibular joints: translation (vertical, horizontal, and lateral components) and rotation (Figure 19).<sup>15</sup>

The Accu-Liner is more than just an articulator. It is an instrument which allows you to register, analyze and treat the occlusion. It is designed around the widely accepted concept that the maxilla is the primary arch of the stomatognathic system,<sup>16</sup> not the mandible. It relates the plane of occlusion to stable landmarks in the cranium using the anatomical reference points of the base of the skull and the Hamular Notches and the Incisive Papilla (HIP Plane) (Figure 20). By using these reference points, the Accu-Liner can measure, in millimeters, all movements of the mandible as well as distortions in the maxillary arch.

The success of a dental prosthesis or restoration has a direct correlation to the amount of precision that is utilised in the dental operatory and

the dental laboratory. Which facebow or articulator system you choose can be based on your own requirements, beliefs, and comfort level. It is more important that you choose to advance your knowledge and skill with a particular system, and become proficient at it, than in which system you choose to work with. If you are interested in pursuing your options, you may wish to consult with your "lab technician". He or she will have the experience to help guide you. With a greater choice in instrumentation than at any other time in dental history, today's dental professionals can create highly functional restorations, appliances and orthotics. It is through these advances that we can look beyond what is just aesthetically pleasing and build greater function into the work we create. The net result is an increased satisfaction in our daily lives and the knowledge that we have provided our patients with optimal oral health to the best of our abilities. **OH**

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