Cosmetic Dentistry considerations when looking at Smile Designs and Nature too!

Back in the mid-to-late 1980s, the advent of the conservative laminate veneer emerged and a select few recognised the opportunity being presented to them. Today, the laminate veneer is a much more conventional alternative in the contemporary dental practice. For years, the Golden Proportion has been a benchmark in designing the patient’s smile.

With contemporary materials, techniques and philosophies, we are now able to evolve beyond the Golden Proportion and gaze to the next tier in contemporary aesthetics – or what I prefer to call the Platinum Paradigm. The Platinum Paradigm is a set of guidelines, or parameters, that make up a system of aesthetic excellence. We, as clinicians, must strive to emulate nature and create restorations that ‘trick’ the eye in believing that what you are seeing is naturally born. With materials such as Empress, Authentic, and d.Sign, the dentist and ceramist are able to provide for the patient the optimum in aesthetics. As aesthetic artists, we must make every effort to attain the most current concepts and take our own abilities to an elevated level.

Picturesque frame
Within the first aspect of the Platinum Paradigm, the basic tooth proportions must be considered, but not absolutely adhered to. To explain, the Golden Proportion is an excellent point of origin, but often there will be a superior aesthetic result if the tooth proportions actually extend outside/inside of the Golden Proportion. Notice the central incisors (Figure 1) are slightly outside of the proportion but works with the overall harmony of the smile. Contour of the gingival tissue is paramount in establishing consistency between the surrounding tissue encompassing the smile.

Figure 1: The central incisors are slightly outside of the proportion but works with the overall harmony of the smile

Stunning restorations add the final touch to an exquisite smile, but the nicely contoured gingival tissue acts as a picturesque frame surrounding a magnificent painting. The properly placed gingival zenith will add the proper symmetry to the entire gingival system. The zenith should be placed at mid to distal of the tooth on the centrals and laterals and distal of center on the canines.

The gingival height must also be in proportion (Figure 2, Horizontal Blue Lines) to maintain symmetry throughout the smile. The canines and centrals should be roughly the same height with the lateral incisor positioned approximately .5-.1.0 mm incisally from the canines and centrals as indicated by the horizontal blue lines. The height – and width – of the inter-dental contact areas play an important role illustrating the desired maturity of the teeth. The more youthful the teeth, the more apically positioned the inter-dental contact.

Figure 2: Natural ranges in the Ivoclar Vivadent Chromoscope Shade Guide fall within the Bleach Shade 040(B1) to the 140(A3)

In contrast, the more incisally the inter-dental contact, the more mature the teeth will appear. This is essential when determining how youthful or mature you desire to make the patient’s smile.
The gingival embrasures (Figure 3) must have a seamless transition of the laminate veneer to maintain a healthy state, and good gingival architecture. Maintaining healthy provisionals – that don’t inhibit the papilla – and properly contoured veneers, will insure the gingival apparatus is sustained.

Figure 3 (below): A 110 (A1) was selected with a natural warming in the gingival 1/3 of the teeth. The ‘Reflective Zone’ (red point) is indicated as the flat, facial surface of the tooth. This area reflects light back to the eye and has very little deflective surface. The ‘Deflective Zone’ (blue point) is important in maintaining detailed anatomy and the natural contour of the teeth.

So often the papilla is impinged upon during the provisional stage, creating ‘Black Triangles’ that will negatively affect the final aesthetic outcome. The ‘Reflective Zone’ (Red point, Figure 3) is indicated as the flat, facial surface of the tooth. This area reflects light back to the eye and has very little deflective surface. The ‘Deflective Zone’ (Blue point, Figure 3) is important in maintaining detailed anatomy and the natural contour of the teeth. This zone will tend to deflect light laterally, giving the teeth vitality and depth.

Natural warming

The subtle transition from the reflective to deflective zones must sustain a natural transition to avoid the ‘picket fence’ or a less than authentic look.

The ‘value’ of the tooth is crucial to the design of the teeth restored. There is a tendency today to have extremely high-value restorations, with the natural shade of teeth typically having a lower value. The Ivoclar Vivadent Chromoscope Shade Guide can be utilised to ascertain the best shade for the patient. Natural ranges fall within the Bleach Shade 040(B1) to the 140(A3) (Figure 2 above).

In the referenced illustration (Figure 3), a 110 (A1) was selected with a natural warming in the gingival 1/3 of the teeth. Unfortunately, many patients and clinicians are demanding shades that fall within the Bleach 010 to the 030 (All of which are below B1 Shading). Although we may rarely see such high values on natural teeth, it seems to be a prevalent trend, but rather unrealistic.

A master ceramist is able to expertly utilise polychromatic shading, creating a beautiful range, and depth of colour. Monochromatic restorations are the surest way to tip off the common observer as to the lack of realism of the restored smile, and should be avoided. Facial anatomy (Figure 4) is another very vital aspect of natural contours. This will properly deflect light within the deflective and reflective zones.

Figure 4 (right): Most often, the gingival 1/3 and the mid-body are reduced by the clinician, but the incisal 1/3 is often omitted, or under-reduced (red point)
The final facet within the Cosmetic Preparation principles involves the three planes of reduction. The three essential planes of reduction include:

The gingival 1/3, mid-body and incisal 1/3 of the teeth.

Most often, the gingival 1/3 and the mid-body are reduced by the clinician, but the incisal 1/3 is often omitted, or under-reduced (see Figure 4, Yellow Line). When the incisal 1/3 of the tooth is not reduced adequately, the final restorations will often appear outsized, or overly prominent. This is one of the most imperative aspects to consider for both the dentist and the ceramists. It is the responsibility of both to insure the success of the case throughout all phases of treatment.

Endeavour of excellence

Many variables come into play when orchestrating a smile design. We must explore these parameters to give clinicians every opportunity to provide the very best result for the patients. If clinicians and ceramists follow these basic fundamentals, then the success of the final case will be greatly increased. Constant communication, education, and experience are essential to our endeavour of excellence – for dentists and ceramists alike.

Teamworking and good Communications/Understanding are critical to the final result!