PLAN YOUR WORK AND WORK YOUR PLAN

Designing personalized treatment plans with VTOs

by Dr. W. Bonham Magness

Dr. W. Bonham Magness has been on the staff of the University of Texas School of Dentistry–Houston since his graduation in 1960. He currently practices part-time with his son, Dr. Marc B. Magness, in the Memorial area of Houston.

The author would like to thank his wife, Marcille, for her aid in preparing this paper.

Course description

This course reviews the creation of personalized visualized treatment objectives, or VTOs.

Abstract

Many orthodontic pioneers have said that VTOs should be the foundation of orthodontic treatment-planning, yet after many years few orthodontists take the time and effort to include this as a part of their practice regimen

Learning objectives

After completing this course, the reader should be able to:

- Understand the value of doing VTOs on patients.
- Comprehend the process of creating visualized treatment objectives.
- Understand how to evaluate facial contour changes with treatment using acetate tracings.
- Understand the pogonion growth rate, in relation to nasion and Point A, during normal mandibular growth.
- Be familiar with the term "F-point," a reference to the junction of the frontal plane and functional occlusal plane.

Academy of General Dentistry PACE Program Approval for Continuing Education

Approved PACE Program Provider FAGD/MAGD Credit
Approval does not imply acceptance by a state or provincial board of dentistry or AGD endorsement.
1/1/2016 to 12/31/2018
Provider ID#304396

AGD Code: 370

This print or PDF course is a written self-instructional article with adjunct images and is designated for 1.5 hours of CE credit by Farran Media. Participants will receive verification shortly after Farran Media receives the completed post-test. See instructions on page 47.

ADA C·E·R·P® | Continuing Education Recognition Program

Introduction

In this competitive era of orthodontics, it's not enough to just put braces on and move teeth around. After carefully reviewing complete initial records, what's your defined plan of treatment? If you don't have one, you're more or less flying by the seat of your pants—which isn't a good thing. (The WWII-era phrase is a reference to Air Force pilots whose instruments had been destroyed during bombing missions and, forced to improvise, often weren't successful in trying to bring their planes home.)

An orthodontic problem in our modern era—especially with the "keep all the teeth" mentality—is that many people "doing braces" aren't carefully analyzing and documenting their plans of treatment before beginning treatment. They're not using their available instruments and truly are flying by the seat of their pants. It's one thing to take comprehensive records for each patient, but an even more important element for successful results is the formation of a personalized treatment plan to bring the plane home successfully for each patient.

Working in all dimensions

Fortunately, the common two-dimensional cephalogram enables the orthodontist not only to record each patient's hard and soft tissue relations but also, through a simple formula, to predict the new transitioned final tooth positions. Even though the current 3-D views are intriguing, valuable and informing, orthodontists shouldn't abandon 2-D views, which provide a valuable format to record orthodontic treatment predictions—and, equally importantly, to compare the final result to the pre-treatment prediction at completion of treatment.

This comparison involves the predicted movement of four key teeth: the upper and lower incisors, which establish lip support required for best facial aesthetics and incisor stability, and the upper and lower first molar interrelationship, which is the basis of occlusion. The visualized treatment objective (VTO) should be considered a reliable GPS for the orthodontist to find home: "F-Point." This will be discussed more fully in a bit, but consider it the key destination to determine the final tooth positions.

Dr. Bjork[1] reminded us that, "A cephalometric radiograph from a single stage of development is undoubtedly of great value in facilitating a morphologic analysis of the facial structures." He also confirmed that it's difficult to assess the exact final facial form of younger children, but said that if the treatment is delayed until maturity, the advantage of earlier therapeutic measures, when they are more effective, has been lost.

In his book *The 7 Habits of Highly Effective People*, Stephen R. Covey succinctly conveyed this important message: "Begin with the end in mind." While his message was not directed to orthodontists specifically, the profession could benefit from its implementation.

Drs. Reed Holdaway,[2] Robert Ricketts,[3] Ron Roth,[4] Ruel Bench[5] and others have recommended that VTOs should be the foundation of orthodontic treatment-planning, yet after many years few orthodontists take the time and effort to include this as a part of their practice regimen.

Almost 40 years ago, after attending a two-week course Ricketts and Bench gave in California, I took to heart the importance of creating a VTO similar to the complex one Ricketts created. His VTO took a great deal of time to create and produced more information than was actually needed for orthodontic treatment. Residents at the orthodontic program at The University of Texas–Houston were taught Ricketts' version, but because of the time and trouble involved in creating VTOs, they weren't used in practices after the students graduated. There's a simple, accurate, less expensive way to create a mini-VTO in your own office[6]. I implemented it into my practice in 1976 and used it continuously for more than 30 years.

The lower incisor to A-pogonion plane landmark

Downs[7] credited Ricketts with establishing the importance of the lower incisor to APo measurement, and Ricketts[8] wrote extensively on its value. When asked why Point A was used as a reference in the maxilla, Ricketts answered, "We simply cannot find a better terminus of bone in the upper jaw." My decision to use this landmark,

Disclosure:
The author declares that neither he nor any member of his family has a financial arrangement or affiliation with any corporate organization offering financial support or grant monies for this continuing dental education program.

after many years of using the ideas of Tweed, Steiner and others, was also based on "The Diagnostic Line," an article by Dr. Raleigh Williams[9] in the 1969 AJO that enumerated in great detail the virtues of this versatile measurement.

Williams wrote: "[T]hose who have optimum oral health, optimum function and optimal facial esthetics have certain common profile characteristics as well as a common position of the lower incisor relative to the APo line, which has been found to be the common denominator."

There have been several measurements in the literature recommended for the lower incisor position relative to APo: Williams, 0 millimeters; Ricketts, +1 mm; Schudy, +1.6mm; Hopkins, +2mm. The measurements of these men were actually made to the incisal tip. Because the labial surface of the lower incisor is what influences the position of the lip, my preference is to measure to the labial surface, rather than incisal tip.

Dr. Cecil Steiner also chose the labial surface of the crown for his measurement. I've found that if I keep this measurement between +1 and +3mm, the facial aesthetics generally are very favorable. If the incisor is on or behind the APo, the lower lip has a resultant weak posture. If the incisor is more than 3mm forward of APo, unless there are inherent full lips with no strain, some lip strain may be produced.

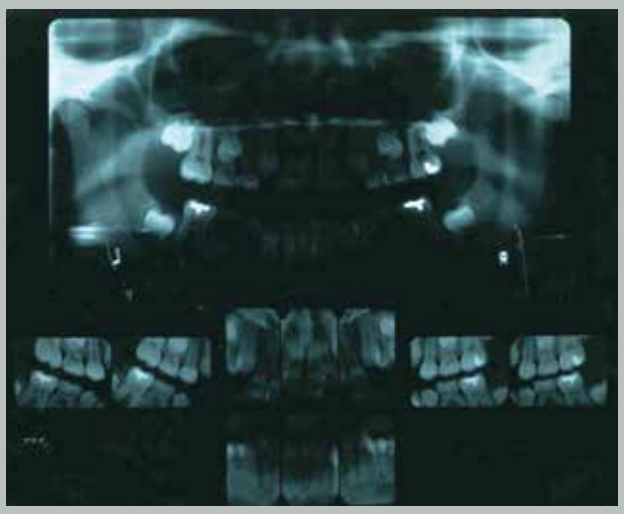
Of interest also is the position of the lower incisor to APo in nontreated individuals. Why is this significant? Because it means that these incisors—without any orthodontic influence regardless of their crowding, spacing, etc.—are in a balance with the perioral muscles and the tongue. In his nontreated study, Ricketts[10] showed the average incisor to be +2.5mm forward of APo. In a similar study of 1,390 individuals, Corbin[11] found the incisor to be a very similar +2.3mm forward in his nontreated cases.

Holdaway, Ricketts and Downs recognized the importance of lower incisor position on the facial profile. However, the primary concern at that time was the *angulation* of the incisor, rather than its position to APo. This was probably because of the influence of Tweed,[12] who originally used the angulation of the lower incisor to the mandibular plane, and then later the angulation of the incisor, to Frankfort Horizontal in his teaching.

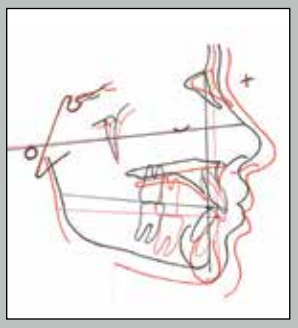
In the current mode of nonextraction treatment, it's critical to control the flaring of the lower incisors—especially in Class 2 corrections with elastics. Years ago,

Patient 1
Pre-treatment photos and X-rays

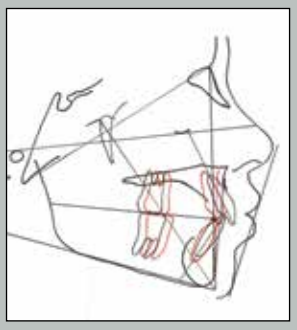
Patient one before treatment



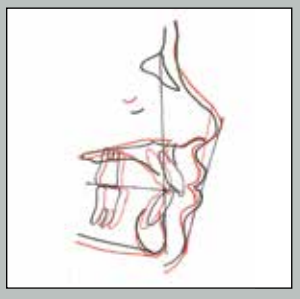
Patient 1
Post-treatment photos and VTOs



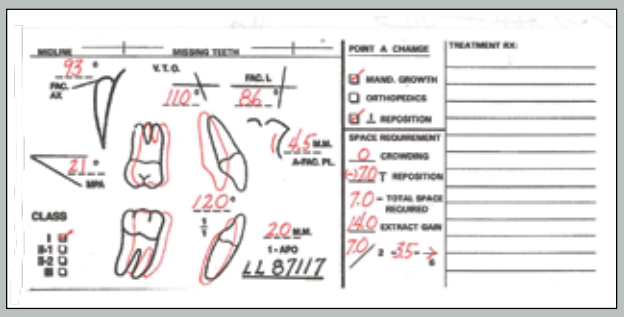
Pre- and post-treatment tracings superimposed on sella/nasion/basion "triad." Mandibular growth was downward and forward.



Original cephalometric tracing, with the VTO prediction in red.



Pre- (black) and post-treatment (red) tracings superimposed at F-Point, showing original and final tooth positions. Facial changes also shown with these superpositions.



Dr. Brodie[13] pointed out that when mandibular incisors are flared, they have a tendency to return to their original axial inclination.

Having used lower incisor to A-Po measurement for many years, I find this measurement satisfies my concepts to both the patient's facial aesthetics and basic stability of final results, especially with lower retention.

Recently, I started reviewing several hundred of my documented and treated mini-VTO cases, treated more than 30 years ago. I wanted to document the pre-treatment predictions and post-treatment results. I was somewhat surprised (and very encouraged) to find out that my prediction of the two key landmarks, the new Point A and the new lower incisor, were extremely close to their final treated positions. The Point A prediction was within 1mm on 84 percent of 163 cases, and the lower incisor prediction was within 1mm on 88.5 percent of these cases. Actually, 51.5 percent of the Point A's and 55.8 percent of the lower incisors were either exactly on or within a fraction of a millimeter of the pre-treatment prediction. It should be mentioned at this point, however, that a noncompliant patient or a patient with abnormal mandibular growth can disrupt our best efforts in achieving these desired positions.

Steps in creating your personalized VTO: Introducing "F-Point"

1. Trace the cephalogram, being certain the frontal plane and functional occlusal plane are registered, in addition to any of your favorite landmarks and planes of reference. (Note again that I have labeled the junction of these two planes the "F-Point.")
2. A key step: Draw your predicted change in the Point A position relative to the facial plane over the anticipated months of treatment. (See mini-VTO article, *AmJOrthoDentofacOrthop* 1987: 361–74.) It's important to remember that the final position of Point A will be the foundation for all four final tooth position predictions.
3. Draw in new APo plane.
4. Draw in the new ideal predicted position of the lower incisor: if possible, 1–3mm forward of APo, root centered in the symphysis, 1mm above the functional occlusal plane.
5. After calculating the space needs in the lower arch, draw in the new lower first molar. Crowding, with controlled expansion or extraction of

teeth and lower incisor positional change, must influence your final decision on molar position. (This tooth will be the least accurately repositioned tooth because of the various amounts of arch expansion.)

6. Draw in the upper central in ideal relationship to the lower central—1mm below the occlusal plane and with proper angulation to the lower incisor. Directing the long axis of the incisor toward the distal of orbitale as a goal was an excellent recommendation by Dr. Albert Westfall, founder and chairman of the orthodontic department at The University of Texas-Houston.
7. Draw in the upper first molar. For correction to Class 1 position, the distal of the upper molar should be approximately 2mm to the distal of the lower first molar along the functional occlusal plane. Ricketts used a 3mm measurement but I found this to be excessive. If the final molar position is to be in a Class 2 relation—meaning an upper bicuspid was removed on each side—the upper molar should be 2.5–3mm mesial to the lower molar. The objective here is to get the correct upper to lower molar horizontal relation.

All the tooth tracings plus the spheno-occipital fissure tracing should be accomplished using a Ricketts template from Dome Co. Some prefer to shade in the outline of the teeth in their new positions with a red pencil as a bright visual aid.

Factors influencing the post-treatment positions of pogonion and Point A

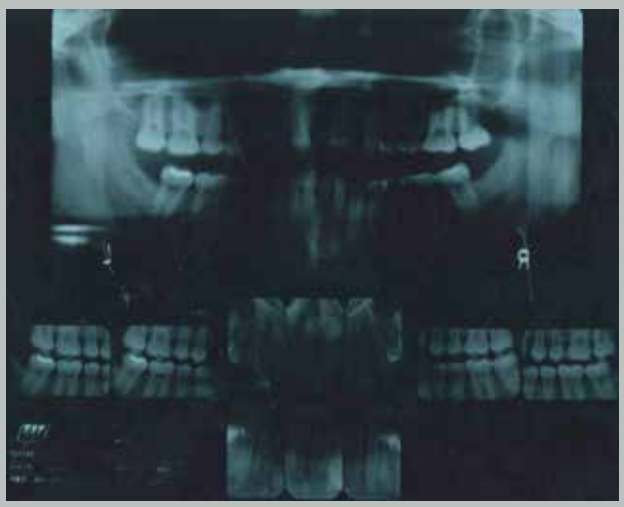
It's important to remember that pogonion and Point A move independently of each other during the period of active treatment.

The final position of pogonion—the mandibular component of growth relative to the cranial base—is changed by the amount and direction of mandibular growth during the period of active treatment. Unfortunately, the orthodontist does not have total control over the amount or direction of this inherent growth.

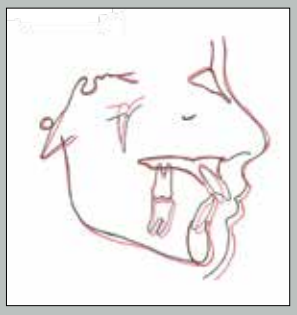
There are several cephalometric entities which can form a basis for predicting the amount of mandibular growth, thus the new, predicted position of pogonion:

1. The mandibular plane angle—vertical growth (high MPA) versus horizontal growth (low MPA).

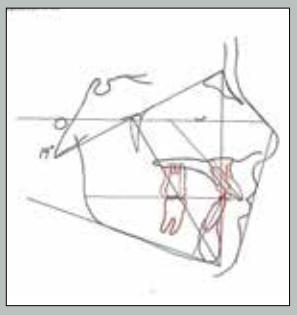
Patient 2
Pre-treatment photos and X-rays



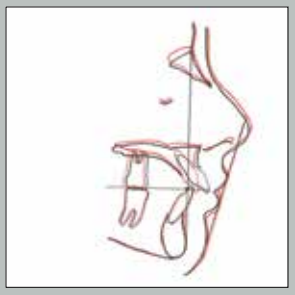
Patient 2
Post-treatment photos and VTOs



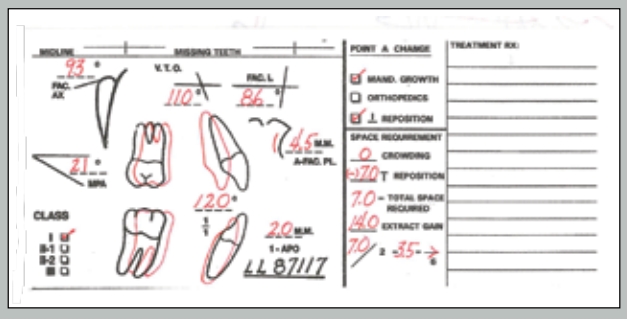
Pre- and post-treatment tracings superimposed on sella/nasion/basion "triad." Mandibular growth was primarily forward.



Original cephalometric tracing, with the VTO prediction in red.



Pre- (black) and post-treatment (red) tracings superimposed at F-Point showing original and final tooth positions.



2. Width of the symphysis—narrow (poor growth) versus wide (good growth).
3. Width of the ramus—narrow (poor growth) versus wide (good growth).
4. Cant of the condylar head—backward cant (poor growth) versus forward cant (good growth). This can be difficult to view on cephalograms.

Obviously, the age of the patient and the family history also have a place in the intrinsic inherited growth potential of the patient.

Point A and nasion normally move forward an equal amount during the treatment growth period. However, it is important to realize that the position of Point A can also be influenced by a new root position of the upper central incisors. This is very important—especially when positioning the new Point A in Class 2, Division 2 cases, because the amount of lingual root torque in the upper incisor will greatly influence the position of that most important new APo line.

"There's a simple, accurate, less expensive way to create a mini-VTO in your own office; I implemented it into my practice in 1976 and used it continuously for more than 30 years."

Remember, the lower incisor position will be set before positioning the upper incisor. This will be an aid in positioning the upper incisor, especially if the upper incisor is to be torqued to satisfy the interincisal angle or moved bodily toward the lingual.

When teeth are to be removed to satisfy space requirements, lower arch length needs can be satisfied by measuring the amount of crowding and then the number of millimeters required to move incisors and molars distally and/or mesially. The VTO is a most valuable tool for making extraction decisions based on arch length and anchorage needs.

While it may seem that some of these factors are difficult to assess, any assessment will certainly be more accurate than making no effort to predict what will happen during the period of treatment. The more one studies the final tooth positions once treatment is completed, the more accurate the future predictions will be.

The discussion of lower arch expansion gain via the many appliance manipulations is subject to many interpretations, thus will not be addressed. Reasonable stability should be the goal of each conscientious orthodontist whatever the treatment protocol, whether or not extractions are done.

The 3-step final evalation

1. **Growth.** Superimpose the pre- and post-treatment tracings on one of two basic cranial landmarks: sella-nasion at sella or basion/nasion/sella triad. This will be necessary to assess the amount, or lack thereof, of mandibular growth and/or the directional pattern of the growth. It will show whether nasion and Point A grew an equal amount.
2. **Point A and lower incisor position changes.** Superimpose on F-point, the junction of the functional occlusal plane and the facial plane. This most important view will enable one to see how well Point A was predicted, and how well the lower incisor position was predicted. Remember that molar relations may not be as accurately predicted as the incisors, because of the inherent mandibular fluctuations in the amount and direction of growth (which may also cause the occlusal plane to tip slightly up or down).
3. **Facial contour.** Slide up or down on the pre- and post-treatment facial planes until you see the maximum related facial contours. Normally this point will be at the embrasure of the lips, the base of the nose, or the anterior nasal spine. It may even be some combination of these.

Factors to be considered when deciding where to place Point A

Some facts to remember when accessing horizontal growth from the cranial base are, as mentioned before: Nasion and Point A normally grow forward about the same amount, regardless of the patient's vertical or horizontal growth, while pogonion normally moves forward a greater amount, especially with a horizontal growth pattern.

Changes in Point A can be rather dramatic. Holdaway[14] estimates 1–4mm of change in Point A depending on the extent of maxillary incisor movement, especially lingual root torque as in a Class 2, Division 2 case. Bench claims to have seen as much as 10mm of Point A reduction.

The University of Michigan Craniofacial Growth Studies[15] showed:

- Mandibular length increased approximately 5mm between ages 11 and 13.
- Point A, perpendicular to nasion-pogonion, decreased 0.5mm between ages 11 and 13. It decreased approximately 2.5mm from the ages 6 to 16.

Conclusion

In any predictive endeavor, the designer-orthodontist must be responsible for two factors:

1. Some knowledge of predictable cranio-facial growth.
2. The effects and limits of orthodontic treatment on the maxillary-mandibular complex and tooth movement.
3. The validity of the prediction process has been succinctly expressed by Dr. Lyle Johnson[16]: *"There appears to be two sources of considerable accuracy available to any contemporary method of growth prediction: (a) The extent to which the individual pattern remains stable and (b) The extent to which the individual orthodontist is capable of predetermining the effects of his own treatment procedures."*

Most important in analyzing treatment results is the comparison of pre- and post-treatment cephalometric tracings. Orthodontists who do not evaluate their final results do a disservice to future patients and to themselves.

Greco, Grubb and Vaden, in their 2016 article in the AJO-DO, reminded us that "Pristine records also provide an introspective evaluation of treatment result for pretreatment and posttreatment comparisons—self-assessment can be an enlightening educational experience."

Orthodontists must be lifetime students. (Also, it's an enjoyable and informative experience to see how close you can come to the predictions after the completion of treatment.) ■

References

1. *Bjork A. Prediction of mandibular growth rotation. AmJORTHOD 1969; 55: 585-99.*
2. *Holdaway RA. Denver summer meeting for the Advancement of Orthodontic Practice and Research.*
3. *Denver:1971*
4. *Ricketts RM, Roth RH, Chacones SJ, Engel GA. Orthodontic Diagnosis and Planning. Vol.1. Denver: Rocky Mountain Orthodontics, 1982.*
5. *Ibid.*
6. *Bench RW. The visualized treatment objective: orthodontics most effective treatment planning tool. ProcFoundationOrthodRes 1971:4: 165-95*
7. *Magness WB. The Mini-Visualized-Treatment Objective. AmJOrthodDentofacOrthop 1987:361-74.*
8. *Downs WB. Analysis of the dentofacial profile. AngleOrthod 1956; 26:191.*
9. *Ricketts RM. The Keystone Triad. Am J Ortho 1964; 50: 244-264.*
10. *Williams R. The Diagnostic Line. Am J ORTHO 1969; 55: 458-476.*
11. *Ricketts RM. Perspective in the clinical application of cephalometrics. Angle Orthod 1981;51:115.*
12. *Corbin PJ. Abstract. A Perspective Study Analyzing the Position of the Lower Incisors in Untreated Cases in Different Sagittal Skeletal Classifications.*
13. *Tweed CH. The Frankfort-mandibular incisor angle (FMIA) in orthodontic diagnosis, treatment planning and prognosis. Angle Orthod. 1954; 24: 121-169*
14. *Brodie AG, Downs WB, Goldstein A, and Myer E. Cephalometric Appraisal for Orthodontic Results. A preliminary report. Angle Orthod.*
15. *Holdaway RA. Seminar. University of Texas Dental Branch. Graduate Orthodontic Department.*
16. *Riolo ML, Moyers RE, McNamara JA, Hunter WS. An atlas of craniofacial growth. Ann Arbor: University of Michigan. 1974.*
17. *Johnson LE. A statistical evaluation of cephalometric prediction. Angle Orthod. 1968; 38: 284-304.*

A Personal History of Developing VTOs

While in dental school, I worked for three years for an excellent orthodontist in Houston. He started my orthodontic treatment, which involved the extraction of four first bicuspids and full banded appliances. He did not, nor did anyone else in Houston, have a cephalometric unit.

After graduating from dental school in 1956, my braces and I went into the U.S. Air Force at San Antonio, since Lackland Air Force Base had one of only two Air Force orthodontists in the U.S.A. to treat me. In addition to a fine cephalometric unit, it also had one of only two new machines in the world—the prototype panoramic X-ray.

Because my Air Force orthodontist, Col. George Bowden, had trained directly under Dr. Charles H. Tweed in his office, I was subjected to a cephalogram every few months, with the Tweed triangle traced directly on the dark ceph in white ink. He was searching for the magic 90 angle of the lower incisor to mandibular plane on the Tweed triangle.

My university orthodontic training program involved having not only Tweed but also Drs. Cecil Steiner, Reed Holdaway and Hayes Nance, among others, as guest lecturers. At that time I decided that the "Steiner sticks" gave me a better definition than the Tweed triangle of the final tooth positions I liked, even though they did not look very "toothlike."

In the early 1970s, Drs. Robert Ricketts and Ruel Bench presented a two-week course in California that advanced the thought of using a lateral cephalometric tracing to predict the final position of the teeth before starting treatment. Ricketts drew for us an elaborate tracing of all the cranial structures producing growth changes in all the various areas of the head over the time period he chose. It was a fine work of art, but too complex to be very useful in a clinical setting.

Because several professors on our UT Ortho staff had gone to the various Ricketts-Bench seminars, we introduced the concept to our residents, only to find that while it was an acceptable teaching tool, again it was not practical for clinical application.

About this same time, several practitioners including Ricketts and Dr. Raleigh Williams started pronouncing the benefits of using the measurement of the lower incisor-to-APo line as the most valuable adjunct, not only to the aesthetics but also to the stability of the dentition.

This certainly caught my attention. The simplicity and ease of starting with selecting an A-Point and then repositioning the lower incisor as the "building block" for the remaining upper incisor plus the upper and lower molar teeth was a logical progression for creating, as it proved, a very simple and reasonably accurate visualized treatment objective. F-point was the product of this discovery.

The main difference between Ricketts' and Holdaway's VTOs was that Ricketts used the hard tissue (tooth) positions aligned in their proper positions to allow the soft tissue profile to drape in an acceptable relation. Holdaway, meanwhile, rearranged the soft tissue where he desired, then placed the teeth in the predicted positions he felt would allow these teeth to form a favorable nose/lip/chin profile. I found it, and still find it, especially difficult to predict nose growth changes.

I earlier studied the Rocky Mountain computer program and am aware of the Dolphin program. They certainly give a wealth of information, and I will be interested to see if they will generate better orthodontic treatment results and, most importantly, provide a better foundation for evaluating future treatment plans based on the VTO predictions and results.

— Dr. W. Bonham Magness

Claim Your CE Credits

POST-TEST

Answer the test on the Continuing Education Answer Sheet and submit by mail or fax with a processing fee of $36. Or answer the post-test questions online at orthotown.com/onlinece. To view all online CE courses, go to orthotown.com/onlinece and click the "View All Courses" button. (If you're not already registered on orthotown.com, you'll be prompted to do so. Registration is fast, easy and, of course, free.)

1) True or False: A single cephalometric radiograph is of no value in facilitating a morphologic analysis of facial structures.

A) True
B) False

2) True or False: According to Dr. Raleigh Williams, the lower-incisor-to-APo line is important for optimum oral health, function and facial aesthetics.

A) True
B) False

3) If the lower-incisor-to-APo line is on or behind the APo, the lower lip will be:

A) In a strained position.
B) In a balanced position.
C) In a "weak" position.
D) In front of the upper lip.

4) Point A is the most valuable landmark because:

A) It is in the middle of the face.
B) It determines the position of the four teeth.
C) It is behind the anterior nasal spine.
D) It is normally in front of the facial plane.

5) The new lower molar position is determined by:

A) Measuring the space gain or loss by the incisor position.
B) Measuring the amount of crowding in the arch.
D) Measuring the amount of spacing in the arch.
D) All of the above.

6) Pogonion movement during normal mandibular growth:

A) Grows at a rate comparable to nasion.
B) Grows at a rate comparable to Point A.
C) Grows at a rate less than nasion and Point A.
D) Grows at a rate greater than nasion and Point A.

7) Excellent mandibular growth can be predicted normally by:

A) A lower mandibular plane angle.
B) A wider mandibular symphysis.
C) A wider ramus.
D) All of the above.

8) When evaluating facial contour changes with treatment using acetate tracings, the pre- and post-treatment positions on the facial plane will be:

A) At the anterior nasal spine.
B) At the lip embrasure.
C) At the base of the nose.
D) At any one or combination of these.

9) Changes of Point A in relation to the facial plane are:

A) Always very consistent.
B) Can be as much as 14 millimeters.
C) Normally 1–4mm.
D) Not dependent on upper incisor torque.

10) The value of doing a VTO on a patient is:

A) Predicting in advance the final tooth positions.
B) Calculating the space needed to achieve the predicted tooth positions.
C) Forming firm ideas on the treatment of future cases once final records are evaluated in relation to the VTO.
D) All of the above.

CONTINUING EDUCATION ANSWER SHEET

Instructions: To receive credit, complete the answer sheet and mail it, along with a check or credit card payment of $36, to: Orthotown.com, Inc., 9633 S. 48th St., Ste. 200, Phoenix, AZ 85044. You may also fax this form to (480) 598-3450 or answer the post-test questions online at orthotown.com/onlinece. This written self-instructional program is designated for 1.5 hours of CE credit by Farran Media. You will need a minimum score of 70 percent to receive your credits. Participants pay only if they wish to receive CE credits; thus no refunds are available. **Please print clearly. This course is available to be taken for credit Dec. 1, 2016 through its expiration on Dec. 1, 2019. Your certificate will be emailed to you within 3–4 weeks.**

Plan Your Work and Work Your Plan

by Dr. W. Bonham Magness

License Number _____ _____ _____ _____ _____ _____ _____ _____ _____ _____

AGD# _____

Name _____

Address _____

City _____ State _____ ZIP _____

Daytime phone _____

Email (required for certificate) _____

o Check (payable to Orthotown.com, Inc.)

o Credit Card (please complete the information below and sign; we accept Visa, MasterCard and American Express.)

Card Number _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____

Expiration Date – Month / Year _____ _____ / _____ _____ _____ _____

Signature _____ Date _____

CE Post-Test

1.	a	b		
2.	a	b		
3.	a	b	c	d
4.	a	b	c	d
5.	a	b	c	d
6.	a	b	c	d
7.	a	b	c	d
8.	a	b	c	d
9.	a	b	c	d
10.	a	b	c	d

Please circle your answers.

Program Evaluation (required)

Please evaluate this program by circling the corresponding numbers: (5 = Strongly Agree to 1 = Strongly Disagree)

1.	Course administration was efficient and friendly	5	4	3	2	1
2.	Course objectives were consistent with the course as advertised	5	4	3	2	1
3.	COURSE OBJECTIVE #1 was adequately addressed and achieved	5	4	3	2	1
4.	COURSE OBJECTIVE #2 was adequately addressed and achieved	5	4	3	2	1
5.	COURSE OBJECTIVE #3 was adequately addressed and achieved	5	4	3	2	1
6.	COURSE OBJECTIVE #4 was adequately addressed and achieved	5	4	3	2	1
7.	COURSE OBJECTIVE #5 was adequately addressed and achieved	5	4	3	2	1
8.	Course material was up-to-date, well-organized, and presented in sufficient depth	5	4	3	2	1
9.	Instructor demonstrated a comprehensive knowledge of the subject	5	4	3	2	1
10.	Instructor appeared to be interested and enthusiastic about the subject	5	4	3	2	1
11.	Audio-visual materials used were relevant and of high quality	5	4	3	2	1
12.	Handout materials enhanced course content	5	4	3	2	1
13.	Overall, I would rate this course (5 = Excellent to 1 = Poor):	5	4	3	2	1
14.	Overall, I would rate this instructor (5 = Excellent to 1 = Poor):	5	4	3	2	1
15.	Overall, this course met my expectations	5	4	3	2	1

Comments (positive or negative): _____

For questions, contact Director of Continuing Education Howard Goldstein at hogo@dentaltown.com.