

THE CUTTING EDGE

(Editor's Note: This quarterly column is compiled by JCO Technology Editor Ronald Redmond. To help keep our readers on The Cutting Edge, Dr. Redmond will spotlight a particular area of orthodontic technology every three months. Your suggestions for future subjects or authors are welcome.)

This month's column, submitted by Dr. Bob Haeger, provides considerable insight into the implementation of systems within the "paperless" office. Dr. Haeger's seamless integration of hardware and software has greatly streamlined his patient entry procedures. After all, the paperless office will be nothing more than individual pieces of computer equipment unless forethought and imagination are coupled to produce a functional and effective flow.

I can personally testify as to the effectiveness of the Excel spreadsheet used in the financial presentation, because my practice has used the same spreadsheet for the past year. Patients and parents appreciate having their financial options presented quickly and concisely, and our treatment coordinators love the ease of using the spreadsheet.

Our society is so time-conscious that the one-visit exam/consultation is a major practice builder. Dr. Haeger's records and correspondence systems perfectly complement the one-visit process. I take my hat off to him for his ingenious combination of technology and human resources, transforming the initial examination into an enjoyable and memorable experience.

W. RONALD REDMOND, DDS, MS



Dr. Redmond



Dr. Haeger

How Technology Has Transformed the One-Visit Initial Exam

Having a fully digital practice with electronic charting and computers at every chair sounds cutting-edge and high-tech, but how do these modern systems improve the efficiency and effectiveness of the initial patient examination? In other words, do the latest computerized communication methods justify their cost?

I would unequivocally answer "yes". A fully networked office with Internet access and specialized software has not only improved our communication with patients, parents, and referring dentists, but has made our one-visit exam/records/consultation appointments flow much more smoothly. The integrated software (Table 1) allows:

- Quick and thorough patient examinations, with digital capture and storage of photographic and radiographic images.
- Easy-to-follow presentations of treatment plans, using readily accessible examples of similar cases.
- Quick and professional presentations of payment options.
- Instant generation of letters to patients and their general dentists.

Computer Setup

My office has a computer work station at every chair, two in each exam room, one in the records room connected to the x-ray machine, and one in the break room for inputting digital images from the camera. Each station is fully

networked to a Windows 2000 server.

Each exam room contains a dental chair, a treatment coordinator work station, a consultation table with a computer and two monitors, and a printer (Fig. 1). Windows 98 and newer operating systems allow two monitors to be connected

to one computer, so that a full-size program can run on each screen and the mouse can move back and forth between them.

Our appointment sequence is described below.

**TABLE 1
INTEGRATED SOFTWARE APPLICATIONS**

Application	Program	Advantages
Digital imaging	Dolphin Imaging*	Fast, high-quality images for patient records and education
Digital radiographs	PlanMeca**	Fast, high-quality images for patient records and education
Digital models	OrthoCAD***	Easily accessible; save storage space
Practice website	Ortho Sesame†	Online access to questions, appointments, financial balances, photos, x-rays
Online credit checks	Internet connection to Equifax††	Ability to assess financial risk from any computer
Online insurance benefits	Internet connection to insurance company websites	Quick access to benefit information
Exam questionnaire	Kodak OrthoTrac Software‡	Efficient, thorough examination that creates a digital record
Demonstration photos	CasePresenter‡‡	Educational images that make one-visit exam/consultations more effective
Photos of previously treated patients	Dolphin Imaging*	Capable of instilling confidence in prospective patients
Financial presentation	Excel§ spreadsheet	Professional, fast, flexible
Patient letter	Kodak OrthoTrac Software‡	Summary of the exam appointment for the patient to take home
General dentist letter	Kodak OrthoTrac Software‡	Thorough, clear, concise correspondence
Electronic charting	OrthoTrac Classic‡	Easy data entry; no lost charts; accessible from anywhere

*Dolphin Imaging & Management Solutions, 9200 Eton Ave., Chatsworth, CA 91311.

**PlanMeca USA, 100 N. Gary Ave., Suite A, Roselle, IL 60172.

***Trademark of Cadent, 640 Gotham Parkway, Carlstadt, NJ 07072.

†Trademark of Sesame Communications, 411 Strander Blvd., Suite 108, Seattle, WA 98188.

††Equifax Credit Information Services, Inc., Atlanta, GA; www.equifax.com.

‡Trademark of Eastman Kodak Company, 1765 The Exchange, Atlanta, GA 30339.

‡‡Trademark of InterActive Communication & Training, 3300 Cahaba Road, Suite 101, Birmingham, AL 35253.

§Microsoft Corporation, Redmond, WA.

§§Fuji Photo Film U.S.A., Inc., Valhalla, NY.

#Sue Hanen, Kirkpatrick & Associates, 5382 Mount Vernon Preserve Court, Murrayville, GA 30564.

##Registered trademark of Dentaurum, Inc., 10 Pheasant Run, Newtown, PA 18940.

Initial Records

The patient and parents are greeted by the treatment coordinator and shown to the records room. The treatment coordinator takes a digital panoramic radiograph with the PlanMeca** unit and digital photographs with a Fuji S1§§ camera. The images are cropped, saved, and printed using Dolphin Imaging* software.

The family is escorted to an exam room and seated at the consultation table. While they wait, the newly taken photographs and radiograph are displayed on one monitor in a slide-show format. The other monitor shows our website, open to the “frequently asked questions” section. I find that the patients and parents are often discussing the malocclusion or looking around our website as I enter the room. This serves as a great introduction to our website and our practice.

As the imaging is being done, one of our scheduling coordinators goes to the Internet to check the family’s credit and insurance benefits. Although only a few of our most commonly used insurance providers currently make their benefits available online, I expect many more to do so soon. High-speed Internet access is available on all computers throughout the office, which allows any staff member to assist at busy times. (See my previous article, “How I Use the Internet in My Office”, JCO, August 2002.)

The treatment coordinator meets with me

outside the exam room, briefs me on the patient’s chief concern and any medical issues, and shows me the printed images. This allows me to identify specific areas to focus on during the exam and consultation.

Clinical Examination

After a brief conversation with the patient and parents, I begin the clinical examination. A questionnaire that we developed with a consultant,# using Kodak OrthoTrac Software‡ modules, starts with external observations and then progresses inside the mouth (Fig. 2). I dictate the answers, and the treatment coordinator records them at her work station. This takes only two to three minutes, yet is amazingly thorough.

Before converting to the computer questionnaire, we merely filled out an information sheet, and the patients and parents had no idea how complete the clinical exam was. My exam hasn’t changed, but it’s much more impressive for the patients and parents to hear me go over all these areas and have the responses recorded. The sequence of our questionnaire usually allows me to make a detailed diagnosis and treatment plan at this initial appointment. The answers also provide the data for generating letters to patients and their general dentists through the Kodak OrthoTrac Software.

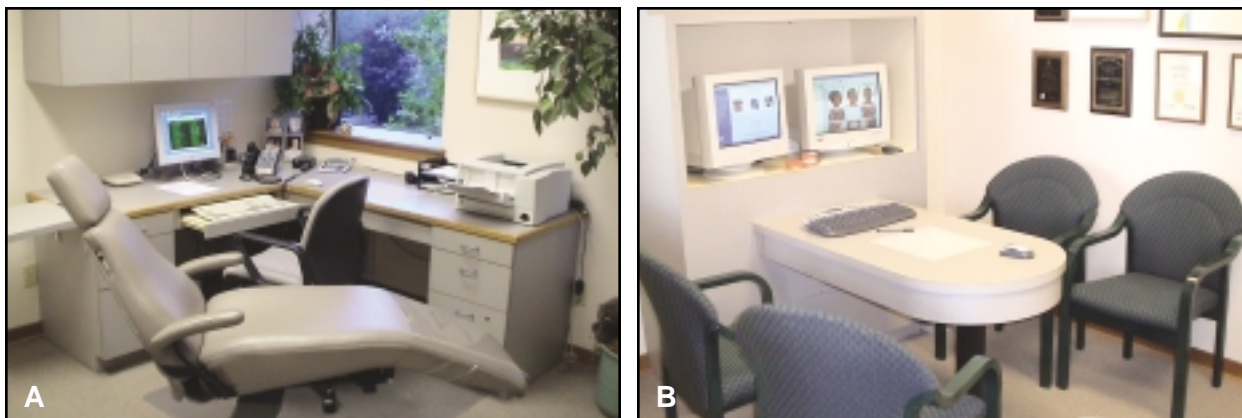


Fig. 1 A. Treatment coordinator’s work station in exam room. B. Consultation table with dual monitors.

EXAM - HAEGER

Questionnaire Questions and Answers

Question	Type	Answer (Quantifier)	Patient Text	Doctor Text	Other Text
28) Bone Loss		Moderate - Generalized Severe - Localized (Around teeth #) Severe - Generalized	----	Moderate generalized bone loss Severe localized bone loss around<<QUANTIFY>> Severe generalized bone loss	Moderate generalized bone loss Severe localized bone loss around <<QUANTIFY>> Severe generalized bone loss
29) Molar Classification(+)	Single-Ans	Class I	----	Class I malocclusion	Class I
		Class II (%)	Lower teeth are too far behind upper teeth (Class II)	Class II malocclusion	<<Quantify>> Class II
		Class II, division 2	Lower teeth are too far behind upper teeth (Class II)	Class II, division 2 malocclusion	Class II, division 2
		Class II, Subdiv. R	Lower teeth are too far behind upper teeth (Class II)	Class II subdivision right malocclusion	Class II, sub right
		Class II, Subdiv. L	Lower teeth are too far behind upper teeth (Class II)	Class II subdivision left malocclusion	Class II, sub left
		Class III (%)	Lower teeth are in front of the upper teeth (Class III)	Class III malocclusion	<<Quantify>> Class III
		Class III Subdiv R	Lower teeth are in front of the upper teeth (Class III)	Class III subdivision right side	Class III, sub right
		Class III Subdiv L	Lower teeth are in front of the upper teeth (Class III)	Class III subdivision left side	Class III, sub left
		Class III Tendency	Lower teeth are slightly ahead of upper jaw (Class III bite tendency)	Class III tendency	Class III tendency
30) Right Cuspid Angle Class	Single-Ans	Not present not present	----	----	----
		Class I	----	----	Class I right cuspid
		Class II (%)	----	----	<<Quantify>> Class II right cuspid
		Class III (%)	----	----	<<Quantify>> Class III right cuspid
31) Left Cuspid Angle Class	Single-Ans	not present	----	----	----
		Class I	----	----	Class I left cuspid
		Class II (%)	----	----	<<Quantify>> Class II left cuspid
		Class III (%)	----	----	<<Quantify>> Class III left cuspid
32) Overjet(+)	Multi-Ans	Normal	----	----	Normal OJ
		Minimal (2-3mm)	Upper front teeth are slightly ahead of the lower	Slightly increased overjet - (2 - 3 mm)	2-3mm OJ
		Moderate (3-4mm)	Protrusive upper front teeth (overjet)	Moderate overjet - (3 - 4mm)	3-4mm OJ
		Excessive (5+mm) (Ant in mm)	Protrusive upper front teeth (overjet)	Excessive overjet <<QUANTIFY>> mm	<<Quantify>> mm OJ
		Edge to Edge	Upper and lower front teeth don't overlap the right way and will lead to excess wear.	Anterior edge to edge bite	Ant Edge to Edge
		Negative (Ant in mm)	Underbite	Negative overjet,<<QUANTIFY>> mm	Negative<<Quantify>> mm OJ
		Pseudo Class III	Lower jaw shifts forward into an underbite	A pseudo Class III shift is present	Pseudo Class III
33) Overbite	Multi-Ans	Normal	----	----	Normal OB
		Insufficient	Lack of adequate vertical overlap of front teeth	Very minimal overbite	Insufficient OB
		Mild (25-40%)	Slightly increased vertical overlap of front teeth	Mild overbite (25 - 40%)	25-40% OB
		Moderate (40-60%)	Excess vertical overlap of front teeth (deep bite)	Moderate overbite (40-60%)	40-60% OB
		Excessive (60%+) (%)	Excess vertical overlap of front teeth (deep bite)	Excessive overbite (60%+)	<<Quantify>> % OB
		Impinging	Lower front teeth bite into the roof of the mouth	Impinging overbite	Impinging OB
		Open bite (from tooth #)	Upper and lower front teeth do not meet (open bite)	Open bite from<<QUANTIFY>>	Open bite from <<Quantify>>
34) Crossbite(X+)	Multi-Ans	Functional Openbite	----	Functional openbite	Functional open bite
		None	----	----	----
		Mx Molars Ling	Both jaws are narrow	Narrow arches	Narrow arches
		Tipped/Narrow Mx Anterior (Tooth #)	Some upper front teeth fit behind lower teeth (crossbite)	<<QUANTIFY>> in crossbite	Ant XB - <<Quantify>>
		Posterior Right	Upper back teeth fit inside lower teeth (crossbite)	Right posterior crossbite is present	Post right XB
		Posterior Left	Upper back teeth fit inside lower teeth (crossbite)	Left posterior crossbite is present	Post left XB
		Bilateral Posterior Crossbites	Right and left upper back teeth fit inside lower teeth (crossbite)	Bilateral posterior crossbites are present	Bilat post XB
		Anterior and Posterior Crossbites	All upper teeth fit inside lower teeth (crossbite)	Anterior and posterior crossbites are present	Ant and post XB

Fig. 2 Page of customized exam questionnaire (Kodak Orthotrac Software[†]). Responses are formatted into letters to patient and general dentist and summary for office records.

After the exam, the patient is asked to have a seat at the consultation table. If treatment is indicated, I record the fee for the treatment coordinator and join the patient and parents at the table. A note is also made if the patient is a candidate for digital models from OrthoCAD.***

Case Presentation

Our goal is to give the patient and parents a quick and thorough visual diagnosis and general treatment plan. First, we activate the CasePresenter†† software on the monitor that was displaying the website. This program from IACT has an extensive image file with short movies of how various orthodontic problems are treated. The patient's own images are enlarged on the other monitor to demonstrate the diagnosis, while appropriate treatment methods such as expanders, elastics, headgear, surgeries, or Herbst## appliances are displayed with the CasePresenter software. We also use photographs of our own patients showing specific appliances and how they look in and out of the mouth.

The ability to visualize the patient's own crooked teeth on one monitor and the proposed correction on a second monitor makes quite an impact on the patient and parents. Never again will you have to hold up your hands to demonstrate overjet and overbite.

Patients often ask us to e-mail some specific images, which can be done on the spot using the Dolphin Imaging software. All patient photographs and x-rays are uploaded to our website nightly by Sesame Communications (formerly Pt Interactive), maker of Ortho Sesame,† and can be accessed by the patients at any time.

I prefer the IACT program over morphing software. In one-visit exam/consultation appointments, it is faster and less expensive to show images already stored on the hard drive than to have someone morph a particular patient photograph as we wait. Many of the CasePresenter images can now be printed, but because printing takes so long, we keep an assortment of preprinted pictures available to give to patients (Fig. 3).

If the patient or parents seem unconvinced

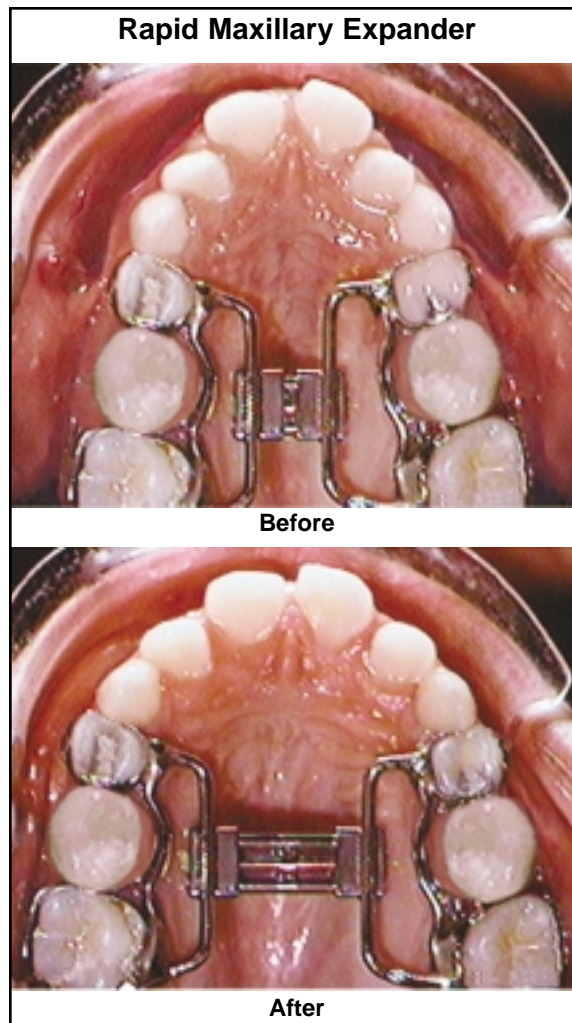


Fig. 3 Sample patient images available from IACT.††

about what outcome to expect, we use our own patients' before-and-after photographs to demonstrate treatment results. These images are stored by Dolphin Imaging and are subdivided into categories such as child nonextraction, adult surgery, and impacted cuspids to allow quick retrieval.

While I am presenting the treatment plan, the treatment coordinator records all the necessary information about treatment options, appliances, and the projected treatment time or recall

schedule. This information is incorporated into the patient and general-dentist letters. After answering any further questions about the mal-occlusion and the proposed treatment, I excuse myself and leave the treatment coordinator to discuss the fee, insurance benefits, payment arrangements, and sequence of appointments needed to start treatment.

Financial Presentation

To allow a more efficient and professional presentation, we have created several financial spreadsheets using Excel[®] (Fig. 4). More lenient payment options and lower down payments are available to patients with better credit. After selecting the appropriate spreadsheet, the treatment coordinator enters the fee that I wrote down, along with any insurance benefits and the number of months of payments. The computer calculates the down payment and monthly payments, as well as the cash discount option. If the patient wants to consider a different down payment, the computer can quickly determine the new payment schedule. The treatment coordinator then prints out a copy of the agreed-upon financial arrangements for the patient and parents.

Initiating Treatment

Once treatment is accepted, the treatment coordinator outlines the next steps. A folder containing a welcome letter derived from the questionnaire (Fig. 5), general information about our office, printouts of the patient's digital photographs and panoramic radiograph, images of appropriate appliances, and the financial spreadsheet is given to the patient and parents.

If the patient is ready to proceed with treatment, a digital cephalometric radiograph is taken and stored in the Dolphin Imaging system, impressions are taken and sent to OrthoCAD if applicable, and the treatment coordinator goes over the dos and don'ts of orthodontic treatment.

A one-page summary of the exam questionnaire is formatted for easy and quick access on the electronic treatment card provided by

OrthoTrac Classic.[‡] Within a week of the initial appointment, I design a formal treatment plan, and the appropriate appointments are scheduled. If the treatment plan changes substantially, we call the family back for another in-person or telephone consultation.

The treatment coordinator also prints out a letter to the general dentist, derived from the exam questionnaire (Fig. 6). Along with the previously printed panoramic radiograph, this letter is placed on my desk for my approval and signature, then mailed to the general dentist. We don't e-mail these letters and images because most of our referring dentists are not yet ready to receive them in that format.

Discussion

Although the expense and time required to network an orthodontic office can be daunting, the improved efficiency and professionalism of the initial examination and case presentation have been worth the investment in my practice. Despite poor economic conditions and a state (Washington) with the highest unemployment in the country, we experienced a 15% increase in revenue in one year. Our patients and parents consistently tell us how helpful it is to visualize the proposed treatment before making their decisions. We have also seen an increase in our case conversion percentage. As more general dentists have been moving toward "soft" referrals (giving the names of more than one orthodontist), anything that makes our office stand out works in our favor.

Time saving has been an added bonus of our conversion to electronic charting and the computerized exam questionnaire. I have personally saved three to six hours per week, and have gone from being the limiting factor in our office schedule to having extra time available for planning treatment during the day. This has enabled us to see six to 10 more patients per day with less work on my part. With another assistant and improved economic conditions, we could probably see another 10 patients per day.

The staff also saves time previously spent

Robert S. Haeger, DDS, MS, PS

Board Certified Orthodontist for Children and Adults

November 18, 2003

Mr. & Mrs. Robert Haeger
1234 NE 16Th Street
Kent, WA 98030

Dear Mr. & Mrs. Haeger:

Thank you for choosing our office for Claire's orthodontic evaluation. Below is a summary of our diagnostic findings. Although these are preliminary recommendations, I hope this will assist you in understanding Claire's orthodontic needs.

Patient's Chief Concern(s)

- Crowded and crooked teeth

Diagnostic Findings

- Oral hygiene appears to be good
- Upper front teeth are slightly ahead of the lower
- Excess vertical overlap of front teeth (deep bite)
- Upper back teeth fit inside lower teeth (crossbite)
- Upper arch is narrow
- Upper midline is deviated to the left
- One or more permanent teeth erupting abnormally, (possible impaction)
- Moderate crowding of upper teeth
- Mild crowding of lower teeth

Benefits of Orthodontic Treatment

- Correct the bite for better function and long term health
- Improve the smile
- Improve self esteem
- Straight teeth make it easier to clean and prevents some forms of gum disease
- Reduce crowding
- Eliminate jaw shifting upon closure and allow the facial muscles to develop symmetrically

Treatment Options

- Start treatment now with extraction of some baby teeth
- Comprehensive orthodontic treatment in the future

Treatment Recommendations

- Comprehensive treatment now with extraction of the remaining baby teeth
- Estimated treatment time will be 20-28 months
- Upper and lower braces
- Upper expander
- Regular cleanings with your dentist are especially important while wearing braces to avoid gum disease and cavities
- Please contact your dentist to schedule the necessary extractions

Next Step

- We will call you after reviewing the models and x-rays to schedule starting treatment

Thanks again for the opportunity to discuss Claire's orthodontic needs. If you have any questions, please feel free to contact me.

Sincerely,

Robert S. Haeger, D.D.S., M.S., P.S.



Phone: 253-850-7043 • Fax: 253-850-2073
24909 104th Avenue SE, Suite 203 • Kent, WA 98030



Fig. 5 Sample letter given to patient at end of initial examination and case presentation.

Robert S. Haeger, DDS, MS, PS

Board Certified Orthodontist for Children and Adults

November 18, 2003

Exam Report for Claire Haeger

Age: 10 yrs 2 mos

Dr. Good Dentist

5678 SE 240Th
Kent WA, 98030

Patient's Chief Concern(s)

- Crowded and crooked teeth

Clinical Findings

- Developmental stage: Late mixed dentition
- Mesognathic
- Mandible deviates left upon closing
- Oral hygiene was good
- Midline diastema present
- Minimal attached gingiva on the following teeth: 22 & 27
- Class I malocclusion
- Slightly increased overjet - (2 - 3 mm)
- Moderate overbite (40-60%)
- Left posterior crossbite is present
- Maxillary arch constriction
- Maxillary dental midline is 2 mm to the left
- Potentially impacted 6
- Moderate maxillary crowding - 4-5mm
- Mild mandibular crowding - less than 3mm
- Curve of Spee is normal

Treatment Options

- Start now with extraction of A, C, J and T
- Comprehensive orthodontic treatment in the future

Treatment Recommendations

- Comprehensive treatment now with extraction of the remaining primary teeth
- Estimated treatment time will be 20-28 months
- Full maxillary and mandibular appliances
- Rapid maxillary expansion appliance

Requested Treatment From Your Office

- We have emphasized the importance of routine preventive care in your office
- Please extract A, C, J and T

Next Step

- Records were taken today and we will contact the patient next week to start treatment

Thank you for referring Claire to our office for an orthodontic evaluation. If you have any questions or concerns, please feel free to contact me.

Sincerely,

Robert S. Haeger, D.D.S., M.S., P.S.



Phone: 253-850-7043 • Fax: 253-850-2073
24909 104th Avenue SE, Suite 205 • Kent, WA 98030



Fig. 6 Sample letter sent to patient's general dentist after initial examination.

in looking for and filing charts and in trying to decipher my handwritten notes. Other benefits include the accessibility of patient information from throughout the office and at home, the elimination of x-ray developing chemicals, and the reduction of radiation exposure.

Conclusion

Using properly integrated technology in a one-visit examination/presentation appointment

can be a wonderful way to set your practice apart, increase your office efficiency, allow you to see more patients with more personal time, improve communication with patients and general dentists, increase your case acceptance rate, and ultimately make the practice more profitable.

ROBERT S. HAEGER, DDS, MS
24909 104th Ave. S.E., Suite 203
Kent, WA 98030
drhaeger@mybraces.net