A Management manifesto: Standard operating protocols and the application of checklists for orthodontic practices

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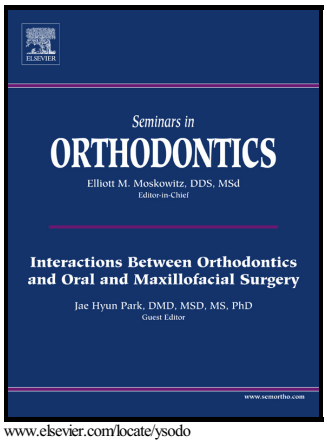

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A Management Manifesto: Standard Operating Protocols and the Application of Checklists for Orthodontic Practices

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ABSTRACT - The management of an orthodontic practice needs to be highly structured and organized. The actual treatment process obviously benefits from a disciplined clinical approach, which can be facilitated by Standard Operating Protocols and Checklists. In addition to the clinical management of patients, the organizational management of the office itself can be further enhanced by adopting these protocols and checklists. This article provides an introduction to both concepts, with sample protocols and checklists that doctors may use in their offices.

KEYWORDS - Management, Protocols, Checklists, Orthodontics

This article is written to introduce the practicing orthodontist to the concept of standardizing treatment protocols, chairside procedures, and management systems. The reader will notice that the subtitle includes both “Standard Operating Protocols” and “Checklists”. The two are not mutually exclusive or contradictory – indeed, the two processes complement each other and assist in making the treatment process both efficient and effective. The author of this article has frequently lectured and written on the concept of Efficiency and Effectiveness. We should begin our understanding of the process by recognizing the importance of amalgamating efficiency and effectiveness.

Effectiveness, you see, refers to “doing the right things”. To effectively rotate a tooth, then, we must apply the appropriate orthodontic couple to that tooth. To effectively change the axial inclination of the root of a tooth, we must apply the appropriate third order activation to that root. Efficiency, on the other hand, refers to “doing things right”. The conundrum is, of course, that it is entirely possible to be very effective while being terribly inefficient. If we eventually get to the end result with a prolong series of activations, it could be argued that we have been eventually

effective, without really being efficient. The mantra behind the concept of developing a disciplined Management Manifesto, then, is to recognize the author's mantra: Being Effective and Efficient means "Doing the Right Things Right". That, in essence, is the objective in introducing Standard Operating Protocols (henceforth referred to as SOPs) and Checklists in the management of orthodontic offices, orthodontic treatment, and routine day to day procedures. This article will introduce the practicing orthodontist to both these concepts and their applications, and will include some sample SOPs and checklists.

Standard Operating Protocols

Standard Operating Protocols are written step-by-step procedures that assure quality control (QC) and quality assurance (QA) in the management of orthodontic treatment, and in the overall management of an orthodontic practice. An SOP should be viewed as a compulsory instruction. For example, applying an etching agent to prepare enamel for a bonding procedure without first removing all plaque from the tooth through an appropriate pumicing procedure is a fundamental violation of appropriate treatment protocol. Anyone in clinical practice recognizes that there are deviations from protocols driven by specific clinical variations. If a deviation from the protocol is allowed, the conditions for such deviations should be well defined. Therefore, the purpose of an SOP is to carry out the operation correctly and consistently. As will be demonstrated in this article, the SOP begins with the initial consultation, becomes a significant part of the treatment planning process, and is integral to the consistent delivery of treatment at the chairside.

Checklists

A Checklist is an informational aid used to reduce failures by compensating for the potential limits of human memory and attention. Checklists help to ensure consistency and completeness in carrying out a task. Checklists are sometimes referred to as "to do" lists. This author has lectured and written extensively on why checklists are beneficial in the day to day

operations of an orthodontic office and, indeed, in any health care facility. Those readers who are familiar with the lectures and writings of this clinician are familiar with the origin of the application. For over 30 years now, I have been an active pilot, and have remained extremely active in the aviation world. I am not just your average weekend pilot. I have pursued this hobby and avocation at an extremely serious level, am currently rated as an Airline Transport Pilot, and have been flying jets and other types of aircraft for over 30 years. During that experience, it came to my attention that the aviation world adheres strictly to checklists. Even pilots who have been flying for many, many, years do not simply rely on personal memory, but adhere strictly to checklists because of the complexity of the tasks that we encounter in the course of what may appear to be a routine flight. The application of that discipline into orthodontic practice has proved to be extremely effective in assuring consistency in the everyday delivery of orthodontic treatment. We have been able to reduce the incidence and frequency of errors, thereby enhancing both the effectiveness and efficiency of orthodontic treatment.

The Amalgamation of SOPs and Checklists

As will become readily apparent to the reader, SOPs and checklists frequently overlap and complement each other. Although they each have their own place in the efficient execution of orthodontic treatment, as well as in the daily operations of an orthodontic practice, they need to be understood both individually, and in combination. There is sometimes a concern that excessive dependence on SOPs and checklists my hinder the execution of tasks that may appear to be straight-forward and routine, because they depend on rote-learning of processes that are concerned routine in the management of an office, and in the execution of treatment. However, as we will demonstrate, an adoption of these protocols can help in integrating the use of adaptive and flexible problem solving techniques.

Standard Operating Protocols Applied to Orthodontic Practice

Orthodontics, to a significant degree, is a procedural specialty. That is entirely consistent with the fact that the dental profession is primarily a procedural profession. That does not, of course, in any way diminish the cerebral elements of what we must do on behalf of our patients, from interpretation of radiographs to differential diagnosis. However, once the diagnostic aspects have been accomplished, the remainder of what we do to deliver the treatment is largely procedural. Such procedures will simply be better executed if SOPs are adopted. Due to the significant variation in the way treatment is delivered in different orthodontic practices, there is obviously room for a lot of variation in the development of such protocols. For example, this author primarily utilizes indirect bonding in his practice. Frequently, when a new member has been added to our clinical staff, they have come from offices that do not have much experience with indirect bonding, and therefore, do not have an appreciation for the level of attention to detail required to properly complete an indirect bonding procedure. For the purposes of training new members of the clinical staff, and to ensure consistency in our clinical technique, we developed a specific SOP for indirect bonding. A sample is provided below:

INDIRECT BONDING PROCEDURE

Initial Preparation

1. Seat patient and place a napkin around their neck. The patient should have been given two tablets of Propantheline, to be taken one hour before the appointment. Ask them if they have taken the Propantheline tablets. If they have forgotten, ask them if they are wearing contacts. If they are, have them remove their contacts and take the Propantheline tablets. Explain the importance of leaving their contacts out for a period of 4 hours.

2. Pumice ALL teeth with a non-flouride prophy paste. Explain to the patient that this is one of several procedures for preparation of the enamel for bonding.

3. Rinse and suction well with water.

4. Show the bonding trays to the patient, and explain the procedure - from taking the impressions to placing the brackets in proper position and forming the tray. It is important to stress the time the doctor spends positioning the brackets and supervising the entire process. We believe there is a significant value in emphasizing the value of proper bracket placement, and the doctor's input on appliance design, to the patient.

5. If there are bands to fit, this should be completed after the indirect bonding procedure has been completed. Since this indirect bonding resin has such a fast set time, the band fitting can be started immediately.

Indirect Bonding

1. Whether the indirect bonding can be completed with a single tray for the entire arch, or whether the tray needs to be sectioned into two segments, is a decision based primarily on the degree of isolation that is feasible. If there is significant crowding and imbrication of the teeth, it may also be easier to section the tray. Since the working time with the indirect bonding resin is virtually unlimited, the degree of isolation, and ease of tray placement, are the determining factors. On rare occasions, it may be advisable to consider sectioning the tray into thirds, in which case the trays may be sectioned as follows:

   6-11 or 27-22 (anterior segment)

2-5 or 12-15: 31-28 or 21-18 (posterior segment)

2. Examine the trays carefully for any remaining separator (Alcote) or tray material covering resin pad on bracket. Use the micro-etching unit to lightly sandblast the resin bases with 50 Micron Aluminum Oxide. Do not use a larger particle size, and take care not to abrade the resin base.

3. It may be necessary to clean the resin pads by running the trays through an ultrasonic detergent, or with a detergent and a toothbrush. The use of acetone is not recommended.

4. Isolate the teeth that are to be bonded with the NOLA dry-field system. Occasionally, if necessary, plastic cheek retractors, tongue away, cotton rolls and dri-angles may be used.

5. Using air syringe, dry teeth thoroughly.

6. DAB - do not rub etching solution onto teeth and set stop-watch for 15 seconds. The etch should be applied in the general area that is to be covered by the bracket. Do not allow the etch to flow into the interproximal contacts. The clean up will go much more smoothly if this is kept in mind.

7. After 15 seconds, rinse with steady stream of water for 10 seconds. Rinse with a steady spray of water and air for another 15 seconds. Suction excess water and be careful that saliva does not come into contact with the etched enamel.

8. Replace cotton rolls and dri-angles; again, making sure that saliva does not contact the etched enamel.

9. A. All visible moisture should be removed. The etched teeth should have a frosty appearance, and be completely desiccated. If a frosty appearance is not noted, repeat the etching process for 15 seconds.

   B. If Enhance Adhesion Booster is used (especially helpful on hypocalcified teeth) dry teeth thoroughly. Mix together 2 drops of A & 2 drops of B and paint on teeth, applying 3 even coats. Dry teeth with air syringe. The tooth surface should appear shiny.

10. If Enhance Adhesion Booster is not used, then the clinician can proceed with indirect bonding utilizing the 3M Unitek rapid set resin.

11. Small amounts of the 3M Unitek Rapid Set Indirect Bonding resin A and B liquids should be poured into the wells. Take care not to let one liquid touch the other, and the use of color coded wells and brushes is recommended. Resin A can be painted onto the tooth surface with a brush, and resin B can be painted on the resin pads in the indirect bonding tray.

12. If too much resin has been placed on the enamel, gently remove the excess sealant with a brush. The overall method of painting the resin on the enamel and the resin pads is not unlike painting one's nails.

13. Position the tray over the teeth and seat the tray with a hinge motion. With the fingers, apply equal pressure to the occlusal, labial and buccal surfaces. Hold for a minimum of 30 seconds. Allow two more minutes of cure time before removing the tray. This procedure is

now repeated for the opposing arch. Due to the rapid set time of this adhesive, by the time the opposing tray is placed, removal of the first tray can begin.

14. Remove the tray using a scaler to peel the tray from the lingual to buccal. Use extreme care when removing tray from around bracket wings. Scale the excess resin around the brackets, and from the interproximal contacts. Use a high speed handpiece with a finishing bur to remove any excess resin that could not be removed with the scaler. Use dental floss to check that all contacts are open.

15. Repeat steps 4-13 for remaining trays.

16. Once the indirect bonding has been completed, the appropriate archwire can be selected and tied in immediately.

This sample SOP is an excellent example of the level of detail that should be specified in order to ensure that tasks are carried out correctly and completely.

Checklists, As Applied to Orthodontic Practice

As has previously been pointed out, checklists are informational aids to ensure that tasks are completed in their entirety, and to compensate for the possibility of error due to the limits of human memory and attention. Let's look at a simple illustration by examining what might be considered a routine and mundane task. Imagine, in an orthodontic office, that they are ready to see their first patient of the day, and a patient is scheduled for the bonding of several brackets. The operator sits down at the chairside, applies the appropriate isolation mechanism, and is ready to begin the bonding procedure by making sure that the field is isolated and dry. As the operator reaches for the suction tip and flips on the switch to turn on the suction, nothing

happens. It is suddenly recognized that somebody had not yet turned on the suction pump (I'm willing to wager that most readers will quickly recognize that such events take place with an annoying level of frequency in a lot of offices). There is suddenly a frantic effort for someone to run and turn on the suction pump so that the procedure can continue at the chairside. It is precisely these types of frustrations and lapses that can be avoided with a strict adherence to checklists. The foregoing example was chosen because it brings us to what is literally the first checklist used in our office every morning. The staff member responsible for opening up the office that day is asked to follow a checklist to make sure that everything that needs to be switched on is switched on, everything that has to be set up has been set up, and that everything is operational when we start seeing our first patients of the morning. An example of our opening checklist for the morning is demonstrated in Figure 1.

As is evident from viewing this checklist, the staff member responsible must not only complete each task, but also place their initials there, which insures follow through on each procedure. As an aside, this is also an excellent method of ensuring adherence to procedures, because if a task has not been completed properly, we know which staff member may need further training, or a corrective action. At the end of the day, a closing checklist is employed for similar reasons. This is demonstrated in Figure 2, and it becomes evident that this avoids someone leaving the office without turning off all the necessary computers, and other essential equipment.

Other checklists are dedicated to clinical procedures. For example, in our practice, we send periodic progress reports to our referring doctors. One of the oft mentioned complaints by general dentists who refer patients to specialists is an inadequate level of communication regarding the progress of treatment. To address this concern, we developed a checklist for the progress reports. At 6 month intervals, during the active treatment process, we send a progress report to the general dentist (sometimes copied to a child's parent as well), in which we are able

to methodically document concerns about progress in treatment, oral hygiene, compliance with elastic wear, etc. (Figure 3)

It is this author's opinion that a Treatment Completion Checklist is extremely beneficial. This can easily be illustrated by bringing up one of the common sources of frustration that can be experienced by patients, referring dentists, implant surgeons, and orthodontists. Let us assume that we are treating a patient with congenitally missing lateral incisors, and the treatment plan calls for the replacement of the maxillary right and left lateral incisors with implants following completion of the orthodontic treatment. The orthodontist proceeds with the orthodontic treatment to best of their ability, and finishes the case to a result that they consider acceptable. It is certainly not uncommon that such orthodontic treatment might be completed by the time the child is 13-14 years old, and we will now have to preserve the space for the implants with some form of retention until the child is old enough for placement of the implants. So, 3 or 4 years later, the patient is finally referred to the implant surgeon, who promptly calls the orthodontist to point out that while the space between the central incisors and the lateral incisors is enough for the placement of a lateral incisor pontic, the root apices are too close together for them to place an implant of adequate dimensions. Their request, usually, is for further tooth movement to provide the appropriate root divergence to permit implant placement. It is readily apparent that this will lead to unhappiness for the patient, the parents, the referring doctor, and the implant surgeon. It is unlikely to be a welcome development for the orthodontist as well, since they now have to rebracket the patient to accomplish this tooth movement. It is precisely to avoid these types of problems that we developed a Treatment Completion Checklist (Figure 4).

As is evident from a perusal of this checklist, it requires the orthodontist to examine specific clinical variables to ensure that the case has been treated to a satisfactory conclusion. You will note, for example, that item 5 under the title of "Occlusal Analysis" specifies confirming with the

restorative doctors that the spacing for implants, bridges, or veneers is adequate. I am also of the opinion that temporomandibular joint function should be checked thoroughly at the completion of treatment, so that we can document that the patient temporomandibular joint function was within normal limits at the completion of orthodontic treatment. This helps to avoid subsequent claims, sometimes made several years later by dentists who subscribe to some unusual (and totally undocumented) schools of thought whereby they imply that the previous orthodontic treatment was responsible for the subsequent development of temporomandibular joint symptoms.

The last checklist that I would like to introduce in this article is the Chairside Checklist. To ensure completion of the myriad different tasks that need to be completed at each appointment, and to ensure that details are not overlooked, we employ a Chairside Checklist. The initial function of this checklist is to prepare the chairside assistant to brief the doctor about the salient details about the patient's treatment plan, the current status of treatment, and the procedures to be performed that day. It therefore requires the operator to learn everything they need to learn about existing archwire sizes, elastic wear, whether the treatment is progressing on schedule, etc. The Chairside Checklist is demonstrated in Figure 5.

Summary

The concept of developing Standard Operating Protocols and Checklists is relatively new to the dental profession, and to the orthodontic specialty. However, this author has been utilizing both for several years, and is of the opinion that adherence to the SOPs, and methodical use of checklists, has been a significant contributor to the level of efficiency and effectiveness that our practice is known for. It is certainly my hope that this will provide a framework that other orthodontists can utilize to develop their own Standard Operating Protocols, and Checklists, to enhance the level of treatment delivered in their own offices.

Image Legends

Figure 1 – Clinic Opening Checklist

Figure 2 – Clinic Closing Checklist

Figure 3 – Orthodontic Progress Report

Figure 4 – Orthodontic Treatment Completion Checklist

Figure 5 – Chairside Checklist

Figure 1

CLINIC OPENING CHECKLIST

Open Week of:	MON	TUE	WED	THU	FRI	SAT
Suction On						
Resin Tray Out						
Computer & Master On						
Charts Out						
On-Deck Light On						
Auto Claves Water Filled						
Empty/Rinse Cold Sterile						
Processor On						
Chairside Computers						
Clinic Printer On						
Dust Computers and Screens						
Camera/iPads Out						
Doctor Terminals On						
Check-in Monitors On						
Dishwashers Needs Ran						
Radio/iPod On						
Presentation Monitor On						
Pull Daily Appliances						

Figure 2

CLINIC CLOSING CHECKLIST

Close Week of:	MON	TUE	WED	THU	FRI	SAT
Suction Off						
Turn water off						
Resin Tray in Fridge						
Doctor Computers off						
Computers & Masters off						
Clean / Stock TB area (Lights off)						
Refill Mouthwash						
Processor, Denar & Light Off						
Clean ELS mirrors in clinic						
Clinic Printer Off						
Remove Cassettes from Ultrasonic						
Submerge Cold Sterile						
Camera, iPod, iPads Away						
Check-in Monitors Off						
Radio Off						
Presentation Monitor Off						
Space Heaters Turned Off						
Remove Remaining Charts						

Figure 3

ORTHODONTIC PROGRESS REPORT

PATIENT <<PatientFirstName>> <<PatientLastName>> DATE December 28, 2015

TREATMENT STARTED <<Treatment Started>> EST. TX COMPLETION DATE <<Est. Tx. Completion Date>>

ORTHODONTIC TREATMENT PLAN

- ☐ FULL APPLIANCES
- ☐ LIMITED TREATMENT
- ☐ ELASTICS
- ☐ EXTRACTIONS
- ☐ RE-EVAL FOR EXTRACTIONS
- ☐ ORTHOGNATHIC SURGERY
- ☐ RE-EVAL ORTHOGNATHIC SURGERY
- ☐ OTHER:

PROBLEMS STILL TO BE CORRECTED

- ☐ OVERBITE
- ☐ OVERJET
- ☐ OPENBITE
- ☐ CROSSBITE
- ☐ CROWDING
- ☐ SPACE CLOSURE
- ☐ SPACING FOR TOOTH ERUPTION
- ☐ DETAILING

TMJ FUNCTION

- ☐ WITHIN NORMAL LIMITS
- ☐ OTHER:

HYGIENE

ORAL HYGIENE: ☐ GOOD ☐ FAIR ☐ POOR

☐ THE CONSEQUENCES OF POOR ORAL HYGIENE HAVE BEEN DISCUSSED WITH YOU. PLEASE UNDERSTAND THAT PERMANENT STAINS MAY FORM ON YOUR TEETH.

COOPERATION

CANCELED/RESCHED. APPTS:	☐ N/A	☐ GOOD	☐ FAIR	☐ POOR
LOOSE BANDS/BRACKETS:	☐ N/A	☐ GOOD	☐ FAIR	☐ POOR
ELASTICS:	☐ N/A	☐ GOOD	☐ FAIR	☐ POOR

RADIOGRAPHS

- ☐ PANOREX
- ☐ NOT APPLICABLE

OBSERVATIONS: ☐ WITHIN NORMAL LIMITS ☐ OTHER:

PROGRESS SUMMARY

- ☐ TREATMENT PROGRESSING ON SCHEDULE
- ☐ CHANGE IN TREATMENT PLAN NEEDED
- ☐ SLOW PROGRESS - COMPLETION OF TREATMENT MAY BE DELAYED
- ☐ COMMENTS:
- ☐ REVIEWED WITH PATIENT, PARENT/GUARDIAN INITIAL_____
- ☐ PARENT/GUARDIAN NOT PRESENT. SENT REPORT HOME WITH PATIENT.
- ☐ DENTAL TREATMENT REQUESTED

ALL PATIENTS ARE REMINDED TO VISIT THEIR DENTIST AT LEAST EVERY SIX MONTHS DURING ORTHODONTIC TREATMENT

REPORT MAILED TO: <<DoctorFullName>>

Figure 4

ORTHODONTIC TREATMENT COMPLETION CHECKLIST

DATE: _____

OCCLUSAL ANALYSIS **Patient: First Last Name**

1. Posterior Occlusion: _____
2. Anterior Occlusion: _____
3. Rotation Corrections: _____
4. Incisal Edges and Marginal Ridges: _____
5. Details for Implant/Bridges, Veneers etc.:_____ DDS Approval: _____
6. Working Guidance: _____
7. Balancing Interferences: _____

TMJ FUNCTION

1. Joint Sounds: None Other: _____
2. Joint Pain: None Other: _____
3. MMO (W.P.): _____ Protrusive: _____mm (W.P.)
   Right Lateral: _____mm (W.P.) Left Lateral: _____mm (W.P.)
4. Overall Joint Function: WNL Other: _____
5. A. Any compromises? _____
   B. Compromises discussed with patient/parent: _____
6. TP: Yes ___ No ___ Eval at Deband ___
7. Retainer Design: Mx:_____ Clasps:_____ Md:_____ Bo:_____
   Occl Rest: _____
8. Pre-Medication: Yes ___ No ___
9. FA Complete: _____

Yes, I am satisfied with the treatment results. Braces for **First Last Name** may now be removed. Signed: _____

☐ Send Deband Letter ☐ Send Deband Letter after TP ☐ Send Modified Deband Letter

Figure 5

Chairside Checklist

Introduce Patient by Common Name _____ **Age:** ____

Oral Hygiene / Hygiene Photo	
Take as needed, ***before*** removing archwire	
Special Alerts / Follow precautions as necessary	
Patient Info Screen / Clean up custom tab **PR** / Recommend if necessary and date of last PR **ECD** / Recommend revision if unrealistic **Tx Plan** / Check and update as needed	
Archwire Sizes	
MX **MD**	
2nd Molars Bonded	
	2 15 31 18
Elastics / verify type & compliance	
3/16 4 oz. 5/16 4 oz. 3/16 6 oz. 5/16 6 oz. **Full Time** **12 hrs/day**	**R** CL II **L** CL II CL III CL III CL II V CL II V CL III V CL III V
Check Band-Lok	
Can it be removed?	
Family Members in Office	
Where are they seated? What type of appointment is patient here for?	