

# Continuing Education

The Baltimore College of Dental Surgery, University of Maryland Dental School

## An Overview of Invisalign® Treatment

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### Learning objectives:

*After reading this article the reader will be able to:*

- Understand the Invisalign® process
- Identify best candidates for treatment
- Recognize the benefits of Invisalign® as an orthodontic treatment alternative



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**Educational Disclaimer**

The information presented here is for educational purposes only. It may not be possible to present all information required to use or apply this knowledge to practice. It is, therefore, recommended that additional knowledge be sought before attempting a new procedure or incorporating a new technique or therapy. The opinions of efficacy or the perceived value of any products or companies mentioned in this course and expressed herein are those of the author(s) of the course.

## INTRODUCTION: WHAT IS INVISALIGN®?

Invisalign® is an esthetic orthodontic treatment alternative developed by Align Technology, Inc. (Santa Clara, Calif.), for adults and teenagers who want improved tooth alignment, but do not want treatment with conventional braces. The system was introduced in the late 1990s and uses Computer-Aided Design and Computer-Aided Manufacturing (CAD/CAM) technology to fabricate a series of custom appliances that are esthetic and removable for patients. Depending on the malocclusion and the type of tooth movement required, Invisalign® may provide an alternative to fixed appliances for many patients.

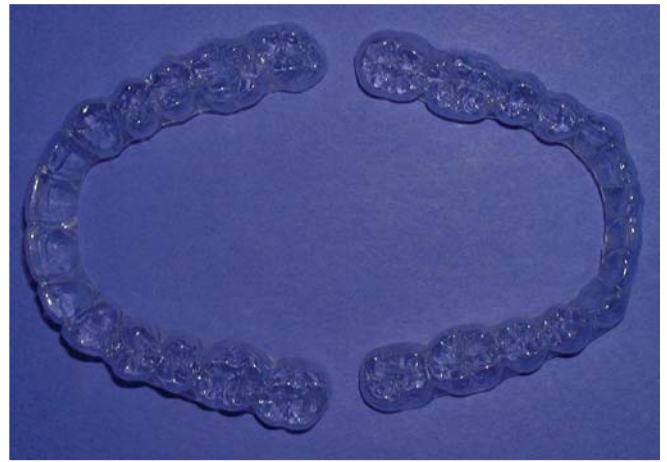
The treatment appliance consists of a series of clear, custom-made, removable aligners created to effectively move teeth into their desired position (**Figures 1a and 1b**). This method of orthodontic treatment combines orthodontics, materials science, and 3-D computer graphics to project and plot tooth movement. Generally, aligners are worn on a full-time basis and are removed only for eating, drinking, brushing, and flossing. Patients usually wear each set of aligners for two-week periods.

The manufacturer, Align Technology, provides guidelines for the types of malocclusion and orthodontic problems that can be managed with Invisalign®. These problems include mild to moderate crowding (1-6 mm), mild to moderate spacing (1-6 mm), constricted arches (nonskeletal), and limited relapse cases after fixed appliance therapy.<sup>1,2</sup> Invisalign® can perform the following orthodontic movements: space closure, tooth alignment, limited dental expansion, incisor advancement, and limited distalization of teeth. Invisalign® is not advised for treating complicated malocclusions such as severe deep bite, open-bite, Class II and Class III cases that require significant anterior-posterior corrections, severely tipped or rotated teeth, or cases that require multiple tooth extraction.

Ultimately, treatment choices are left to the clinician's judgment.<sup>1,2</sup> In general, cases that require significant root movement may be difficult to treat with Invisalign® solely. Approximately 40,800 orthodontists and general practitioners worldwide are Invisalign®-certified, and that number grows each year. More than 529,000 patients have started Invisalign® treatment to date. (Jennifer Olson-Wilk, manager of university programs, Align Technology; oral communication, February 2007.)

Align Technology accepts more than 98 percent of all cases it receives. The company defers to the professional judgment of the treating doctor to determine how Invisalign® can be incorporated into the treatment plan.<sup>3</sup> Align Technology has manufactured more than 22.9 million unique Invisalign® aligners since its inception. (Olson-Wilk, oral communication, February 2007.)

As noted previously, Align Technology has stated that Invisalign® is indicated for patients with mild to moderate crowding (1-6 mm), mild to moderate spacing (1-6 mm), nonskeletal constricted arches, and those patients who have experienced relapse after fixed appliance therapy. The fact that each clinician is responsible for the treatment results achieved in every patient makes it important to conduct more clinical studies.<sup>4</sup>



**Figure 1a** Maxillary and mandibular aligners extended to cover fully erupted permanent second molars.



**Figure 1b** Aligners being worn by patient. Note the attachment on the maxillary left lateral incisor.

It has been shown that, in an orthodontist's hands, fixed appliances produce better treatment outcomes than Invisalign®.<sup>1</sup> Specifically, in one study (the sample treated with the Invisalign® system), the greatest positive change measured was in the alignment of teeth, followed by closure of interproximal space. But an undesirable change was found with a decline in posterior occlusal contacts, showing that treatment with Invisalign® aligners had adverse effects on posterior occlusal contacts and positive effects on tooth alignment, buccal-lingual inclination, and interproximal spaces.<sup>5</sup> Other studies, however, have shown that more complex cases managed with Invisalign® may be successfully treated, but have noted that the treatment outcome is highly dependent on the practitioner's clinical experience and case selection.<sup>6</sup>

## THE INVISALIGN® SIX-STEP PROCESS

Before initiating Invisalign®, all necessary basic restorative treatment must be completed, the patient should exhibit no active periodontal disease, and the patient should have fully erupted second molars. As with fixed-appliance orthodontic treatment, a thorough clinical examination, patient history, diagnosis, case presentation including alternative treatment plans, if appropriate, and informed



**Figure 2** The Six Steps of the Invisalign® Process. Courtesy of Align Technology, Inc.

consent should be completed before treatment begins.

Treatment using Invisalign® involves a process of at least six steps (**Figure 2**). They include:

- Step 1:** Patient records, diagnosis, and treatment plan submission
- Step 2:** Records submission
- Step 3:** 3-D computer modeling
- Step 4:** Review of ClinCheck® by doctor
- Step 5:** Manufacturing of aligners, initiation of treatment, and aligner delivery
- Step 6:** Treatment, midcourse correction, refinements, and retention

### Step 1: Diagnosis and Treatment Plan Written by Doctor

When all necessary preliminary restorative treatment has been completed and the patient is free of active periodontal disease, the patient can be evaluated further to assess the orthodontic needs.

As with any orthodontic treatment, a comprehensive evaluation of the patient is advised. Not all records from this evaluation need to be submitted to Align Technology, if treatment with Invisalign® is feasible. Eight photographs are required for submission: Extraoral: frontal smiling (1), frontal repose (2), lateral profile repose (3); Intraoral: anterior (4), right and left buccal (5,6), and maxillary and mandibular occlusal (7,8). The patient should also have fully erupted second molars, which limits the care of many adolescents. Good candidates for Invisalign® treatment include patients with:

- Generalized spacing
- Generalized mild to moderate crowding
- Evidence of orthodontic relapse

- A moderately deep bite
- A need for combined restorative/orthodontic treatment
- A need for posterior dental expansion of 1 to 2 mm per quadrant
- Diastemas
- Late-onset lower crowding (adults)

### Step 2: Records Submission

The minimal needs for submission to Align Technology are original Polyvinyl Siloxane (PVS) upper and lower impressions, an original PVS bite registration, photographs, and a prescription form (**Figure 3a**). When the technique was first available, duplicate X-rays were also necessary but currently are not required. With the exception of the impressions and bite registration, the patient's diagnostic data can be submitted online, along with the provider's preferences as to how each case should be managed.

For example, in a case that exhibits crowding, the provider may want to use interproximal enamel reduction, dental expansion, or incisor proclination to alleviate the crowding. Doctors can register their general priorities and preferences for case treatment in their personal data record on the Align Technology Web site. This record will serve as a general guide to the Align technician for all of the doctors' cases.

Before submitting records, practitioners should have a clear idea of their specific objectives for treatment. When cases are submitted, new disposable trays, submission forms and boxes are supplied by the company (**Figure 3b**). Prepaid mailing boxes are provided by Align Technology.

Different types of prescription forms can be submitted. The first is the more traditional FULL-Prescription and Diagnosis Form, which is used for aligners fabricated to

**Figure 3a** An example of a printed full-treatment prescription form. Online forms may be submitted instead.

treat the full arch and/or include three refinements (additional aligners or slight modifications), if necessary, at no additional charge. Midcourse corrections are also available and will be described later in this article. The second is the Anterior Prescription and Diagnostic Form, which is used for aligners fabricated to treat only anterior teeth, canine to canine, with no extractions (this includes three refinements, if necessary, and midcourse corrections are also available). Finally, there is the Invisalign® Express Form, which is used for single- or dual-arch treatment for very minor cases of crowding and spacing that meet the Invisalign® Express criteria and require 10 aligners or less to complete the patient's treatment. One refinement and one detailing set (fine, finishing movements) can be requested for an Invisalign® Express case, but no midcourse corrections can be ordered.

Invisalign® Express is an orthodontic treatment for patients with very minor malocclusions. Treatments must meet the Invisalign® Express criteria and be 10 or fewer stages. Invisalign® Express delivers similar esthetic benefits to patients, with limited orthodontic needs. The clinical criteria for Invisalign® Express include: spacing or crowding of less than 2 mm per arch, rotation of canines/bicuspids that are less than 10 degrees, rotation of incisors less than 15 degrees, less than 1.5 mm dental expansion per arch, less than 2 mm midline correction, no mesial or distal movement of the molars or premolars and less than 1 mm distal movement of any canine, and no extrusions.<sup>7</sup>

Aside from determining the proper diagnosis and treatment plan, the most critical step in fabricating aligners is obtaining accurate PVS impressions. Attention to detail is of the utmost importance.<sup>2</sup>

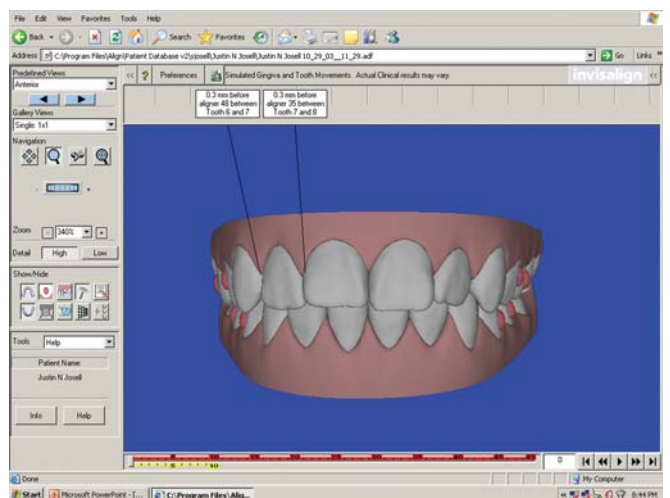
### Step 3: 3-D Computer Modeling

Once records are submitted, Align Technology transforms the patient's PVS impressions into 3-D images to prepare a three-dimensional computer graphic image of the patient's teeth and associated tissues. Later, additional models are used to validate the orthodontist's diagnosis and treatment plan. The PVS impressions are archived for model duplication or replacement.<sup>2</sup>

ClinCheck® is a three-dimensional representation of the planned orthodontic tooth movement in increments or stages (**Figure 4**). The ClinCheck® software uses the practitioner's treatment form and stated preferences to generate a computerized final status, which includes stages in between the start and finish. Planned movements of teeth are projected at two-week intervals with



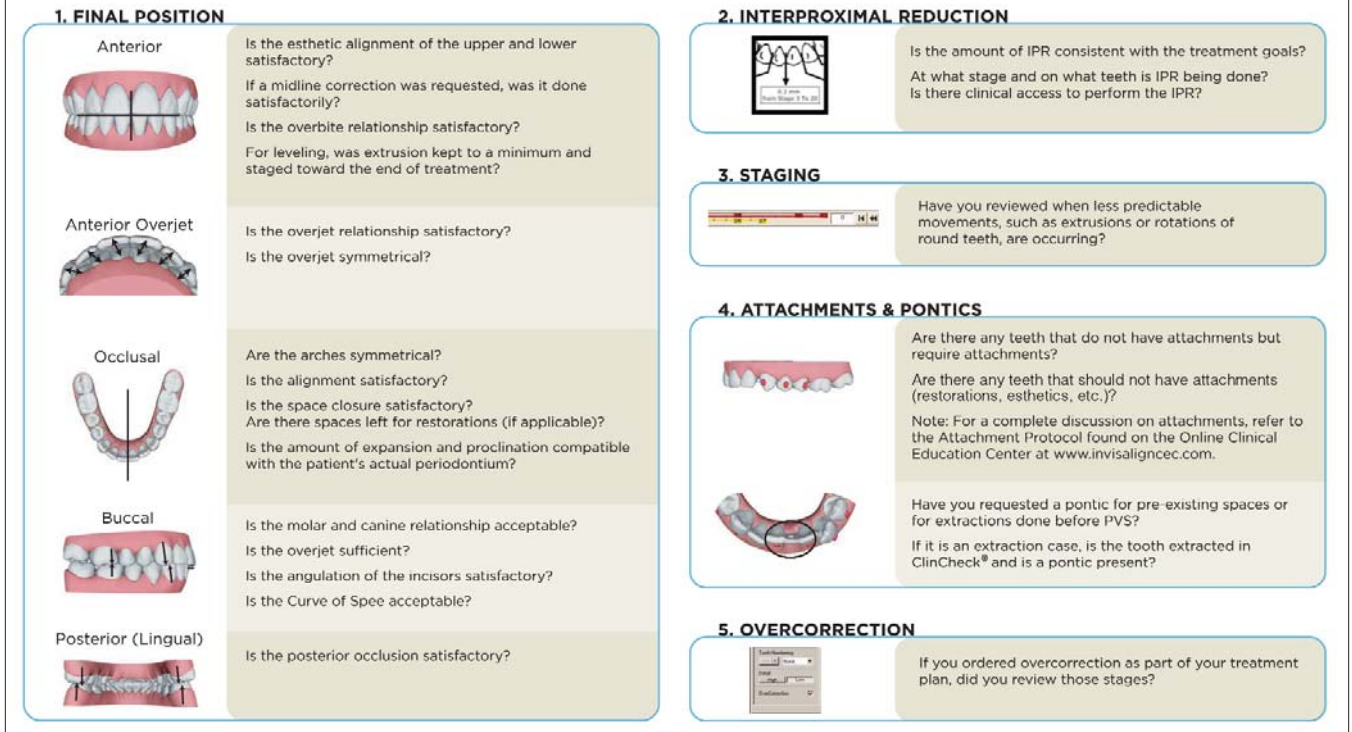
**Figure 3b** Materials including PVS impressions, PVS bite registration, photos, and radiographs ready for submission. Radiographs, photographs, and prescription form may be submitted online. Align Technology, Inc. provides disposable impression trays, boxes, and packaging and postage.



**Figure 4** ClinCheck® screen. Anterior view on ClinCheck® is interactive and allows the practitioner to manipulate images and view planned treatment from various views and at variable magnification.

# The 5 Basic Steps to Reviewing ClinCheck®

This "ClinCheck® Review Guide" presents the core concepts you should consider in order to successfully analyze your ClinCheck® setups.



**Figure 5** Five steps of ClinCheck® review with recommendations of what to look for during the review of a patient's proposed treatment.

Courtesy of Align Technology, Inc.

approximately 0.25 mm of movement anticipated for anterior tooth movement. After this computerized plan of treatment is projected, the doctor is notified that the case is ready for review of its ClinCheck®.

## Step 4: The Doctor Reviews and Approves ClinCheck®

There are five basic steps that Align Technology recommends for reviewing ClinCheck® (Figure 5).<sup>8</sup> A "ClinCheck® Review Guide" is available on the Web site. Careful review of ClinCheck® is essential to achieve the best possible results. If tooth movement is not planned properly in ClinCheck® treatment, results may be disappointing. When first viewing ClinCheck®, it is important to verify that the interocclusal relationship is correct. If it is not, the practitioner must communicate with the Align technician and have the occlusion reset in its proper position.

The areas to review are:

1. The final positions of the teeth as viewed from the anterior, overjet, occlusal, buccal, and lingual perspectives. Basically, the doctor must have his or her specific goals and objectives for the case represented in the ClinCheck® simulation.

2. Interproximal reduction (IPR): recommendations regarding the quantity, location, and timing of the enamel reduction. Interproximal reduction of enamel [also referred to as Air-Rotor Stripping (ARS)], reproximation, slenderizing, stripping, or interproximal recontouring are often necessary and integral parts of Invisalign® treatment. Any case requiring interproximal reduction will have an IPR form indicating when, where, and how much is required.<sup>9</sup> IPR is performed where additional space needs to be established to alleviate crowding. IPR is usually done during treatment, but it can be done before the PVS impression, as long as the space is retained until aligners are delivered. If performed during treatment, properly adhering to the IPR instructions is important to achieve the predicted treatment outcome. If the IPR is inadequate, crowded teeth will not be able to align properly and treatment will not progress or come to a successful completion.<sup>9</sup>
3. Staging is the process of determining the sequence, timing, and rate of tooth movement from the initial to the final occlusal position. Each stage represents one aligner. Aligners are fabricated to move teeth 0.25 mm per tooth per stage. However, the practitioner may choose to



**Figure 6** Attachments. Note vertically placed rectangular attachments to assist in the intrusion of the incisors. Some elliptical attachments can be seen posteriorly.

provide movement speeds different from those recommended in the proposed protocol in certain cases. More difficult and less predictable movements may be slowed and staged over a longer period to better express the movement.<sup>9</sup>

4. Attachments and pontics. Align Technology defines attachments as three-dimensional shapes added to tooth geometry to enhance the interaction between an aligner and the teeth. These are represented by red shapes on the ClinCheck<sup>®</sup>. Attachments are tooth-colored composite forms that are bonded onto the teeth using a template and a restorative composite (**Figure 6**). Attachment can be used to anchor aligners for better retention, to modify force delivery, or to improve specific tooth movements. The most commonly used attachments are rectangular or elliptical shapes and may be oriented either horizontally or vertically, depending on their function. Pontics are spaces built into the aligner that narrow over the course of treatment as the spaces are closed. In the ClinCheck<sup>®</sup>, pontics are represented as half a tooth with a retention dimple.
5. Overcorrection is planning tooth movement beyond ideal to anticipate tooth relapse. However, trying to predict before treatment begins which teeth may need overcorrection is difficult and unreliable. It is recommended that overcorrection be done as part of refinement. If overcorrection of specific teeth has been requested as part of your treatment plan, try to be as precise as possible in prescribing the amount (in millimeters or degrees) and direction of movements.<sup>10</sup>

### Step 5: Aligners Manufactured and Shipped to Practitioner for Delivery to Patient

After ClinCheck<sup>®</sup> approval of the treatment plan, Align Technology uses the sequence of graphical images combined with CAD/CAM to produce clear, lightweight aligners.<sup>2</sup> Within 10 business days of the ClinCheck<sup>®</sup> approval, Align Technology ships the aligners to the doctor's office. If attachments are part of the plan of treatment, an "attachment template" is sent with the aligners.

After any necessary attachments are placed, the aligners are delivered to the patient with a starter kit, and written and verbal instructions are provided as well. Patients are generally instructed to wear the aligners full time, except for eating and drinking. The patient wears each set of aligners for two-week intervals until treatment is complete. Monitoring the treatment occurs as the patient visits the doctor every six to eight weeks or as otherwise instructed.

The attachments referred to previously are composite forms bonded to a tooth surface or surfaces to aid in movement of the teeth. They serve as "handles" used to assist in the retention of the appliance or specific types of movements.

These composite attachments are bonded to teeth by the doctor at the beginning of treatment using a ready-made template. They are placed to assist in: (1) retention of the aligner, (2) intrusion, (3) rotations of teeth, (4) limited uprighting, and (5) space closure. The attachment templates can be made in different shapes, as prescribed by the practitioner.

### Step 6: Monitoring Treatment, Obtaining Desired Results, and Retention

Careful treatment monitoring will help identify problems and issues before they become major issues that may limit the success of the planned treatment. When monitoring a patient's treatment, it is important to make sure that the teeth are tracking (fitting intimately within the aligner), as planned in the appliance. Sometimes, one or more teeth do not track according to the plan mapped out in the ClinCheck<sup>®</sup>. This may occur for a variety of reasons, including a lack of patient compliance, inadequate IPR, excessively tight proximal contacts, or planned tooth movement that exceeds the capability of the aligner.

An important routine procedure in any Invisalign<sup>®</sup> treatment is to check the tightness of interproximal contacts with a thin piece of dental floss at each visit and to relieve tight contacts in areas of planned tooth movement.<sup>11</sup> At each patient visit, check the occlusion and verify that aligners are fitting and tracking properly, perform IPR as planned, and check the condition of the attachments. It is advisable to compare treatment progress to the ClinCheck<sup>®</sup> simulation at three-month intervals to evaluate that the treatment is proceeding appropriately and according to plan. If teeth do not seem to be tracking well in the aligners or treatment needs to be modified, some type of midcourse correction or "refinement" may be necessary.

## REFINEMENTS AND MIDCOURSE CORRECTIONS

During treatment, it may be necessary to revise the original plan or augment it with additional or slightly modified aligners. When additional aligners are needed to move teeth closer to the desired final position originally approved in the ClinCheck® setup, a refinement may be requested.

A midcourse correction is an option to order new aligners during treatment if clinical results have deviated to such an extent that the aligner(s) no longer fit(s). It is advisable to take new PVS impressions for such refinements and midcourse corrections.

### Auxiliary Treatment

Using other supplemental appliances along with Invisalign® is considered “auxiliary” treatment. Buttons, elastics or other techniques, including brackets and bands, before, after or in combination with aligners may be required to achieve certain tooth movements or occlusal seating. Auxiliary treatment may also include the use of more traditional fixed appliances in one arch or the use of traditional fixed appliances, as needed, for surgery patients.<sup>3</sup>

### Retention

When the case has been completed, the patient goes into retention. The final aligner should not serve as a long-term retainer as the material is not as durable as other available retainers. A retainer may be fabricated by Align Technology, but the practitioner may elect to design and fabricate the retainer elsewhere.

Align Technology does not accept work models or additional impressions to make retainers. Retainers are only created from initial or case refinement ClinCheck® plans.<sup>12</sup> In retention all of the more complex restorative procedures that could not be completed before or during treatment can now be accomplished.

## REFERENCES

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# CE Questions

## An Overview of Invisalign® Treatment

- The primary responsibility for the final treatment simulation lies with Align Technology, Inc.  
A. True\_\_\_\_ B. False\_\_\_\_
- The use of auxiliary treatment with brackets, buttons, and elastics may be needed in some cases to achieve a successful treatment outcome.  
A. True\_\_\_\_ B. False\_\_\_\_
- ClinCheck® is a 3-dimensional, computer-based representation of the patient's treatment plan.  
A. True\_\_\_\_ B. False\_\_\_\_
- Planned tooth movement may not express clinically due to:  
A. inadequate wear of the aligners  
B. binding or tight interproximal contact  
C. performing less IPR than planned  
D. tooth movement exceeds the capacity of the aligner to move the teeth  
E. all of the above
- Which of the following is NOT true about attachments?  
A. attachments may be used to increase aligner retention  
B. attachments may be used to facilitate tooth movement  
C. attachments are composite shapes bonded to the teeth  
D. attachments are needed in all cases  
E. a template or current aligner is used to accurately place the attachment
- Important factors to ensure a successful treatment outcome include:  
A. careful evaluation of ClinCheck®  
B. a systematic and complete clinical patient assessment  
C. an accurate diagnosis and treatment plan  
D. careful monitoring of treatment progress  
E. all of the above
- Difficult tooth movement such as root movement or extrusion may require a slower rate of movement over a longer period of time.  
A. True\_\_\_\_ B. False\_\_\_\_
- In cases requiring minimal tooth movement such as express cases, each aligner may be worn less than typically prescribed, 20-22 hours per day for two weeks.  
A. True\_\_\_\_ B. False\_\_\_\_
- If one or more teeth are not tracking within the aligner it means that all tooth movement has not been expressed, or inadvertent or incorrect movement has occurred.  
A. True\_\_\_\_ B. False\_\_\_\_
- Since Invisalign® treatment has been precisely planned, long-term retention is seldom needed.  
A. True\_\_\_\_ B. False\_\_\_\_
- Records submitted for Invisalign® treatment may include all of the following except:  
A. photographs including three extraoral facial and five intraoral views  
B. full mouth series or panoramic radiograph  
C. alginate impressions and a bite registration  
D. prescription form
- All of the patient's diagnostic data can be submitted online.  
A. True\_\_\_\_ B. False\_\_\_\_
- Refinements may be used for all of the following reasons except:  
A. overcorrection of individual tooth rotation  
B. to bring teeth closer to their final position as planned in ClinCheck®  
C. in cases where teeth are not tracking during treatment because of poor patient compliance  
D. in a majority of full-treatment Invisalign® cases  
E. multiple refinements may occasionally be needed to achieve the best result
- Invisalign® Express may be appropriate for all of the following, except:  
A. spacing or crowding of less than 2 mm per arch  
B. rotation of canines/bicuspids that are less than 10 degrees  
C. rotation of incisors less than 15 degrees  
D. 1.5 mm dental expansion per arch  
E. 3 mm midline correction
- IPR is rarely a necessary part of Invisalign® treatment and only used to alleviate crowding in more severe cases.  
A. True\_\_\_\_ B. False\_\_\_\_
- For retention of an Invisalign® case.  
A. A retainer may be fabricated by Align Technology, Inc. from work models submitted after the last aligner is worn  
B. The final aligner may serve as the patient's long-term retainer  
C. A retainer can not be fabricated from ClinCheck® plans  
D. The practitioner can elect to design and fabricate the retainer

# CE Questions

## An Overview of Invisalign® Treatment

17. Late mixed dentition patients with limited orthodontic needs are generally good candidates for Invisalign® Express treatment.  
A. True\_\_\_\_ B. False\_\_\_\_
18. Good candidates for Invisalign® treatment include patients who present with all of the following, except:  
A. generalized spacing  
B. generalized moderate to severe crowding  
C. evidence of orthodontic relapse  
D. needing posterior dental expansion of 1 to 2 mm per quadrant  
E. patients with diastemas
19. Treatment outcome with Invisalign® is dependent on practitioner's clinical experience and case selection.  
A. True\_\_\_\_ B. False\_\_\_\_
20. For a case that will probably require 10 or fewer aligners, it would be most appropriate for the case to be submitted as:  
A. full prescription  
B. anterior prescription  
C. Invisalign® Express prescription

### Instructions

- 1) Use a pen or pencil to complete the answer sheet.
- 2) Mark one answer only for each question.
- 3) Complete Section A, B, and C (on facing page).

- |     |                         |                         |                         |                         |                         |
|-----|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| 1.  | A <input type="radio"/> | B <input type="radio"/> | C <input type="radio"/> | D <input type="radio"/> | E <input type="radio"/> |
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| 9.  | A <input type="radio"/> | B <input type="radio"/> | C <input type="radio"/> | D <input type="radio"/> | E <input type="radio"/> |
| 10. | A <input type="radio"/> | B <input type="radio"/> | C <input type="radio"/> | D <input type="radio"/> | E <input type="radio"/> |
| 11. | A <input type="radio"/> | B <input type="radio"/> | C <input type="radio"/> | D <input type="radio"/> | E <input type="radio"/> |
| 12. | A <input type="radio"/> | B <input type="radio"/> | C <input type="radio"/> | D <input type="radio"/> | E <input type="radio"/> |
| 13. | A <input type="radio"/> | B <input type="radio"/> | C <input type="radio"/> | D <input type="radio"/> | E <input type="radio"/> |
| 14. | A <input type="radio"/> | B <input type="radio"/> | C <input type="radio"/> | D <input type="radio"/> | E <input type="radio"/> |
| 15. | A <input type="radio"/> | B <input type="radio"/> | C <input type="radio"/> | D <input type="radio"/> | E <input type="radio"/> |
| 16. | A <input type="radio"/> | B <input type="radio"/> | C <input type="radio"/> | D <input type="radio"/> | E <input type="radio"/> |
| 17. | A <input type="radio"/> | B <input type="radio"/> | C <input type="radio"/> | D <input type="radio"/> | E <input type="radio"/> |
| 18. | A <input type="radio"/> | B <input type="radio"/> | C <input type="radio"/> | D <input type="radio"/> | E <input type="radio"/> |
| 19. | A <input type="radio"/> | B <input type="radio"/> | C <input type="radio"/> | D <input type="radio"/> | E <input type="radio"/> |
| 20. | A <input type="radio"/> | B <input type="radio"/> | C <input type="radio"/> | D <input type="radio"/> | E <input type="radio"/> |



## A. Personal Information

Name: \_\_\_\_\_

Title: \_\_\_\_\_ Specialty: \_\_\_\_\_

Address: \_\_\_\_\_ E-mail: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ ZIP: \_\_\_\_\_

Telephone: (h) \_\_\_\_\_ (w) \_\_\_\_\_ (cell) \_\_\_\_\_

## B. Course Evaluation

Using the statements below, please evaluate this course. (5=Excellent, 0=Poor)

- Rate the objectives and educational methods.  
5    4    3    2    1    0
- Were the course objectives accomplished?  
5    4    3    2    1    0
- Rate the course content.  
5    4    3    2    1    0
- Was the administration of the course effective?  
5    4    3    2    1    0
- Please rate the author's grasp of the topic.  
5    4    3    2    1    0
- Were the references adequate?  
Yes  No
- Please list any unclear or ambiguous questions (by number) you encountered.
- Describe any subject matter you found confusing.
- Would you participate in a future CE offering by this institution?  
Yes  No
- What additional CE topics would you like to see in the future?

## C. Payment

Payment of \$50 enclosed. Make checks payable to the University of Maryland.

MasterCard  Visa  Discover

Acct#: \_\_\_\_\_

Exp. Date: \_\_\_\_\_

Signature: \_\_\_\_\_

Print name as it appears on card:  
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### Author Disclaimer

The author of this course has no commercial ties with sponsors.

### Instructions

All questions should have only one answer. Grading is done manually. Participants will receive verification by mail in three to four weeks after taking the exam.

### Course Credits/Cost

Participants who score 70 percent or better (14 or more correct answers) will receive verification of CEUs accredited. This four-hour CE course is presented by the University of Maryland Dental School, which is a member of the PACE accreditation program.

### Participant Feedback

Comments and questions may be e-mailed to [BCDSCE@umaryland.edu](mailto:BCDSCE@umaryland.edu).

