

THE DAMON SYSTEM

Class II Therapy



One of the exciting benefits of the Damon System is how well it corrects Class II malocclusions. Combined with a Herbst and/or elastics, the number of times maxillary bicuspids are extracted is dropping dramatically.

However, extractions are often still indicated, as we will see in a patient case later Let's address extractions now



The Damon System

- When to extract?
 - To improve bone/tissue
 - To satisfy A-P occlusions
 - Pre-surgery
 - Extreme midline discrepancies

When should you consider extracting teeth?

- 1. When you have extremely malposed teeth with weak supporting bone and soft tissues, consider extracting teeth *only if there will not be an adverse impact on the patient's profile*
- 2. When there are no other ways to do it otherwise, consider extractions to help improve your anteroposterior occlusion requirements
- 3. In surgical cases, extractions may totally appropriate and necessary

4.	When there are no other means to correct a <i>severe</i> midline discrepancy, extraction(s) may be needed

Caveats of Extraction

with the Damon System

- 1. Working with the cuspids alone can have detrimental effects on the supporting bone.
- 2. Use +7 degree (high torque) brackets on all 3s (U & L)
- 3. Hook closing springs distal to 6s, not the 7s (including the 7s flares them!)
- 4. For maximum anchorage, ligate the 6s and 7s together
- 5. Retract anterior teeth together in blocks (en masse).

En masse retraction is a method of space closure whereby the six anterior teeth are ligated together and moved as a unit closing the extraction site:

- 1. The anterior space is first consolidated via elastic C-chains (under the archwire if large spaces) on a .016 x .025 or .014 x .025 CuNi-Ti or Ni-Ti SE archwires.
- 2. After anterior space closure, this segment is ligated from cuspid to cuspid with .008 stainless steel ligature wire behind the archwire to prevent anterior spaces from opening.
- 3. Posterior spaces are closed utilizing Ni-Ti coils or Pletcher stainless steel coils on a preposted .019 x .025 Stainless Steel archwire.
- 4. The coil springs are placed over the end of the archwire cut distal to the first molar while the other end is activated with ligature wire to the hook on the archwire placed mesial to the cuspids.

Pletcher coil springs are typically used in adult cases as well as those cases where the space desired to be closed has been evident for long periods of time (previous extraction spaces).

They are made of stainless steel, as opposed to NiTi), and are used for space closure. They are attached to the mesial hook of the posted .019 x .025 archwire and extended distal to the first molar. These deliver a greater force than Ni-Ti coils and All other mechanics are identical for space closure.

Extraction Mechanics

The orbicularis oris and mentalis muscles maintain the AP (anterior-posterior) position of the anterior teeth while the crowding seeks the path of least resistance, which is into the extraction sites. This is a very significant mechanical advantage since the crowding is alleviated without any demand on posterior anchorage. Taking advantage of these mechanics eliminates need for individual cuspid retraction. Moving the anterior teeth en masse appears to have a positive long-term periodontal impact particularly around the cuspids.



In extraction cases

- Space closure
- Space consolidation

Space Consolidation is the process of gathering anterior space between teeth prior to en masse retraction. Chain elastics are used from lateral to lateral or cuspid to cuspid, depending on the amount of space needed to close. If major space is present, care is given not to round trip the cuspids. In this situation, space would be closed lateral to lateral.

Only close anterior space on .014 x .025 or .016 x .025 Ni-Ti archwires in the second phase of archwire sequencing. Closing space on round archwires will cause rotations. If major anterior space is involved, the chain elastics are placed before insertion of the archwire, thus minimizing friction. Occasionally, elastic thread is utilized to control the force of the space closure. It is preferable to consolidate space distal to the cuspids prior to *en masse* retraction of the anterior segment. Space closure is easier if the forces vectors are parallel to the major mechanics posterior archwire. All rotations should have been corrected before posterior space closure.

Space Closure

Following anterior space consolidation in the High-Tech edgewise phase of archwire sequencing, the six anterior teeth are ligated together under the archwire with .008 stainless steel ligature wire. A pre-posted .019 \times .025 Stainless Steel archwire is inserted with the hooks placed between the laterals and cuspids. Medium Ni-Ti (9 or 12 mm) springs are placed over the end of the slightly protruding archwire clipped distal of the first molars. The other end of the spring is attached to the hook on the archwire with ligature wire. The springs are usually activated approximately 2/3 of their original length.



Space creation

- Conversion of crowding into nonextraction case
- Late mixed-dentition stage
- With Herbst, prn

Space Creation is the process of altering the course of treatment by changing an extremely crowded situation into a nonextraction case. Ideally, this is performed in the late mixed dentition stage before the eruption of the cuspids.

- 1. A four tooth sectional .014 wire is placed in the anterior segment to align and control severe rotations.
- 2. Following the initial phase, a .014 x .025 or .016 x .025 Ni-Ti wire is placed with a compressed Ni-Ti coil spring extending from the lateral incisor to the first molar. Great care is given to only activating the spring approximately 1X times the width of the bracket. Too much activation will overpower the lip bumper effect of the orbicularis oris and mentalis muscles.
- 3. Crimpable stops are placed on either side of a central bracket to prevent the archwire from sliding.
- 4. The patient is reappointed at an appointment interval, usually 10 weeks, so the archwires do not have time to slide out of the first molar tube.

NOTE: This procedure can be performed in conjunction with Herbst® therapy by welding a wire tube to the maxillary stainless steel crown and aligning the anteriors as described above. It is also advisable to weld a long molar tube in an attempt to prevent the archwire and spring from becoming dislodged from the molar tube between appointments.



THE DAMON SYSTEM

Class II Therapy



By including the face fully in the treatment planning phase, Damon mechanics provides straight-forward means to correct Class II malocclusions.

As a general rule, it is recommended that you:

- Treat Class II with good face using Damon System and elastics
- Treat Class II poor profile use Damon System and Herbst®
- Start fixed Herbst® Treatment in mixed dentitions when the patient's growth just begins to accelerate:
 - Begin girls by ~10.5 11 yrs old
 - Begin boys by ~11.5 12 yrs old

We will address patients with the poorest of profiles and investigate the use of the Herbst® appliance in a minute, but let's first look at the torques that are available for Class II patients.

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MON	Class II Torques
1	Damon System Prescriptions
	D2D3MXTandem A/WNon-Tandem A/W
F	Patient #
I	DoctorLocation
	Start Date
	UR7 UR6 UR5 UR4 UR3 UR2 UR1 UL1 UL2 UL3 UL4 UL5 UL6 UL7
	+7 +10 +17 High +17 +10 +7
	-27 -18 -7 -7 0 +8 +12 Std +12 +8 0 -7 -7 -18 -27
	+3 +7 Low +7 +3
	+7 High +7
	-10 -28 -17 -12 0 -1 -1 Std -1 -1 0 -12 -17 -28 -10
	-6 -6 Low -6 -6
	LR7 LR6 LR5 LR4 LR3 LR2 LR1 LL1 LL2 LL3 LL4 LL5 LL6 LL7
	TIPS: Indicate inverted brackets by marking an "i" beside the torque being used. When using more than one type of Damon bracket, write the bracket type used (2, 3, M) over the box containing the torque prescription
9	Comments
	Damon System educational materials for orthodontists & staff. 706.255.4499 - www.intellident.org Copyright 2007 by intelliDENT solutions, inc. To order more Rx pads, visit www.intellident.org

Consider the following torques in Class II cases:

Damon Brackets Torque Selections									
	U1s	U2s	U3s	L1s	L2s	L3s			
Class I									
non-XT	Std	Std	Std	Std	Std	Std			
XT	High	High	High	Low	Low	High			
Class II									
non-XT protrusion	Std/Low	Std/Low	Std	Low	Low	Std			
Div 2	High	High	Std	Std	Std	Std			
ХТ	High	High	High	Low	Low	High			
Class III	Low	Low	Std	Std	Std	Std			

MON System	l1s: l	JPPE INCI			ITR.	AL	
Damon Brackets Torque Selections							
	U1s	U2s	U3s	L1s	L2s	L3s	
Class I							
non-XT	Std	Std	Std	Std	Std	Std	
ХТ	High	High	High	Low	Low	High	
Class II							
non-XT protrusion	Std/Low	Std/Low	Std	Low	Low	Std	
Div 2	High	High	Std	Std	Std	Std	
XT	High	High	High	Low	Low	High	
Class III	Low	Low	Std	Std	Std	Std	

HIGH TORQUE BRACKET: +17 TORQUE

- Division 2 cases
- Cases needing extensive Class II elastics (prevents loss of torque control that might otherwise result from wearing elastics)
- Most extraction cases (prevents loss of torque control when extracting anterior teeth)

U2s: UPPER LATERAL INCISORS							
Damo	n Bracl	kets 1	orqu	e Sel	ectio	ns	
	U1s	U2s	U3s	L1s	L2s	L3s	
Class I							
non-XT	Std	Std	Std	Std	Std	Std	
ХТ	High	High	High	Low	Low	High	
Class II							
non-XT protrusion	Std/Low	Std/Low	Std	Low	Low	Std	
Div 2	High	High	Std	Std	Std	Std	
XT	High	High	High	Low	Low	High	
Class III	Low	Low	Std	Std	Std	Std	

HIGH TORQUE BRACKET: +10 TORQUE

- Division 2 cases
- Cases needing extensive Class II elastics (prevents loss of torque control that might otherwise result from wearing elastics)
- Most extraction cases (prevents loss of torque control when extracting anterior teeth)

MON System U3	Bs: U	IPPE	R	CUS	SPI	DS
Damo	n Bracl	kets 1	Torqu	e Sel	ectio	ns
	U1s	U2s	U3s	L1s	L2s	L3s
Class I						
non-XT	Std	Std	Std	Std	Std	Std
ХТ	High	High	High	Low	Low	High
Class II						
non-XT protrusion	Std/Low	Std/Low	Std	Low	Low	Std
Div 2	High	High	Std	Std	Std	Std
ХТ	High	High	High	Low	Low	High
Class III	Low	Low	Std	Std	Std	Std

HIGH TORQUE BRACKET: +7 TORQUE

- Any cuspid needing uprighting
- Most extraction cases requiring 1st bicuspid space closure
 - prevents lingual tipping of the cuspid's crown during space closure
 - helps position the root in medullary bone and away from the cortical plate

System L1s 8	& L2s ι LAT	: LO\ ERAI	WEF L IN	R CIS	EN1 OR	TRA S
Damo	n Brack	kets 1	Torqu	e Sel	ectio	ns
	U1s	U2s	U3s	L1s	L2s	L3s
Class I						
non-XT	Std	Std	Std	Std	Std	Std
ХТ	High	High	High	Low	Low	High
Class II						
non-XT protrusion	Std/Low	Std/Low	Std	Low	Low	Std
Div 2	High	High	Std	Std	Std	Std
XT	High	High	High	Low	Low	High
Class III	Low	Low	Std	Std	Std	Std

LOW TORQUE BRACKET: -6 TORQUE

- Extreme crowding in the lower anterior sextant
- Cases needing extensive Class II elastics (prevents the loss of torque control resulting from wearing elastics
 - The mentalis and orbicularis oris muscles also aid in controlling the torque of the lower anterior teeth
- Any incisor locked lingually with labial root position
- Cases with the Herbst attached to the archwire

MON System L3	s: L	OWE	R	CUS	SPI	DS
Damo	n Bracl	kets 1	Γorqu	e Sel	ectio	ns
	U1s	U2s	U3s	L1s	L2s	L3s
Class I						
non-XT	Std	Std	Std	Std	Std	Std
XT	High	High	High	Low	Low	High
Class II						
non-XT protrusion	Std/Low	Std/Low	Std	Low	Low	Std
Div 2	High	High	Std	Std	Std	Std
ХТ	High	High	High	Low	Low	High
Class III	Low	Low	Std	Std	Std	Std

HIGH TORQUE BRACKET: +7 TORQUE

- Any cuspid needing coronal uprighting
- Most extraction cases requiring first bicuspid space closure
 - prevents lingual tipping of the cuspid's crown during space closure
 - helps position the root in medullary bone and away from the cortical plate



Reverse Curve

- Sizes:
 - -.017x.025
 - -.019x.025
- 20 degrees of torque from 2-2
- NiTi
- · CI II Div II

Reverse Curve Ni-Ti Wires are 017 x .025 or .019 x .025 in size.

They are manufactured by Orthodontic Specialties and have 20 degrees of torque built into the archwire from lateral to lateral.

Their reverse curve in design and are manufactured of Nickel titanium.

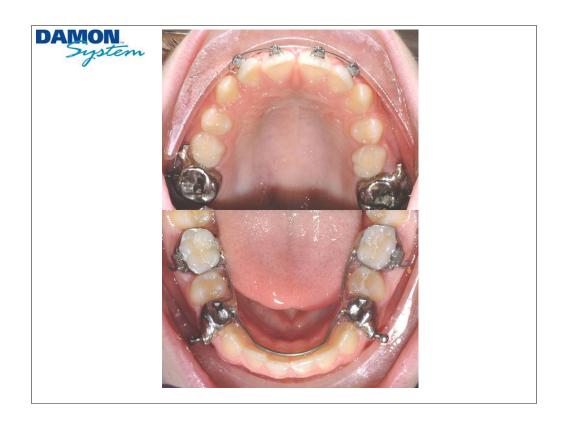
These archwires are particularly effective in severe Class II, Div. II cases. They are placed in the upper arch following the initial phase of archwire sequencing. If only intrusion is desired, the same dimension of archwires is used without the additional 20 degrees of torque.



Management of the Herbst appliance involves:

- 1. 4-5mm initial advancement and hold for 3-6 months
- 2. Advance 3 mm every 3-4 months until an edge-to-edge relationship is achieved. Dr. Terry Dischinger advocates even positioning the edges of the mandibular teeth *in front of* the maxillary anterior teeth's edges (i.e., overcorrecting).
- 3. Keep the teeth edge-to-edge for at least 6 months
- 4. When using a Herbst, do not place brackets on the lower arch until Class II treatment is completed and the Herbst is removed.
- 5. The total Total Herbst treatment time can be expected 15-18+ months (longer if Class II is severe).

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Suggested design used when lower first bicuspids are erupted and profile change is desired



Suggested Herbst design when first bicuspids are not yet erupted or when patient presents in mixed or permanent dentition	



Note modification of the crossover wire which creates a rest to the lower first bicuspids for additional stability



Flip Lock Herbst Mechanism:

- 1. Ball Joint Base
- 2. Soldered to Upper Crown
- 3. Tube and Piston

Why this mechanism?

- No screws
- Ease of assembly
- · Ease of activation
- Patient comfort
- · Frankel effect of mechanism in the cheek area

Tube socket Color Coded (inset):

- Red/Left
- Green/Right
- · Piston Coded with Circle: Labial Surface



Ball Hinge Free Socket Design

(Upper Right) Upper Tube and Socket

(Lower Left) Lower piston properly oriented Note that the embossed round circle on the lower piston faces out to the buccal.

(Lower Right) Advance Mechanism using C-Spacers

- No need to disengage piston to advance
- Slip C-Spacer over piston and crimp in place



The flip lock piston comfort cap (clear, seen on left) is available from AOA Lab in the U.S. and from Comfort Solutions in Canada



You deliver the Flip Lock Herbst as you would any fixed Herbst

- 1. To cement use glass ionomer
- 2. You can place the upper tube on the ball hinge prior to cementation, holding it in place with pink bead wax

3.	Place some easily removed gel/paste on the occlusals of the teeth to be crowned to greatly assist in cleanup when the crowns are removed



Flip Lock on-the-wire Herbst:

- 1. The upper ball hinge soldered tube extensions are left longer to fill the 6-7 interbracket width.
- 2. The lower ball hinge soldered tube extensions are cut close to the ball base because of less interbracket width between the 4s-3s and is tied distal to the cuspid.

3.	The ball hinges soldered to the tubes slip over posted 19x25 stainless steel archwires.



Placement of Upper and Lower Ball Hinge Bases:

- 1. An .012 ligature tie back wire is placed from the hook on the upper 2nd molar to the post on the upper archwire
- 2. Another tie back is placed on the lower from the hook on 1st molar to a post on the lower archwire

These act to keep spaces from opening in the posterior during Herbst treatment

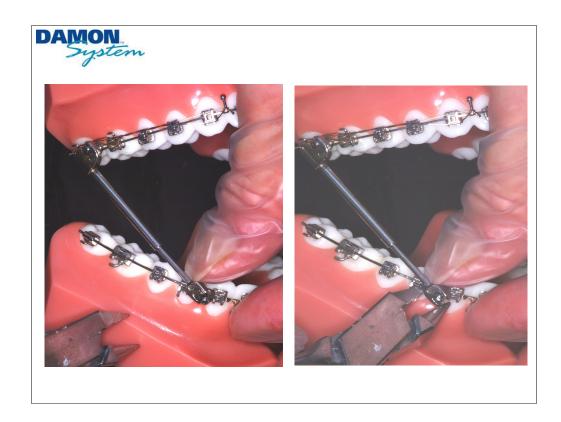
Case provided by Dr. Dwight Damon



UPPER TUBE ARM PLACEMENT

- 1. Engage the upper tube by sliding the tube socket from mesial to distal onto the ball hinge
- 2. Orient it with the tube socket upward, color coded dot to the labial (left is red, right is green)
- 3. Slip the tube socket from mesial to distal onto the ball hinge.

4.	Lay the tube parallel to the buccal surface of the teeth to lock it in place.



LOWER ARM PLACEMENT

- Slip the lower piston into the upper tube
- Orient the piston socket (small circle to the labia)
- Slide it onto the ball hinge base



The lower ball hinge base is tied distal to the lower cuspid.	



Above you can see the "Flip Lock On-The-Archwire Herbst" appliance fully engaged. The teeth are positioned end-to-end.

Of course, you would provide a 4-5 mm initial advancement first (*shown below*), holding it for 3-6 months, and work toward the edge-to-edge position by advancing the lower jaw 3 mm every 3-4 months until the edge-to-edge relationship is achieved.

Do not advance the "On-the-Archwire
Herbst" more than 3mm initially, and only 2mm at each advancement until teeth are edge to edge. Too much force will cause loose brackets.

Patients teeth should be in an edge to edge relationship by the sixth month of treatment.

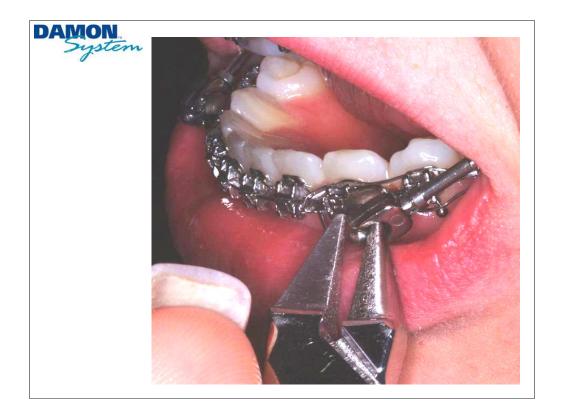
The appliance is kept in about 10 months.





POINTS TO KEEP IN MIND...

This patient's on-the-wire Herbst appliance is able to close with ease.		
A spring was placed in the upper posterior segment to close posterior space		
The upper tube-and-socket assemble is not impinging in the back of the cheek.		



TO REMOVE THE ON-THE-WIRE HERBST:

The lower piston is easily removed using a Weingart or bird beak pliers.

1. Wedge one end of the plier between the ball joint and the inside curve of the piston's fork.

2.	Use the other end to push the piston's occlusal prong over and off of the ball joint.