Complete Clinical Orthodontics

You are an active member of the orthodontic community, you’re dedicated to practicing in the most efficient, effective and efficacious way and you pride yourself on remaining up-to-date and informed on the latest in orthodontics, yet you may be of the opinion that the last thing we need is another technique!

As the founding father of Complete Clinical Orthodontics, I couldn’t agree more.

This is exactly why Complete Clinical Orthodontics (CCO) represents such a significant step forward in orthodontics. This is not a radical new technique or technology, but a unique way to treat each and every case to achieve the most successful clinical outcome for the individual patient.

By uniting the brightest minds and ideas in orthodontics (Angle, Tweed, Ricketts, Andrews, Roth Alexander, McLaughlin and Damon to name a few) we’ve been able to impact control, predictability and efficiency for all cases.

Unlike traditional orthodontic treatment where treatment strategies can vary on a visit-by-visit basis, the objective of the CCO™ System is to emphasize goal-directed treatment that ends in a pre-visualized result. This not only instills confidence in the practitioner for the patient, but it leads to a more efficient and higher quality outcome.

Ultimately the goal of the CCO System is to capitalize on the wealth of knowledge available to us as orthodontists, and to incorporate new technology and proven concepts to achieve a higher level of efficiency. Excellent treatment mechanics should allow the orthodontist to deliver optimal treatment to the majority of his or her patients, and to do it in the most efficient and simple way that maximizes an often-overlooked commodity—TIME.

“When I think about the future of clinical orthodontics, I don’t think of a new technological discovery that will make us forget everything we have done in the past. I see an intelligent integration of the best concepts our predecessors gave us with the most efficient technologies we currently have.”

– Dr. Antonino Secchi
While Dr. Antonino Secchi is the most visible member of the CCO movement, he views his role as more of curator or caretaker rather than founding father. That’s because Dr. Secchi knows that, at its heart, the CCO is not the result of any one individual. Instead, the CCO System is a blend of many minds and the compilation of many schools of thought. Dr. Secchi views himself as the architect who assembled all the individual parts. In finding unity in disparity, the CCO System is able find a way to streamline treatment and enhance clinical outcomes.

Dr. Secchi is Clinical Assistant Professor and Former Clinical Director of the Department of Orthodontics at the University of Pennsylvania. He received his DMD, Certificate in Orthodontics, and a Master of Science in Oral Biology from the University of Pennsylvania.

Dr. Secchi is a Diplomate of the American Board of Orthodontics and member of the Edward H. Angle Society of Orthodontists. At the University of Pennsylvania, he has developed and implemented courses on Orthodontic Treatment Mechanics, Straight Wire Appliance Systems and Functional Occlusion in Orthodontics for postdoctoral orthodontic residents.

Dr. Secchi’s research interests include the relationship between self-ligating appliances, friction and treatment mechanics as-well-as orthodontics and functional occlusion. He has published in various dental and orthodontic peer review journals. In 2005 he received the David C. Hamilton Orthodontic Research Award from the Pennsylvania Association of Orthodontists (PAO) and in 2010, the Outstanding Teacher Award from the Department of Orthodontics of the University of Pennsylvania.

His passion for clinical orthodontic and commitment to education have made him a solicited lecturer at a National and International level. In addition, he maintains an active orthodontic practice in Philadelphia, PA.
The CCO system is supported by a leadership team of well respected clinicians from around the world. An interactive learning environment with advanced educational tools allows each course participant to have a unique and informative learning experience. The system and philosophy are clearly demonstrated through real world clinical application and results.

**Dr. Jerry Clark**
CCO Leadership
USA

Dr. Jerry Clark is a graduate of St. Louis University’s orthodontic program and maintains a full-time orthodontic practice in Greensboro, North Carolina. He is also Founder and Partner in Bentson Clark & Copple LLC, an orthodontic valuation and transition company, which provides a variety of services to buyers and sellers of orthodontic practices including: practice valuation, partner location services, and provides assistance to buyers and sellers with the negotiations of practice sales and transitions.

Dr. Clark is also a much sought after speaker on a variety of topics including comprehensive programs on the business aspects of effectively managing an orthodontic practice, practice transition information and strategies, and he presents comprehensive courses on achieving exceptional treatment results and optimizing treatment efficiency utilizing self-ligation. He has published numerous articles that have appeared in notable orthodontic publications.

**Dr. Dan Fishel**
CCO Leadership
USA

Dr. Daniel L. W. Fishel, DMD is dual-specialty trained in orthodontics and periodontics. He completed his dental training at the Harvard School of Dental Medicine and his residency training at The University of Pennsylvania. He practices in multiple locations in south central Pennsylvania, including Harrisburg, York, and Hanover. He emphasizes educating his patients on the best treatments dentistry has to offer, providing orthodontic, periodontal, and dental implant treatments that maximize dental health and longevity, as well as quality of life.

**Dr. Julia Garcia-Baeza**
CCO Leadership
Spain

Dr. Baeza is a Diplomate of the American Board of Orthodontics and member of the Spanish Society of Orthodontics. She received her DMD from the University European of Madrid, Spain; and her Certificate in Orthodontics, and Master of Science in Oral Biology from the University of Pennsylvania.

Dr. Baeza’s interest on research in orthodontics appliances has taken her to enroll a PhD program at the University Complutense of Madrid, Spain. She has published in various research and orthodontic journals and presented at the 2010 IADR meeting in Barcelona.

Dr. Baeza’s devotion for clinical orthodontics and multidisciplinary work has made her to join an outstanding professional dental team in Madrid, in which “Passion for Excellence” is their main goal. She maintains her own orthodontics and multidisciplinary private practice in Madrid.
Dr. Andres Giraldo
CCO Leadership
Colombia

Dr. Andres Giraldo graduated as a dentist at Universidad Autonoma de Manizales and made his postgraduate studies as an orthodontist in Universidad Militar Nueva Granada. He has been the director of Universidad Autonoma de Manizales’ orthodontics program for four years. He is the director of the pre-clinic and clinic of CCO in Universidad Autonoma de Manizales’ orthodontics program. He is member of Colombian Society of Orthodontics (SCO) and of AAO.

Dr. Sam King
CCO Leadership
USA

After receiving his DDS at The Ohio State University, he matriculated to the University of Pennsylvania in Philadelphia. There he completed his three year residency in orthodontics and received a Master of Science in Oral Biology. During this time, he took additional training in facial and dental esthetics and function and completed the two year course at the Roth-Williams Advanced Education in Orthodontics Program. Upon graduation, Dr. King was offered a position as an instructor at the University of Pennsylvania where he currently maintains a faculty position. He is a Diplomate of the American Board of Orthodontics.

Dr. Isabell Mortalena
CCO Leadership
France

Dr Mortalena received her DDS from the University of Bordeaux, France; her dual certificate in Orthodontics and Periodontics, as well as her Master of Science in Oral Biology from the University of Pennsylvania. She completed a two-year advanced course in functional occlusion from the Roth-Williams Center for Advanced Orthodontic Education. She also is a diplomate of the American Board of Orthodontics.

Dr Mortalena’s research interests include the use of miniscrews-miniplates in Orthodontics, periodontally facilitated Orthodontics, surgical and orthodontic management of impacted teeth and multidisciplinary treatment.

She maintains a private Orthodontics-Periodontics practice in Biarritz, France with her husband, a board certified periodontist who also graduated from the University of Pennsylvania.
CCO Leadership

Dr. Luis Nunez
CCO Leadership
Uruguay

DOS, University of the Uruguayan Republic, Uruguay, 1996. Former Assistant Professor, Department of Orthodontics, Dental Faculty, University of the Uruguayan Republic, 1997 - 2007. Graduated from two long term orthodontics courses at the Uruguayan University. Graduated from Roth / Williams long term course, Catholic University, Uruguay. 2002 – 2004. Course taught by Drs. Ronald Roth, Robert Williams, Anka Sapunar and assistants.

Member of ALADO (Latin American Orthodontists Association) and WFO. International lectures in Argentina, Brazil, Venezuela, Colombia, Perú, Ecuador y República Dominicana. DENTSPLY GAC Latin American Continuing Education Program in Orthodontics Director. New York University, Orthodontics short programs for foreign doctors coordinator, along with Dr. Celestino Nobrega, San Pablo - Brazil. Private practice in Montevideo - Uruguay.

Dr. Shalin Shah
CCO Leadership
USA

Dr. Shah earned his Bachelor of Arts, Doctorate of Dental Medicine, Certificate in Orthodontics, and Masters of Science in Oral Biology from the University of Pennsylvania. During his tenure at Penn, he learned to become a critical thinker through ten years of research, he developed leadership experience as Chief Resident and President of Penn’s American Student Dental Association, and discovered an unwavering passion for orthodontics.

His passion for the profession led him to earn additional certifications while a resident, most notably becoming a Diplomate of the American Board of Orthodontics. Dr. Shah also developed an interest in published orthodontic literature, and as a result, he accepted the position of Abstracts Editor for the peer-reviewed journal, Orthodontic Practice US. He is also on the faculty at the University of Pennsylvania and lectures nationally and internationally for Complete Clinical Orthodontics and Roth-Williams Center for Functional Occlusion.

Dr. Celestino Nobrega
CCO Leadership
Brazil

Dr. Celestino Nobrega is the director of ORTOGEO, an orthodontics school with over 20 years of experience bringing scientific research and cutting-edge technology to professionals and patients. He completed his general dental training at Sao Paulo State University, Brazil, his certificate in Orthodontics in Rio de Janeiro State at Brazilian Dental Association and his Mastering of Dental Science in 1996.

Dr. Nobrega is an international speaker and has presented his research in countries like the United States, Canada, Mexico, Dominican Republic, Venezuela, Colombia, Ecuador, Uruguay, Chile, Brazil, Spain, Portugal, France, Italy, UAE and Lebanon. He is currently leading a project of 19 biomechanical studies regarding the characteristics of the interactive self-ligating system. The research is based on friction and flexibility studies and the impact of low intensity laser and vibration therapy during orthodontic treatment.
Dr. Raffaele Spena
CCO Leadership
Italy
Dr. Raffaele Spena received his degree in Odontoiatria e Protesi Dentaria at the II Facoltà di Medicina e Chirurgia of Napoli, his Certificate in Orthodontics at the Dental School of the University of Pennsylvania, Philadelphia and his degree of “Specialty in Orthodontics” at the University of Ferrara. He is a published author, an international speaker on the lecture circuit and Adjunct Clinical Professor at the Orthodontic Department of the Dental School of the University of Pennsylvania.

A member of the American Association of Orthodontists, the Angle Society of Europe and the World Federation of Orthodontists, Dr. Spena is currently involved in numerous research projects including spreading from non-extraction treatment and the Periodontally Facilitated Orthodontics. A resident of Italy, he currently practices orthodontics in the town of Napoli.

Dr. Ryan Tamburrino
CCO Leadership
USA
Dr. Tamburrino grew up in Pittsburgh, and his tinkering and technical interests during his early years led him to Duke University where he received degrees in Biomedical Engineering and Mechanical Engineering/Materials Science. Wanting to also to be involved in healthcare, he enrolled at the University of Pennsylvania where he received his Doctorate of Dental Medicine and was Chief Resident while obtaining his specialty Certificate in Orthodontics.

In addition to private practice, Dr. Tamburrino is on the faculty at the University of Pennsylvania in the Department of Orthodontics. Dr. Tamburrino also lectures locally with various study groups, as well as internationally/nationally with the Complete Clinical Orthodontics Course and Roth-Williams Center for Functional Occlusion. He strongly believes that it is important to teach and to help raise the standard of care for our community as well as for the entire profession, and thoroughly enjoys any opportunity to do so.
Many Minds, One Comprehensive Mindset

Complete Clinical Orthodontics represents a philosophy that — when correctly applied — may enhance the capabilities of appliances, improve treatment mechanics, and more importantly, produce better results. It literally takes components of treatment and maximizes the benefits of each.

In the 1970’s the first Straight Wire Appliance (SWA) was introduced by Dr. Larry Andrews. This was the first orthodontic appliance with all three dimensions for tooth position built into the bracket. Shortly after, a series of additional brackets called “Translation Brackets” were introduced to account for undesired tooth movement when sliding teeth in extraction cases.

In the early 80s’, Ron Roth combined some of the Andrews Standard Rx values with some of the values found in the Translation Brackets to come out with the Roth Rx. Filling the slot with a large stainless steel archwire to express the Rx was one of the premises of the Roth system.

In the early 90s’ McLaughlin, Bennett and Trevisi modified the SWA Rx based on the fact that most orthodontists would finish cases with a .019x.025 ss wire, which on a .022 slot could have up to 12° of play. They increased buccal crown torque of maxillary incisors, reduced lingual crown torque of mandibular molars and increased lingual crown torque of mandibular incisors.

Over the last decade, I have used different “versions” of the SWA, studying its concept and development and collecting personal experiences as well as experiences from many clinicians. I have used different Self-Ligating Brackets (SLBs), studied the theory behind them, used them in my own patients (today 100% of my practice is Active SLB) and researched them in-vitro. Based on my clinical experience, I have come to the conclusion that active SLBs have a lot to offer to facilitate and therefore improve the delivery of our treatment. However, based on the different interaction between bracket and archwires due to the active clip, a “fine-tuning” of the Rx was necessary. Introducing the CCO Rx.

Today we have a more comprehensive understanding of biomechanics with pre-adjusted active self-ligating appliances, effective and efficient early treatment, adult orthodontics with periodontal challenges and esthetic considerations for each patient’s face and smile. The CCO System integrates the latest technological advancements to best facilitate an effective new overarching treatment philosophy. What’s more, it uses time-tested treatment planning strategies that stress 3D skeletal and dental diagnosis while integrating concepts from periodontics, restorative dentistry, and oral surgery to provide a comprehensive treatment planning system to propel the diagnostic scope of your entire practice to an even higher level.

This simple and efficient mechanical approach, combined with the state-of-the-art, active self-ligating appliance, provides the necessary elements to consistently deliver exceptional results…case after case.
A Healthy Practice

We like to define a healthy practice of orthodontics, from a clinical standpoint, as a practice where you can count the problem cases on one hand. We’ve all had the unpleasant experience of losing sleep over “that case”. The case that refuses to go the way we want, and seems to confound us at every step. It takes only a few of those cases to make your practice—and your life—miserable. Today, that can be avoided.

By combining the experience of over one hundred years of clinical orthodontics with the best technology currently available, the CCO system is the answer to providing control, predictability, and efficiency for all cases.

Emphasis on Control

Controlling the variables of what we do in all aspects of our lives leads to productivity and predictability of results. The CCO system commands total orthodontic control through a logical sequence to treatment – one that is easily determined through planning and simulation – before ever initiating work on a patient. Unlike traditional orthodontic treatment where treatment strategies can vary on a visit-by-visit basis, the objective of the CCO system emphasizes goal-directed treatment towards a pre-visualized end result, thereby instilling confidence in both the practitioner and the patient and leading to a more efficient and higher quality result.
The Mechanics Behind the Movement

By integrating classic mechanics with modern, straight-wire active self-ligating appliances, CCO shows you how to improve efficiency and control while achieving predictable results.

The CCO mechanical system introduces a highly practical methodology to diagnose and use straight wire active self-ligating brackets for efficient application in all clinical situations.

The system leverages the basis of the straightwire appliance and how it integrates with self-ligation to improve efficiency and control, while incorporating a new appliance prescription to take full advantage of active self-ligating brackets.

The CCO Rx was developed to take full advantage of the bracket/archwire interaction when using an active clip and to achieve optimal tooth position at the end of treatment.

Rotational Control

The interactive capability together with the full slot clip coverage of the active clip in the In-Ovation® brackets facilitates the correction of rotations within the stage of leveling and aligning. The active clip also promotes complete engagement of the wire into the slot. This avoids leaving small rotations uncorrected as the wire sequence progresses. Therefore, the CCO Rx removes some of the offset overcorrection found in previous prescriptions.

Full Torque Expression

Thanks to the active clip of the In-Ovation brackets, full torque expression is achieved on a .019 x .025 ss wire. The interactive clip pushes the wire into the slot. Research shows that on the In-Ovation brackets a .019 x .025 ss wire can express the same amount of torque as a .021 x .025 Stainless Steel wire.* Therefore, some of the overcorrection implemented in previous Rx systems to overcome the play between the bracket and a .019 x .025 ss wires, do not apply when using the In-Ovation bracket. The CCO Rx removed these overcorrections.

Molar Control

Remember that it is the interaction between the bracket and the wire that will transfer the values of tip, torque and offset to the teeth. Tubes are passive attachments. Tubes are not able to transfer the values they have, specifically torque, even if large wires are used. Trouble correcting the curve of Wilson of maxillary molars and excessive lingual crown torque of mandibular molars are some of the problems commonly reported by many orthodontists. Therefore, the CCO Rx has a specific overcorrection for the maxillary and mandibular first and second molars to achieve proper molar control on a .019 x .025 ss archwire.

Incisors Control

It is very important for both esthetics and function to achieve optimal torque of the maxillary and mandibular incisors. It affects lip support and consequently facial esthetic as well as anterior coupling of the incisors and therefore anterior guidance. It is sometimes difficult for the maxillary incisors to achieve optimal torque due to the large amount of bone the roots must go through, specifically in extraction cases as well as Class II Division II cases.

The inclination of the mandibular incisors is critical for both function and stability. Their position should be upright within the alveolar bone. Class III camouflage, Class II mechanics and deep curve of Spee are specifically challenging with regard of the upright position of mandibular incisors. The CCO Rx combines proven values of torque for maxillary incisors that can be fully expressed thanks to the active clip, with a slight overcorrection for the mandibular incisors to achieve optimal control in a variety of clinical situations.

The CCO Rx is conveniently and progressively expressed throughout the stages of treatment mechanics by using specific archwires at each stage. The ultimate goal is to achieve optimal tooth position at the end of treatment, even before the appliance is removed.
CCO System Rx Highlights

The CCO System Rx works as a comprehensive treatment protocol from second molar to second molar.

The following identifies specific segments in the arch where the CCO System Rx has adjusted values to meet the clinical outcomes desired. The transparent teeth in each illustration represents typical tooth position from alternate prescriptions. The solid tooth represents the adjusted values and tooth position of the CCO System Rx.

1. **U1: 12˚ Torque | U2: 10˚ Torque:** These values are optimal if full expression of torque is achieved. Thanks to the active clip, full expression can be achieved on an .019 x .025 ss wire. It is NOT necessary to increase/overcorrect these values.

2. **L1/L2: -6˚ Torque, 0˚ Tip, 0˚ Offset:** A small lingual crown torque overcorrection has been shown to help keep the incisors in an upright position when leveling and aligning and through Class II correction. 0˚ tip and offset makes all four incisor brackets interchangeable, facilitating bracket inventory.

3. **U3: 10˚ Tip:** This value of 10˚ has the optimal angulation. The increased mesial crown tip found in some prescriptions (13˚) has shown undesired distal tip of the U3 root, frequently seen in x-rays. However, excessive up-righting (8˚ or less) could compromise proper coupling with the L3 and could also leave spaces in the upper arch that when closed, could prevent proper Class I relationship.
4. **L3: -8˚ Torque:** In many cases where the width of the maxillary and mandibular arches are normal, an excessive lingual crown torque (-11˚), found in some prescriptions, makes proper coupling with the U3 difficult.

5. **U4/U5: -9˚ Torque, 0˚ Tip, 0˚ Offset:** Unique values are clinically insignificant, therefore the same values have been chosen, making them interchangeable providing bracket inventory flexibility.

6. **L4: 2˚ Tip | L5: -1˚ Tip:** Although this small difference of tip between the L4 and L5 will not be seen in non-extraction cases, it is significant in extraction cases to prevent “dumping” of the premolar into the extraction space.

7. **U6: -14˚ Torque | U7: -20˚ Torque:** Increased lingual crown torque, specifically for the second molar facilitates the correction of the curve of Wilson and therefore arch coordination, while minimizing the use of auxiliaries such palatal bars, etc.

8. **L6: -25˚ Torque | L7: -20˚ Torque:** These values have been selected to facilitate uprighting L6/L7 preventing them from rolling lingually.
The CCO System Rx

Maxillary Arch

<table>
<thead>
<tr>
<th>Tooth</th>
<th>Torque</th>
<th>Tip</th>
<th>Offset</th>
</tr>
</thead>
<tbody>
<tr>
<td>U1</td>
<td>12</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>U1 Low Torque</td>
<td>7</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>U2</td>
<td>10</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>U2 Low Torque</td>
<td>3</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>U3 Hook*</td>
<td>-7</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>U3 Low Torque Hook*</td>
<td>0</td>
<td>10</td>
<td>2M</td>
</tr>
<tr>
<td>U4 • 5</td>
<td>-9</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>U4 • 5 Hook*</td>
<td>-9</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>U6 Hook*</td>
<td>-14</td>
<td>0</td>
<td>10D</td>
</tr>
<tr>
<td>U7 Hook*</td>
<td>-20</td>
<td>0</td>
<td>10D</td>
</tr>
</tbody>
</table>

Mandibular Arch

<table>
<thead>
<tr>
<th>Tooth</th>
<th>Torque</th>
<th>Tip</th>
<th>Offset</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1 • 2</td>
<td>-6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>L1 • 2 High Torque</td>
<td>-1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>L3 Hook*</td>
<td>-8</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>L4</td>
<td>-12</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>L4 Hook*</td>
<td>-12</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>L5</td>
<td>-17</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>L5 Hook*</td>
<td>-17</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>L6 Hook*</td>
<td>-25</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>L7 Hook*</td>
<td>-20</td>
<td>-1</td>
<td>0</td>
</tr>
</tbody>
</table>

* All hooks are placed disto-gingivally. Note: Values of torque, tip and offset refers to the crowns. Positive values of torque and tip mean buccal while negative mean lingual. Offset values are indicated as M (mesial) or D (distal).
**Wire Sequencing**

**Stage 1: Leveling and Aligning**

<table>
<thead>
<tr>
<th>Severe to Moderate Crowding</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>.022 Slot</strong></td>
</tr>
<tr>
<td>.014 Sentalloy***</td>
</tr>
<tr>
<td>.018 Sentalloy</td>
</tr>
<tr>
<td>.020 x .020 Bioforce*</td>
</tr>
</tbody>
</table>

**Stage 2: Working Stage**

<table>
<thead>
<tr>
<th><strong>Non-Extraction</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>.022 Slot</strong></td>
</tr>
<tr>
<td>.021 x .028 Bioforce**</td>
</tr>
<tr>
<td>.019 x .025 ss</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Extractions</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>.022 Slot</strong></td>
</tr>
<tr>
<td>.019 x .025 ss with hooks Sentalloy coils 150 gr</td>
</tr>
<tr>
<td>.019 x .025 ss with hooks Sentalloy coils 150-200 gr</td>
</tr>
<tr>
<td>.021 x .025 ss with hooks Sentalloy coils 150-200 gr</td>
</tr>
</tbody>
</table>

**Use of inter-maxillary elastics at the Working Stage**
Within the Working Stage for Non-Extraction as well as for Extraction cases we use short 3/16” 4 or 6 oz. in a Class II, III or triangular vertical fashion as indicated by the specific clinical situation.

**Stage 3: Finishing Stage**

| **.022 Slot** | **.018 Slot** | **Time** | **Goals** |
| .021 x .025 Braided | .018 x .025 Braided | 4-6 weeks | Detail occlusion to achieve optimal intercusption. |

**Use of inter-maxillary elastics at the Finishing Stage**
Within the Finishing Stage we use short 3/16” 6 or 8 oz. in a Class II, III or triangular vertical fashion as indicated by the specific clinical situation.
Optimizing Treatment

The CCO System is designed to be an effective, efficient and practical way to achieve excellent results in a variety of clinical situations when using straight wire self-ligating appliances. It’s an overarching orthodontic philosophy that can be applied to every case. The following case studies will provide you with a sampling of the abilities of the CCO System in treating some inherently challenging cases.

Wire Interaction
Figure A and B show a lateral view of an extraction case at the beginning of Stage 1 with an .014 Sentalloy® wire, and at the end of Stage 1 with an .020 x .020 Bioforce® wire.

Notice how as the teeth level and align, the length of the wire between canines and premolars becomes smaller (red indicators). The extra wire slides back and therefore it has to be clipped at each visit. Anterior teeth upright and even retract without losing anchorage. No elastics or auxiliaries have been used.

Torque Control
Figure C and D show a lateral view of a Class II deep bite case at the beginning of Stage 1 with an .014 Sentalloy wire and at the end of Stage 2 with an .019 x .025 ss wire. Lower wire with Reverse Curve of Spee, short Class II 3/16 6oz have been used.

Notice the change of torque of the maxillary central and lateral incisors (12°/10°).  

Closing Space with Sentalloy Coil Springs
Figures E and F show a lateral view of an extraction case at two different points during Stage 2. The upper and lower show an .019 x .025 ss wire with hooks.

Notice how the space closed within a couple of months of the Sentalloy coil spring being activated.
**Opening Space with Sentalloy Coil Springs**

Figures G, H, I and J show a lateral view of a case that presented with severe extrusion of maxillary first premolar and block out maxillary second premolar due to early loss of primary teeth. After leveling and aligning, a Sentalloy open coil (Fig. I) was used to open space for the blocked second premolar.

Figures K, L, M and N show the occlusal view.

**Post Treatment Stability**

Figures O and P show a lateral view of an extraction case at the beginning of Stage 1, the end of Stage 3.

Figures Q and R show the finished case right after treatment and 3 years in retention respectively. The goal of the Finishing Stage is to achieve an optimal occlusion before removing the appliance and to create stability.
Case Study 1

20 year-old female with an anterior open bite and a unilateral posterior crossbite. Combination of In-Ovation ‘C’ and ‘R’ were used to level and align, flatten the occlusal plane and coordinate the arches.

Treatment duration: 15 months. • Case treated by Dr. Secchi

Initial intraoral photos showing the anterior open bite and posterior unilateral crossbite on the left side. Notice how the maxillary occlusal plane diverges from the mandibular occlusal plane.

In-Ovation ‘C’ appliance on the upper arch and ‘R’ on the lower arch. Photos show upper and lower .014" Sentalloy initial archwires. Initial alignment was done in 6 months through a sequence of two archwires: .014" Sentalloy and .020" x .020" Bioforce. No vertical elastics were used at this stage of treatment. Posterior crossbite was corrected by coordinating the arches using a transpalatal bar.

Final .021" x .025" Braided archwire. At this final stage, vertical triangular elastics are used. Notice how maxillary and mandibular occlusal planes are now almost parallel.

Finished case. Class I molar and canine was achieved as well as good overjet and overbite. Both maxillary and mandibular arches are coordinated to have an optimal overjet from second molar to second molar.
Case Study 2

12 year-old female with a deep bite, Class II canines and crowding. In-Ovation ‘R’ appliance was used to level and align, parallel maxillary and mandibular occlusal planes and provide optimal buccal crown torque to the maxillary incisors. Short Class II elastics were used at the working stage.

Treatment time: 25 months. • Case treated by Dr. Secchi

Initial intraoral photos showing the severity of the deep bite, right side buccal crossbite and Class II canines. Notice the lack of inclination of maxillary incisors. In order to level the mandibular occlusal plane, proper inclination of maxillary incisors must be achieved.

In-Ovation ‘R’ appliance. Due to the severe deep bite upper arch was bonded first to level, align and procline upper incisors to create space to level and align lower arch. Picture shows an .014” Sentalloy wire at the initial bonding.

Upper and lower .019” x .025” SS, lower arch with reverse curve of Spee and short Class II elastics. Parallelism of upper and lower wire has been achieved. Notice proper inclination of maxillary incisors and level curve of Spee.

Finished case. Notice proper intercuspation, Class I molar and canine and proper overjet and overbite.
Case Study 3

14-year-old male with a blocked canine, end-on molar relationship and midlines off. In-Ovation ‘R’ appliance was used with extractions of maxillary first bicuspid and mandibular second bicuspid. Minimum anchorage mechanics was used.

Treatment time 20 months. • Case treated by Dr. Secchi

Initial intraoral photos showing maxillary right canine ectopically positioned, end-on molar and canine relationship and maxillary midline off to patient’s right side.

Intraoral photos at the time the In-Ovation ‘R’ appliance was placed with an upper and lower .014” Sentalloy archwires. Initial alignment was done in 7 months through a sequence of three archwires: .014” Sentalloy, .018” Sentalloy and .020”x.020” Bioforce.

After spaces have been closed, arches have been coordinated and proper overjet and overbite have been achieved, upper and lower .021” x .025” Braided finishing wires are used together with vertical triangular elastics for detailing and optimal coupling.

Finished case. Proper intercuspation, Class I molar and canine with proper overjet and overbite. Minimum anchorage mechanics allowed maintaining maxillary and mandibular incisors inclination while protracting mandibular molars to a Class I relationship.
Case Study 4

12 year-old female with a Class II malocclusion, increased Over-Jet and moderate maxillary and mandibular crowding. Extraction of maxillary and mandibular second premolars. Anchorage was managed with a combination of High Pull Head Gear and short Class II elastics. In-Ovation ‘R’ appliance was used.

Treatment time 30 months. • Case treated by Dr. Secchi

Initial photos showing an “end on” Class II malocclusion with maxillary and mandibular crowding as well as increased overjet.

Extraction of maxillary and mandibular second premolars. Photos showing initial bonding with an upper and lower .014” Sentalloy archwires. Maxillary anchorage was managed by a combination of transpalatal bar and head gear. Short Class II elastics were used at the working stage.

Spaces were closed, arches coordinated and Class I molar and canine achieved with proper overjet and overbite. Finishing upper and lower .021” x .025” Braided are shown.

Finished case showing optimal intercuspation.
Educational Support

The CCO System is taught through a series of interactive, hands-on courses. Small class sizes and advanced educational tools allow each participant to have a unique and informative learning experience.

CCO Courses Explore:

- Biomechanics with pre-adjusted, active self-ligating appliances
- Effective and efficient early treatment
- Adult orthodontics with periodontal challenges
- TADs management
- Facial esthetics considerations for diagnosis and treatment planning

The CCO System is a comprehensive orthodontic system that addresses diagnosis, treatment planning and treatment delivery in a single, inclusive approach. With curriculum that’s now taught in some of the most prestigious institutions of learning around the world, the CCO System is shaping the way orthodontics is practiced. What’s more, a comprehensive agenda of alumni classes is now being planned and will soon be made available both online and in person. Led by some of the most-respected names in orthodontics, the current CCO Leadership team now includes names like Dr. Julia Garcia-Baeza, Dr. Isabell Mortalena, Dr. Andres Giraldo, Dr. Jerry Clark, Dr. Luis Nunez, and Dr. Antonino Secchi to name but a few.
Enhancing the Art and Science of Orthodontics

From esthetics perfection to essential care, orthodontics is about moving the individual parts to perfect the collective whole. It’s why DENTSPLY GAC is moving the field of orthodontics forward to deliver the highest in patient care. From brackets, force-intuitive wires and highly efficient buccal tubes to bonding, auxiliary appliances and innovative software programs, our mission is to help you achieve rapid, optimal treatment results while streamlining your orthodontic practice. To ask your GAC representative for more information, please call 800.645.5530, or visit www.gacintl.com.