



“The 14 Keys to Pitts Case Management”

“We are what we repeatedly do, excellence, then, is not an act but a habit” - Aristotle

Introduction:

How many times in your career have you come back from a course having seen and heard some wonderful things that you wanted to implement into your clinical procedures, only to find out when you got home that putting them into practice was very difficult. Very shortly, you reverted to old habits, and all the “value” you thought possible was lost. Inspirational speaker and self-help author, Tony Robbins is correct when he says, “I know lots of people who know what to do, but fewer that do what they know”.

Today’s orthodontic patients consistently demand more than “just straight teeth”. While “putting the plaster on the table” is now generally acknowledged as not being representative of the best orthodontics has to offer, the reality of everyday

practice confirms that esthetic decline is quite common with treatment¹, and patients want treatment time to be as short as possible.

For years I have tried to simplify diagnostic processes and case management strategies allowing the Orthodontist to attain greater consistency in delivering optimal esthetic and functional occlusal results. This requires that the Orthodontist expand his/her diagnostic and mechanical understandings beyond reliance on improved “straight wire” appliances to attain superior esthetic results. David Sarver has made great contributions by painting an accurate picture of today’s desired facial and smile esthetics and the impact on esthetics of orthodontic treatment mechanics. I also agree with his concept on placing the position of the upper incisor

as the prime diagnostic criteria in developing superior esthetics².

Today I would like to develop the context for the pivotal role of case management in attaining superior esthetic and occlusal results, and suggest strategies for application of simple case management practices that provide consistent improvement in esthetic and functional outcomes during treatment.

The Pivotal Role of Case Management:

Treatment planning is one of the milestones of every Orthodontist’s training. Large amounts of time and energy can be devoted to the evaluation of “static” records, like model analysis for crowding, cephalometric evaluation of potential growth direction, positions of the teeth

Pitts Case Management Principles



Figure 1

and skeletal bases, traditional “closed mouth” facial photographs for soft tissue positions, VTO’s for potential tooth movements, and mounted models for CO/CR discrepancies. Once a doctor has been in practice for a while, and comes to appreciate the dynamic aspects of patient care, the value of these “initial planning exercises” change, and value of sound case management practices comes into play (Figure 1).

The finest “artistic” orthodontic results are produced by the best case managers regardless of the appliances they use. This is because these clinicians clearly understand the technology they use on a daily basis, and apply clinical opportunities that are available to address specific patient clinical needs. In addition, these special orthodontists are not stymied by the “stability” ball and chain in their treatment protocols.

“Active Early” Case Management Core Principles:

For years Orthodontists have desired to gain control of axial inclination earlier in the treatment cycle. However limitations imposed by the traditional application of “straight wire theory”, where torsion is created through incremental increases in wire dimension occur late (if at all) in the treatment cycle make it nearly impossible³. By using certain protocols, orthodontists are now able to remove that limitation.

Applying appropriate levels of technology to an “artistic” end result creates many positive opportunities. If I want to “activate” the appliance and treatment as early as possible, I can use the SAP⁴ bracket position to adjust the vertical position of the incisors, invert groups of brackets to activate the appliance, select arch wire progressions that control axial inclination early in treatment, use arch forms that develop the posterior segments of the

arches sooner, implement “ELSE” (Early Light Short Elastics) to control forces, and appropriate disarticulation to encourage early “wanted” tooth movements. This is known as an “Active Early” approach to case management⁵.

Clinicians have been trying to explain the “stages of clinical management” for years, usually without broad success. In our case management approach⁵ the treatment cycle is conceptualized as occurring in two stages based on clinical management opportunities available during the stage (Figure 2).

First Stage:

Where either round or non-adjustable dimensional wires are used. The goal during the first “Active Early” stage of treatment is to achieve the majority of your occlusal and esthetic goals for the patient. Clinical management opportunities focus on adjustment in bracket position, adjustment of ELSE patterns, refinement of disarticulation, adjustment in tooth morphology with positive and negative coronoplasty, slenderizing, use of auxiliaries (TAD’s for example) to control anterior and posterior tooth movements and NMI (neuromuscular intervention) as appropriate. With our protocols, we now begin early arch width development,

leveling, torque control, AP and early vertical development. This stage lasts until the Pan/Repo appointment (PRACM). This is described by Dr. Jim Morrish of Bradenton Florida as Panorex Reposition, Adjust Case Management. In my experience, this commonly occurs around the 4th appointment, after some degree of torsion improvement and arch development in non-adjustable dimensional arch wires has been attained (Figure 4). At PRACM, adjustments in bracket position, bracket torque (upright/flipped), ELSE, disarticulation, need for tooth re-approximation, or a modification of mechanics (decision to extract, TAD placement, etc.), based on a definitive review of the case progress are made (Figure 5, 6).

Most traditional orthodontics is taught on the basis of “sequential mechanics”, where one mechanical goal is addressed after the preceding goal is attained (transverse development, level/align, overbite correction, occlusal correction). One of the reasons I enjoy using a PSL appliance like H4 self-ligating bracket from Ortho Classic, is that many of these clinical managements aspects can be approached “simultaneously”, resulting in significant gains in treatment efficiency. This “simultaneous mechanics” approach to addressing esthetic and functional treatment goals is a pivotal feature of “Active Early” (Figure 3). Significant occlusal gains in alignment, OB correction, and A/P correction, are combined with improvements in smile arc creation, transverse arch developments, and axial inclination improvement occurring quite early in the treatment cycle, usually by the 4th appointment.

Another hallmark of “Active Early” is the continuous assessment of progress that is occurring towards both esthetic and functional goals as treatment progresses. I encourage the broad adoption of an

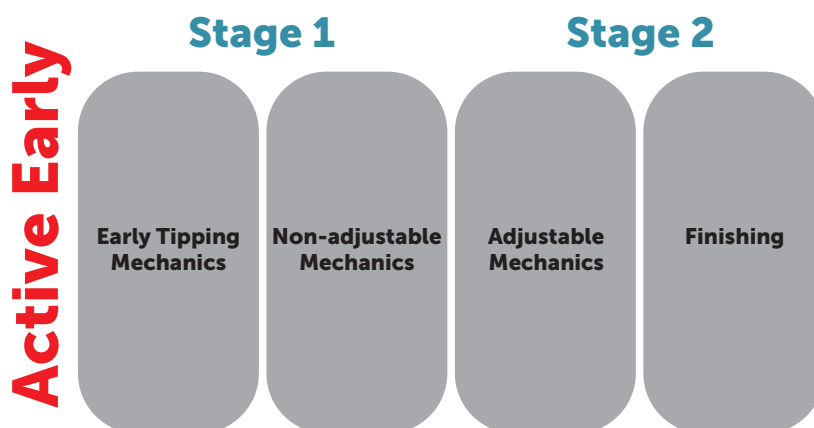


Figure 2

"every patient/every appointment imaging approach" as a discipline in improving continuous case progress assessment. The collateral marketing and patient education benefits of imaging are so great that even staff members who are initially concerned with the extra effort, are soon converted to raving fans! None of the clinicians I know that have adopted this discipline, have ever regretted the effort.

Second Stage:

After PRACM, where adjustable dimensional wires are used, the goal is the refinement of the esthetic and occlusal aspects leading to optimal results most appropriate for the patient. Clinical management opportunities focus on overcorrection, AW adjustment for occlusion and esthetic refinement, tooth size adjustments for either esthetics or anterior/cuspid guidance, optimization of the occlusion through occlusal adjustment (CO=CR), and refinement of mini-esthetics of hard and soft tissue.

The Goal: Better Results Through Simple Concepts, Trainable Skills

My goal in clinical teaching has been to simplify complex concepts into contemporary treatment protocols that can provide significant advantages in the treatment of most orthodontic cases. While some features of a patient's clinical outcome cannot be determined by orthodontics, many are able to be directly influenced by the Orthodontist. In an "Active Early" approach, I encourage clinicians to focus on the clinical opportunities they can control. In my experience I have identified several clinical approaches that positively affect the quality of the end result: "The 14 Keys to Pitts Case Management".

The next section will introduce some of these important concepts and clinical opportunities that Orthodontists can use to improve their clinical results. These will all be discussed more fully in subsequent "white papers".

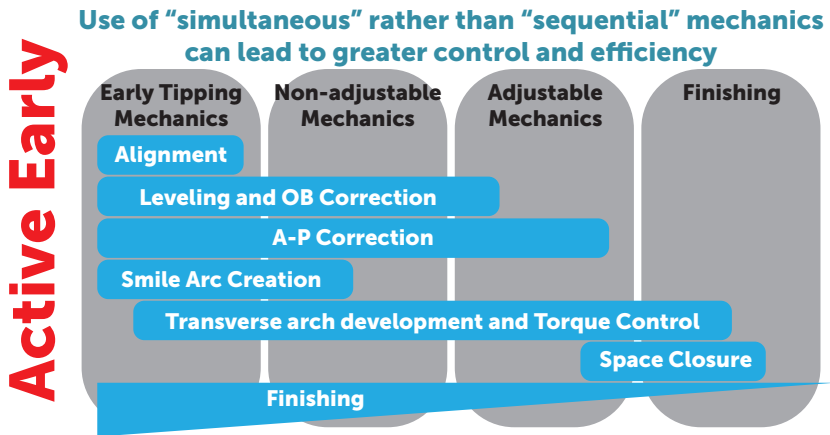


Figure 3

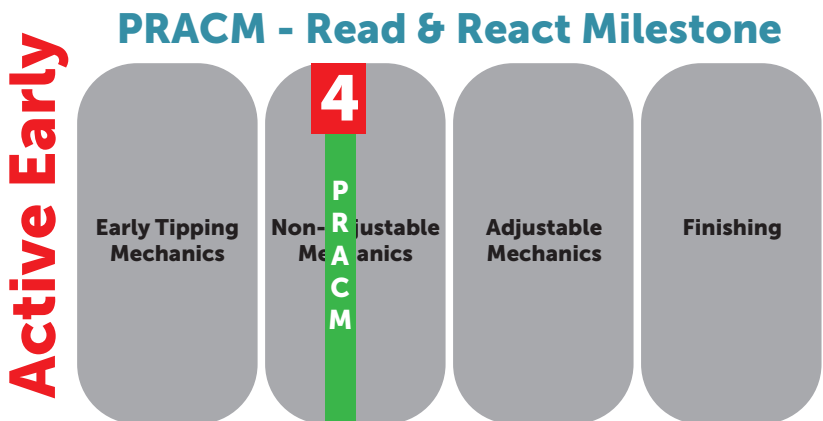


Figure 4

Incisor Display at Rest	2
Incisor Display on Smile	2
Transverse Smile Dimension	2
Resting Lip Support	3
Crowding	3
Smile Arc	2
Buccal Corridors	3
Gingival Display on Smile	2



Figure 5

4 Appointments

Incisor Display at Rest	2	2
Incisor Display on Smile	2	2
Transverse Smile Dimension	2	3
Resting Lip Support	3	3
Crowding	3	3
Smile Arc	2	3
Buccal Corridors	3	3
Gingival Display on Smile	2	2



Initial Smile Close Up



Progress Smile Close Up

Figure 6

Stage 1: the first of the 14 Keys to Case Management

In a conventional "straight wire" approach to treatment, all early tooth movements involve tipping, and in most approaches very limited control is afforded to the Orthodontist. In contrast, in the "Active Early" approach a good deal of control is available through a number of clinical opportunities even when using non-adjustable wires. Most obvious among them are:

1. Positive and Negative Coronoplasty: Patients today want beautiful faces, beautiful smiles, and beautiful teeth; meaning teeth need to be "optimized" for shape and contour. Prior to bonding, esthetic re-contouring improves the ability to place brackets in the appropriate location to maximize the smile arc, optimize axial inclination, and control 1st and 2nd order changes during tipping or early torsion mechanics. Softening the cusp tips of the cuspids and first bicuspid, normalizing facial irregularities, and optimizing length/width ratios of the upper anterior teeth is critical to optimum bracket placement through either positive or negative coronoplasty. All surfaces that have been adjusted are smoothed with a white stone and black rubber tip using a high speed hand piece.

2. "SAP Bracket Position" as a tool in gaining optimal esthetics: Bracket position is individualized to meet patient esthetic need. In patients with "flat" occlusal planes or those that require increased enamel display, the progression of the wire plane, created by bracket position, must increase to develop the smile arch by extruding the upper incisors relative to the upper bicuspids (Figure 7, 8). In patients with normal occlusal planes a more modest progression in the wire plane is still advisable to protect the smile arc as the upper arch broadens with treatment. A modest progression is still advised in deep bite cases to avoid excessive reduction in smile arc with reduction in overbite. It is important to remember that large bracket progressions in the upper arch must be compensated for by over-leveling the lower arch to establish optimum overbite relationships. A number of articles on the SAP technique have been published in recent years^{6,7,8} and SAP bracket positioning is now being employed regularly around the world.

3. "Bracket and Torque selection", Why I love the H4 Passive Self-Ligation by Ortho Classic: With practitioners attempting to treat more cases without extractions, control of proclination of the upper anterior teeth has become a greater challenge. Frequently the technical challenge is getting enough lingual crown torque without having to resort to complex wire bending to attain esthetic results. "Low torque" Rx's endorsed by some PSL bracket producers have not met these needs for me⁹. One of the reasons I prefer the H4 appliance is that the Rx is predictable when upright, and appropriate when flipped, providing greater lingual crown torque to the central when up-righting of the anteriors is required (Figure 9). When using "flipped" anterior brackets, we encourage the patient to be seen every 6-7 weeks to assess progress and palpate and the upper anterior alveolus. Once ideal axial inclination is attained, the appliance can be "deactivated" simply by reducing the arch wire dimension or adjusting the 3rd order bending. Note that it is important to use Beta Titanium arch wires no larger than 19x25 when using "flipped" appliances.

4. "ELSE" - Early, Light, Short, Elastics: I have advocated use of early light elastics for the past 20 years, especially when using PSL mechanics. Sabrina Huang, a close friend of mine from Taiwan, suggested the acronym some years ago, and I continue to describe the technique in those terms. The use of ELSE (no more than 2.5 oz.) increases the efficiency of treatment dramatically by maximizing "wanted" tooth movements in all dimensions, and minimizing or mitigating "unwanted" tooth movements during the tipping or early torsional phases of treatment. Patient cooperation is critical, and reinforcing early progress through "every appointment" photography is very useful. John Campbell describes the use of ELSE to his patients as, "24 hour elastic wear is not part of your treatment, it is your treatment".

5. "Disarticulation" - bite turbos, or occlusal pads as a tool in increasing

effectiveness of ELSE: PSL mechanics are broadly appreciated as using minimal RTS (resistance to sliding), in conjunction with low forces. By encouraging "wanted" tooth movement and removing the forces of occlusion that perpetuate the malocclusion, disarticulation contributes to the effectiveness of early mechanics. Adjustment to the disarticulation is made when required. This eases TM joint loading.

6. Arch Wire Selection and Progression - as a tool in controlling axial inclination early in treatment:

Traditional straight wire application relies on incremental increases in arch wire dimension to gradually develop 1st, 2nd, and 3rd order control. The reality is that this approach is not very effective, encouraging many to reconsider the basic premises of straight wire theory¹⁰. One of the distinguishing features of the "Active Early" approach is the adaptation to "slop" that is present in all straight wire appliances. Through tested case management practices, appliances, and wire selection we can now negate the adverse effects of "slop". It has never made sense to me to start with arch wire forms that are narrower than the case needs to finish esthetically. Working with Ortho Classic, we have created a full suite of arch wires that develop the arches transversely from the outset, through the whole of the buccal segments (Pitts Standard, Pitts Broad), where research has shown that a great amounts of transverse development occurs¹¹ (Figure 10). In order to help early torque control, **i2, i3 Leashes - are used as a tool of controlling axial inclination early in treatment:** The "rediscovery" by Daniela Storino and other believers of placing incisal "leashes" of elastomeric chain to minimize unwanted tipping of teeth during the relief of crowding is proving very helpful, especially in cases where the anterior brackets have not been "flipped".

7. Patient Motivation - as a tool of controlling axial inclination early in

treatment: Everything depends on the patient being a full partner in attaining their best esthetic result. Whether it is 24 hour elastics wear, modification of sleep patterns, or doing "PT" exercises, it is important to educate the patient or their parents on their critical participation in the process. Larry White has correctly identified overall compliance as the "Achilles heel" of our profession¹², and the inadequacy of traditional approaches to change that dynamic. It is critical to have a collaborative relationship with patients in their treatment, to celebrate what they have accomplished, and what their new "possible self" holds for them. This goes beyond "mere cooperation" and beyond the health benefits of orthodontics into the social and psychological benefits of treatment.

8. NMI - "neuromuscular intervention" as a tool in improving results:

The control of habits and behaviors that may be detrimental to treatment progress is generally appreciated as critical. By intervening in noxious breathing patterns (SDB sleep disorder breathing, sleep apnea), and noxious muscular behaviors (lip hypotonicity, swallowing patterns, digital habits, lip biting, postural concerns, sleep patterns) the quality of treatment can be improved.

9. "PRACM" - the critical "read and react" milestone: If adjustments to bracket position or major mechanics are required to bring the case to an esthetic conclusion, non-adjustable wires are replaced and Stage 1 clinical opportunities continued. If a significant number of brackets have been repositioned or "flipped", it is usually wise to replace the same size non-adjustment wire for one treatment interval.

Stage 2 - Clinical Opportunities

If the Stage 1 response to treatment has been favorable, Stage 2 adjustments are directed towards refining the occlusion and optimizing the esthetic result. There are a number of clinical opportunities available in Stage 2:

10. Arch Wire Adjustments - As a tool of controlling axial inclination, arch form, and transverse arch development:

The "10 tooth smile" has represented the gold standard for dental ethics for years. Today many excellent students of dental esthetics prefer a "12 tooth smile" esthetically¹³, and I agree with them. Due to the fact that the arch form is directly related to the shape of the wire used and not the bracket system the orthodontist decides to use¹⁴, I do not use "standard arch blanks" but shape

SAP Bracket Position

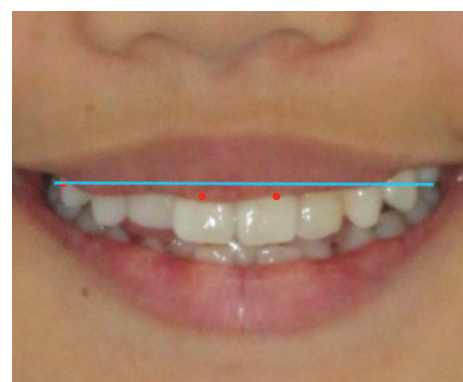
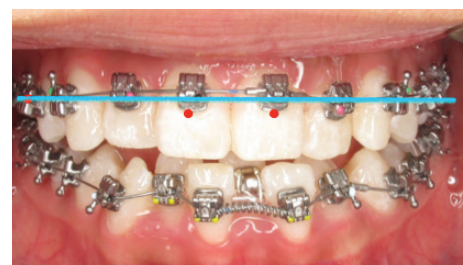


Figure 7



7 Months



4 Appointments

Figure 8

H4 Torque Opportunities

Torque	U1	U2	U3	U4	U5
Normal	+12	+8	+7	-11	-11
Flipped	-12	-8	-7		

Torque	L1	L2	L3	L4	L5
Flipped	+6	+6			
Normal	-6	-6	17	-12	-17
Flipped			-7		

Figure 9

bendable arch wire to optimize posterior arch development for esthetics. Palpation of the buccal and lingual alveolar processes at each appointment is required to ensure that the patient’s “biological availability”²⁵ is not compromised.

Arch forms have tended to be too flat anteriorly, too broad through the cuspid and first bicuspid, and too narrow through the second bicuspid and molars. I found that bending of adjustable arch wires was unavoidable. I have worked with Ortho Classic to produce arch forms that mimic a shape that provides superior esthetics; Ortho Classic’s Pitts Standard and Pitts Broad arch forms. I typically use the “Broad” Arch form on all cases from the first bracketing. The only exception is when I have a narrow upper arch combined with a wide lower arch. Then I will use a “Standard” on the lower arch. Research has shown that as much posterior arch development occurs in round wires as occurs in dimensional arch wires²¹, and that is why the Pitts form is available in the same arch form for round, square, and rectangular wires. This feature facilitates an “active early” approach to transverse arch development with a greater degree of torsion control whether using familiar wire progressions or when using Ortho Classic’s H4 appliance.

Where unadjusted nickel-titanium or beta-titanium arches have not optimized axial inclination, the practitioner can use shapeable beta-titanium arches for minor corrections (Figure 11). Stainless steel wires are available, however in the “Active Early” approach, I usually only use stainless steel arch wires for extraction cases. We teach necessary posterior torque control in our courses.

11. “Overcorrection”: as a tool of controlling rebound: With it being generally conceded that permanent retention is a requirement of orthodontic stability, the role of “overcorrection” as a means of guiding the treatment result to a satisfactory conclusion has become more important. In our Masters training program, we spend considerable effort clarifying this complex challenge, but in essence it is advisable to overcorrect A/P, vertical, and transverse discrepancies for period of time, and then discontinue major mechanics as the occlusion adapts to the revised neuromuscular environment. With the improved tolerances of the H4 bracket system, I have found that there is less need for overcorrection of individual rotations.

12. “CO=CR”: as a tool in supporting long term joint health: I treat cases to CR whenever possible. There has been much discussion of how to best attain this goal. I have gravitated towards a Peter Dawson style approach¹⁵ for manipulating the mandible as something that is reproducible, relatively simple to do, and broadly applicable during the course of treatment. One important aspect of this technique is “bi-manual manipulation” of the mandible as a means of disclosing CO/CR discrepancies, occlusal interferences, and centric “slides” prior to or during treatment. Mandibular position is evaluated at each appointment, and adjustments to mechanics or possibly buccal segment coronoplasty is done to address interferences that develop in the course of treatment. With disarticulation buttons, it is easy to manipulate the mandible. In those cases where manipulation is difficult and CR cannot be reproducibly determined, a “leaf gauge” is used to manipulate, or mounting of models whenever necessary. I have

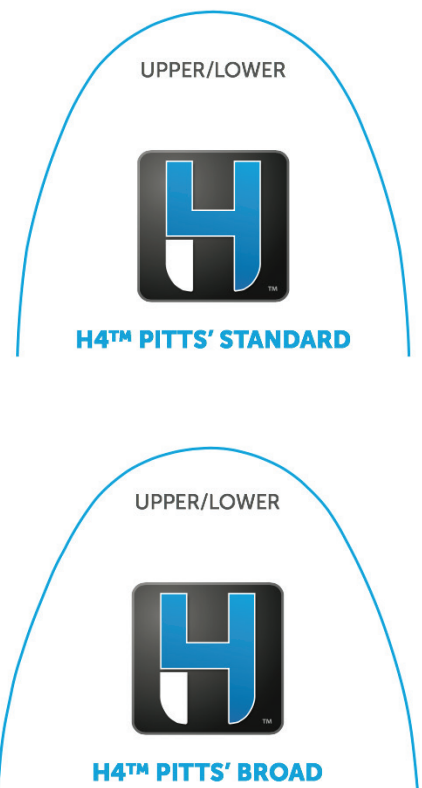


Figure 10

Incisor Display at Rest	2	4
Incisor Display on Smile	2	4
Transverse Smile Dimension	2	4
Resting Lip Support	3	4
Crowding	3	4
Smile Arc	2	4
Buccal Corridors	3	4
Gingival Display on Smile	2	4

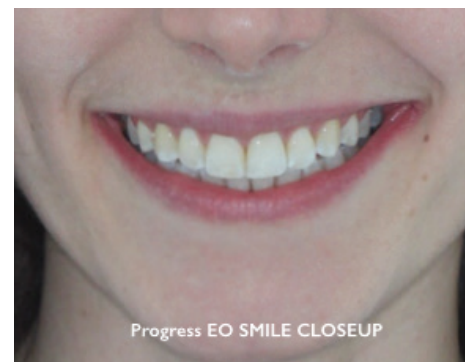


Figure 11

Initial Smile Close Up

Progress Smile Close Up

20 Months, 11 Appointments



found diagnostic mountings to be most appropriately applied in selective adults, surgery cases where a maxillary procedure is indicated, or cases where the nature of posterior interferences is uncertain.

13. "Micro-Esthetic Detailing": as a tool in providing dental esthetics: David Sarver has championed the role of micro-esthetics in attaining a wonderful orthodontic result in both hard and soft tissues¹⁷, and I agree completely with his approach. The refinement of "white and pink" esthetic contributions is now a routine part of esthetically superior treatments¹⁸. We encourage a disciplined approach to both hard and soft tissue refinement during treatment. This includes;

14. "Tooth size refinement": as a tool in perfecting guidance systems: No matter how well the brackets have been positioned, or how well the case has been managed, attaining centric stops and guidance patterns requires occlusal adjustments.

Summary of the Role of Case Management the "Active Early" Approach:

The art of Orthodontics is constantly evolving with the goal of becoming more efficient, and providing better aesthetic and functional results for our patients. Today with the combination contemporary diagnostic approaches, "Active Early" principles of case management, and purposefully designed and built precision appliances from Ortho Classic; we are excited about the possibilities for the future. The future is so bright I have to wear shades!

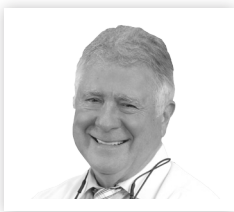
Until next time.....



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Author's Comments



Dr. Tom Pitts



Dr. Duncan Brown

"Our goal in teaching continues to be to improve esthetic and functional outcomes, while simplifying treatment mechanics and improving predictability, and efficiency. Combining the "14 Keys of Pitts Case Management", an "Active early" approach to treatment, and superior OC H4 self-ligating brackets with Pitt's Broad Arch Forms has gone a long ways to achieving those ends."

¹Ackerman J, Ackerman MB, Brensinger CM, Landis JR. A morphometric analysis of the posed smile: Clin Orthod Res 1998;1:2-11.

²Sarver D. The importance of incisor positioning in the aesthetic smile: the Smile Arc, Am J Orthod Dentofacial Orthop 2001;120:98-111

³Jimenez-Carlo et al - Are the Orthodontic Basis Wrong - Revisiting Two of the Keys of Normal Occlusion - ISBN: 978-953- 51-0143-7

⁴Pitts, T. Begin with the end in mind and finish with beauty: SIDO Published online: 29/05/2014, 39-46

⁵Pitts,T - Active Early Principles, OrthoEvolve White Paper, 2014

⁶Pitts, T. - Begin with the end in mind and finish with beauty: SIDO Published online: 29/05/2014, 39-46

⁷Pitts, T. - Begin with the end in mind: Protocols for smile arc Protection, Clinical Impressions Vol 17; 1: 2009

⁸Pitts, T - The Secret of Excellent Finishing, News and Trends in Orthodontics: April 1, Vol 14, 2009

⁹Pitts, T - OrthoClassic, a leading authority in orthodontics, OrthoTown November 2014

¹⁰Jimenez-Carlo et al - Are the Orthodontic Basis Wrong - Revisiting Two of the Keys of Normal Occlusion - ISBN 978-953 - 51-0143-7

¹¹Flemming et al - Comparison of maxillary arch dimensional changes with passive, active, and conventional brackets in the permanent dentition, Am J Orthodontia Dentofacial Ortho 2013; 144: 185-193

¹²White, L - Limiting the Sequellae of Poor Compliance - Orthotown November 2014

¹³Martin - Goal Oriented Treatment, SIDO 2013: 4-11

¹⁴Flemming et al - Comparison of maxillary arch dimensional changes with passive, active, and conventional brackets in the permanent dentition, Am J Orthod Dentofacial Ortho 2013; 144:185-193

¹⁵Peter E Dawson - From TMJ to Smile Design, Mosby 2006

¹⁶Sarver, D - Enameloplasty and Esthetic Finishing in Orthodontics- Identification and Treatment of Microesthetic features in Orthodontics, JERD Vol 23 No 5, 298-302, 2011

¹⁷Sarver D - Principles of cosmetic dentistry in orthodontics: Part 3. Laser treatments for eruptions and soft tissue problems, AJODO 2005; 127:262-264

¹⁸Brandao, R - Finishing procedures in Orthodontics: dental dimensions and proportions, Dental Press J Orthodontics 2013 Sept-Oct; 18(5): 147-74