The AAO is the only organization solely dedicated to orthodontic specialists. Membership leaders work to develop tools and support needed to succeed in practice.

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Clear Aligner Treatment:

What Treatment Coordinators and Assistants Need To Know

Mark Lowe, D.D.S.
Mark Lowe, D.D.S.

- Stanford University
  - B.S. Biology
  - B.A. Economics
- UCSF
  - Dental School
  - Orthodontic Residency
- Orthodontic Attending- CRMC-UCSF-Fresno/ General Practice Residency
  - Teaching for over 25 years
  - Teaching Clear Aligner Treatment since 2007
- Orthodontist
  - Private Practice
  - Group Pediatric Practice
  - Over 25 years
  - Using Clear Aligners since 1999
Clear Aligner Treatment: What Treatment Coordinators and Assistants Need To Know

Clear Aligner Therapy is increasing in prevalence as a treatment modality to correct malocclusions. Aligners are delivered to treat minor problems like orthodontic relapse and even more complex cases involving extractions.

This lecture will provide an overview of Aligner Treatment: covering the spectrum of case types that can be resolved predictably and what assistants need to know, start to finish, to deliver quality aligner care.
Attendees of this lecture will be able to:

• Identify patients that want clear aligner treatment

• Recognize malocclusions that can be treated predictably using aligners.

• Manage patient aligner treatment from Initial Delivery to Retention.

• Outline start to finish, the procedures involved in delivering aligner care.
Overall Market Orthodontic Market Growth

Fueling the growth of the US Orthodontic Market (which grew from 2.6M to 2.9 M in the last 4 years) Clear Aligners as a category grew from 15% of all starts 4 years ago to 20% in 2014.

Source: AAO Member Survey 2006, Investor Relations data, 2009 NA Financial data
Overall Market Orthodontic Market Growth

Non - Adult carve out

Will Clear Aligners % share Triple again?
Or more?

Clear Aligner Share TRIPLED

2009
Clear Aligners, 3%

Other Appliances (Braces), 97%

2014
Clear Aligners, 9%

Other Appliances (Braces), 91%

2020

Clear Aligners?

Other Appliances (Braces)?

TOTAL Market Size - 2,900,000
TOTAL Market Size - 2,900,000
TOTAL Market Size - ??M

Non-Adult Market Size - 1,950,000
Non-Adult Market Size - 2,175,000
Non-Adult Market Size - ??M

Adult Market Size - 650,000
Adult Market Size - 725,000
Adult Market Size - ??M
- Wires and Brackets is up + ~3% YoY (Source: AAO, Align Investor Relations)

- 2016 Wires and Brackets is flat YoY (Source: Gadge data, Sample size= ~557 Orthos)

- December Wires and Brackets is down -3 % YoY (Source: Gadge data, Sample size= ~557 Orthos)

- 2016 Ortho Invisalign CCA's grew 21.6% YoY, (Source: Internal Align data. Data size = ~6,799 Orthos)

- December Ortho Invisalign CCA's grew 33% YoY, (Source: Internal Align data. Data size = ~6,799 Orthos)

- 2016 Aligner Case Starts up 21.7% YoY (Source: Gadge data, Sample size= ~557 Orthos)
Gaidge Analytics

Source: Gaidge, 2013-2015 data
Mega Trends: Aligner Treatment

◊ Do it yourself treatment:
  - Smile Direct Club- Aligners delivered directly to individuals with no direct orthodontist/dentist supervision.

◊ CAD/CAM innovation:
  - Advanced technology (tooth alignment software/3D printers) leading to in-house labs capable of producing aligners for minor movement.

◊ Accelerated orthodontics:
  - Auxiliary devices to aid in decreasing treatment times.
  - Decreased wear protocols to decrease treatment times.
AcceleDent

- Accelerated orthodontics
- Handheld Device
- Treatment time in half
- Chewing - 200x greater force than AcceleDent Aura vibrations (5000g vs. 25g)
- Reduces discomfort associated with tooth movement
Biolux - OrthoPulse

- Accelerated orthodontics
- Handheld device
- Infrared light technology
- Infrared (NIR) spectrum reduces inflammation and pain
Aligner Advantages

◊ **Patients**
  ◇ Esthetic appliance/ removable
  ◇ Self confidence
  ◇ Comfort
  ◇ Convenience
  ◇ Oral Hygiene
  ◇ Appointment flexibility
  ◇ Accelerated treatment times

◊ **Office**
  ◇ Happier patients
  ◇ Increase referrals
  ◇ No emergencies
  ◇ Less chair time
  ◇ No decalcification/ less root resorption
  ◇ Long distance orthodontics - increase sphere of influence
  ◇ Increased profitability
1. Apples are the enemy. Apple skins are the WORST.

2. Flossing takes FOREVER! It's practically the next day when you finally finish!

3. You're always nervous about smiling because you never know what food might be stuck in there.

4. Getting them tightened HURTS A LOT!

5. Switching out band colors is cool, but you're stuck with that color for a whole month. Who wants to wear the same color ANYTHING for that long?

6. After eating a sandwich, at least 45% of the sandwich is stuck in your braces.

7. No gum, caramel, or hard candy! Like I said . . . those were the LONGEST years of my life!

8. Getting scratched and cut by stray wires on the inside of your mouth—ouch!

9. That awful feeling when the orthodontist tells you it's going to take longer to be braces-free than you were initially told. (Absolutely devastating.)

10. Finally getting your braces off, but then wearing a retainer for what feels like the rest of forever.
Deep Bite
Aligner Systems

- 8 Aligner Systems
  - Minor Tooth Movement Systems
    - CAS (Clear Aligner System)
    - MTM Clear Aligner
    - Simpli 5
    - Smart Moves
  - Minor-Moderate Treatment
    - EZ Align
    - Originator
  - Major Treatment
    - Clear Correct
    - Invisalign
Aligner System Functions

**Minor Treatment**
- CAS (Clear Aligner System)
  - CAS aligner trays are designed for minor anterior treatment.
- MTM Clear Aligner
  - Used to correct minor anterior misalignments.
- Simpli5
  - Express aligner treatment for minimal movement.
- Smart Moves
  - Offers exceptional seating and controlled movement, high predictability and patient comfort.

**Minor-Moderate Treatment**
- EZ-Align
  - Designed for minor to major movement.
- Originator
  - Used for minor to moderate tooth movement

**Major Treatment**
- Clear Correct
  - Designed for major tooth movement
- Invisalign
  - Designed for major tooth movement
CASE TYPE OVERVIEW

• Generalized Spacing
• Diastema
• Crowding
• Orthodontic Relapse
• Deep Bite
• Open Bite
• Over Bite
• Under Bite
• Cross Bite
• Combination Restorative
Generalized Spacing
Diastema
Crowding
Orthodontic Relapse
Deep Bite
Open Bite
Over Bite
Over Bite
Under Bite
Under Bite
Cross Bite
Aligner Delivery:
Start To Finish
Orthodontic Records

- Diagnostic Photos
- Panoramic Radiograph
- Cephalometric Radiograph
- 3D Intra-Oral Scan/ PVS Impressions
PVS Impressions or 3D Scan

- Poly Vinyl Siloxane (PVS) - Silicone Elastomer
  - Dimensional Stability
Pre 3-D Scanner
“Wild West”
3D Intra-Oral Scanner
Submit Case With Treatment Plan
Computerization

CAD - Computer Aided Design

CAM - Computer Aided Manufacturing
Initial Delivery Start Kit

- Aligner Retriever
- Aligner Cases
- Closys Toothpaste
- Floss
- Mouth Mirror
- Chapstick
- Travel Toothbrush
- Aligner Chewies
- Aligner Retriever
Care Instructions

Forget everything you've heard about teeth straightening. Because now there's breakthrough technology that lets you get the smile you always wanted without bands, brackets, or wires.

A clear alternative
By using a series of clear removable aligners, they straighten your teeth right before your eyes. Change them about every two weeks, and your teeth will move—little by little, week by week—until they have moved to the final position your orthodontist or dentist has prescribed. Comfortable to wear, our aligners are also removable so you can eat, drink, brush, and floss as usual.

Less treatment time
A typical case takes about a year from start to finish. You’ll see your doctor every month or two to see how you’re progressing. Every few visits, you’ll be given additional aligners to continue your treatment. Commonly, the number of aligners worn during treatment is between 18 and 30, but treatment time and the number of aligners will vary from case to case.

Invisible. And comfortable
is a virtually invisible solution. So you won’t draw undue attention to your mouth while in treatment. In fact, virtually no one will know you’re wearing them unless you tell. Comfortable to wear, our aligners are also removable so you can eat, drink, brush, and floss as usual.

Is it for me?
can be used to treat the vast majority of common problems for adults and teens. Whether your smile needs minor improvements or more extensive adjustments, can certainly help. It’s successful in treating overly crowded or widely spaced teeth. It can also relieve more complex issues, including overcrowded, underbites and even crossbites. In fact, an Certified Orthodontist or Dentist can use clear aligners in all or part of just about any treatment plan.

Look your best during treatment
is clear and practically invisible, so nothing gets in the way of your new smile. No wonder is the choice of over half a million people.

* Unobtrusive in business meetings or social gatherings
* No metal wires or bands to irritate your mouth
* Most people won’t notice you’re wearing aligners
Patient Start Video
Attachments

- Increased Surface Area of the Teeth
- Increased Retention of the Aligner
- Ideal Surfaces for Applying a Push Force
Attachment Placement
Attachment Treatment Overview
Attachment Set Up

- Cheek Retractors
- Suction Tip
- Mouth Mirror
- Cotton Rolls
- Bonding Brushes
- High-Speed Handpiece with Flame Bur
- Gel Etchant
- G-Bond Primer
- Composite Material
- Scaler
- High-Speed Flame Carbide Bur
- Bonding Agent
- Aligner Templates
- Composite Material
Etching Gel is a phosphoric acid used for etching enamel and dentin to promote adhesion of primer/bonding agent adhesives to tooth structure and restorative materials.

Ormco Dental Gel Etchant is fast-acting and 37% Phosphoric Acid. It is dispensed from a bendable syringe tip, which provides precise placement and an easy rinse, without leaving behind residue.

Place gel etch on the tooth by syringe or by bonding brush, leave on for 30-45 seconds and rinse.
G-Bond Unit Dose

- 7th Generation One Component Self-Etching Light-Cured Adhesive

- The unique combination of phosphoric acid ester monomer and 4-MET adhesive technology creates superior etch and adhesion to enamel in addition to providing chemical and mechanical seal to dentin – referred to as the Nano Interaction Zone.

- Etch, desensitize, prime and bond in as little as 20 seconds

- No post-op sensitivity; Fast and easy application
Tetric EvoCeram is the universal nano-hybrid composite for anterior and posterior restorations that affords outstanding esthetics. The filler technology employed in Tetric EvoCeram is based on an optimum blend of different fillers and filler sizes.

Advantages
- Universal nano-hybrid composite for anterior and posterior restorations
- Proven clinical performance with over 100 million restorations placed worldwide
- More working time due to the patented light sensitivity filter
- Natural shade blend with surrounding dentition ensures outstanding restorative results
Komet Dental USA

- H48L.31.012 Long Flame Carbide Bur

- Once a bonded orthodontic appliance is removed, remnants of dental adhesive will be left on the teeth. This flame carbide bur was designed to remove the residual adhesive and restore a smooth aesthetic finish.
IPR- Interproximal Reduction

• Decrease Binding of the Teeth
• Re-Shape Teeth
  • Correct Tooth Size Discrepancies
  • Decrease Black Triangles
• Decrease Crowding to Minimize Extractions
• Aid in Retraction of Teeth
Interproximal Reduction
Reducing tooth widths for form, function and stability

You're on your way to a healthy new smile

To help you achieve your goal, you will undergo a procedure that involves the removal of some of the tooth surfaces, called enamel, in the areas between your teeth. This procedure is known as interproximal reduction or bonding. It may also contribute to long-term stability of your results after your braces are removed.

Whatever the name, the intention is the same—to acquire more space for your teeth, bring your teeth into alignment, improve your bite, and improve your smile. Sometimes interproximal reduction is done alone, but it is usually done in conjunction with orthodontic appliance treatment. Sometimes it is done during or after orthodontic treatment to create a balanced and harmonious appearance of your teeth. Your orthodontist will recommend interproximal reduction if it is a solution to your individual need.

2 mm deficient

22 mm

6 6 6 6

24 mm

Interproximal reduction (also known as slendering, stripping, enamel reduction, resharpening and interproximal redefinition) is a means by which additional space is acquired for your teeth. This illustration shows how 2 mm of space can be gained through the process of interproximal reduction.

Questions and answers

Will interproximal reduction damage my teeth or gums?

The health of your teeth and gums is always a concern to your orthodontist. Studies among patients who have had interproximal reduction show that the procedure does not make teeth more susceptible to tooth decay. It may improve some aspects of your tooth color or shape, but not overall tooth appearance. Occasionally, some patients may experience some sensitivity to hot or cold food.

Overall, the results are generally positive.

Front teeth intervene upon which lip rest. Evaluating facial characteristics through photographs and x-rays is an essential step in orthodontic treatment. Your orthodontist will examine your facial appearance and decide whether or not interproximal reduction is suitable or beneficial.
IPR Treatment Overview
IPR Set Up

Mouth Mirror
ACT Fluoride Rinse
2x2's
Floss
Slow-Speed with Diamond Wheel and Guard
Finishing Strip
Diamond Strip
IPR Diamond Strips

Komet USA Dental

• Vision Flex Interproximal Strips used to hand-file in the interproximal surfaces of the teeth to relieve the tight contact.

• Easy to use finishing strips used to smooth proximal surfaces
Komet USA Dental

- Disk Guard and Adapter to be used on a slow speed hand-piece with a disk wheel.

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>5014222U0</td>
<td>53200 DISC GUARD MEDIUM 18MM Protects discs up to 18mm wide (Must order in multiples of 1)</td>
</tr>
<tr>
<td>5014223U0</td>
<td>53202 DISC GUARD LARGE 22MM Protects discs up to 22 mm wide (Must order in multiples of 1)</td>
</tr>
<tr>
<td>5014224U0</td>
<td>53203 DISC GUARD ADAPTER. The disc guard screws onto the adapter and the adapter is snapped onto the end of the nosecone (Must order in multiples of 1)</td>
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<td>021204U0</td>
<td>6934 11.220 HP COARSE VISION FLEX OPEN MESHED DOUBLE SIDED DIAMOND DISC (Must order in multiples of 1)</td>
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<tr>
<td>5019041U0</td>
<td>6934 11.250 HP COARSE VISION FLEX DIAMOND DISC (Must order in multiples of 1)</td>
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Diamond Bur with Highspeed Handpiece

Komet Dental USA

- 8392.FG.016 Diamond F/M/C Mosquito Bur
- The narrow bur is used to reduce enamel interferences especially near the incisal embrasures.
SpaceFile

Versatility and Value

- Swiss-made
- Diamond impregnated files
- Hand held
- Double sided or single sided
Reduction Between Upper Incisors

Black Triangle Closed
Monitoring Aligner Fit

**Good Fit**

- Aligners are seating well over the teeth
- No visible gaps or rocking
- All attachments are engaged properly

**Poor Fit**
Tracking Set Up
Assessment of Aligner Tracking

ALIGNER FEATURES

UPPER

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Buccal
Lingual

stages 1-28
stages 1-28
stages 1-28
stages 1-28

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Lingual
Buccal

stages 1-28
stages 1-28
stages 1-28
stages 1-28

lower

17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
Buccal
Lingual

stages 1-28
stages 1-28
stages 1-28
stages 1-28

RIGHT

32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17
Buccal
Lingual

stages 1-28
stages 1-28
stages 1-28
stages 1-28

The colors are for your reference only; in each instance, you need to evaluate whether Invisalign treatment is appropriate for your patient.

MISSING TOOTH/PONTIC
MODERATE
ADVANCED

Learn more about each assessment category

TOOTH MOVEMENT ASSESSMENT

<table>
<thead>
<tr>
<th>Tooth</th>
<th>Assessment</th>
<th>Movement</th>
<th>Value</th>
<th>Range</th>
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<tbody>
<tr>
<td>2</td>
<td>Blue</td>
<td>Intrusion</td>
<td>0.3 mm</td>
<td>0.5 mm to 1.0 mm</td>
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<tr>
<td>3</td>
<td>Blue</td>
<td>Intrusion</td>
<td>0.7 mm</td>
<td>0.5 mm to 1.0 mm</td>
</tr>
<tr>
<td>12</td>
<td>Blue</td>
<td>Intrusion</td>
<td>0.6 mm</td>
<td>0.5 mm to 1.0 mm</td>
</tr>
<tr>
<td>13</td>
<td>Blue</td>
<td>Intrusion</td>
<td>0.7 mm</td>
<td>0.5 mm to 1.0 mm</td>
</tr>
<tr>
<td>14</td>
<td>Blue</td>
<td>Intrusion</td>
<td>0.7 mm</td>
<td>0.5 mm to 1.0 mm</td>
</tr>
<tr>
<td>15</td>
<td>Blue</td>
<td>Intrusion</td>
<td>0.8 mm</td>
<td>0.5 mm to 1.0 mm</td>
</tr>
<tr>
<td>18</td>
<td>Blue</td>
<td>Intrusion</td>
<td>0.7 mm</td>
<td>0.5 mm to 1.0 mm</td>
</tr>
<tr>
<td>19</td>
<td>Blue</td>
<td>Intrusion</td>
<td>0.7 mm</td>
<td>0.5 mm to 1.0 mm</td>
</tr>
<tr>
<td>20</td>
<td>Blue</td>
<td>Intrusion</td>
<td>0.7 mm</td>
<td>0.5 mm to 1.0 mm</td>
</tr>
<tr>
<td>30</td>
<td>Blue</td>
<td>Root Movement</td>
<td>4.5 mm</td>
<td>4.0 mm to 6.0 mm</td>
</tr>
<tr>
<td>31</td>
<td>Blue</td>
<td>Intrusion</td>
<td>0.8 mm</td>
<td>0.5 mm to 1.0 mm</td>
</tr>
</tbody>
</table>
Treatment Overview

1. Place engagers
2. IPR (0.2 mm)
3. IPR (0.3 mm)
4. IPR (0.2 mm)
5. IPR (0.3 mm)
6. IPR (0.2 mm)
7. IPR (0.3 mm)
Auxiliaries

- Buttons for Elastics
  - Class II or III Elastics
  - Vertical
  - Rotations
- Expanders
- Sectional Fixed Appliances
- Sagittal Correctors
  - Carriere
  - Herbst
  - Pendulum
Class II Elastic Auxiliary
Rotational Auxiliary
Sectional Fixed Auxiliary
Carriere Sagittal Correction Appliance

BEFORE

AFTER
Pontic System
Pontic
Refinement

Refinement is the detail and finishing stage of treatment. A new scan and progress set of photographs and/or radiographs are used to design additional aligners and/or plan auxiliary treatment to fine tune the result.
Right Buccal Cross Bite

Initial Right Buccal

Post Auxiliary Right Buccal
Initial Aligner Records
Final Records
• Invisible Retainers
  • Clear removable plastic appliance designed to fit precisely over the teeth. These retainers are easily removable and have no visible wires.

• Hawley Retainers
  • Thin acrylic molded appliance with wires that retain the teeth in their new position. Hawley retainers are durable, removable and come in a variety of colors.

• Lower Fixed (Bonded) Retainer
  • Fixed retainers are not removable. They are bonded on the lingual surface of the teeth and remain in place for years or indefinitely.
Aligner Therapy Takeaway:

Three Partners for Success (Removable Treatment)

1. Orthodontist (Coach)- Design the right treatment plan
2. Assistants (Support Staff/Assistant Coaches)- Active motivators with information, guidance and encouragement.
3. Patients (Team Players)- Cooperation: Right Effort and Attitude
Fresno State Volleyball
2009 National Champions

Fresno State Volleyball
2013 National Champions
ORTHODONTICS IS MY PASSION...

“That’s why I support the AAOF.”