Chapter 9--Orthodontics

Overview

Introduction

This chapter describes preventive/interceptive orthodontic treatment as well as limited treatment orthodontic (minor tooth movements). Preventive techniques of exploiting leeway space, treating ectopic eruption, midline diastema, and habit (thumb sucking) appliances are discussed. Additional preventive orthodontic information is found in Chapter 4, (Management of Developing Dentition) that addresses space maintenance as well as overretained, supernumerary, and infraoccluded teeth. This chapter also describes limited tooth movement with removable appliances (including cross-arch elastics) for the correction of a portion of the total occlusion. Generally, limited orthodontic procedures involve the alignment of no more than four teeth per arch. Correction of more than four teeth usually requires comprehensive therapy.

Critical elements of orthodontic treatment include following the standard of care and providing the patient and parent/guardian with the proper orthodontic informed consent. The patient and parent/guardian should be aware of potential risks and limitations associated with any orthodontic treatment. The standard of care requires that minimal diagnostic records be obtained before any orthodontic treatment is initiated. This chapter will review these areas for delivering orthodontic treatment.

A discussion of the treatment for crossbites, regaining space, and space closure of flared maxillary incisors is included. Corrections for these conditions are more easily employed and have greater long-term stability when treated early. Therefore, the methods described in this chapter should usually be performed during the mixed or early permanent dentition stages. This generally means up to the age 12 years.

Fixed appliances (braces) are also very efficient for these limited correction cases, but are beyond the scope of this manual. Attendance of continuing education courses in orthodontics (including those within the IHS) are strongly recommended if one wishes to utilize these appliances.

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Section A--Levels of Orthodontic Care

Overview

Orthodontics, like the other dental clinical specialties, has its own definitions and terminology. Three different terms are used to describe the different levels of orthodontic care:

- Preventive (Interceptive)
- Limited
- Comprehensive

Preventive Orthodontics

Introduction

Preventive procedures are those that can aid in correcting a nonskeletal orthodontic problem without active tooth movement.

Examples

The following examples are preventive procedures:

- Using space maintainers
- Extracting over retained, supernumerary and ankylosed teeth
- Disking of teeth
- Treating ectopic molar eruption
- Using thumb habit appliances

Limited Orthodontics

Introduction

Limited orthodontic procedures are those that involve alignment of no more than four teeth per arch. This would include the use of removable appliances or banding of no more than 6 teeth per arch to provide dental correction.
Examples

The following examples are limited procedures:

- Anterior crossbite correction with a Hawley or a fixed 2-by-4 appliance
- Tipping a molar distally to regain space
- Quad helix or removable appliance to correct a dental posterior crossbite
- Cross arch elastic to correct a molar in crossbite

These procedures are limited in that they are only correcting a limited part of the total dentition. Unless all other teeth are in proper occlusion, further orthodontic or comprehensive treatment may be required.

**Comprehensive Orthodontics**

**Introduction**

Comprehensive procedures are those that involve growth modification for skeletal correction and procedures that require banding more than 6 teeth per arch. This level of orthodontics is beyond the scope of this manual and therefore is not covered in this chapter.

**Examples**

The following examples are comprehensive procedures:

- Full Fixed Appliances (Braces)
- Headgear
- Surgical Cases
- Serial Extractions
- Fränkl Appliance
- Bionator

In most instances, these procedures are for total occlusal correction and therefore require comprehensive orthodontic records (study models, photographs, panoramic and cephalometric films)
to arrive at a proper diagnosis and treatment plan.
Section B--Preventive Orthodontic Treatment

Overview

Some orthodontic procedures that do not actively move teeth may be employed to correct an existing or a developing malalignment of the dentition.

Guiding Eruption (Exploiting Leeway Space)

Introduction

Leeway space can be used to reduce mild crowding if a lower lingual arch (LLA) or Nance is employed. Exploiting the leeway space may be performed where a primary tooth is prematurely lost, as well as in cases without premature primary tooth loss.

Definition of Leeway Space

**Leeway Space** is the greater mesiodistal width of the primary molars than the mesiodistal width of the permanent bicuspids. The amount of space varies, but the average on each side of the arch is 1.5 mm in the maxilla and 2.0 mm in the mandible.

Indications

Exploitation of the Leeway Space is indicated in the following situations:

- If a primary canine is lost early due to an erupted lateral incisor
  
  **Note:** These cases almost always are a result of arch length deficiency. In these situations place a lingual arch wire, or Nance, and extract the other primary canine. This will prevent both lingual tipping of the incisors and a midline shift. In this situation, disking the mesial of the first primary molars can make additional space available for the erupting canines.

- If a primary first molar is lost early and some space loss has occurred
  
  **Note:** A lingual arch or Nance is also needed. Disking the mesial of the primary second molars will make additional space available for the erupting first premolars (Figure 7-1).
If no primary teeth have been prematurely lost and some anterior crowding is present

**Note:** At the earliest, a lingual arch or Nance may be placed just prior to the exfoliation of the primary canines or primary first molars. At the latest, one of these space maintainers should be placed prior to the exfoliation of the second primary molars. Disking the mesial of the primary first and second molars will allow the first premolars and canines to drift distal to ease crowding further anterior in the arch.

**Contraindications**

Disking or removal of both primary canines solely to allow for better alignment of the incisors is generally **contraindicated** without an orthodontic consultation. **Retention of these teeth until natural exfoliation allows for maximum arch development.**

**Treating Ectopic Eruption (Permanent Molars)**

**Introduction**

Ectopic eruption signifies a disturbance in the normal eruption of the permanent dentition. It most commonly affects the first permanent molars, but can also involve the maxillary and mandibular lateral incisors and canines.

**Evaluation**
Studies show that the first permanent molar erupts ectopically in two to six percent of the population. In approximately two-thirds of the cases, the permanent molar will self-correct. The remaining one-third may be classified as irreversible and require treatment.

The diagnosis of ectopic eruption is usually made by radiographs. It may be necessary to monitor with a monthly radiograph to determine if the condition may be reversible or irreversible.

Clinical experience indicates that first permanent molars that are locked with their crowns visible in the mouth are not good candidates for self-correction. If the tooth has not self-corrected within 3 to 4 months, treatment should be initiated.

Treatment Options

The following treatment options are recommended for treating ectopic eruption:

- Brass wire technique
- Distalizing spring technique
- Extraction technique

Procedures for Using the Brass Wire Technique

The following steps describe the brass wire technique. This should be the primary treatment option.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Thread a .020 brass wire gingival to the contact point of the permanent molar (Figures 7-2A and 7-2B). Use a local anesthesia if necessary.</td>
</tr>
<tr>
<td>2</td>
<td>Bend the wire over and twist the ends together to fit tightly around the contact area (Figure 7-3).</td>
</tr>
<tr>
<td>3</td>
<td>Cut off a 3-mm length of pigtail and tuck along the gingival contour of tooth (Figure 7-4).</td>
</tr>
<tr>
<td>4</td>
<td>Reschedule patient every 1 to 2 weeks to further twist the wire until correction is completed.</td>
</tr>
</tbody>
</table>
Indication for Using the Distalizing Spring

Distalizing springs (Figure 7-5) are used when placement of a brass wire is not possible or the brass wire is not producing the necessary distal movement.

Distalizing Spring

![Figure 7-5](image)

Procedures for Using the Distalizing Spring Technique

The following steps describe the distalizing spring technique:

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Place separators for the primary second molars.</td>
</tr>
<tr>
<td>2</td>
<td>One-week later, band the primary second molar on the ectopic side and the first permanent molar on the unaffected side and take an impression.</td>
</tr>
</tbody>
</table>
| 3    | Have lab construct a Nance for the maxilla or a .036 lingual arch if a lower tooth requires correction.  
**Note:** The use of a space maintainer is necessary to provide additional anchorage for the primary second molars. Have a .028 helical spring soldered onto the affected side. The spring should be 2 mm off of the soft tissue |
| 4    | Place separators for the primary second molars. |
| 5    | One week later, try appliance with the helical spring activated 2 mm, then cement it in place. Hand out *Care For Fixed Appliances* (found in the Appendix to this chapter).  
**Note:** A composite button on the occlusal of the molar may be helpful to provide... |
retention for the end of the spring arm.

<table>
<thead>
<tr>
<th>6</th>
<th>Reschedule patient in 4 weeks.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Note:</strong> If further distalization is needed, remove the appliance, activate an additional 2 mm, try appliance in, and then cement it.</td>
</tr>
<tr>
<td></td>
<td><strong>Caution:</strong> Do not activate appliance intraorally. The only way to accurately determine the amount and direction of the activated spring is to remove it from the mouth.</td>
</tr>
<tr>
<td>7</td>
<td>Reschedule and activate every 4 weeks until correction is completed</td>
</tr>
</tbody>
</table>

**Indication for Extraction**

If the brass wire or distalizing spring options are unsuccessful or the second primary molar is not able to be saved, extraction is the only alternative. This is the last treatment of choice and would require a space maintainer or a space-regaining appliance.

**Treating Midline Diastema**

**Introduction**

A maxillary midline diastema is a common finding in children during the mixed dentition stage.

**Causes**

The following are common causes of midline diastema:

- One cause is the classic "ugly duckling" stage that results from the unerupted canines contacting the distal apical portions of the lateral incisors. This, in turn, forces the lateral and central incisor root apices mesially while the crowns diverge distally (Figure 7-6A). As the canines continue to erupt, they push the incisor crowns mesially, reducing the size of the spaces (Figure 7-6B). Often the spaces will spontaneously close by the time the canines are fully erupted (Figure 7-6C).
A second potential cause of diastema is the presence of a mesiodens. A periapical or occlusal film is indicated to confirm this diagnosis.
Another possible cause may be the presence of small incisors. Bonding to enlarge these teeth may be required to alleviate this situation, but only after the canines have fully erupted.

**Treatment**

Two treatment options are provided for treating midline diastema:

- A midline diastema is only treated early if it is so large as to impede or inhibit the eruption of the lateral incisors or canines. In this scenario, bodily movement of the incisors with fixed appliances usually is required.

- In some cases a large or inferiorly attached labial frenulum may be present. A frenectomy is not indicated until after an orthodontic consult has been undertaken. Frenectomies do not guarantee spontaneous space closure, and they may leave scar tissue.

**Treating Thumb/Finger Sucking**

**Introduction**

Many individuals will suck their fingers or thumb sometime during their childhood years. An anterior openbite may develop during this time, the severity of which is dependent upon the frequency, duration, and intensity of the habit.

Usually, the openbite will self-correct if the habit stops during the mixed dentition stage. For most children, this sucking habit terminates with their psychological development and as contact with their peers at school occurs. However, there will be a small percentage of children who will continue this habit; some of them would like to stop and some would not.

**Caution:** Appliance therapy will only have a good chance of success for a child who wishes to stop. For a child who does not want to stop, appliance therapy has a poor prognosis.

**Treatment Options**

Generally, treatment to stop a sucking habit is not indicated prior to age 5 years, but should be started when the maxillary incisors first begin to erupt. Two levels of treatment can be used:

- Discussion with child

- Appliance (See Figure 7-7.)

**Discussion with Child**
The first level of treatment is as follows:

- Initially, a straightforward talk between the dentist and child (not the parents) should be performed. This explanation may include why the teeth are getting crooked and that a smooth wire on top of the mouth can be placed later as a reminder if he/she needs some extra help.

- Have the patient back 1-month after the talk to evaluate his/her progress. In many cases, during this one-month period the habit will usually cease.

**Habit Appliance**

![Figure 7-7.](image)

**Procedures for Using An Appliance To Treat Thumb/ Finger Sucking**

If the straightforward talk has been unsuccessful, the second level of treatment (appliance therapy) can be performed as follows:

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Place separators for the first permanent molars or primary second molars.</td>
</tr>
<tr>
<td>Step</td>
<td>Instruction</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td>2</td>
<td>One week later band the molars and take an impression.</td>
</tr>
</tbody>
</table>
| 3 | Send model with bands in the stone to the lab.  
**Note:** Have a Nance with a crib constructed of .036 or heavier wire. The crib should be anterior and inferior enough to disrupt the placement of the thumb (or finger) into the mouth. No sharp points or edges should be present. |
| 4 | Have patient return for separators. |
| 5 | Cement appliance 1 week after separator placement. Hand out *Care for Fixed Appliances* (found in the Appendix to this chapter).  
**Note:** Ensure that the patient realizes that this appliance is only a reminder device and that it is not being done as a punishment. |
| 6 | Recall the patient monthly until the habit stops. Often the habit will stop during the first month. |
| 7 | If the habit has not stopped after 3-6 months, cut the tops of the loops off to convert them into spurs.  
**Note:** Be sure to discuss this first with the patient and the parent. |
| 8 | Leave the crib/spurs in for 3 to 6 months after the habit has stopped. After this time, remove the appliance and keep it. |
| 9 | Have the patient back next month. If the habit has returned with the crib out, reevaluate and consider recementing the crib. Appliance therapy is effective in about 85 to 90 percent of the cases. |
| 10 | After the habit has terminated, allow at least 6 months for the open bite to self-correct. If the open bite shows little or no improvement, a skeletal disharmony may be present which would require comprehensive orthodontic treatment. |
| 11 | If the habit has stopped and the open bite spontaneously corrects itself, then limited orthodontic procedures to correct flared incisors/constricted maxilla (if present) may be initiated. |

**Having a Fixed Laboratory Appliance Made**

**Introduction**

The preparation for having a fixed laboratory appliance involves the following three steps:

- Placing elastomeric separators
- Fitting preformed bands
- Fabricating the laboratory cast

**Placing Elastomeric Separators**

Elastomeric separators are placed prior to fitting bands. They provide interproximal space so bands can be properly fitted.

**Procedures for Placing Elastomeric Separators**

Perform the following steps when placing elastomeric separators:

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<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Place two pieces of floss through the separator (Figure 7-8A).</td>
</tr>
<tr>
<td>2</td>
<td>Snap one of the pieces of floss under the contact point (Figure 7-8B)</td>
</tr>
<tr>
<td>3</td>
<td>Stretch elastomeric separator under the contact point (Figure 7-8C).</td>
</tr>
<tr>
<td>4</td>
<td>Pull the floss occlusally until elastomeric ring completely encircles the contact point (Figure 7-8D).</td>
</tr>
<tr>
<td>5</td>
<td>Remove the floss (Figure 7-8E).</td>
</tr>
</tbody>
</table>

**Note:** Separators are placed mesial and distal to the interproximal contacts of all teeth to be banded.

**Note:** Separators should remain in place for 1 week. They are removed prior to fitting bands on the teeth.

**Note:** Radiopaque separators should be used. If the separators are missing at the banding appointment, confirm that the patient is aware that they came out. If the patient is unaware of any missing separator(s), then a periodontal probing and radiograph of the area should be done to confirm the presence or absence of a gingivally submerged separator.
Figure 7-8A.

Figure 7-8B.
Figure 7-8C.

Figure 7-8D.
Fitting Preformed Bands

Preformed bands are commonly used for space maintainers, habit appliances, and molar crossbite correction. Preformed bands are made to fit a tooth by following a specific sequence, which varies among different teeth.

Procedures for Fitting Preformed Bands on Maxillary Molars and Premolars

Perform the following steps when fitting preformed bands on maxillary molars (primary and permanent) and premolars:

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remove the separators.</td>
</tr>
<tr>
<td>2</td>
<td>Select the band that you think will fit.</td>
</tr>
</tbody>
</table>
| 3    | Place the band on the tooth and start seating with finger pressure.  
  **Note:** The proper size band will only partially seat at this stage. |
| 4    | Push on mesial and distal, then apply heavier pressure on the lingual using band seater/pusher to further seat the band (Figure 7-9A).  
  **Note:** The band still may be 1 to 2 mm occlusal of the mesial and distal marginal ridges at this point. |
| 5    | Use the nylon molar band seater (bite stick) next (Figure 7-9B).  
  **Note:** Biting force is primarily used on the lingual. Final heavy biting force is usually on the distolingual corner. Band should be 0.5 mm to 1 mm gingival to the mesial and distal marginal ridges. |
| 6    | Burnish open margins with the band seater/pusher (Figure 7-9C). |
Figure 7-9A.

Figure 7-9B.
Procedures for Fitting Preformed Bands on Mandibular Molars and Premolars

To fit preformed bands on mandibular molars (primary and permanent) and premolars, follow the steps for fitting preformed bands on maxillary molars (primary and permanent) and premolars except at Step 3, place the heavy pressure on the buccal and not the lingual.

Fabricating the Laboratory Cast

Impressions are taken so a cast with bands seated on it can be sent to a laboratory to have an appliance fabricated.
Section C--Principles of Limited Orthodontics

Overview

Prior to starting any active tooth movement, an understanding of some basic orthodontic rules is necessary. Also, pretreatment considerations of a thorough exam, records, treatment plan, informed consent and an agreement to orthodontic treatment need to be completed.

Basic Rules of Orthodontics

Introduction

Orthodontics has six basic rules that we will discuss in this chapter. Adherence to these rules under normal circumstances will ensure the patient of optimal care.

Rule 1

Treating patients during childhood generally involves the least treatment time and the best long-term stability. Procedures described in this reference usually should be performed for patients not beyond the late mixed or early permanent dentition stage. This generally means treatment up to the age 12 years. An exception to this is maxillary incisor retraction (space closure) as described in Section D of this chapter.

Rule 2

Ankylosed teeth cannot be moved. Because ankylosed teeth lack an intact periodontal ligament they biologically cannot be moved orthodontically. Ankylosed teeth are more common with impacted and traumatized teeth.

Rule 3

Asymptomatic teeth that have been traumatized or have deep restorations may become symptomatic when moved with orthodontic appliances. Although this is not common, root canal treatment may become necessary.

Rule 4

Orthodontic treatment can further enhance periodontal pathology when plaque and calculus are present. Good oral hygiene is essential.

Rule 5
Never treat a posterior crossbite in a patient with an anterior openbite or minimal overbite (10 percent or less). These are very difficult cases to treat. Referral to a specialist is indicated.

Rule 6

For treatment of any posterior crossbite, always watch the patient closely for the development of an anterior openbite. If the overbite is becoming minimal or an anterior openbite is developing, stop treatment and allow relapse to occur.

Pretreatment Considerations

Introduction

Prior to starting limited orthodontic treatment, you should perform the following tasks:

- Perform a complete dental examination
- Complete the orthodontic examination form
- Obtain radiographs
- Make study models
- Complete the orthodontic treatment plan form
- Explain the frequency of appointments and estimated treatment time
- Discuss the risks and limitations with the parent and patient

Perform a Complete Dental Examination

A complete dental examination includes the following actions:

- **Caries evaluation.** All caries should be restored.
- **Periodontal evaluation.** Ensure that there is healthy soft tissue present with an adequate amount of attached gingival and bony support.
- **Oral hygiene evaluation.** Ensure that the patient presents himself/herself with consistent good oral hygiene.
• **TMJ evaluation.** Check for the following conditions:
  - Check joints for clicking, crepitation, or pain.
  - Check musculature for any tenderness.
  - Check range of motion (the adult range is 7 mm for lateral movement and a minimum of a 40 mm for wide opening).
  - Check patient history for any TMJ symptoms.

• **Hard and soft tissue pathology.** Check for absence of other hard and soft tissue pathology.

**Complete the Orthodontic Examination Form**

Directions for completing part of this form are located in Section D, Limited Treatment Orthodontic Diagnosis; otherwise, it is self-explanatory. The following page (Sample A) illustrates an example of a completed form and a blank copy of the form is found in the Appendix.

After the dental examination and all necessary work are completed, a separate appointment can be made to complete the orthodontic examination form. At this time, you should discuss the malocclusion and other general orthodontic information with the **patient and guardian**.

---

Sample A

<table>
<thead>
<tr>
<th>ORTHODONTIC EXAMINATION</th>
</tr>
</thead>
</table>

9-24

Chapter 9
Orthodontics

July, 2003
DATE: 11/22/2002

PATIENT: John Doe          DOB: 10/17/1993          SEX: M

* All evaluations performed with patient in centric occlusion.

Overbite: 50%        Overjet: 4 mm

Classification: Molars R I L E Cuspids R I L E (I, E, II, FSII, III, FSIII)

Midlines: [ ] OK [X] OFF

Max to [ ] R [X] L mm

Mand to [ ] R [X] L mm

Crowding: Max 2 mm    Mand 3 mm

Crossbites: #8

Missing: #m (Premature loss)

Impactions: None

Decalcif: Slight-Lingual of #19 & #30

Rotations: None

Large Rest: #8 Incisal Fx Rest.

Perio: [ ] Normal [ ] Periodontitis None

[ ] Recession None [X] Inad att ging: #24 1 mm

Hygiene: [ ] Good [X] Fair [ ] Poor

CR = CO [ ]

CR ≠ CO [X] Ant [ ] Post [ ] Right [ ] Left Amount 2 mm

TMJ Pain: [ ] Yes [X] No

[ ] Muscle [ ] Joint [ ] Left [ ] Right

Noises: [ ] Yes [X] No

Left [ ] Click [ ] Crepitation

Right [ ] Click [ ] Crepitation

Comments: Patient says that his jaw sometimes gets sore, but no muscle or joint pain can be palpated today.

Patient Interest: [X] Eager [ ] Indifferent [ ] Resistant
Obtain Radiographs

Either a quality panorex or a full-mouth periapical series of films should be taken. It is imperative to check for:

- **Pathology.** Check for the following conditions:
  - An asymptomatic nonvital tooth that could flare up if moved
  - Periodontal inflammation that could become exaggerated (bone loss can be expedited while a tooth is moving)
  - Other pathology

- **Supernumerary teeth and impactions.** Check to see if the root of a tooth undergoing movement is pushed against another crown or root. If it is, it may be difficult to move the tooth, and it can also result in resorption of the root.

- **Root anomalies.** Check for root anomalies (e.g., dilacerated roots, short roots, etc.).

Make Study Models

A quality set of study models are made not only for medical-legal reasons but also to give a professional appearance when showing the case to the patient and guardian. When making study models, trim casts so bases are parallel to the occlusal plane. Also trim the backs of the maxillary and mandibular casts so that they are flush with each other in centric occlusion (Figure 7-10).

Complete the Orthodontic Treatment Plan Form
When the Orthodontic Examination form is completed and radiographs and study models are made, then the Orthodontic Treatment Plan can be developed. It should contain specific objectives, treatment time, appliance design, and step-by-step treatment sequence.

An example of a completed form (Sample B) is shown on the following page, and a blank copy of the form is found in the Appendix.
Sample B

ORTHODONTIC TREATMENT PLAN

Maxillary

Objectives: Correct #8 x-bite
Est. Treatment Time: 9 months
Appliance: Hawley +finger spring
Treatment Plan:
Complete Ortho Exam Form
Ortho Records (Pan & models)
Discuss Tx Plan and sign Risk
Limitations & Agreement
Forms
Upper Alginate Impression
Insert Appliance
Reactivate Appliance monthly
After #8 is 1 mm overcorrected
continue appliance for 1
Month Passively
Stop Appliance wear
Re-eval if #8 is relapsing
-If not relapsing, dismiss patient
-If relapsing, start appliance again

Mandible

Objectives: Maintain Leeway Space for #22
Est. Treatment Time: 2 years
Appliance: LLA
Treatment Plan:
Seps #19 & 30
Band #19 &30 Lower impression
Seps #19 & 30
Cement LLL
Extract #r
Disk the mesial of #m
After #m exfoliated, disk mesial #l
Monitor a minim of every 6 month
Remove LLA after all canines &
premolars are fully erupted
Explain the Frequency of Appointments and Estimated Treatment Time

Explain the frequency of appointments (generally every 4 weeks) and give an estimate of the total treatment time. Removable appliances described in this section will move teeth approximately 1 mm per month. In addition to active tooth movement, factor in necessary retention time. Generally, it is best to slightly overestimate the treatment time.

Discuss Risk and Limitations

After the Treatment Plan is completed, another appointment with the patient and guardian should be made. At this time it is important to cover the specific objectives of the treatment, the type of appliance, step-by-step treatment sequence, and estimated treatment time. Discuss the risks and limitations with the parent and patient. Use the checklist, Potential Risks and Limitations of Orthodontic Treatment, found in The Appendix A. Have the patient or guardian sign the Potential Risks and Limitations of Orthodontic Treatment form and an Agreement for Orthodontic Therapy. An example of a completed Risks and Limitations of Orthodontic Treatment form (Sample C) and Agreement for Orthodontic Therapy (Sample D) follows. You should also:

- Keep a signed copy in the patient's folder and give a second copy to the parent
- Document that you reviewed the risks and limitations with the parent and patient
POTENTIAL RISKS AND LIMITATIONS OF ORTHODONTIC TREATMENT

Generally, excellent orthodontic results can be achieved with informed and cooperative patients. Therefore, you should be aware that orthodontic treatment, like any treatment of the body, has some risks and limitations. These risks are seldom severe enough to offset the advantages to treatment, but they should be considered when you decide to start orthodontic treatment.

X Tooth decay, gum disease and permanent markings (decalcification) on the teeth can occur if orthodontic patients eat foods containing excessive sugar and/or do not brush their teeth frequently and properly. These same problems also can occur in patients not in braces, but the risk is greater while in braces.

#19 and #30

In some patients the length of the roots of the teeth may shorten during orthodontic treatment. Some patients are prone to this happening, some are not. Usually this is of no significant consequence, but on occasion it may become a threat to the longevity of the teeth involved.

X The health of the bone and gums which support the teeth may be affected by orthodontic tooth movement if a condition already exists, and in some rare cases where a condition doesn't appear to exist. In general, orthodontic treatment lessens the possibility of tooth loss or gum infection due to malocclusion.

#24 minimal attached gingiva

Teeth have a tendency to change their positions after treatment. This is usually only a minor change and faithful wearing of retainers reduces this tendency. Throughout life, the bite can change adversely due to the eruption of wisdom teeth, mouth breathing, and other oral habits that are out of control of the dentist.

X Patients with malocclusion may have a high potential for Temporo-Mandibular-Joint (TMJ) problems, which may become evident before, during, or after orthodontic treatment. These may include joint pain, ear pain, and/or headaches. Orthodontic treatment may help remove the dental causes of the TMJ syndrome, but not the non-dental causes.

Patient reports a history of pain

X Orthodontic tooth movement may aggravate the condition of a tooth that was traumatized by a previous accident or has a large filling, which may have damaged the nerve of the tooth. In rare instances, a tooth of this nature may flare up and require root canal treatment.

#8 history of trauma
Sometimes orthodontic appliances may be accidentally swallowed or inhaled, or may irritate or damage the oral tissue. But if the patient is careful and follows the instructions given, the possibility of such a mishap is extremely rare.

The total time required to complete treatment may exceed our estimate. Poor oral hygiene, poor cooperation in wearing the appliance the required hours per day, broken appliances, and missed appointments can lengthen the treatment time and affect the quality of the end results.

All of these items are potential risks for all orthodontic patients.

Items marked with an X means that you may be at a higher risk for the particular potential problem.

It is my professional opinion in this case that the potential benefit from orthodontic treatment outweighs the risk that can be reasonably anticipated. If you have any questions about treatment and the potential risks involved, please do not hesitate to ask for further explanation.

Signature of Dentist  Dr. Ortho Straight

I have read and understand the above and consent to treatment for:  John Doe  
Patient

Ms. Mary Doe  11/22/2002
Signature of Guardian  Date
AGREEMENT FOR ORTHODONTIC THERAPY

Orthodontic therapy may be indicated for treatment of different types of problems. Teeth may be crooked, the bite may not be functional, and the jaws may not have grown as they should have, or there may be problems with the jaw joints. Our goal is to provide treatment to correct or prevent these problems. To achieve best results, a fixed appliance and/or a removable appliance will be required.

The time required for treatment of orthodontic problems varies from a few months to several years. Several factors are involved in determining the length of treatment time, one of the most important being patient cooperation. Just placing an appliance on teeth does not correct an orthodontic problem. Patients must be seen regularly (every 4-8 weeks) for adjustments, the appliances must not be broken through careless eating habits, patients must comply with instructions from their dentist and the teeth and gums must be kept clean and healthy. Lack of patient cooperation in any of these areas cannot only extend treatment time, but also prevent the dentist from achieving the best possible result.

It is the patient's responsibility to be on time for appointments, to notify their dentist as early as possible if an appointment must be canceled and to call for another appointment if one is missed. It is in the best interest of patient to have their treatment monitored regularly by their dentist. Parents must be aware that during the school session their child will probably miss school or a portion of it for their appointments.

The appliances serve as a means for the dentist to move the teeth. When appliances are broken or bent, tooth movement is not controlled and in some cases, the problem can become worse than before treatment was started. Eating hard, tough, chewy foods and biting on hard objects will damage an appliance and interfere with controlled tooth movement. A protective mouthpiece must be worn for contact sports.

The dentist may request that patients do certain things between appointments such as wearing headgear, elastics, or a removable appliance. His treatment is planned assuming the patient will comply with these requests, and the treatment result will be compromised if the patient does not cooperate.
It becomes difficult for patients to clean their teeth after appliances or braces are placed. However, the extra effort must be made, or permanent damage can occur to the teeth and gums. Excessive sugar in the diet (candy, gum, soft drinks) will also cause damage. After receiving instruction in oral hygiene, it is the patient's responsibility to keep their teeth and gums healthy.

There are many benefits to be derived from orthodontic therapy, but there are also risks. Cavities, gum disease, and compromised results due to lack of patient cooperation have already been mentioned. Other risks are root resorption (shortening of the roots of teeth), possible need for root canals on teeth that have been traumatized previously, the onset of jaw joint dysfunction, and teeth not remaining perfectly straight after treatment.

The dentist reserves the right to discontinue treatment of any patient who will not maintain acceptable oral hygiene; who repeatedly damages; who refuses to comply with instructions regarding the wearing of headgear, elastics, or removable appliances; or for any other reason that the orthodontist feels is contrary to the welfare and best interest of the patient.

It must be emphasized that neither the Indian Health Service (IHS) nor any other government agency is in any way obligated to continue care in an IHS dental facility or to pay for orthodontic treatment by a civilian dentist should the patient leave this area prior to completion of treatment. Continuation of care will be at personal expense if the patient transfers to an IHS facility that has no orthodontist or where the workload is such that the IHS orthodontist is unable to assume transfer treatment for the patient.

It is difficult to anticipate the patient's and parent's needs for additional information regarding treatment. Should a question arise concerning treatment, you are encouraged to ask for an explanation.

Patient: ___________________________  Date: ________

[Legal signature of the patient (if 18 years old) or Parent/Guardian]

Sample C (Back Page)
Section D—Limited Treatment Orthodontic Diagnosis

Overview

This section will discuss the diagnosis of the following orthodontic conditions listed on the Orthodontic Examination Form (Appendix):

Diagnosing Overbite and Overjet

Introduction

Many orthodontic conditions are defined in terms of the following:
- Overbite
- Openbite
- Overjet
- Anterior crossbite
- Normal overbite
- Normal overjet

Overbite

Overbite is defined as the vertical percentage of the lower central incisors that is overlapped by the upper central incisors. Approximately 10 to 20 percent (2 to 3 mm) is considered normal. A somewhat excessive or deeper than normal overbite is illustrated below (figure 7-11)

![Figure 7-11.](image)
Openbite
In an openbite (Figure 7-12) the vertical separation is measured as a negative percentage (or negative millimeters).

Overjet
Overjet is defined as the millimeter horizontal overlap of the central incisors from the facial surface of the lower incisors to the facial surface of the upper incisors. A normal overjet of 2 to 3 mm is equal to the thickness of the incisal edges of the maxillary incisors. An excessive overjet is illustrated below (figure 7-13).
Anterior Crossbite

In the case of an anterior crossbite (also called a reverse overjet), negative millimeter measurements are used (Figure 7-14).

Normal Overbite and Overjet

A normal overbite (Figure 7-15) is defined as a 10 to 20 percent vertical percentage, and a normal overjet is defined as a horizontal overlap of 2-3 mm.
Diagnosing Molar Classification

Introduction

The classification of molars is usually described with the system devised by Edward Angle:

- Class I is defined as the mesiobuccal cusp of the maxillary first molar occluding with the mesiobuccal groove of the mandibular first molar.
- Class II is defined as the mesiobuccal cusp of the maxillary first molar occluding mesial to the mesiobuccal groove of the mandibular first molar.
- Class III is defined as the mesiobuccal groove of the mandibular first molar. Angle’s classification, however, does not describe the severity of the molar relationship. For example, a Class II malocclusion could vary from a 2 mm discrepancy to a 10 mm discrepancy.

The classification system described below is simply a method to more specifically describe the molar relationship. This system can also be extrapolated to describe the canine relationship (see Figures 7-16A through 7-16F).

Class I

Mesiobuccal cusp of the maxillary first molar occludes with the mesiobuccal groove of the mandibular first molar. Range: maxillary mesiobuccal cusp is 1 to 2 mm anterior or posterior to the mesiobuccal groove.

Class E (End-to-End)

Mesial surface of the maxillary first molar is even with the mesial surface of the mandibular first molar. Range: ±1 to 2 mm.
**Class II**

Mesial surface of the maxillary first molar is more than 2 mm further anterior than the mesial surface of the mandibular first molar.

**Class FSII**

*(Full Step)*

Mesiobuccal cusp of the maxillary first molar occludes with the embrasure between the mandibular second premolar and the mandibular first molar.
Class III

The mesiobuccal cusp of the maxillary first molar is more than 2 mm posterior to the mesiobuccal groove of the mandibular first molar.

Class FSIII

(Full Step)

The mesiobuccal cusp of the maxillary first molar occludes with the embrasure between the mandibular first and second molars.
Diagnosing Crowding

Introduction

Crowding is determined by subtracting the total mesiodistal tooth mass present from the amount of space available:

- A negative number indicates a lack of space
- A positive number means there is excessive space.

Procedures for Determining Amount of Space Available

The following procedures are used to determine the amount of space available. This procedure uses the straight-line method:

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Draw a straight line on a sheet of paper (Figure 7-17).</td>
</tr>
</tbody>
</table>
| 2    | Make the first measurement on the cast with a bow divider or fine-tipped Boley gauge (Figure 7-18) from the mesial of the left first permanent molar to the distal of the left lateral incisor (line A)  
  **Note:** Do not measure to an incisor that is severely displaced or blocked out bucco-lingually |
| 3    | After the first measurement, puncture two small holes in the line with the measured bow divider or Boley gauge. |
| 4    | Repeat Steps 2 and 3 for the next three measurements, inserting one end of the bow divider into the previous hole made as follows:  
  - Measure from the distal of the left lateral incisor to the mesial of the central incisor (line B). |
• Measure from the mesial of the central incisor to the distal of the right lateral incisor (line C).
• Measure from the distal of the right lateral incisor to the mesial of the right first permanent molar (line D).

5 Measure the distance between the two terminal end holes on your sheet of paper. This is the amount of space available.

Illustrations for Determining the Amount of Space Available

Figure 7-17.

Figure 7-18.
Procedures for Determining the Total Mesiodistal Tooth Mass in the Permanent Dentition

Individually measure the greatest mesiodistal width of all of the following (10 teeth) on the cast with the bow divider or Boley gauge:

- Premolars
- Canines
- Incisors

Again, use the straight-line method described on the previous page for ease of measurement and greater accuracy; i.e., insert the bow divider into the hole that was previously made on the straight line after each tooth measurement. Then measure the distance between the first and last holes after all of the measurements are completed.

Procedures for Determining Total Mesiodistal Tooth Mass in the Mixed Dentition

There are several mixed dentition analysis available. By age seven most children will have their mandibular central and lateral incisors fully erupted. To estimate the size of the unerupted canine and premolars the Tanaka and Johnston method, J Am Dent Assn 88:798, 1974 will be used:

**Estimated Mandibular Arch Length**

\[
\left(\frac{1}{2} \text{ the sum of the widths of the mandibular incisors, plus 10.5 mm}\right) \times 2 \\
\text{PLUS} \\
\text{sum of the widths of the Mandibular incisors}
\]

**Estimated Maxillary Arch Length**

\[
\left(\frac{1}{2} \text{ the sum of the widths of the mandibular incisors, plus 11.0 mm}\right) \times 2 \\
\text{PLUS} \\
\text{sum of the widths of the Maxillary incisors}
\]

The difference between the arch length and the actual tooth mass will give the arch length discrepancy. A positive number indicated spacing while a negative number represents crowding.

Recommended Bow Divider

Spring Bow Divider 4 ½ inch #68-695
Miltex Instrument Company, Inc.
700 Hicksville Road
Bethpage, NY 11714
866-854-8300
www.miltex.com
Section E—Removable Appliances

Overview

Introduction

Removable appliances are designed to align and/or maintain the teeth in their correct position. These appliances must be worn exactly as prescribed. This section will address the following components of removable appliances:

- Acrylic Baseplate Material
- Clasps
- Labial bows
- Springs
- Jackscrews

Responsibilities

Instructions for the wear of removable appliances are contained in The Appendix A. The instruction sheet, Removable Appliance Instructions, should be provided to the patient and reviewed carefully with them on the day that the appliance is first inserted.

Acrylic Baseplate Material

Introduction

The acrylic baseplate material, which is composed of acrylic and can have incorporated into it bite plates, retentive clasps, active springs, labial bows, and jackscrews.

Adjustment

Generally, limited adjustments are required for occasional minor smoothing or relief needed during initial placement of the appliance.

Clasps

Introduction

Various types of clasps are utilized to provide retention of an appliance. These types include the following:

- Adams
- Circumferential
- Ball
- Arrowhead
Adams Clasp

The most overall effective clasp is the Adams clasp (Figures 7-19A and 7-19B). This clasp is made of .028 wire that engages the mesiobuccal and distobuccal undercuts of posterior teeth. In children, the clasp may slip slightly into the gingival sulcus requiring some stone being trimmed away on the lab cast.

**Figure 7-19A.**

**Figure 7-19B.**

Tightening of an Adams Clasp
Tightening of an Adams clasp is done with a bird beak pliers. Two different adjustments can be performed:

- Generally at the initial placement of the appliance, the retentive points are bent inward (figure 7-20A).
- At follow up visits, the clasp is bent gingivally where the wire emerges from the acrylic (Figure 7-20B).

The clasp should be evaluated at each visit and tightened as needed. The number of clasps that are required is variable – the more active the appliance, the more clamping that is required to hold it in place.
Circumferential Clasp

The circumferential clasp (Figures 7-21A and 7-21B) provides adequate support for passive retainers but generally does not provide adequate retention for active appliances.
Ball Clasp

The ball clasp (Figures 7-22A and 7-22B) is easy to fabricate but does not provide as much retention as an Adams clasp.
Arrowhead Clasp

The arrowhead clasp (Figures 7-23A and 7-23B) will provide retention, but not as much as an Adams clasp.

Figure 7-23A.
Introduction
A labial bow is sometimes added to an appliance. This bow can have several functions, including:

- Added retention
- Limitation of the anterior movement of teeth with a finger spring appliance
- Lingual movement of teeth

Features of the Labial Bow
The labial bow has these features:

- Made of .030 wire
- Wire runs horizontally through the incisal-gingival midpoint of the incisors
- The adjustment loop covers the distal two-thirds of the canine (Figure 7-24)
Springs

Introduction
Springs are the active element of the appliance. They provide only tipping movement of teeth up to a maximum of 3 to 4 mm. The light continuous forces they produce are ideal for tooth movement.

Tips for Using Springs
To be effective, springs must be prevented from sliding on the teeth. This can be achieved by:

- Placing the spring arm in an undercut area of the tooth, which is usually only found on posterior teeth
- Having a layer of baseplate material over the spring to prevent occlusal displacement of it
- Bonding some resin on the tooth to develop a slight undercut

Features of Springs
These are the features of springs (Figure 7-25):

- Made of .022 or .028 wire
- Having one or two helices present
**Jackscrews**

**Introduction**

Jackscrews (Figure 7-26) are another type of active element, which also produces only tipping movement of teeth. These screws open 1 mm per one complete revolution. Jackscrews are designed so that each possible activation is limited to one quarter of one turn at a time. The activation key must be reinserted into the jackscrew if more than 0.25 mm of activation is to occur.
Indications

A jackscrew appliance (Schwartz-type) can be effective for buccal tipping maxillary posterior teeth to a maximum of 5 mm of total across-arch expansion. In this case the force is distributed over many teeth, limiting the force applied to any individual tooth.

Contraindications

These contraindications are associated with the use of jackscrews:

- Jackscrews produce a heavy intermittent force, which is not ideal for movement of just one or two teeth. A removable appliance with springs or fixed appliances work best for those individual tooth movements.

- Jackscrews, in removable appliances, do not reliably open the midpalatal suture for correction of skeletal crossbites.
Section F—Limited Orthodontic Treatment

Overview

This section addresses some of the various limited orthodontic treatment procedures that you may be called upon to use at your facility.

Treating Anterior Crossbite

Introduction

Many anterior crossbites can be corrected with a removable appliance.

Evaluation

Removable appliances are indicated when the following three criteria are present:

- When the incisors are very close to or at an end-to-end relationship in centric relation.
- When the incisors are not already tipped excessively.
- When there is adequate space in the immediate area to where the tooth (teeth) needs to be moved.

A referral for orthodontic consultation/treatment is recommended if the anterior crossbite does not have these three criteria present or the following is present:

- The patient has a skeletal Class III malocclusion.
- The tooth (teeth) are severely displaced and will require fixed appliances to obtain proper bodily and root position of the teeth.
- When there is inadequate space in the immediate area to where the tooth (teeth) needs to be moved. (i.e., a palatally displaced lateral incisor that is 7 mm in width with only 5 mm of space immediately facial to it would require fixed appliances to make space prior to correcting the crossbite.)
- The upper incisors may already be excessively tipped labially, while the lower incisors are overtipped lingually giving the appearance of a not too severe crossbite. This is often seen in Class III malocclusions (Figure 7-27).
Treatment of primary incisor crossbites is **not** generally necessary.

**Appliance**

Appliance components are recommended as follows:

- Use a .022 double helix spring (Figure 7-28A). This is useful for moving 1 or 2 teeth at a time. Have baseplate acrylic extend over spring to control the incisal displacement of it.

- Use four Adams clasps, whenever possible. Clasp the permanent first molars and primary first molars (or first premolars).
• Do not use z-springs or mattress springs. These springs deliver heavy forces and have a limited range of action.

![Figure 7-28B.](image)

• Consider a labial bow if you--
  - need some additional retention (such as not being able to use four Adams clasps when the primary first molars are mobile or the first premolars are not sufficiently erupted.)
  - like the “fail safe” feature of limiting the movement of teeth. The labial bow in this situation should extend 1 mm further labial from where you ultimately want the corrected tooth to be. A slight over correction is desirable.

![Figure 7-28C.](image)
• A slight overbite (10 to 20 percent) does not require a bite plate. Deeper overbites of more than 20 percent should have an anterior bite plate to open the occlusion just enough to clear the incisor in crossbite (Figure 7-28D). Adjust acrylic to allow as many of the lower incisors to occlude on it as possible.

![Figure 7-28D](image)

• Once the crossbite is corrected, relieve the anterior acrylic so that the molars can fully occlude again. Do not have the patient occlude long term on just the anterior acrylic. This will cause supereruption of the posterior teeth resulting in the anterior teeth being out of occlusion.
Procedures for Treating an Anterior Crossbite

The following procedure is recommended when treating an anterior crossbite:

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Activate spring 1.5 to 2 mm per month. Note: This will move teeth approximately 1 mm per month. Over activation may place too much force on the tooth, displace the appliance, or negate your fail-safe feature (unless a labial bow is present). Too little activation will prolong treatment time.</td>
</tr>
<tr>
<td>2</td>
<td>Tighten clasps as necessary each month.</td>
</tr>
<tr>
<td>3</td>
<td>Have patient wear appliance 24 hours per day. Note: Give the patient a case to hold the retainer when not wearing it (i.e., while eating and brushing teeth). Numerous appliances wide up lost or broken. Hand out Removable Appliance Instructions (Appendix).</td>
</tr>
<tr>
<td>4</td>
<td>Reschedule patient every four weeks to follow progress</td>
</tr>
<tr>
<td>5</td>
<td>Slightly overcorrect crossbite (no more than 1 mm) and retain until overbite is adequate to hold the tooth in its correct position.</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> Usually 1 to 2 months with the appliance in a passive state is adequate for retention.</td>
</tr>
<tr>
<td>6</td>
<td>Remove the appliance and keep it.</td>
</tr>
<tr>
<td>7</td>
<td>Reschedule the patient in 2 to 3 weeks.</td>
</tr>
<tr>
<td>8</td>
<td>If crossbite correction is not holding, consider starting appliance treatment again. If a normal or deep overbite is present, the correction almost always holds.</td>
</tr>
</tbody>
</table>

Space Regaining

Introduction

The premature loss of a second primary molar may result in space loss. Space regaining is a technique, which reestablishes space for the erupting second premolar.

Evaluation

Space regaining can be effective with removable appliances in cases with all of the following criteria:

- **When the first permanent molar has tipped mesially (Figure 7-29A) due to premature loss of the second primary molar.** If the molar has bodily moved forward (Figure 7-29B), headgear or fixed appliances are usually required for correction.
• **Unilateral loss of a second primary molar with mesial tipping of the first permanent molar.** Headgear of fixed appliances are usually required if bilateral corrections needed to limit the forward movement of the premolars and anterior teeth. Bilateral correction can sometimes be performed by correction of one side at a time. However, an orthodontic consultation is advised for these cases prior to starting treatment.

• **When the Second permanent molar is early in its development where the crown is only touching the apical one half to two thirds of the first permanent molar root or**
not touching it at all. To distalize two molars can again result in too much forward movement of the premolars and anterior teeth if headgear or other fixed appliances are not utilized.

- **When no more than 3 mm of distal tipping is required.** This is the maximum amount that a removable appliance can be expected to tip a molar. If space regaining cannot be corrected by use of a removable appliance fitting the above-described criteria, a referral for orthodontic consultation/treatment is recommended.

**Appliance**

Use of appliances are recommended as follows:

- If first premolars or first primary molars are present and stable, place Adams clasps on these two teeth as well as the first permanent molar opposite of the one to be corrected (Figure 7-30). If the first primary molars are mobile, it might be wise to place a transpalatal arch (TPA) or LLA and regain space later when the first premolars have erupted enough for clasping.

![Figure 7-30.](image)

- Ensure that the baseplate material adapts well to all teeth and embrasures (except distal to the molar to be moved) for maximum anchorage.

- Use a single helix .028 spring with a small loop on its terminal end (Figure 7-30. This loop will not irritate the soft tissue and will be easier for the patient to seat the spring on the tooth.
Procedures for Space Regaining

The following procedure is recommended when space regaining is indicated:

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Activate spring 2 mm per month. Note: this will move teeth approximately 1 mm per month.</td>
</tr>
<tr>
<td>2</td>
<td>Tighten clasps as necessary each month.</td>
</tr>
<tr>
<td>3</td>
<td>Have patient wear appliance 24 hours per day. Note: Give the patient a case to hold the retainer when not wearing it. Hand out Removable Appliance Instructions (Appendix).</td>
</tr>
<tr>
<td>4</td>
<td>Some occlusal equilibration may be necessary. Evaluate monthly.</td>
</tr>
<tr>
<td>5</td>
<td>If possible, over expand space so that it is 1 mm wider than the erupting second premolar.</td>
</tr>
<tr>
<td>6</td>
<td>Consider placing a fixed space maintainer (TPA or LLA) instead of holding the space with the removable appliance if the second premolar is expected to take more than 3 to 6 months to erupt after the molar is corrected. Note: Although the appliance can be used in either maxillary or mandibular arch, it is generally more effective in the maxilla.</td>
</tr>
</tbody>
</table>

Treating Multiple-Teeth Posterior Crossbite

Introduction

Often a posterior crossbite exists with multiple teeth. The following information addresses the evaluation, appliances, and treatment procedures to use with this condition.

Evaluation

The following four points of evaluation must be followed:

- **Check the patient in centric relation (CR).** Crossbites may present themselves as either unilateral or bilateral:
  - Multiple teeth in posterior crossbite are often seen as **unilateral** in centric occlusion (CO) with the maxillary buccal cusps occluding with the central fossae of the mandibular teeth on one side of the arch.
  - When the patient is evaluated in centric relation, however, the constriction usually shows itself as **bilateral** (the maxillary and mandibular buccal cusps
occlude with each other). A lateral shift occurs from CR to CO giving the appearance of a unilateral crossbite.

Although true unilateral crossbites do exist, they are rare. Occasionally, a single tooth, usually a primary canine, can cause a lateral shift from CR to CO. Equilibration of the canine will often correct this shift.

- **Determine the severity of the transverse problem.** Removable expansion appliances are effective when a total of 5 mm or less of total across arch expansion is required. An example of this is illustrated in figure 7-31A where there is a normal transverse occlusion on one side while the other side is end to end transverse. If there is a full cusp crossbite on either one or both sides of the arch (7-31B and 7-31C), opening of the midpalatal suture may be necessary and should be referred for orthodontic consultation/treatment.

![Figure 7-31A.](image)

![Figure 7-31B.](image)
**Evaluate the overbite.** Buccal tipping of the maxillary teeth generally opens the bite (Figure 7-32A) as posterior cusp interferences occur. Therefore, treatment should be restricted to cases where a normal (Figure 7-32B) or deep overbite (Figure 7-32C) exists. Fully erupted maxillary incisors should overlap at least 10 to 20 percent of the mandibular incisors. (See Diagnosing Overbite and Overjet in this chapter.)
Figure 7-32B.

Figure 7-32C.
Caution: Use caution in treating posterior crossbites in patients with a 10 to 20 percent overbite. If the overbite is becoming minimal or an anterior openbite is starting to develop, stop treatment and allow relapse to occur. Openbite cases are very difficult to treat and usually require comprehensive treatment. Patients with less than a 10 percent overbite should be referred for orthodontic consultation/treatment.

• Determine if the maxillary first permanent molars are present. The first permanent molars are excellent anchor teeth for appliances and generally by the time they erupt, the patient is old enough to provide good cooperation.

Appliance

The use of appliances is recommended as follows:

• Split palate acrylic with jackscrew in the midline (Figure 7-33A).

• If more expansion is required on one side (as evaluated in CR), an asymmetrically divided plate can be used (Figure 7-33B). Never have less than two to three teeth in the small segment, however.

• Use four Adams clasps. Clasp first permanent molars and first primary molars (or first premolars). Maximum retention is needed with this appliance.

• Do not use jackscrews to—

  - tip incisors forward
  - tip only one posterior tooth buccally

Jackscrews produce heavy forces. For these situations, light force finger springs are indicated.
Limitations

The procedures described for treating multiple-teeth crossbites below are for cases that—

- have a minimum of a 10 to 20 percent overbite
• require 54 mm or less of total cross arch expansion

• has erupted first permanent molars

Generally, the earlier these procedures are performed, the more efficient the teeth move and the greater the stability of the long-term result.

### Procedures for Treating Multiple-Teeth Crossbite

The following procedure is recommended when treating multiple-teeth crossbite:

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Insert appliance adjusting the acrylic and tightening the Adams clasps as necessary.</td>
</tr>
<tr>
<td>2</td>
<td>Tighten clasps as necessary each month.</td>
</tr>
</tbody>
</table>
| 3    | Activate the appliance by turning the screw one activation (0.25 mm) with the appliance firmly seated in the mouth.  
  
  **Note:** Do not remove the appliance for several hours after activation. |
| 4    | Activate the appliance once or twice (but not more than twice) weekly.  
  
  **Caution:** Too much activation will displace the appliance. |
| 5    | Have patient wear the appliance full-time (24 hours per day).  
  
  **Note:** Give patient an appliance case to store appliance in when not wearing it (i.e., when eating or brushing teeth). Give the Removable Appliance Instructions (Appendix). |
| 6    | Reschedule patient monthly to monitor the overbite.  
  
  **Caution:** If the overbite is becoming minimal or an anterior openbite is developing, stop treatment and allow relapse to occur. |
| 7    | Over expand until lingual cusps of the maxillary molars occlude with the lingual inclines of the buccal cusps of the mandibular molars.  
  
  **Note:** Overexpansion (Figure 7-34A) is necessary because some relapse will occur after treatment. |
| 8    | If more expansion is seen on one side than on the other, further evaluate this condition. |
in centric relation, **not** centric occlusion.

**Caution:** Do not grossly over expand one side (Figure 7-34B) to get the opposite side corrected. Gross overexpansion is having the maxillary lingual cusps buccal to the mandibular buccal cusps.

<table>
<thead>
<tr>
<th>9</th>
<th>Maintain overexpansion for 3 months with appliance not being further activated.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>After three months, keep the appliance and have the patient return in two weeks for follow-up.</td>
</tr>
</tbody>
</table>

**Note:** If occlusion is proper (the overexpansion has relapsed to a proper occlusion or is still over expanded somewhat), recall the patient in one month to reevaluate. If constriction were to reoccur, start with the appliance again.

---

**Figure 7-34A.**

**Figure 7-34B.**

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**Treating Single-Tooth Posterior Crossbite**
Introduction

Single-tooth posterior crossbites are essentially dental (nonskeletal) in nature. The first or second permanent molars are most frequently involved. Corrective techniques for mild to moderate discrepancies (each tooth moved 4 mm or less) of these teeth will be discussed. The appliances and procedures for treatment will be discussed for the following two situations:

- Both upper and lower molars are displaced causing the crossbite
- Just the upper or lower molar is tipped buccal or lingual while the other one is in good alignment

Evaluation

Evaluate the overbite. Correction of a posterior tooth in crossbite generally opens the bite (figure 7-32A) as posterior cusp interference occurs. Therefore, treatment should be restricted to cases where a normal (Figure 7-32B) or deep overbite (Figure 7-32C) exists. Fully erupted maxillary incisors should overlap at least 10-20 percent of the mandibular incisors.

Caution: Again use caution in treating posterior crossbites in patients with a 10 to 20 percent overbite. If the overbite is becoming minimal or an openbite is starting to develop, stop treatment and allow relapse to occur. Openbite cases are very difficult to treat and usually require comprehensive treatment. Patients with less than a 10 percent overbite should be referred for an orthodontic consultation/treatment.

Appliance (Both Upper and Lower Molars are Displaced Causing the Crossbite)

Use the cross arch elastic (Figure 7-35) for treating single-tooth crossbite.

Note: Cross arch elastics require separators, banding, and impressions for laboratory services (unless you have soldering capabilities at your facility). These procedures are found in Section B of this chapter.
**Procedures for Treating Single-Tooth Crossbite (Both Upper and Lower Molars are Displaced Causing the Crossbite)**

The following procedure is recommended when both upper and lower molars are displaced causing the crossbite:

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Place separators for the teeth to be banded</td>
</tr>
<tr>
<td>2</td>
<td>One week later, band the upper and lower molars</td>
</tr>
<tr>
<td>3</td>
<td>Take impressions and send models with bands in the stone to laboratory to have buttons soldered to the bands. <strong>Warning:</strong> Do not just bond buttons on the molars – they can fracture off and become swallowed or aspirated.</td>
</tr>
<tr>
<td>4</td>
<td>Place separators again when bands return from lab.</td>
</tr>
<tr>
<td>5</td>
<td>One week, later, try bands in for fit and then cement them.</td>
</tr>
<tr>
<td>6</td>
<td>Use a ¼ inch 4 oz elastic for 24-hours-per-day wear.</td>
</tr>
</tbody>
</table>
Note: Elastics need to be replaced at least once a day. Give patient Care for Fixed Appliances handout (Appendix).

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Monitor the overbite.</td>
</tr>
<tr>
<td></td>
<td>Note: Elastics will tip and extrude the molars. If a minimal overbite or an anterior open bite is developing, stop treatment and allow relapse to occur.</td>
</tr>
<tr>
<td>8</td>
<td>Reschedule patient monthly to monitor crossbite.</td>
</tr>
<tr>
<td></td>
<td>Note: Overcorrect the crossbite approximately 1 to 2 mm.</td>
</tr>
<tr>
<td>9</td>
<td>When some over correction has been achieved, stop elastics for 2 to 3 weeks (leave the bands on) and reevaluate. Start elastics again if necessary.</td>
</tr>
</tbody>
</table>

Appliance (Just the Upper or Lower molar is Tipped Buccal or Lingual While the Other One is in Good Alignment)

Use the cross arch elastic with a lower lingual arch or transpalatal arch attached to the tooth in proper alignment.

Note: Cross arch elastics require separators, banding, and impressions for laboratory services (unless you have soldering capabilities at your facility). These procedures are found in Section B of this chapter.

Treating Single-Tooth Crossbite (Just the Upper or Lower molar is Tipped Buccal or Lingual While the Other One is in Good Alignment)

Follow the same procedures as for treating single-tooth crossbite except at Step 3, have the lab construct a lower lingual arch or a transpalatal arch with .036 wire in addition to attaching a button to the band for the malposed tooth.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Place separators for the teeth to be banded</td>
</tr>
<tr>
<td>2</td>
<td>One week later, band the upper and lower molars</td>
</tr>
<tr>
<td>3</td>
<td>Take impressions and send models with bands in the stone to laboratory to have the lab construct a lower lingual arch (LLA) or a transpalatal arch (TPA) with .036 wire in addition to attaching a button to the band for the malposed tooth</td>
</tr>
<tr>
<td>4</td>
<td>Place separators again when bands return from lab</td>
</tr>
<tr>
<td>5</td>
<td>One week later, try bands and the TPA or LLA in for fit and then cement them</td>
</tr>
<tr>
<td>6</td>
<td>Use a ¼ inch 4 oz elastic for 24-hours-per-day wear.</td>
</tr>
</tbody>
</table>
Note: Elastics need to be replaced at least once a day. Give patient Care for Fixed Appliances handout (Appendix).

7 Monitor the overbite.

Note: Elastics will tip and extrude the molars. If a minimal overbite or an anterior open bite is developing, stop treatment and allow relapse to occur.

8 Reschedule patient monthly to monitor crossbite.

Note: Overcorrect the crossbite approximately 1 to 2 mm.

9 When some over correction has been achieved, stop elastics for 2 to 3 weeks (leave the bands on) and reevaluate. Start elastics again if necessary.

## Treating Maxillary Incisors with Retraction/Space Closure

### Introduction

The following information addresses the evaluation, appliances, and treatment procedures for treating maxillary incisors using retracting and space closure.

### Evaluation

The following six criteria need to be present to determine if the case is within the scope of limited treatment. Retraction is for the incisors only. Closing spaces distal to the canines usually requires more comprehensive procedures.

- **The Maxillary permanent canines are fully erupted.** The “ugly duckling” stage is a normal stage in which a diastema is present. It is not recommended to treat the diastema at this stage.

  **Exception:** If both of the maxillary primary canines are firm (not exfoliating) and the permanent maxillary incisors are flared facially, a removable Hawley appliance may be used for retraction.

- **The maxillary incisors are tipped facially** (Figure 7-36A). If the incisors are already quite upright (Figure 7-36B), further retraction would produce an unaesthetic result.
• **The Maxillary incisors are normal size.** Small lateral incisors are somewhat common. Partial space closure may be attempted if spaces are exceptionally large followed by bonding to enlarge the teeth.

• **Adequate occlusal clearance is present.** An adequate amount of clearance in the vertical (overbite) and horizontal (overjet) dimensions is required (Figure 7-37A). For example, an individual may have a large overjet and maxillary incisor spacing, but retraction and space closure would not be possible if a deep bite (overbite) existed (Figure 7-37B). Likewise, if adequate clearance is present vertically but not horizontally,
retraction would result in an anterior crossbite (Figures 7-35C and 7-37D).
• **Habits are not present.** If flaring and spacing of the maxillary incisors are due to thumb

---

Figure 7-37C.

Figure 7-37D.
sucking, the habit must be stopped first and teeth allowed to relapse. (See Section B of the Chapter.) If retraction of the incisors is performed without the habit being terminated, relapse will certainly occur when treatment is discontinued.

• **The maxillary canines are aligned fairly well.** If the canines have rotations, moderate to severe tipping, or are otherwise displaced in the arch, the case will require comprehensive treatment.

**Appliance**

Construct a maxillary Hawley appliance (Figures 7-38) with the following:

• .030 labial bow extended from distal of the right canine to distal of the left canine

• Adams clasps on the first permanent molars

**Procedures for Treating Maxillary Incisors with Retraction/Space Closure**
The following procedure is recommended when treating maxillary incisors with retraction/space closure:

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1 Insert appliance-adjusting acrylic for proper seating and tightening Adams clasps as necessary.

2 Remove 1.5 mm of acrylic lingual to the incisors to the retracted.

3 With a three-prong pliers, close labial bow loop to activate 1.5 to 2 mm.

   **Note:** This will result in approximately 1 mm of retraction per month. Keep bow in the middle third of the incisors.

4 Have patient wear the appliance 24 hours per day.

   **Note:** Give patient Removable Appliance Instructions (Appendix) and an appliance container.

5 Recall patient every 4 weeks to reactivate bow, remove lingual acrylic, and tighten Adams clasps as necessary.

6 After correction, use appliance as a retainer (6 months full-time and an additional 6 months of nighttime wear).

7 After 1 year of retention, monitor patient.

   **Note:** If spaces are reoccurring, continue retainer wear.

---

**Requesting Orthodontic Consultation**

**Introduction**

If you wish to have a case evaluated by one of the IHS orthodontists, you should submit the following material:

- Study models
- Panoramic radiograph
- Lateral cephalometric radiograph
- Extra-oral photographs
- Orthodontic examination and treatment plan

Please follow these procedures closely. Details are provided below. With incomplete information, only limited information can be returned to you.

**Study Models**
A quality set of study models are made, not only for medical/legal reasons, but also to give a professional appearance when showing the case to the patient. Trim the models as illustrated below (Figure 7-39). This takes the guesswork out of how the teeth occlude.

Panoramic Radiograph

If a panoramic radiograph is not obtainable, then a full-mouth series of periapical films is needed.

Lateral Cephalometric Radiograph

To determine if a skeletal discrepancy is present it is key to have a lateral cephalometric radiograph.

Extra-oral Photographs

A facial assessment is a necessary step to insure that underlying discrepancies are not missed.

Orthodontic Examination and Treatment Plan

Please write down your proposed treatment plan. Your input helps the orthodontist know the type of treatment mechanics you are comfortable with as well as what orthodontic supplies are available to you.

Instruments, Supplies, and Dental Laboratories
The stock numbers for two orthodontic vendors who have General Service Agency (GSA) contracts are provided. Also, two examples of orthodontic labs are listed. The IHS does not endorse these vendors. Other orthodontic companies may be used.

### List of Instruments and Supplies

The following is a list of instruments and supplies used in orthodontics along with catalog numbers for the two vendors:

<table>
<thead>
<tr>
<th>Item</th>
<th>Stock Number</th>
<th>ORMCO Stock Number</th>
<th>3M Unitek Stock Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nylon molar band seater</td>
<td>844-0000</td>
<td>811-001</td>
<td></td>
</tr>
<tr>
<td>Band seater and burnisher</td>
<td>844-0001</td>
<td>900-832</td>
<td></td>
</tr>
<tr>
<td>Mathieu Hemostats</td>
<td>801-0064</td>
<td>809-007</td>
<td></td>
</tr>
<tr>
<td>Intraoral elastics (1/4 4oz)</td>
<td>635-0051</td>
<td>404-536</td>
<td></td>
</tr>
<tr>
<td>Posterior band removing pliers</td>
<td>803-0409</td>
<td>900-713</td>
<td></td>
</tr>
<tr>
<td>Posterior elastic separators</td>
<td>640-0080</td>
<td>406-084</td>
<td></td>
</tr>
<tr>
<td>Bird beak pliers</td>
<td>803-0414</td>
<td>900-709</td>
<td></td>
</tr>
<tr>
<td>Three-jaw wire bender pliers</td>
<td>803-0413</td>
<td>900-705</td>
<td></td>
</tr>
<tr>
<td>Glass ionomer band cement</td>
<td>740-0155</td>
<td>712-050</td>
<td></td>
</tr>
<tr>
<td>Brass .020 separating wire</td>
<td>704-6032</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper first molar bands Trial kit</td>
<td>Mark II bands</td>
<td>151-408</td>
<td></td>
</tr>
<tr>
<td>Lower first molar bands Trial kit</td>
<td>Mark II bands</td>
<td>151-308</td>
<td></td>
</tr>
</tbody>
</table>

### Dental Laboratories

The following two vendors are sources of orthodontic laboratories:

- TP Orthodontics, Inc.
  100 Center Plaza
La Porte, IN 46350
800 348-8856
www.tportho.com

• AOA Pro
13931 Spring St
Sturtevant, WI 53177
800 262-5221
www.ormco.com
Appendix — Sample Orthodontic Forms

Overview

Introduction

This appendix contains all of the necessary forms and instruction sheets referenced in Chapter 9, Orthodontics.
ORTHODONTIC EXAMINATION

DATE: ____________________

PATIENT: ________________________ DOB: _______ SEX: _____

* All evaluations performed with patient in centric occlusion.

Overbite: ________ %

Overjet: ________ mm

Classification: Molars R ___ L ___ Cuspids R ___ L ___ (I, E, II, FSII, III, FSIII)

Midlines: [ ] OK [ ] OFF

Max to [ ] R [ ] L ______ mm

Mand to [ ] R [ ] L ______ mm

Crowding: Max ______ mm

Mand ______ mm

Crossbites: ____________________

Missing: ____________________

Impactions: ____________________

Decalcif: ____________________

Rotations: ____________________

Large Rest: ____________________

Perio: [ ] Normal

[ ] Periodontitis

[ ] Recession ________________

[ ] Inad att ging: ______________

Hygiene: [ ] Good [ ] Fair [ ] Poor

CR = CO [ ]

CR ≠ CO [ ] Ant [ ] Post [ ] Right [ ] Left Amount ______ mm

TMJ Pain: [ ] Yes [ ] No

[ ] Muscle [ ] Joint [ ] Left [ ] Right

Noises: [ ] Yes [ ] No

Left [ ] Click [ ] Crepitation

Right [ ] Click [ ] Crepitation

Comments:

Patient Interest: [ ] Eager [ ] Indifferent [ ] Resistant
ORTHODONTIC TREATMENT PLAN

Maxillary
Objectives: ____________________________
Est. Treatment Time: ________________
Appliance: ____________________________

Mandible
Objectives: ____________________________
Est. Treatment Time: ________________
Appliance: ____________________________

Treatment Plan:

Right  Left

Right  Left

Right  Left
POTENTIAL RISKS AND LIMITATIONS OF
ORTHODONTIC TREATMENT

Generally, excellent orthodontic results can be achieved with informed and cooperative patients. Therefore, you should be aware that orthodontic treatment, like any treatment of the body, has some risks and limitations. These risks are seldom severe enough to offset the advantages to treatment, but they should be considered when you decide to start orthodontic treatment.

__Tooth decay, gum disease and permanent markings (decalcification) on the teeth can occur if orthodontic patients eat foods containing excessive sugar and/or do not brush their teeth frequently and properly. These same problems also can occur in patients not in braces, but the risk is greater while in braces.

__In some patients the length of the roots of the teeth may shorten during orthodontic treatment. Some patients are prone to this happening, some are not. Usually this is of no significant consequence, but on occasion it may become a threat to the longevity of the teeth involved.

__The health of the bone and gums which support the teeth may be affected by orthodontic tooth movement if a condition already exists, and in some rare cases where a condition doesn't appear to exist. In general, orthodontic treatment lessens the possibility of tooth loss or gum infection due to malocclusion.

__Teeth have a tendency to change their positions after treatment. This is usually only a minor change and faithful wearing of retainers reduces this tendency. Throughout life, the bite can change adversely due to the eruption of wisdom teeth, mouth breathing, and other oral habits that are out of control of the dentist.

__Patients with malocclusion may have a potential for Temporo-Mandibular-Joint (TMJ) problems, which may become evident before, during, or after orthodontic treatment. These may include joint pain, ear pain, and/or headaches. Orthodontic treatment may help remove the dental causes of the TMJ syndrome, but not the non-dental causes.

__Orthodontic tooth movement may aggravate the condition of a tooth that was traumatized by a previous accident or has a large filling, which may have damaged the nerve of the tooth. In rare instances, a tooth of this nature may flare up and require root canal treatment.

__Sometimes orthodontic appliances may be accidentally swallowed or inhaled, or may irritate or damage the oral tissue. But if the patient is careful and follows the instructions given, the possibility of such a mishap is extremely rare.
Sometimes orthodontic appliances may be accidentally swallowed or inhaled, or may irritate or damage the oral tissue. But if the patient is careful and follows the instructions given, the possibility of such a mishap is extremely rare.

The total time required to complete treatment may exceed our estimate. Poor oral hygiene, poor cooperation in wearing the appliance the required hours per day, broken appliances, and missed appointments can lengthen the treatment time and affect the quality of the end results.

All of these items are potential risks for all orthodontic patients.

Items marked with an X means that you may be at a higher risk for the particular potential problem.

It is my professional opinion in this case that the potential benefit from orthodontic treatment outweighs the risk that can be reasonably anticipated. If you have any questions about treatment and the potential risks involved, please do not hesitate to ask for further explanation.

Signature of Dentist______________________________

I have read and understand the above and consent to treatment for:____________________ Patient

__________________________________________  ______________
Signature of Guardian                  Date
AGREEMENT FOR ORTHODONTIC THERAPY

Orthodontic therapy may be indicated for treatment of different types of problems. Teeth may be crooked, the bite may not be functional, and the jaws may not have grown as they should have, or there may be problems with the jaw joints. Our goal is to provide treatment to correct or prevent these problems. To achieve best results, a fixed appliance and/or a removable appliance will be required.

The time required for treatment of orthodontic problems varies from a few months to several years. Several factors are involved in determining the length of treatment time, one of the most important being patient cooperation. Just placing an appliance on teeth does not correct an orthodontic problem. Patients must be seen regularly (every 4-8 weeks) for adjustments, the appliances must not be broken through careless eating habits, patients must comply with instructions from their dentist and the teeth and gums must be kept clean and healthy. Lack of patient cooperation in any of these areas cannot only extend treatment time, but also prevent the dentist from achieving the best possible result.

It is the patient's responsibility to be on time for appointments, to notify their dentist as early as possible if an appointment must be canceled and to call for another appointment if one is missed. It is in the best interest of patient to have their treatment monitored regularly by their dentist. Parents must be aware that during the school session their child will probably miss school or a portion of it for their appointments.

The appliances serve as a means for the dentist to move the teeth. When appliances are broken or bent, tooth movement is not controlled and in some cases, the problem can become worse than before treatment was started. Eating hard, tough, chewy foods and biting on hard objects will damage an appliance and interfere with controlled tooth movement. A protective mouthpiece must be worn for contact sports.

The dentist may request that patients do certain things between appointments such as wearing headgear, elastics, or a removable appliance. His treatment is planned assuming the patient will comply with these requests, and the treatment result will be compromised if the patient does not cooperate.
It becomes difficult for patients to clean their teeth after appliances or braces are placed. However, the extra effort must be made, or permanent damage can occur to the teeth and gums. Excessive sugar in the diet (candy, gum, soft drinks) will also cause damage. After receiving instruction in oral hygiene, it is the patient’s responsibility to keep their teeth and gums healthy.

There are many benefits to be derived from orthodontic therapy, but there are also risks. Cavities, gum disease, and compromised results due to lack of patient cooperation have already been mentioned. Other risks are root resorption (shortening of the roots of teeth), possible need for root canals on teeth that have been traumatized previously, the onset of jaw joint dysfunction, and teeth not remaining perfectly straight after treatment.

The dentist reserves the right to discontinue treatment of any patient who will not maintain acceptable oral hygiene; who repeatedly damages; who refuses to comply with instructions regarding the wearing of headgear, elastics, or removable appliances; or for any other reason that the orthodontist feels is contrary to the welfare and best interest of the patient.

It must be emphasized that neither the Indian Health Service (IHS) nor any other government agency is in any way obligated to continue care in an IHS dental facility or to pay for orthodontic treatment by a civilian dentist should the patient leave this area prior to completion of treatment. Continuation of care will be at personal expense if the patient transfers to an IHS facility that has no orthodontist or where the workload is such that the IHS orthodontist is unable to assume transfer treatment for the patient.

It is difficult to anticipate the patient’s and parent’s needs for additional information regarding treatment. Should a question arise concerning treatment, you are encouraged to ask for an explanation.

Patient Name: ________________________________

Date __________________

[Legal signature of the patient (if 18 years old) or Parent/Guardian]
REMOVABLE APPLIANCE INSTRUCTIONS

Removable appliances are to align and/or maintain the teeth in their correct positions. These appliances must be worn as prescribed.

1. Wear the appliance at all times; all day and all night. The only exceptions are: a) when eating  b) when brushing  c) when playing sports (e.g., football, basketball, volleyball, swimming, etc.)
2. As soon as you have finished eating, carefully brush your teeth and place the appliance back in your mouth. Make sure that you clean all tooth surfaces and use dental floss.
3. Clean the appliance in this manner: Hold the appliance in the palm of your hand and brush the inside and outside surfaces with a toothbrush and liquid soap. It is recommended to soak the appliance in a retainer or denture cleaning solution (effervesce tablets) at least once a week to help in keeping it clean.
4. Replace the appliance as soon as you have cleaned it.
5. We want the delicate adjustment of the wires to remain in perfect order; be gentle when removing and replacing the appliance.
6. The plastic taste of the appliance will disappear in a few days.
7. With the appliance in place, your speech will return to normal in two or three days. Reading aloud to yourself can help you to become accustomed to its presence.
8. The safest place for the appliance is in your mouth.

Don’t wrap the appliance in a paper napkin (it may get thrown away).
Don’t put it in your pocket (it may break or bend).
Place retainer in a retainer box if it must be removed.
Dogs love to eat retainers.

Always bring your appliance to each appointment.

If a replacement or repair of a retainer is necessary, there will be a charge!
CARE FOR FIXED APPLIANCES

During the initial adjustment period, patients may experience minor symptoms, such as:

- **Discomfort** can be expected during the first week of having your braces and after your regular adjustments. Your teeth will become sore, especially when you bite down. Common pain relievers, such as aspirin, Tylenol, or Advil, will help, along with eating softer foods until the discomfort goes away.

- **Irritations** that feel sharp can occasionally occur, even though we take precaution to avoid it. If something feels like it is “poking”, cover it with wax to make a smooth surface temporarily. Then call us to schedule a time to come in as soon as possible. We don’t want you to be uncomfortable.

- **Mouth sores** occasionally develop as your mouth is adjusting to your braces. Rinsing with warm salt water (½ teaspoon salt in 8 oz. warm water) will be soothing until these areas “toughen up.”

- **Mobility**. As your teeth begin to move, they sometimes feel “loose” and mobile. It is a normal, but strange sensation. You may feel your teeth becoming mobile off and on throughout treatment.

**Proper care of your teeth while in braces is very important. This must include:**

- **Brushing and Flossing.** This will take extra time at the beginning to keep your teeth, braces, and gums clean and healthy. Brushing after every meal and snacks is the only way to prevent plaque buildup and decay. Another handy device is a sonic toothbrush (*Sonicare*®), which can assist in good brushing.

- **Regular Dental Check-ups** with your family dentist during your treatment is required. Regular cleansings are important while wearing braces, and the frequency of check-ups will vary between patients. Generally, it’s at least every 6 months and more often for those with periodontal (gum) problems.

- **A Fluoride gel or rinse** should be used every day for extra protection against permanent markings (dalcification).

**Avoid breakage by watching your diet:**

- **Avoid hard, sticky foods** that may cause damage to the appliances or bend the wires. For example: ice, gum, hard candy, popcorn, nuts, corn nuts, pretzels, etc.

- **Cut up some foods into bite-size pieces** before eating such as: hard crusts (pizza, breads, etc.), apples, carrots, celery, steak, etc.

- **Avoid habits that will break the appliances**: Nail biting, chewing on pencils or pens, pulling or picking on your appliances.

If you damage your appliances, the situation can prove to be uncomfortable, and may delay your treatment time. If any part of your appliance becomes loose or broken between visits, please call our office as soon as possible.