

# CLINICAL Impressions®

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# Video Technology—Nondiag

by David M. Sarver, D.M.D., M.S.  
Birmingham, Alabama



The incorporation of video imaging technology into orthodontic practice is of great interest to most practicing orthodontists today. There has been an explosion of interest in this technology and its application to the orthodontic specialty. Video imaging has the potential to touch almost every aspect of orthodontic practice: diagnosis and treatment planning, consultations, use of computerized images rather than photography, practice management, communication with other offices, and, without a doubt, applications yet to be realized.

I became involved in video imaging technology in 1985 because I needed to improve communication with my orthognathic surgical patients. Because of the unavailability of software designed specifically for orthodontists, one had to be either a computer whiz or at least a wealthy avocado farm owner (who could afford his own in-office computer whiz) in order to incorporate this technology into the practice. Initially, we utilized off-the-shelf software that we patched together to accomplish specific goals. The original use of video technology in my experience was to aid in communication and in the determination of mutual treatment goals, particularly in the area of orthognathic surgery, where we could visualize the face

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and its underlying structures. However, other attributes of this technology rapidly became evident. At the 92nd annual meeting of the AAO in St. Louis, this technology was effectively brought to the attention of most of the profession by Dr. Jim Hilgers when he unveiled the "One-Step Consult" concept in which computers and video imaging technology were used to create documentation for his patients on the first appointment.

What's happening now? There are many commercially available programs that have been developed over the past decade, but fragmentation of systems is still the rule. In other words, programs that are very good in diagnostic applications may be quite deficient in office management applications and vice versa. I have written a fair amount of material on the use of video technology for treatment planning, mediation and prediction. The purpose of this paper will be to explore applications of video imaging technology to orthodontic practice in two areas:

1. Record taking—This is an area a lot of orthodontists are interested in, since it offers the possibility of easier record management and decreased costs.
2. Communication—Many doctors are attracted to the desktop publishing aspects of video imaging (Figure 1). Attractive letters and reports, complete with pictures, may enhance the image of the office.

As an active observer of the development of video technology, I have been struck by the myriad of uses that orthodontists have developed for this technology. In addition to many commercial vendors, many clinicians, such as Dr. Mike Stewart (Atlanta, Ga.), have been actively involved in conceptual software development for



# rostatic Clinical Applications

**ADOLESCENT GROWTH MODIFICATION**



**Dental Characteristics:**

- 1) Class II with overjet
- 2) Upright upper incisors, flared lower incisors (dental compensation)

**Ideal Referral Time:**

- Prior to adolescent growth spurt to time growth modification with the period of the maximum growth rate
  - Female - age 7-8
  - Male - age 7-8

**Treatment:**

- Adolescent:
  - Growth modification - headgear or functional appliance to retard maxillary or redirect mandibular growth more anteriorly
  - Extractions - in mild cases, retraction of the upper incisors is acceptable as long as care is exercised not to compromise the profile

Figure 1. The development of "desktop publishing" allows us to create our own illustrated instruction sheets, training booklets, practice promotion materials, etc., by importing pictures into word processing programs by the use of imagers. This is an excerpt out of a book, *Faces for Braces*, created internally in our office.

imaging and database management. As I go to meetings, I am continually amazed to run into doctors such as Bob Buck and Ephraim Medina who are so capable in the computer arena that it is extremely difficult to stay ahead of them! Different clinicians feel that different features of video technology are important. Let's take a quick look at the assets and potential pitfalls in the application of video imaging to record taking and communication.

## Digital Photography versus Conventional Photography

The movement toward electronic photography, talked about for years, is gaining some momentum because of a reduction in cost and a shift in our communications culture. The surge in home and office computers and the proliferation of CD-ROMs have made the computer—not the television as many predicted—the

main access machine. This means that the digital mode—not the analog mode—is the way in which pictures will be taken, processed and printed.

Two years ago, the only digital camera available that produced images that were close to 35 mm in quality and at an affordable cost was the Nikon medical model. Its price tag was \$25,000. Kodak/Apple produced a small, inexpensive (\$1,000) digital snapshot camera called the QuickTake, but its picture quality fell far below the standard desired for medical records. As is the case with most electronic equipment, size and costs are diminishing rapidly while quality is improving. Today, we can consider professional-level digital cameras such as the Minolta Digital Maxxum, the Kodak VCS 460 and the Canon EOS DCS 5. For \$8,000, the EOS DCS 5 handles

36-bit color with a resolution of 1.5 megapixels and provides a built-in microphone to record sound bites to caption your pictures. It can record more than 100 images on a removable card-type hard disc and may be hard-wired directly into your computer via standard SCSI cable. It has all the photographic features of the high-end Canon EOS-1N and accepts all Canon lenses and accessories.

One exciting prospect of digital photography is its potential for coordination with digital radiography. Someday we may be able to eliminate not only conventional photography, but darkrooms as well. Our radiographs can be captured in digital form, enhanced, integrated with the facial images, etc. All our records can then be dispatched directly to the computer for storage and analysis, and

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# Dr. Sarver

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this information can be distributed via E-mail, fax, or conventional hard copy printout.

## Medicolegal Issues

Video images are alterable. In principle, this renders video-imaged records not a very strong medicolegal record. It has been suggested, however, that as long as this is your normal record-taking tool, this type of record is usable in the defense of a malpractice suit. So how can we strengthen our position?

1. Digital cameras allow the digital data to be recorded onto diskettes which are WORM (write once, read many times). This means that the data is unalterable, but can be transferred to computers, printers, telephone lines, etc. Image file data can be "compressed" (Figure 2), which alters the way that the image is stored but does not change the image interpretation itself. The major difference between compression techniques is whether "lossless" or "lossy" compression is used. Most techniques use lossy compression, which means the computer decides what information can be thrown away. If lossy compression is used, the stored image cannot be returned to its original captured state. Lossless compression maintains the unaltered original image.

2. For those using video cameras or non-WORM technology to take medical records, I suggest that a "still" gallery be sent through your printer and that a hard copy be made, and then dated and signed by the doctor.

## Quality of Image Issues— Digital versus Film

Kodak and Canon promised to deliver a 6-megapixel version of the Canon EOS DCS 5 later this year. The current model yields a photographic-quality image of 150-line resolution up to 5x7 inches in size. The next version promises to eliminate any doubts about the quality gap, at least when it comes to enlarge-

ments up to and slightly larger than 8x10 inches. Though no prices have been released, published guesses are that it will be in the \$15,000+ range. As in all things, quality is attainable for a price! Many doctors are currently using video cameras for image taking. A couple of issues are involved here:

1. *What distortion ratios are present in "handy cams"?* This becomes an issue when video imaging is used as a diagnostic tool. A doctor would not think of taking facial pictures of a surgery patient with a 28 mm lens. The same principles apply to video imaging,<sup>1</sup> so when selecting a camera, keep this in mind.

2. *The quality of pictures taken in video recording versus digital photography versus conventional photography.* In our office, a hybrid version of record taking best suits our needs. We still shoot slides (I need them for lectures and publications anyway), but we use a Sony PHV-A-7 slide scanner (\$1,200) to scan the slides into

the videoimager. This gives photo-quality imaging and it retains an unalterable medical record in the form of the slides. At present, this is the method I feel most comfortable with until digital photography becomes more affordable and practical for the demands of my practice.

## Perceived Advantages of Video Imaging Records Over Photography

1. *Instant quality control*—We all have had the experience of sending off our film and not getting it back. Sometimes the exposures are not correct, and sometimes the photos are just not posed properly. The use of video imaging allows our pictures to be viewed instantaneously, and if mistakes are present, the pictures may be retaken, cropped or even recomposed later.

2. *Retrievability*—Photographs must be stored in a chart and can be accessed only by retrieving the chart. Digital photography allows us to store the images and

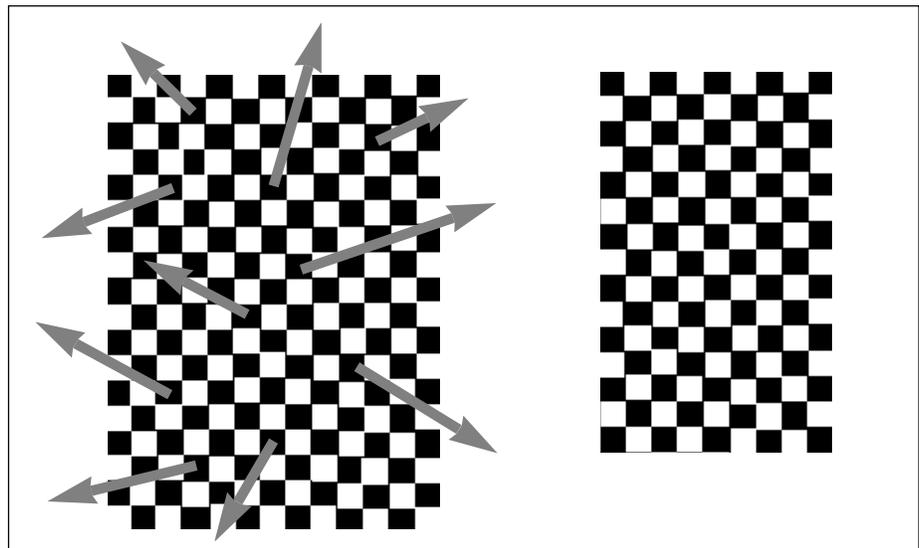


Figure 2. Compression of image files can be best illustrated this way: Each square represents a pixel from the image, much like how the number of silver particles determines the "graininess" of a conventional photograph. The left picture illustrates a picture file. In the right image, the computer selects a number of pixels to be discarded when saving the image. This saves storage space on the computer, but depending on how much compression is demanded, loss of image clarity may occur when the image is "blown up" again.

retrieve them from computers, make copies, or print transfer images between computers or over phone lines to other destinations.

3. Importability—Images can be imported into documents such as letters, charts and chairside monitors.

4. Presentation—Visualization and alteration of images are possible. For example, Class II correction can be achieved by either incisor retraction or mandibular advancement via growth modification or surgery. Demonstration of the profile outcomes of either of these treatment choices can be visualized by the patient and it has important medicolegal advantages.

5. Coordination with digital radiography—As described above.

#### **Disadvantages of Imaging versus Photography**

1. Storage—The two key phrases to always keep in mind are “on-board memory” and “improved compression.” Picture files in raw form are very large. The comparison is often made between a frame of 35 mm color film and a digital image file: 35 mm frame is said to hold approximately 18 million pixels of imaging information, the pixel being the definable building block of the digital picture. The space in your computer needed to store these pictures can be daunting, but a number of things have happened to remove this hurdle:

a. Processing speed has increased markedly. This means that information (including pictures) can be brought in, manipulated, and processed through and transmitted to other computers at ever increasing rates.

b. Higher capacity CCD chips are now available for less money. Accompanying this price drop is a parallel trend toward greater memory capability in cameras and storage. This means higher resolution (sharper pictures), in that we can store

**“Video imaging allows the patient better visualization of what the result may be and may reduce unrealistic expectations.”**

more pictures in the computer without the need for a massive storage unit.

c. New image compression schemes are being discovered at a rapid pace. Image compression is a way of shrinking the very large image files to a more manageable size, then, when needed, expanding them back to the original full-resolution size. This has been done with algorithms, that is, making assumptions about pixel arrangements and neighboring pixel identification and then creating a digital form that can be used to reconstruct the whole picture.

As presented previously, large image files can now be compressed and stored in the computer without undue space requirements. Probably the only disadvantage is that other hardware may be needed, such as optical disk-drive storage, but this is a relatively inexpensive problem compared to the positive impact that digital photography offers.

2. A capture station is often required in video imaging. This requires the patient to be transported to a particular location in the office, since in most commercial packages the camera and lighting are not easily transported to different areas of the office or to satellite offices. Some clinicians try to overcome this through the use of low lux video cameras, but again, the lighting is less than ideal.

3. Video imaging may require several people for good image taking. Conventional photography usually requires only one person to take pictures, since the patient can manage retraction and the photographer can operate the camera and mirrors. In video imaging, one person operates the video camera and another holds the light source. Retraction may be done by the patient, but often an assistant is required for this function as well. So two or three members may be required for picture taking.

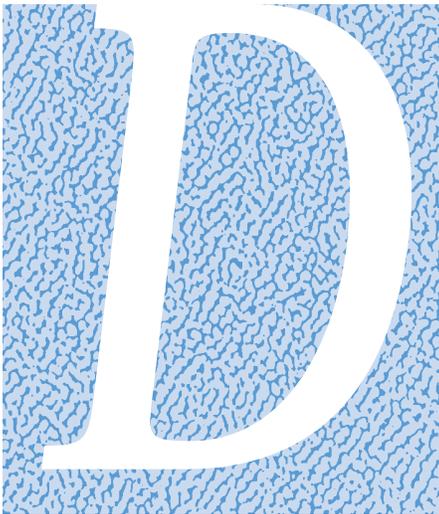
#### **Communicating Images in Documents**

Importing photographs into reports to the referring dentist is more than a glitz factor. Think about it—the dentist sees his patients every six months. He generally has a hard time associating your letter with the patient. He may refer the patient and not really have a clear idea as to why he did so, and what may be done. If a prose letter returns and he is intent on knowing what is going on, he needs to have the chart pulled, but he doesn't have visual records anyway. So his memory will have to do. The value of the enclosed photos is to allow him to visualize the patients and problems while the document explains how these problems are to be solved and what the treatment goals are. Our documents reflect treatment choices and describe why other options of treatment may not be desirable.

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# How to Improve Practice Ef

by John R. Smith, D.D.S., M.S.D.  
Winter Springs, Florida



o you remember your last hectic day? The schedule was overbooked and everyone was stressed out. There was no “quality” time to spend with patients or staff. No one was having fun.

Over the past 18 years of practice, I have experienced my share of these hectic days. I eventually sought the help of other seasoned veterans of our profession to guide me to a more rational and methodical approach to the practice of orthodontics. After carefully comparing my practice with theirs, I realized that the more important issues were clinical efficiency and timing of treatment. By enhancing clinical efficiency and starting orthodontic therapy at the optimal time, many of the common problems that plagued my practice evaporated. The two greatest changes the office experienced were reduced stress and higher profitability. It is my hope that this article will help you realize the many benefits that can be achieved through improving clinical efficiency.

## **The Price You Pay for Inefficiency**

As a growing orthodontic practice matures, the demands on both doctor and staff increase dramatically. The complexities of managing an increasing family of patients and staff can become overwhelming and lead to frustration and deterioration of patient and staff relationships.



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Dr. John R. (Bob) Smith received his D.D.S. from Emory University in 1975 and his M.S.D. from the University of Washington in 1977. He received the Milo Hellman Research Award for his graduate thesis. An original member of the “Lingual Task Force,” Dr. Smith has lectured and published extensively on lingual orthodontics as well as practice management, diagnosis and treatment planning, and early intervention. He maintains a full-time practice in Winter Springs, Florida.

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Once relationships are compromised, the health of the practice suffers. Relationships are the building blocks of a successful practice. When a practice that seeks continued growth reaches a plateau, experiences a decline in production or has significant staff problems, it is usually related to weakened relationships. If patients feel that the services they are receiving are not worth the time and money they are investing, they may stay in the practice, but they will probably not refer family or friends. Similarly, if staff members fail to receive adequate recognition from patients, doctor or fellow staff members, they can become disenchanted with the practice. Reduced staff morale leads to reduced commitment and the quality of services to patients is compromised.

Profitability is not the only factor compromised in an inefficient office. There are hidden costs that affect the general health of the practice. These include:

1. Unavailability of appointments for future procedures. This usually results in overbooked schedules that extend waiting times for patients.
2. Chronically running behind schedule increases stress on the doctor, staff and patients. This leads to decreased morale and is a major factor in staff turnover and poor performance.
3. Since longer productive appointments are hard to schedule on a timely basis, treatment times are usually increased, contributing to schedule overrides.
4. There is little time for structured staff meetings, education or creative thinking.
5. The most important factor is the decrease in quality time to enhance relationships with patients.

If an orthodontic practice experiences these internal stresses, it is essential to solve the problems with effective evalua-

# iciency & Profitability

tion and management. Once a practice develops a negative image in the community, it is extremely difficult and time-consuming to change that perception.

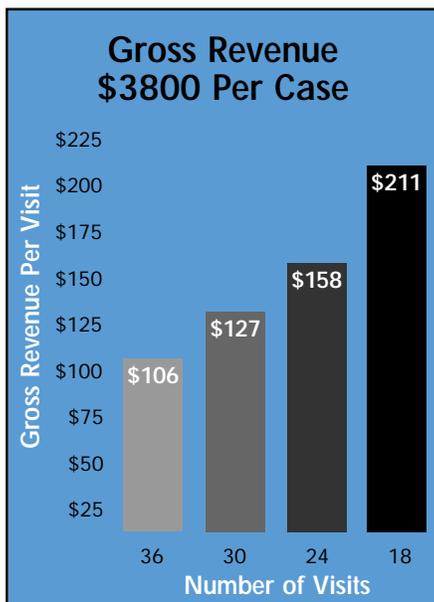
## Evaluating the Essential Elements

In the quest for enhanced efficiency and profitability, the orthodontic team needs to evaluate the essential elements of the practice. These elements are:

1. Increasing new patient exams.
2. Increasing new patient enrollment.
3. Improving treatment quality and efficiency.
4. Creation of practice missionaries to provide a continuing source of new patients.

While each of these elements is vital for the health of the practice, which, if modified, would give the best return on the investment of time, energy and money?

The area of the practice that has the greatest influence on efficiency and profitability falls within the orthodontist's province—



the diagnosis and treatment of patients. A practice will receive the greatest rewards for efficient and timely quality care. If the doctor makes poor decisions on when to initiate treatment and uses compliance-based orthopedic appliances (i.e., headgear and removable functional appliances), the average patient will be seen an unnecessary number of visits. These added visits will stress an already busy practice and reduce profits. Also, the extra trips to the orthodontist can be a hardship on the patient and parents, particularly when both parents work and the child is in school.

## Developing a Simple Statistical Measure of Practice Efficiency

The first step toward enhancing the practice environment is to establish a statistical system for measuring efficiency. Several statistical measures are necessary for the proper management of a practice, but one particular ratio gives the most information concerning efficiency: per visit collection-adjusted gross collections divided by patient visits (\$/visit).

There are two ways the \$/visit ratio should be used to monitor practice efficiency. First, the overall practice must be evaluated for efficiency. This is done by dividing the adjusted gross income by the total number of patients seen in a given month. All visits should be included to get an accurate representation of efficiency. There are many procedures done in the orthodontic practice that are free to the patient. Many orthodontists do not charge for new patient exams, recall appointments, retainer adjustments or emergency visits to repair loose or broken appliances. The collection of fees for charged services must pay for these free services. By monitoring \$/visit, practitioners will quickly realize how important it is to reduce emergency visits and retainer adjustments.

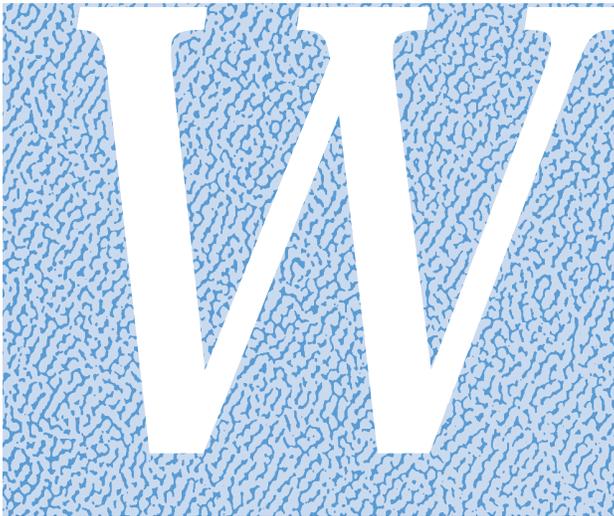
**“The orthodontist should be continually searching for innovations to reduce the number of visits needed to effectively treat patients.”**

Also, it may be necessary to charge a reasonable fee for emergency visits resulting from abusive behavior.

Once an office has established the per visit collection ratio for the month (gross collections/all patients seen for the month), it is essential to compare the result with a benchmark. An office that is both efficient and profitable should have an overhead of approximately 48 to 50 percent, with an overall per visit collection ratio of \$130/visit. Therefore, an orthodontist seeing 50 patients per day (income producing visits) with an average full-treatment fee of \$3,800 should collect approximately \$6,500 a day. If the doctor works 180 days per year, he or she can expect to gross approximately \$1,170,000. A practice seeing 100 patients per day would gross approximately \$2,340,000. Of course, if the average treatment fee is less than \$3,800, these figures would be affected proportionately.

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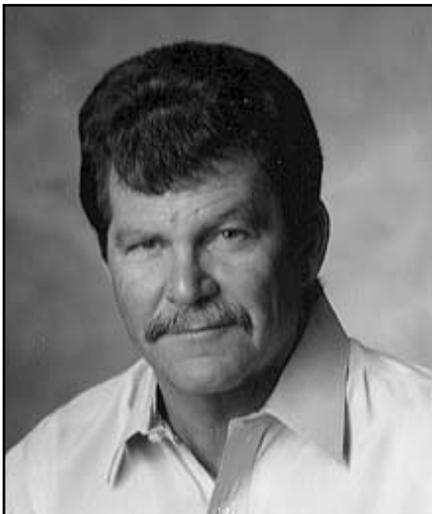
# Simplified Treatment Mech or getting the overhead bac



## **WHAT IS STM?**

It is what I call a “tri-phasic” system of simplified treatment of orthodontic malocclusions. First, it involves correcting the width; second, correcting the antero-posterior discrepancy (sometimes I do both or parts of both at the same time—more on this later); and third, placing braces on uncrowded Class I cases. This applies to both full- and early-treatment cases.

by Joe H. Mayes, D.D.S., M.S.D.  
Lubbock, Texas



Early treatment cases are a small part of our practice. I prefer to wait until I can treat in one phase unless one of the following criteria is exhibited and I feel interceptive treatment is *necessary*:

1. Extreme Class II—Danger to upper anteriors
2. Class III—Deficient maxilla
3. Posterior Crossbite—Constricted nasal airway
4. Anterior Crossbite—Nonfunctioning anterior guidance
5. Severe Crowding—With facial aesthetics calling for nonextraction
6. Open Bite—Due to tongue thrust or thumb sucking

I can tell you to the penny how much every orthodontist in the country makes—he or she makes what is left over! The most common obstacle facing orthodontics today is increasing overhead. The escalation of overhead erodes profits and adds to stress on the orthodontist. The pressure of increased spending is caused by several things. Compliance with OSHA and other government regulations is expensive. Fees have not increased as fast as salaries and supply costs in most ortho-

dontic offices. Even though there are fewer orthodontic graduate students, many orthodontists are retiring later; therefore, there appear to be too many orthodontists in many locations across the country. There is increased pressure from general dentists doing more orthodontics, and PPOs, HMOs, etc., are attempting to lower orthodontic fees. Finally, inherent and taught over-treatment visits and inefficiency of treatment mechanics increase overhead and are two of the biggest drains on office expense. However, this is one area that, when addressed, can be corrected and brought into line to get the overhead back below 50 percent.

Changing outdated treatment mechanics to become more streamlined and efficient requires courage. There is fear in changing your mechanics—you are most comfortable with what you have always done. However, if you keep doing what you’ve always done, you’ll get what you’ve always gotten. One of the definitions of insanity is to keep doing the same thing and expect to get a different result. I experienced quite a bit of trepidation myself as I changed my practice, but not for long, as STM produced an improved bottom line and rekindled my enthusiasm for my work. I am only going to describe how I do things now and hope that you will find something that will help you as well.

There are several advantages to STM. The orthodontist has a more controlled

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A native of Crane, Texas, Dr. Joe H. Mayes received his B.S. from Texas Tech University, followed by his D.D.S., M.S.D. and Certificate in Orthodontics from Baylor College of Dentistry. Dr. Mayes is engaged in the private practice of orthodontics in Lubbock, Texas, and has been actively involved in new product development.

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# mechanics (STM), Part I...

## cost below 50%!

practice—fewer “SOS” or surprise visits, and cases are finished on time. Total patient visits for treatment are reduced, helping decrease the number of patients seen each day, while achieving equal or better results. This is most important, as simpler things can be taught to assistants more easily and faster. The longer treatment intervals help decrease the number of patients seen each day. Parents love not having to interrupt their schedules so often—we have to recognize that they have better things to do with their time than sitting around our offices. With Simplified Treatment Mechanics, the cases finish in

the same or shorter treatment times, mostly due to the removal of compliance requirements. Fewer active treatment patients per day is an advantage that allows fewer employees and leads to a lower overhead.

One of the biggest advantages is finishing cases on time. I’m probably the only orthodontist who gets asked each visit, “When are my braces coming off?” With longer treatment intervals and fewer active patients each day, the orthodontist can work fewer days a month and maintain the same size practice. Hand-in-hand with

fewer treatment visits per case is enhanced profitability. Dr. Bob Smith is addressing this aspect in his accompanying article. All these advantages lead into the final few. STM creates less patient, parent, orthodontist and orthodontic staff stress, decreasing doctor “burnout.” Another plus is that the practice appears less busy and harried to patients and parents. Having more fun with the practice is a benefit everyone will enjoy. My favorite benefit is having more time to be creative. If we are always busy or rushed, we do not have the time to develop new ideas that enhance the practice or our private lives. Enough about why we should consider changing our mechanics. Now let’s talk about Simplified Treatment Mechanics.

## A Sample of Five Consecutive Cases Treated With STM

### Case One

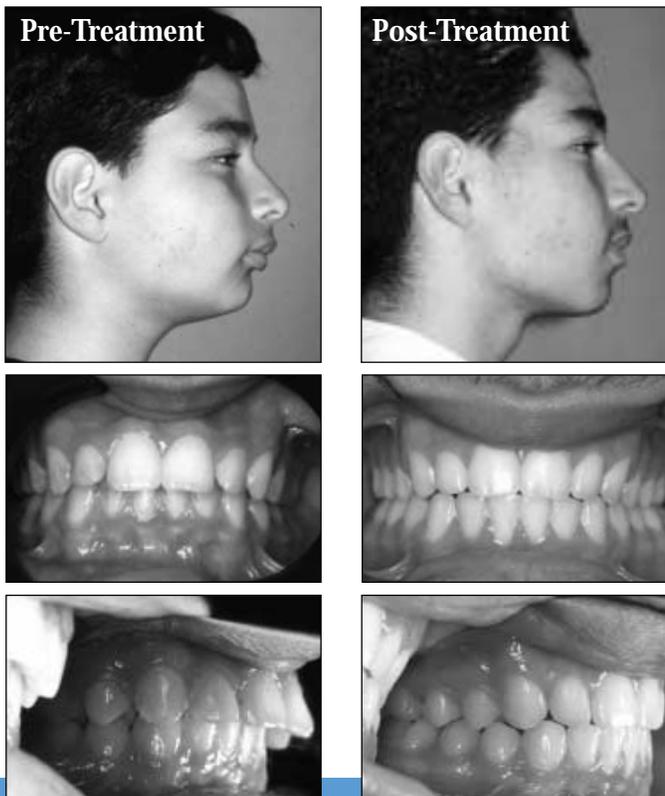
Patient S.S.  
Treated in 22 months

- Upper expander
- Cantilever bite-jumping appliance
- Full appliances upper and lower
- Three total archwires

New patient exam to retainer delivery...

## 14 visits

Cases continue on following pages



### STM GOALS

Before describing treatment mechanics, we have to know what we hope for them to accomplish.

**Dependability.** This is most critical. We want to eliminate SOS appointments and after-hours visits. If our mechanics involve appliances that can be lost or broken easily, maybe we should consider other appliances or treatment mechanics.

**Compliance-Free.** This is one of the most important things to consider when thinking of changing treatment mechanics. If it can be removed, it probably will be removed. Perfect cooperation cannot be expected, even from the best of patients. If a child looks better with his lower jaw forward, I will not ask that a headgear and/or elastics be worn. I will, however, receive great compliance with a bite-jumping appliance. Growing up was the hardest thing I ever did (some would argue that I did!) and the second hardest was raising my children. There are lots of

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# Dr. Mayes

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opportunities for conflict, and if we can eliminate some of them, this is a service.

**Simple Case Selection.** I have the Class II, Division 1 patient slide their lower jaw forward as if biting a thread and hold their jaw in this position. If their face looks much more balanced, you can bet they will be in a bite-jumping appliance in my office. We need to learn more about how to treat faces—we already know how to straighten teeth.

**Simple Mechanics.** I mean to get as much from each procedure as possible. For instance, when closing spaces, use a finishing-size stainless steel archwire with no tiebacks. Utilize crimp-on Class II or Class III hooks and nickel titanium springs with eyelets to attach to the archwire hooks and molar hooks. Then, when the space is closed, tie back from the molar hook up to the hook on the archwire with a steel tie to maintain the space closure.

**Simple Adjustments.** Simple adjustments come in many varieties. In my office, they do not include tiebacks, head-gear adjustments, adjusting lip bumpers, adjusting and checking removable expansion appliances, replacing O's or chains, or checking elastic wear. In my office, they would include adjusting a bite-jumping appliance, adjusting a Pendulum Appliance, checking to see if enough interarch spring wear has occurred, or checking to see if we have received the desired expansion. These are all very brief and easily performed adjustments.

**Long Treatment Intervals.** We made a study of working mothers in my office. We found that 74 percent of the moms were working and that 52 percent of that 74 percent were single. My feeling is that if we can do more at each visit and see the patient less often, this is a better service. Most patients and parents appreciate not having to come to our office every month. What I mean by long intervals is seven to eight weeks between routine visits and two to three months for bite-jumping

## Case Two

Patient A.R.  
Treated in 12 months

- Upper expander
- Lower "Frozal"
- Full appliances upper and lower
- Three total archwires

New patient exam to  
retainer delivery...

## 8 visits



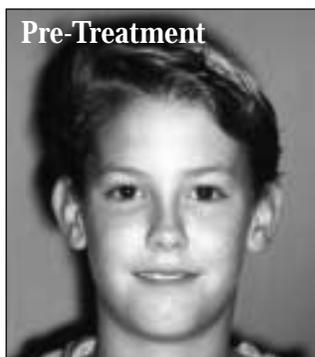
## Case Three

Patient C.N.  
Treated in 18 months

- Upper expander
- Full appliances upper and lower
- Three total archwires

New patient exam to  
retainer delivery...

## 11 visits



## Case Four

Patient R.H.  
Treated in 17 months  
(after just finishing 35 months in full braces with a local general dentist)

- Modified upper "W"
- Modified lingual bar
- Full appliances upper and lower
- Three total archwires

New patient exam to retainer delivery...

### 12 visits



## Case Five

Patient R.D.  
Treated in 23 months

- Upper expander
- Lower "Frozal"
- Cantilever bite-jumping appliance
- Full appliances upper and lower
- Three total archwires

New patient exam to retainer delivery...

### 15 visits



appliance patients.

**Enhanced Marketing.** When Ormco introduced Copper Ni-Ti™ wire, it helped my in-office marketing immeasurably. This is the first wire we normally place, since it easily engages malposed teeth, causes less patient discomfort and produces consistent, predictable results. Once the wire is engaged and tied, the parent(s) is asked to come back to the treatment area. I take one of the Copper Ni-Ti wires out of the packet, dip it in ice water and let the patient make all the bends they wish in the wire as I describe its "high-tech" nature. I explain that the patient is benefiting from the most metallurgically advanced archwire in existence. Then I have the patient hold the wire under running warm water and watch the arch straighten out immediately. Both patient and parents are impressed. I tell them that this is why I want the patient to rinse with warm salt water at least once a day. Everyone enjoys the demonstration, and the "high-tech" wire story is told to friends and neighbors.

**Fewer Treatment Visits.** This is the ultimate goal of improving treatment mechanics. It is much more profitable to see patients only 12 to 14 visits during treatment than it is to see them 20 to 25 visits. If you want to open your eyes, divide your last year's overhead by the total number of patient visits to derive the average cost of each patient visit. This is also why we want to keep the total number of treatment visits as low as possible.

**Predictable Results.** When compliance is not a factor, predictable results are made possible. As an example, we know how to adjust a cantilever bite-jumping appliance to get more or less dental and/or orthopedic correction of the Class II malocclusion. Predictable results also allow us to actually plan at the start of treatment what we expect to do at each visit of the entire treatment. Predictable results allow us to schedule longer intervals between visits,

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# Dr. Mayes

continued from preceding page

confident that when the patient returns for their next visit, we will be ready to move on to the next step in treatment.

**Simple Delivery Systems.** Everything we do in the office should be outlined and written out in clear, concise terms for simplicity and training. The delivery systems should be 100 percent repeatable. In other words, my expectations for fitting a band are that it should require no more than three bands to be tried on and the final-fit band to be done in less than two minutes. If we do not have simple systems for delivery of our appliances and mechanics, we cannot be this efficient.

**Simple Staff Training.** The only thing worse than losing a trained staff member is keeping an untrained one. Staff training is a never-ending process. The key to training is “perfect practice makes perfect.” Our entire office participates in a “practice university” with monthly sessions of 1 to 3 hours. All of us go over the same procedures each month of each year so that training is consistent from year to year. I use the “MISS” principle in training. In other words, I want to “make it so simple” that no one “misses” the point. This allows the necessary repetitions to implant the training so everyone does everything the same way each time.

**Simple and Repeatable Scheduling.** Scheduling should be repeatable. Within a few minutes, each patient visit for the same purpose should be repeatable. If not, it raises havoc with scheduling. We should be in control of how long it takes to perform each patient visit. What if the patient is late? Either reschedule or, if time permits, write down on the tray paper when they are to leave the office and do whatever you can during the time remaining. Doing like things at the same times also simplifies scheduling.

**Simple and Few Arch/Appliance Changes.** This allows fewer visits. Ideally, I prefer to correct the width first.

**“With Simplified Treatment Mechanics, the cases finish in the same or shorter treatment times, mostly due to the removal of compliance requirements.”**

Then I remove this appliance(s) and correct the A-P. Finally, when I have a Class I uncrowded case, I place the braces. This means I normally place braces only on Class I uncrowded cases. This allows me to place the lower braces first and use a .017 x .025 Copper Ni-Ti archwire. In a few months, the upper braces will be placed and I will use this archwire as the first upper wire at the same time I place my finishing lower archwire. This allows a three (total—not per arch) archwire system.

**Simple Retention.** Mechanics do affect retention. One of the older styles of treatment involved extraction of upper bicuspids and a single lower incisor. This not only makes it impossible to get the midline on but it also commits the patient to a future deep overbite. The only way to prevent this is the nightly wearing of a bite plate-type retainer and this still doesn't allow proper anterior guidance. Much simpler retention is to fabricate suck-down polypropylene retainers with the ability to utilize the mechanics of resetting teeth, if needed, before making the retainers.

The overall goal of my treatment is to place braces only on Class I uncrowded cases. As you will notice, my appliance therapy gets me there.

## STM KEYS

These 14 keys will help you achieve your goal of treating cases in the minimum number of visits, from new-patient exam to retainer delivery:

1. *Do as much as possible at each visit, then wait for what was done to expend itself fully.* If, for example, you place a .017 x .025 Copper Ni-Ti archwire and “O” it in, you should steel tie it for full engagement (after the patient rinses with cold water). It will take two to four months for the wire to completely straighten out using warm water rinses daily. Leave the wire in until it has completely done all it can accomplish. Only when the wire is through is it time to go to the finishing wire.

2. *Schedule the new patient exam, records, treatment explanation, financial arrangements, and separators for a single visit.* My office routinely accomplishes this in about 50 to 55 minutes. Before I see the new patient, a headfilm and panoramic X ray are made. I trace the headfilm on my computer and then make a tracing and three-year growth forecast. This way I can diagnose the case when I first meet the new patient. This type of service needs to start with the initial phone call. Use this first contact with the office to get the necessary information about the patient and parents and

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# Dr. Smith

continued from page 7

The second way to use the \$/visit ratio is to evaluate every income-producing procedure. It is imperative to use the most efficient and profitable procedures in the practice. For example, a practice may use three types of mechanical devices with the typical Class II malocclusion: Frankel, headgear and Herbst.\* Assuming each device can deliver a high-quality result, which is the most efficient and fulfills the criteria for reduced visits? Cases treated with each device must be monitored with the \$/visit ratio (total fee for service/visits). After several months of analysis, an office can determine which mode of treatment best meets their efficiency goals.

Productive procedures should generate approximately \$190 to \$200 per visit. For example, a full-treatment case at \$3,800 should require about 19 to 20 visits to complete (including separation, emergency and retainer placement visits). Carefully staging patient treatment and using the most sophisticated and efficient appliances, it is possible to achieve these production figures. Many doctors do not have a basis for structuring fees for each procedure. By knowing the average number of visits needed to achieve the desired results and the necessary per visit production, the orthodontist can establish sensible fees.

We can compare three hypothetical practices to illustrate the effect that poor clinical efficiency has on increasing patient visits. Each practice starts 200 cases a year and has an average treatment fee of \$3,800. Assuming the doctors finish the cases and collect all fees in 24 months, each doctor would gross \$760,000. Suppose Doctor #1 takes 24 treatment visits to complete the average case, Doctor #2 takes 30 visits and Doctor #3 takes 36 visits. Dividing the number of visits into the case fee of \$3,800, Doctor #1 collects \$158 per visit, Doctor #2 collects \$127 per visit and Doctor #3 collects \$106. If the impact of the extra visits is assessed over an entire year, the loss of productivity is remarkable. Reducing the number of visits is one major key to enhancing total

## August 1995

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30	31	1 Office with Patients 7am-6pm	2 Office with Patients 7am-6pm	3 Office with Patients 7am-12 noon Office Study 1pm-5pm	4 Visit Mom and Dad	5
6 Office with Patients 7am-6pm	7 Office with Patients 7am-6pm	8 Office with Patients 7am-6pm	9 Family Vacation - Bonefishing and Diving in Belize	10	11	12
13 Fishing and Diving in Belize	14	15 Office with Patients 7am-5pm	16	17 Dad and Son Weekend	18	19
20 Office with Patients 7am-6pm	21 Office with Patients 7am-6pm	22 Office with Patients 7am-6pm	23 Office with Patients 7am-6pm	24 Office with Patients 7am-12 noon Office Study 1pm-5pm	25 Office Retreat Video-taping of Office Procedures/ Consultations	26 Office Retreat 7am-12 noon
27 Office with Patients 7am-6pm	28 Office with Patients 7am-6pm	29 Office with Patients 7am-6pm	30 Office with Patients 7am-6pm	31 Office with Patients 7am-noon	1 To Alaska, Fishing 'til Sep 10th	2

Clinical efficiency provides a lifestyle of choice – Dr. Smith's typical monthly schedule.

practice efficiency. A doctor's decision to start a case too early or use a mechanical system that requires frequent adjustments is doomed to poor treatment efficiency and reduced collections per visit. When the total number of treatment visits is reduced, the one overwhelming benefit to the orthodontist is the increase of time. Additional time gives orthodontists more choices in directing their personal and professional lives. Some choose to reduce the number of workdays to focus on family and hobbies, while others want to expand their practices to higher levels of profitability. The bottom line is that time and profitability give you the choices.

### Reducing Overhead

The greatest cost of inefficiency results from the need for additional staff to treat and support the increased number of patient visits per year. An increase in the number of patient visits requires more time for the staff to schedule appointments and handle the necessary correspondence with parents and referring doctors. More supplies are used and sterilization procedures mushroom, increasing office overhead.

Using our previous examples, if each doctor consistently starts 200 cases a year, each office will have approximately 400 active cases under treatment. If Doctor #1 takes 24 total visits to treat a patient over

a two-year period, the office would perform 4,800 treatment visits/year. Doctor #2, at 30 total visits, would have 6,000 treatment visits/year and Doctor #3, at 36 total visits, would have 7,200 treatment visits/year. Assuming Doctor #1 has a highly efficient staff of six members, Doctor #2, because of the 1,200 extra treatment visits per year, would probably need one more staff member. Similarly, Doctor #3, because of the 2,400 extra treatment visits, would need two additional staff members. These assumptions are based upon my own experiences and those of others who have succeeded in improving efficiency and profitability.

Since the average cost of each staff member is approximately \$25,000/year (salary and all benefits), each additional staff member in a \$760,000/year practice raises overhead 3.3 percent (\$25,000/\$760,000). This difference in the number of staff is one of the main reasons that orthodontic offices can start the same number of patients yet have tremendous differences in net profitability. By incrementally improving the time and efficiency of orthodontic therapy, most orthodontists can see the same number of active cases with fewer staff members.

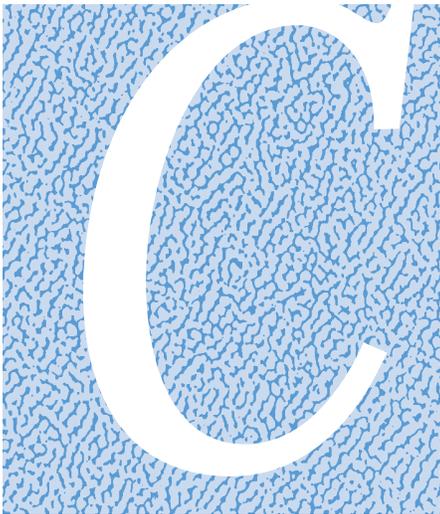
### False Economies

Most doctors focus an inordinate amount

continued on page 21

\* Herbst is a registered trademark of Dentaaurum, Inc.

# New Miniaturized Magnets for Molar Distalization



by Abraham M. Blechman, D.D.S., M.S.  
Tappan, New York  
Charles Alexander, D.D.S., M.S.D.  
Arlington, Texas



Continuing interest in the use of rare earth magnets for orthodontic treatment has stimulated the evolution of miniaturized, less expensive magnets for molar distalization. This latest development, Magneforce™, is both doctor- and patient-friendly. Unlike their bulky and difficult-to-insert predecessors, Magneforce appliances are comfortable and easy to use. Timely distalization of maxillary molars, without undesirable side effects, has often been a frustrating task, largely because of the need for patient cooperation in force application and the limitations of conventional forces.

In the three case reports shown, static magnetic forces were the chosen distalizing modality, since this technology is not dependent on patient compliance. These forces also produce reliable, safe and predictable distalization results, with minimal mobility and discomfort when used correctly, thereby serving as a unique practice builder. Graber noticed this

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Dr. Abe Blechman received his D.D.S. from New York University and his orthodontic training and M.S. in bioengineering from Columbia University, where he has served a long-term tenure on the orthodontic faculty. He has been involved in the development of magnets for tooth movement since 1967. Dr. Blechman has published and spoken extensively in the United States and internationally. He maintains a private orthodontic practice in Westchester County, New York.



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Dr. Charles (Chuck) Alexander was an OKU graduate of Baylor College of Dentistry and earned his M.S.D. from the University of Washington in Seattle. He now serves Baylor as a clinical instructor in the Department of Orthodontics. Dr. Alexander has been a partner in an Arlington, Texas, practice for the last six years, has published in the AJO-DO and has had various lecture engagements.

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reduction in mobility during an increased rate of movement in his report on disimpacting canines with magnetic force<sup>1</sup>. Decreased discomfort during movement is related to decreased mobility. Since bone resorption is faster than deposition, increased tooth mobility is usually observed with conventional forces. Although movement is rapid, the decrease in mobility reported with magnetic force fields can be explained by a stimulated osteogenic rate that, at least, equals resorption. Possibly both rates are accelerated. An interesting related observation is that less magnetic force appears to accomplish the same result as a greater conventional force. While the light force generated by Magneforce is more than adequate for rapid, mostly translatory, molar distalization, this type of force also minimizes local pathology and reactive anchorage force. It should be noted that simultaneous maxillary and mandibular distalization is also possible where necessary.

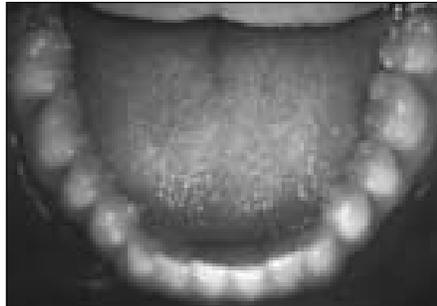
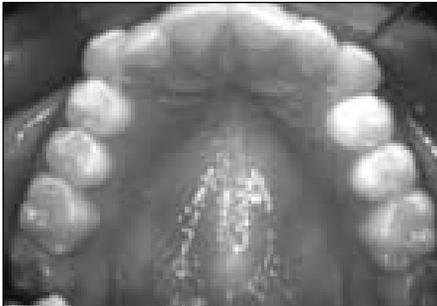
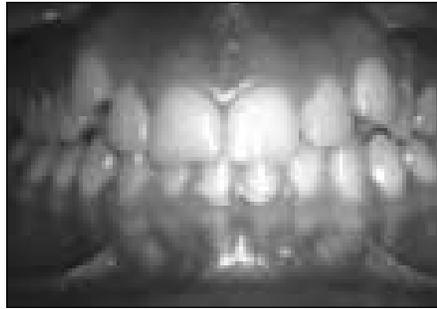
The three case reports and insertion instructions illustrate the ease of use and effectiveness of Magneforce for molar  
*continued on page 16*

## Case Two

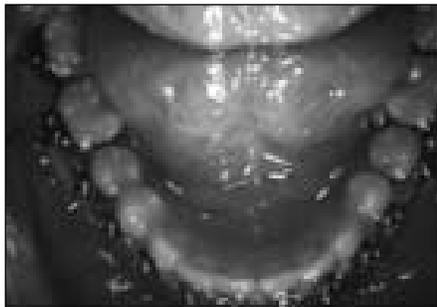


Pretreatment

# Case One



Pretreatment: Fourteen-year-old female with Class II end-on molar and cuspid relationships. OJ=5mm; OB=3mm; mandibular arch length discrepancy=5mm. Mild Class II skeletal pattern, normal mandibular plane angle, strong hard tissue pogonion and normal root and bone formation. Mandibular arch shows mild crowding.



Seven months' progress views after magnetic molar distalization on maxillary arch. Magnets have been removed, and a Nance placed to retain the distalized molars. Magnets were reactivated once a month. Mandibular arch was banded and bonded at three months. View shows an .012 x .025 D-Rect® archwire. Composite view reveals mostly translatory molar distal movement and minimal anchorage loss.



Pretreatment

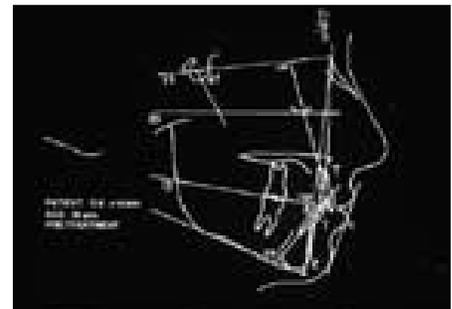
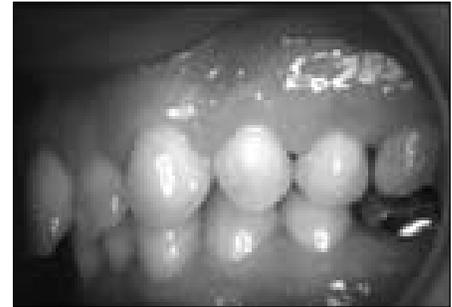
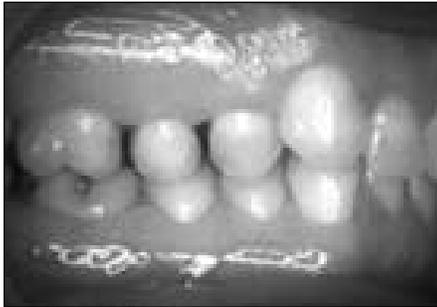


Three months' progress view of magnetic distalized maxillary molars. Note that the anterior bite plane, which is an extension of the Nance, has discluded the posterior teeth.



Four months' progress view of magnetic distalized mandibular molars. Note that the lingual arch provided anchorage. Magnetic reactivation occurred once a month.

## Case Three



Pretreatment: Thirty-six-year-old female with Class II end-on molar and cuspid relationships. OJ=4mm; OB=4mm; maxillary arch length discrepancy=2-3mm; mandibular arch length discrepancy=4mm. Class II skeletal pattern (ANB=5°). Normal mandibular plane angle. Mandibular incisors proclined (115°). All third molars removed. Root and bone formation normal.

distalization. While the initial focus on magnets has been on the force component of the field, the successful use of osteogenic, time-varying magnetic induction fields in orthopedic fracture nonunions has long intimated the possibility of a similar beneficial result using static magnetic fields in orthodontics as well as orthopedics.<sup>23456</sup> Moreover, clinical results with magnetic molar distalization suggested that the simultaneous force (which perturbs the local equilibrium) and field bioeffect provided by the magnets resulted in an accelerated rate of tooth movement and bone deposition, while minimizing the usual adverse consequences associated with rapid movement. A recent study<sup>7</sup> seems to further support the validity of these biologic advantages of magnets.

As previously noted, the bulky and complex design of earlier magnets used in

orthodontics made their insertion difficult and time consuming. With Magneforce, once the bands are cemented, bilateral magnet insertion should take less than five minutes. The proven performance of magnets for force application, their ease of use today, and the mounting evidence of additional biologic benefits all point to a promising future for magnets in meeting molar distalization and other treatment requirements.

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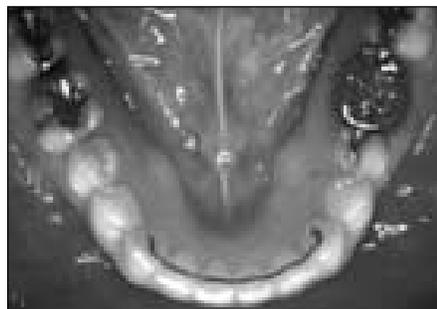
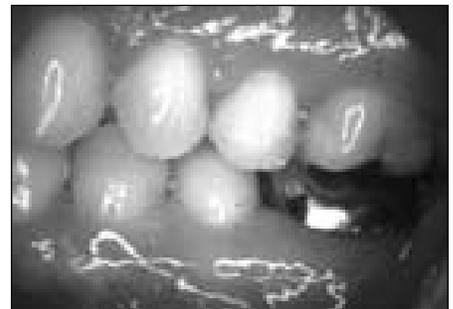
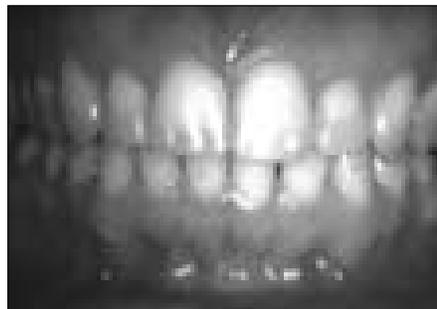
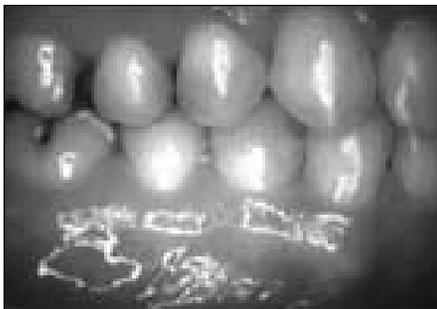
*Appliance Insertion Techniques  
begin on page 18*



Six months' progress views of magnetic molar distalization. Anchorage was provided by a Nance from the second bicuspids; reactivation of the magnets occurred once a month. After completion of distalization, the magnets were removed, and a new Nance was placed from the first molars and used for retention. Mandibular arch was essentially unchanged.



At 14 months a .017 x .025 TMA® archwire was used in the maxillary arch. (Conventional mechanics were used beginning in the eighth month to distalize bicuspids and cuspids and ultimately to complete treatment.)



Posttreatment views at 24 months.

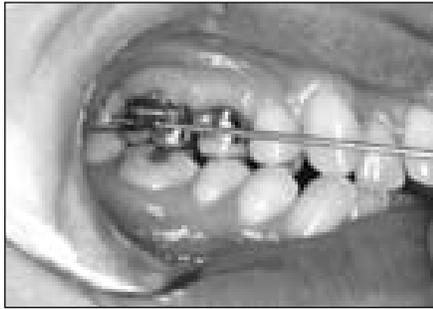
# Appliance Insertion Techniques

(Complete instructions are provided with single-patient Magneforce kits.)

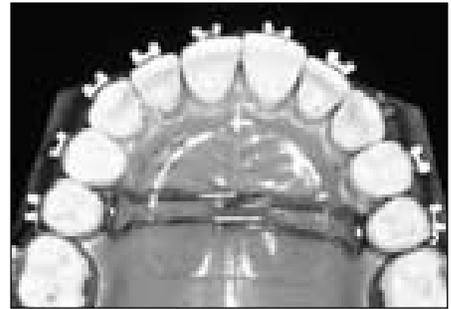
## Standard Method



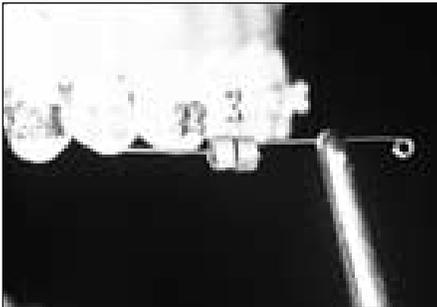
1. To simplify magnet insertion, advance correct alignment of the molar buccal tubes is important. A long wire inserted into a buccal tube and extended mesially parallel to the buccal surfaces of the first and second bicuspid teeth will help accomplish this alignment during band cementation.



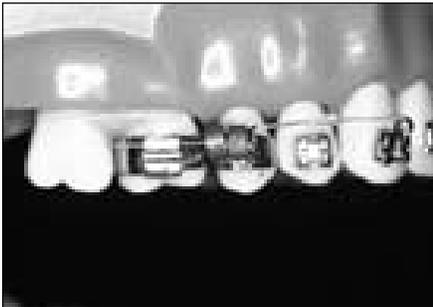
2. Molar buccal tube alignment is further aided when the long wire is also parallel to the occlusal plane when viewed buccally.



3. Second bicuspid bands, connected to the modified Nance for anchorage, are cemented. The acrylic button is located in the area of greatest curvature of the palatal vault and extends laterally and anteriorly.



4. One of the two sectional wires with magnets included in the single-patient kit is shown. The .016 stainless steel wire (with two repelling, cylindrical magnets held together by a wire clamp) is ready for insertion into the auxiliary edgewise tube. A mesial helix accepts a ligature to activate the magnets when the restraining clamp is later removed.



5. Insert the distal end of the sectional wire into the most buccally positioned edgewise tube.

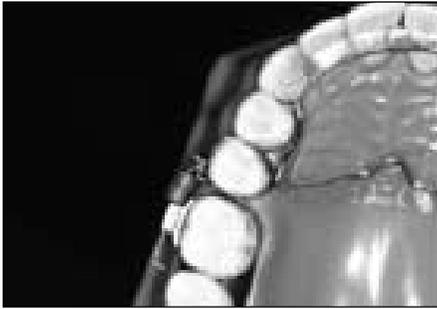


6. Push the sectional wire distally until the magnet contacts the buccal tube. About 3mm distal to the tube, bend the distal end of the wire lingually to avoid buccal irritation.

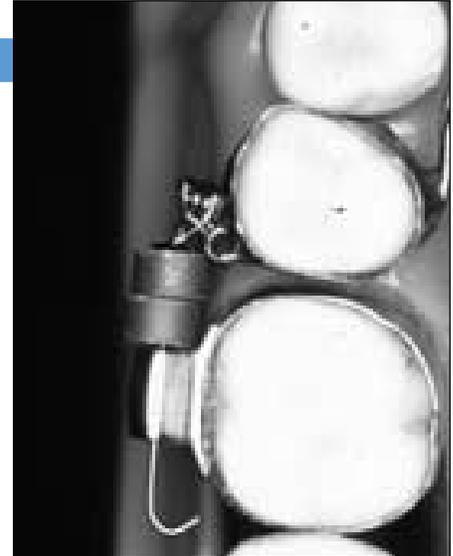


7. Ligate the sectional wire to the first and second bicuspid brackets. Begin to ligate the activating ligature from the helix at the mesial end of the wire to the second bicuspid bracket to activate the magnets by keeping them in maximum contact. Then remove the clamp holding the magnets together. While tightening the activating ligature, to achieve maximum contact push both magnets together distally with your finger and hold. Test to be sure that magnets remain together in contact when your finger is removed.

# Alternative Method



1. Shorten the mesial helix, since the first bicuspid bracket is eliminated. The second bicuspid band may or may not have a bracket but must have a welded, short vertical tube deep in the distobuccal embrasure for ligature activation. The Nance anchorage may be further enhanced with a soldered lingual arch from second bicuspid to second bicuspid. To activate the magnets, ligate from the shortened mesial helix to the vertical tube on the second bicuspid while pushing the magnets distally with your finger.



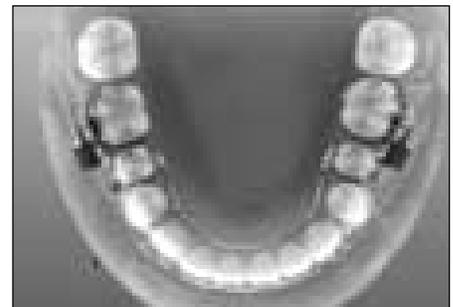
2. Occlusal view of alternative method.



3. Buccal view of alternative method.



4. Magnets used to distalize maxillary and mandibular molars simultaneously without occlusal interferences.



5. Mandibular lingual arch anchorage from second bicuspid to second bicuspid. A modified Hawley extension from the lingual arch may be used to augment mandibular anchorage.



6. Maxillary arch with bilateral magnets. Nance and lingual arch provide anchorage.

## Magneforce™ Molar Distalization System



Of the many options for molar distalization, Magneforce provides a clinically efficient, easy-to-use and patient-friendly choice. Magneforce Kits contain two universal magnet assemblies and a complete instruction booklet. See Page D of the Center Section for order information.

In my opinion this is a valuable professional educational system (Figure 3).

## Video Imaging in Case Presentation

As stated earlier, video imaging is a new technology to our specialty, and studies evaluating its impact on patients and practices are scant. However, research on this topic has been done that is very relevant to our discussion. The first concern most clinicians have about video imaging is that it may lead to unrealistic patient expectations. Because the software can be programmed to calculate differential soft tissue response to hard tissue movement, realistic projections of treatment should be attainable (Figure 4). Many clinicians fear that patients would be led to expect too much from these predictions and that the use of imaging may produce patients who, if dissatisfied with the esthetic result, would sue, claiming the end result did not live up to the image provided. In orthognathic surgery (which is where most of the research on video imaging has been done), most data on postoperative patient attitudes does not support that fear. Kiyak<sup>2</sup> reports that although 85-90 percent of surgical orthodontic patients eventually indicate they are satisfied with their

“...programs that are very good in diagnostic applications may be quite deficient in office management applications and vice versa.”

Figure 3. Patient images are easily transported into consultation reports to referring dentists.

treatment 24 months after the procedure, the percentages are significantly lower six weeks to six months after surgery. Instead, we have found that video imaging allows the patient better visualization of what the result may be<sup>3</sup> and may reduce unrealistic expectations. In one of our initial studies of patient attitudes about video imaging, six months after the procedure, we asked 18 patients if their final result was better than, as good as, or worse than the projected video image. Eighty-nine percent replied that they felt their final esthetic result was as good as or better than the video treatment plan. We note that patient satisfaction was achieved more rapidly in the imaging group, but as yet we do not have follow-up as to the long-term attitudes. What might be the reasons for these improved figures? They may be due to:

1. Patients are better able to visualize the esthetic outcome of their treatment than they can from verbal descriptions.

2. The interaction of the doctor and the patient in arriving at treatment decisions. Ackerman and Proffit<sup>4</sup> describe in their paper on bioethics how video imaging through its mutually descriptive template allows the doctor to “talk with” the patient rather than to “tell the patient what to do.”

In an effort to understand how patients react to video image-based case presentations, Hill, Phillips and Cannac<sup>5</sup> evaluated 57 patients presenting for orthognathic surgery. The patients were randomly assigned to two groups: videoimaged case presentations (VI), and standard case presentations (SCP) with tracing, models and photos. Prior to the case presentations, there were no significant differences between the groups with respect to motives for treatment (esthetic or functional). Seventy-six percent of the VI group and 63 percent of the SCP group ranked the anticipated change in facial appearance as an important factor in making a treatment decision. However, after case presentation, 88 percent of the

VI group but only 63 percent of the SCP group agreed with the statement that surgery would be needed to correct their problem.

Interestingly, in the SCP group, the dental casts were ranked as the most helpful record in making a treatment decision (52 percent of patients), with the acetate tracing (44 percent) next most helpful in understanding what to expect from treatment. In the VI group, the video imaging was ranked as the most helpful part of the presentation.

We are obviously in the very early stages of understanding the depth of patient reaction to this use of technology. Important studies are being initiated, most notably a study recently begun by Phillips and Kiyak (UNC and University of Washington in Seattle) in which some understanding of the psychological impact of this process may result.

## Conclusion

I hope this article will give the reader an insight into some of the important issues of this growing aspect of orthodontic treatment and practice management. I am certain that many of you have already created improvements on what I have written. In true cyberspace tradition, I would appreciate any feedback. This can be communicated via FAX (205/979-7140) or E-Mail at 620 3791 MCIMAIL.COM.

<sup>1</sup>Sarver, D.M., Johnston, M.W., Matukas, V.J.; Video Imaging in Orthognathic Surgery, *J. Oral Maxillofacial Surg.*, 46: 939-945, 1988.

<sup>2</sup>Kiyak, H.A., Hohl, T., West, R.A., McNeill, R.W.; Psychologic Changes in Orthognathic Surgery Patients: A 24-Month Followup; *J. Oral Maxillofacial Surg.*, 42:506-12, 1984.

<sup>3</sup>Sarver, D.M., Johnston, M.W., Matukas, V.J. Video Imaging for Planning and Counseling in Orthognathic Surgery; *J. Oral Maxillofacial Surg.*, 46:939-945, 1988.

<sup>4</sup>Ackerman, J.S., Proffit, W.R.; Communication and Orthodontic Treatment Planning: Bioethical and Informed Consent Issues; *Angle Orthod.*, Vol. 65, No. 4, 1995.

<sup>5</sup>Phillips, C., Hill, B.J., Cannac, C.; The Influence of Video Imaging on Patients' Perceptions and Expectations; *Angle Orthod.*, Vol. 65, No. 4, 1995.

of time and energy trying to trim expenses in areas such as professional supplies. In an attempt to save money, they buy the cheaper bondable brackets, adhesives, bands, wires and orthopedic appliances. While they may reduce expenses 1 or 2 percent, they often give up the efficiency and dependability of the more sophisticated products. Increased bond and band failures, frequent visits necessary for arch-wire adjustments and activations, and compliance-driven orthopedic appliances create additional work for the orthodontic team. The savings realized by using cheaper products are buried by the increased hidden costs of inefficiency. Today, there are many sophisticated straightwire appliances, superelastic wires, high-strength adhesives and non-compliance Class II correctors (like the Herbst and Pendex) that deliver very consistent results with improved efficiency. The orthodontist should be continually searching for innovations to reduce the number of visits needed to effectively treat patients.

## Achieving Your Goals

The journey to enhancing efficiency and profitability is an ongoing process of incremental improvements to existing systems. Systems that are not efficient and effective are discarded or modified. There is no end to this process (until the orthodontist retires!). As the orthodontic team reaches their practice efficiency goals, they will feel the positive effect throughout the practice. Stress is reduced as the working environment for both doctor and staff improves. Because the office is delivering high-quality service on a timely basis, the practice image is enhanced with referring doctors and individuals in the community. Patients in the practice are excited about their orthodontic experiences and share their enthusiasm with others. The positive relationships established during orthodontic treatment generate devoted missionaries who continue to refer new patients to the office. With a vision of improved efficiency, the orthodontic office can be transformed into both a fun and very profitable business.

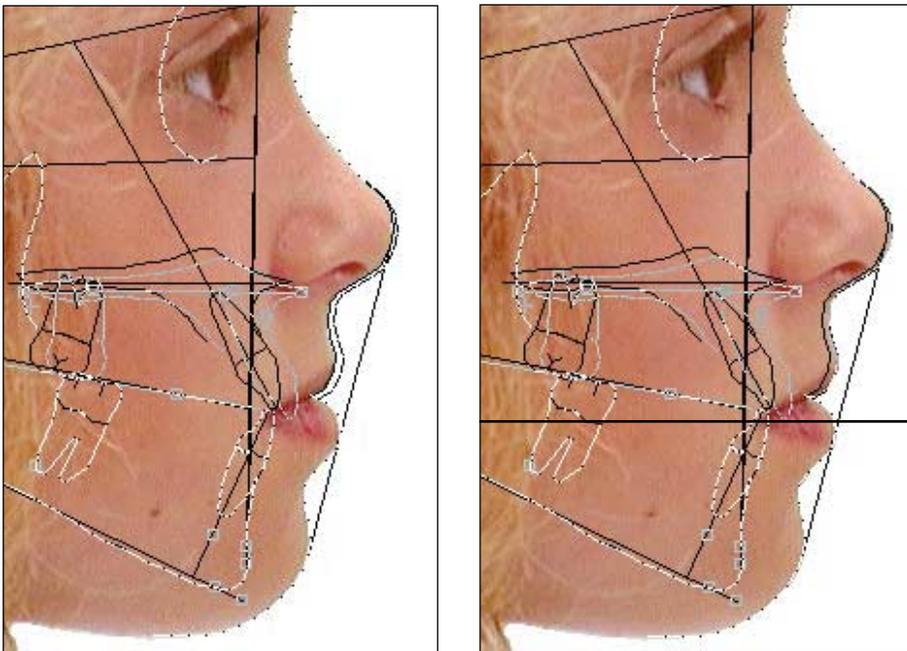


Figure 4. Algorithms use conventional cephalometric data to calculate the approximate profile outcome created by hard tissue movements. The left picture illustrates the predicted cephalometric lip response to maxillary protraction based on algorithmic data, while the right image represents the "morphed" image, with the video image placed to the cephalometric prediction.

# Dr. Mayes

continued from page 12

to describe how we try to do as much as possible at each visit in order to reduce the number of times that mom and dad will be away from work. Most parents appreciate our consideration and concern.

3. *Remove the bands and deliver the retainer in a single visit.* At the deband appointment, upper and lower impressions are made immediately after the teeth are cleaned. The impressions are poured in quick-set lab plaster, and immediate .030 or .040 polypropylene suck-down retainers are fabricated. This visit lasts 45 to 60 minutes.

**“With longer treatment intervals and fewer active patients each day, the orthodontist can work fewer days a month and maintain the same size practice”**

4. *Use compliance-free appliances if possible.* For instance, I use a bite-jumping appliance rather than headgear for lower-jaw-deficient Class II patients. We are not only attacking the problem directly but also using a compliance-free appliance.

5. *Use fixed appliances delivered in a single visit (more easily done with an in-house lab).* My upper and lower expanders are an

example of what I am discussing here. My thoughts are that all expanders should be fixed, because if they are removable, they get removed. To deliver my expanders, the lab pre-makes as much as possible. When the patient presents, the assistants fit the first four molars and take impressions. The bands are placed in the impressions and poured in quick-set lab plaster. Then the soldering and polishing exercise begins and the appliances are soon ready for delivery.

6. *Use the simplest mechanics possible to do what is required.* If it is reasonable to close extraction or other spaces with your finishing archwire, that is a simpler procedure than using several arches to retract the cuspids and then bonding the anteriors and retracting them. Another example is to use steps between the centrals to eliminate omega or other tieback stops.

7. *If the routine is to band/bond lower 7s and not the upper 7s, place appliances on the lower arch first, then use the first lower arch on the upper when appliances are placed.* This allows a three (total) archwire system of therapy (five at most). I normally place a .017 x .025 Copper Ni-Ti archwire in my .018 slots on the lower. The patient returns in seven to eight weeks and we steel tie the arch in. In seven to eight more weeks, I bracket the upper arch and transfer the lower archwire to the upper. I also place my .016 x .022 stainless steel finishing wire in the lower. Seven to eight weeks later, I steel tie both arches. After seven to eight more weeks, I place my .016 x .022 stainless steel finishing wire in the upper. Once again, after seven to eight weeks, I steel tie the upper archwire to place. Usually the patient is ready for finishing elastics by the next visit (seven to eight weeks).

8. *Never use orthopedic forces on an orthodontics-only case.* If a patient presents with a dental Class II and not a skeletal Class II, do not use a headgear or a bite-jumping appliance to correct the Class II. Use elastics/springs or a Pendulum/Pendex for

the Class II correction. This is fairly self-explanatory.

9. *Close spaces with Ni-Ti™ springs and crimp-on hooks.* If intra-arch spaces are present, we close them not with chain but with Ni-Ti springs hooked over the molar hook and the Class II/Class III hook on the archwire. The hooks can be placed when the archwire is first placed or can be added to an already tied-in arch without its removal. Place the hooks as close to the laterals as possible. This will also prevent the arch from sliding side-to-side.

10. *Check bite-jumping appliance therapy with transcranials or tomograms.* Always compare the final film with the beginning film to verify condylar position before appliance removal. If the condyle is not in the fossa where it was originally, the patient is not ready for appliance removal. I prefer a good, reproducible transcranial over a tomogram for checking the condylar position. Because of the head position and the soft tissue in the external auditory meatus, a transcranial is more reproducible than a tomogram. Since we're not looking for joint pathology, use the transcranial, as it is more reproducible.

11. *Hold Pendulum/Pendex-gained space with a Nance.* Once again, I correct the width first. Therefore, I normally do not use a Pendex. If I want midsagittal separation for width correction, I use a maxillary expander first, then place a single-appointment Pendulum. The Pendulum will hold the width gained and is easier to fabricate in the lab than the Pendex. The Pendulum is made so that acrylic does not touch the teeth, but the occlusal rests bonded to hold the appliance to place will maintain the width correction.

12. *Routinely correct width before AP (except with facemask use).* Most Class IIs and Class IIIs have a narrow upper arch and require expansion before the antero-posterior correction is done. There are only two real exceptions:

a. If a facemask is to be used and we

want the palatal disjunction and other sutural separation to allow the upper jaw to be brought forward more rapidly and get true suture separation as the maxilla is protracted.

b. In the rare case when braces are placed and the dental Class II is to be corrected with elastics/springs.

13. *Use braces only after AP correction (after width correction).* Ideally, I want to place braces only in Class I “emergency cases.” This allows the three-archwire system I discussed earlier. We take a “tri-phasic” look at our treatment and correct the width. Next, correct the antero-posterior discrepancy. Finally, put braces on a Class I uncrowded case. This three-segment type of treatment mechanics reduces the wearing of braces to only eight to twelve months. Not only do the patients appreciate this, but we also reduce the risk of poor oral hygiene and the possibility of “racing stripes.”

14. *Make full use of communications to minimize questions and problems (letters, throw-aways, verbal, phone).* Anything we can do to eliminate questions or problems is a boon to our practice. If we can answer our patients’ or parents’ questions before they are asked, this adds to their confidence in choosing us. My assistants or I go over any problem areas, what was done that day, what we are going to do next visit, and how we are progressing toward appliance removal.

This brings us to the discussion of types of cases and their treatment. I categorize my cases by how I treat them more than whether they are Class I, Class II, or Class III, because when they go into braces, they generally are Class I uncrowded cases. These are all treated the same from this point on.

*Dr. Mayes describes his appliances and treatment of the various cases in “Simplified Treatment Mechanics, Part II,” which will appear in the next Clinical Impressions.*

## Recommended – A Simplified Bite-Jumping Appliance for Simplified Treatment Mechanics

The Hex-Head Bite-Jumping Appliance is essential to Dr. Mayes’ Simplified Treatment Mechanics. In his *Clinical Impressions* article on the Cantilever Herbst (Vol. 3, No. 2, 1994), Dr. Mayes states, “I suggest using the hex-head screws, as they are easier to re-insert if they ever do come out, especially on the upper molars. This is because of the trauma caused to the corner of the mouth trying to get a screwdriver back far enough to get the screw lined up and started into the axle assembly on the upper first molar. Another advantage to the hex-head screws is that they are much more comfortable to



The hex-head screw allows positive Allen wrench insertion without burring the screw head.

the patient, because some burring will inevitably occur to the screw slot when ‘slot-head’ screws are tightened.”

In addition, Ormco’s Bite-Jumping Appliance has enlarged pivot openings to enhance lateral movement and maximize the ease of mandibular motion. A positive sleeve stop prevents the lockup that can occur with traditional designs as the sleeve slides along the plunger.

The prefabricated appliance can be ordered from one of the rapidly growing number of orthodontic laboratories constructing their conventional and cantilever bite-jumping appliances with Ormco hex-head components. Or to order the Hex-Head Bite-Jumping Appliance Kit, see the order information on Page D of the Center Section. Each kit contains one left and one right plunger-sleeve combination, 4 screw/casing assemblies, one hex key and instructions.

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## Lecture/Course Schedule at a Glance – Through April 1996

Date	Lecturer	Location	Sponsor, Contact and Subject
12/6-7	Kyoto Takemoto	Matsudo, Japan	Dr. Takemoto & Ormco/Sankin; Nakazawa 81-3-3836-2821; Lingual Orthodontics*
1/13	David Sarver	Denver, CO	Denver Midwinter Dental Convention; Lecture – “Faces for Braces”
1/14-16	Wick Alexander	Manila, Philippines	AVM Ortho; Ms. Mandap 632 843 6208; Alexander Discipline Comprehensive*
1/17-18	Wick Alexander	Manila, Philippines	AVM Ortho; Ms. Mandap 632 843 6208; Alexander Discipline Advanced
1/19-20	Randall Bennett	Copenhagen, Den.	Dan. Ortho Soc.; Dr. Holm 453 1632630; Patient Mgt. & Noncompliance Tx
1/20-22	Wick Alexander	Shanghai, China	Chengyuan Med./Dent.; Ms. Qingya 86 20 424-0646; Alexander Discipline Comprehensive*
1/24-25	Wick Alexander	Bangkok, Thailand	Accord; Ms. Suchada 662 2145290; Alexander Discipline Advanced
1/27-28	Wick Alexander	Taipei, Taiwan	Yong Chieh; Mr. Yu 886 2 778 8315; Alexander Discipline Advanced
2/9-10	Courtney Gorman	Indianapolis, IN	Indiana U.; (317) 274-7782; Lingual Orthodontics Comprehensive*
2/9-10	David Sarver	Los Angeles, CA	USC; Dr. Sinclair (213) 740-4236; “Facial Esthetics in Orthodontics”
2/23-24	Wick Alexander	Turku, Finland	Turku U.; Ortomat Herpola Ky, Mr. Herpola 358 2 1306900; Alexander Discipline Adv.
3/2-3	Wick Alexander	Ann Arbor, MI	U. of Mich.; Dr. McNamara (313) 763-5070; Moyers Symposium, “Patient Motivation”
3/2-3	J. Hilgers/R. Bennett	El Paso, TX	Tweed Group; Dr. Sullivan; (915) 593-1181; “The Essence of Practical Orthodontics”
3/9-10	Randall Moles	Singapore	Budget Dent.; Mr. Lim 65 339 6208; Ortho Mechanotherapy
3/10-12	Randall Moles	Bangkok, Thailand	Accord; Ms. Suchada 662 2145290; Ortho Mechanotherapy
3/11	David Sarver	Beaver Creek, CO	Faces; Dr. Thomas (919) 493-8944; Condylar Resorption & Sleep Apnea
3/20	Randall Bennett	Melbourne, Aust.	Aust. Soc. Ortho. Mtg.; Lecture – “Adopting Current Thinking to Advanced Technologies”
3/16-17	Randall Moles	Manila, Philippines	AMV Ortho; Ms. Mandap 632 843 6208; Ortho Mechanotherapy
3/19-20	Randall Moles	Davao, Philippines	AMV Ortho; Ms. Mandap 632 843 6208; Ortho Mechanotherapy
3/21-22	Wick Alexander	Kansas City, MO	UMKC Alumnae; Dr. Blackwell (816) 524-6525; Open Bite & Class III Tx
3/21-23	ESLO	Monaco	European Soc. of Ling. Ortho; Dr. Altounian (Fax) 33-1 39 64 9554; 2nd Symposium
3/22-23	Randall Moles	Beijing, China	Chengyuan Med./Dent.; Ms. Qingya 86 20 424-0646; Ortho Mechanotherapy
3/25-27	K. Takemoto/G. Scuzzo	Barcelona, Spain	Spanish Assoc. Lingual Ortho; 0034 1 418 9484; Lingual Orthodontics*
4/11-12	David Sarver	Ann Arbor, MI	U. of Mich.; Dr. McNamara (313) 763-5070; Surg. Symposium Lect., Surg. Orthodontics
4/12	James Hilgers	Nashville, TN	Tenn. Ortho Assoc.; Dr. Johnson (615) 893-9151 “Moving Toward Noncompliance”
4/19-20	David Sarver	Braselton, GA	GA Ortho & Oral Surg. Mtg.; Dr. Field (404) 536-0882; Surgical Orthodontics
4/19-21	Wick Alexander	Madrid, Spain	Kalma; Manuel de Felipe 341 380 2383; Alexander Discipline Advanced
4/22-27	J. Hilgers/R. Bennett	Laguna Beach, CA	Drs. Hilgers & Bennett; Linda (714) 830-4101; “The Essence of Practical Orthodontics”*
4/25-26	J. Hilgers/R. Bennett	Laguna Beach, CA	Drs. Hilgers & Bennett; Linda (714) 830-4101; Key Personnel Seminar

\*Typodonts and/or Participation

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