SUMMARY
As restorative dentists, one of the largest challenges we face is to restore proper form and function while considering the impact on the esthetic outcome. One must consider the clinical strengths and weaknesses of various materials and their applicability in different situations. For each clinical situation, there is always a most favorable choice coordinating material and design for optimum physiological, functional and esthetic results.

The cast gold 7/8 crown with esthetic buccal margin, as designed and advocated by Dr Richard V Tucker, is an extremely valuable procedure, providing a very long-lasting, esthetically pleasing restoration for extensive involvement of maxillary bicuspid or first molar teeth—particularly in cases where there has been some degree of recession of the buccal or mesial-buccal cusp, while that cusp remains strong and of good stock in the gingival third of the tooth. Under the right circumstances, these teeth can be extensively restored without showing the gold, while leaving the natural color and contours of the buccal cusp and avoiding insult to the gingival tissues from the restoration margin. All of these benefits contribute to esthetics that are superior to porcelain-to-metal or all-ceramic restorations, with less loss of tooth structure and trauma to the pulp.1

LIMITING FACTORS
Limiting factors to the optimum use of this restoration include incipient horizontal fracture under the buccal or mesial-buccal cusp of the bicuspid or molar; over-extension of a pre-existing restoration or lesion to the mesial-buccal, which would require casting to extend undesirably out of the embrasure; lack of adequate tooth stock of the retained cusp.

TECHNIQUE
This article addresses the maxillary first molar (Figure 1). However, the same design principles, with minor modifications, can be used on maxillary bicuspid. Provided the clinician has determined that the buccal cusp has adequate stock and is free from fracture, the first step is to build-up the crown of the tooth with the
material of choice to provide a platform for optimum preparation design.

For expediency, the initial occlusal reduction can be done with a straight diamond bur and refined with a straight fissure bur in the final stages. A notation must be made as to where the opposing functioning cusp will fall on the occlusal table and the central groove of the occlusal reduction placed accordingly. The inner incline of the mesial-buccal cusp is not reduced at this time (Figure 2). Using a Brasseler (Brasseler USA, Savannah, GA, USA) 860-012 (or similar) bur (Figure 3), the next reduction is on the mesial wall, taking particular care to have the mesial-buccal cavosurface margin parallel with the buccal surfaces of the anterior teeth in the arch, while extending past the point of contact as little as possible.

The buccal aspect of the mesial reduction should form roughly a 90° angle at the cavosurface. This is accomplished while establishing a concave or “hollow grind” contour to the mesial wall (Figure 4). Establishing the axial inclination of the mesial-buccal margin without
over-extension is key to the esthetic success of this restoration and dictates the draw of the rest of the preparation, which is tilted slightly to the lingual.

The distal wall is then defined to draw with the mesial. At this time, care is taken not to wrap the distal reduction around to the buccal, but rather to carry it straight out from the embrasure (Figure 5). The mesial and distal reductions are now joined by reduction of the lingual wall. The larger diameter Brassler 860-014 bur can now be used and, if space allows, it can be carried onto the mesial and distal surfaces to provide a more prominent chamfer and deeper hollow grind (Figure 6).

The buccal wall reduction is only done on the distal half of the tooth, and it need not extend any more gingivally than necessary to capture the extension of the previous restoration or provide adequate compliment to the resistance and retention of the rest of the preparation, specifically the mesial hollow grind. The line angle at the juncture of the distal and buccal walls remains quite precise and not rounded (Figure 7). Care must be taken not to finish the mesial aspect of the buccal reduction in the mid-buccal groove, which would impair optimum finishing of the margins with disks at cementation (Figure 8). The distal reduction of the mesial-buccal cusp must draw with the mesial hollow grind (Figures 8-9).

The final stage is reduction of the mesial-buccal cusp. The inner incline must be reduced enough to allow ade-
quate clearance for the opposing functioning cusp without reducing the height or altering the outline of the cusp tip. Using a mechanical pencil perpendicular to the cusp tip, the height of contour of the cusp is defined (Figures 10-11). Reduction of the inner incline is done with a #56 straight fissure bur parallel to an imaginary line joining the already established central groove and height of contour of the cusp tip (Figure 12). The rest of the occlusal reduction can be smoothed with the #56 bur at this time and the functional cusp counter bevel provided. Note the sharp line angle along the buccal cusp tip just to the height of the contour (Figure 13).

The buccal line angle distal to the mesial-buccal cusp is refined with a Suter (Suter Dental Mfg Co, Chico, CA, USA) 42S off-angle hatchet, first on the distal of the cusp, then on the buccal wall (Figure 14). This provides for a flat, slightly wider surface of gold to brace the distal aspect of the cusp and compliment the bulk of gold of the mesial hollow grind. The distal wall of the mesial-buccal cusp is planed with a medium garnet disk, maintaining a flat surface and providing a straight, precise cavosurface margin (Figure 15).

The final step in preparation is to place a very fine counterbevel along the buccal cusp tip with a fine cuttle disk to eliminate loose enamel rods, taking care not to change the shape of the cusp tip outline, while smoothing the margin. Note the slight change in plane of the inner incline approaching the cusp tip (Figure 16). Examination of the casting reveals all details of the preparation steps (Figure 17). From the occlusal, the buccal-axial margin is short of the buccal height of contour and not in the concavity of the buccal groove, while the occlusal-buccal margin finishes at the height of contour of the cusp tip (Figure 18). When viewed from the distal, the sharp lineangle between the distal and buccal reductions is reflected by the presence of an “ear” of enamel at the casting margin (Figure 19).
The lingual margin can be kept supragingival, owing to the extremely retentive design, provided the old restoration and tooth stock allows this. The height of both buccal cusps are the same as the pre-operative state and match the second molar (Figure 20). The gold on the buccal wall distal to the mesial-buccal cusp is blocked from view by contour of the mesial-buccal cusp, while on the mesial, the mesial gold of the casting is well hidden in the embrasure. There is slight plus gold covering the counter bevel to be reduced in finishing (Figure 21). If visible at all, the gold on the mesial buccal cusp is not readily noticeable, providing that the margin is harmonious with the buccal contours of adjacent teeth (Figure 22).

In the buccal view, the buccal cusps match the pre-operative form and are harmonious with the second molar (Figure 23). The mesial-buccal cusp will initially show a slight “plus gold” covering the cusp tip counter-bevel (Figures 22 and 23). However, after proper finishing with disks, the “plus gold” is eliminated, as it is reduced to blend with the height of contour of the cusp tip at the counter-bevel margin (see clinical cases—Figures 25-35). The finished casting approximates the original cusp height but appears unrestored, owing to the esthetic margin technique (Figures 1 and 24).

When prepared properly in the right clinical circumstances and using proper finishing techniques, there is no more superior restoration combining preservation of tooth structure, longevity, biocompatibility and optimum esthetics than the Esthetic-Buccal 7/8 crown.

Acknowledgement
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Reference
1. As learned from Richard V Tucker in Study Club over the years.