



Study & Manipulative Training Guide

What is the XCOLLAR?

The XCollar is a **complete Cervical Spine Splinting System** designed especially for EMS. It ensures the highest level of patient safety while significantly reducing movement of the Cervical Spine. It helps rescuers in the management of potential Cervical Spinal injuries by securing the head to the torso at four points; two posterior and two anterior above and below C-1 and C-7. This works to eliminate harmful Distraction by protecting the Cervical Spine.

What is the XCOLLAR Plus?

The XCollar Plus integrates the XCollar and an Adjustable Head Restraint System (HRS). Each HRS contains a set of two Velcro straps designed to secure the patient to the spinal board by preventing lateral and vertical movement, while allowing inline movement of the patient's head with the body. The HRS also contains an Adjustable Occipital Support Pad which ensures that proper height support is provided for patient's spinal alignment to be maintained. The Adjustable Support Pad is capable of allowing rescuers to adjust the height of the support for the Occipital as needed from 0 to 2" in height with 4 possible 1/2" increments.

This new Technology allows EMS responders to provide:

1. **Better patient care and safety:** Efficiently provides a high level of Cervical Spine stabilization for trauma patients regardless of body type, age, or size, while also capable of immobilizing in the "Position of Comfort". Additionally, the **HRS** with the **XCollar Plus** allows rescuers to provide support for the Occipital region while ensuring Head to Torso unity. This helps to avoid further harm caused by dynamic forces during transport for injuries to the Cervical Spine.
2. **Faster treatment: 30 SECOND APPLICATION.** Capability of multiple patient care by a single rescuer; reducing patients' wait time for initial treatment, and acting as a **FORCE MULTIPLIER** during **MASS CASUALTY INCIDENTS (MCI)**.
3. **The best treatment requiring less equipment:** Care for small pediatric through large adult size patients (from approx. 25-30 pounds to over 360 pounds) with the same device.

NEW TECHNIQUE OF APPLICATION: S-A-X

- **Setup (Deploy prior to use)**
- **Adjust (Circumference and Height)**
- **X-Straps (Complete the Splint)**





3-Step Easy Application in 30 seconds:

“S-A-X” (SETUP –ADJUST – X-STRAPS APPLICATION)

#1: SETUP

- Extend the XCollar to its longest setting. Unfold the Back Support and lock it in place.

#2: ADJUST

- Encircle the patient and capture the chin before connecting the buckle. Note that the chin is the anchor point, so ensure that the chin properly captured between the Chin Strap (in front) and the Foam Padding (below).
- While holding the front of the device in place, use the “push & pull” (Opposing Forces) method to adjust Side Straps evenly (circumference adjustment).
- Extend Chest Support Piece until firm contact with the upper sternum is obtained (height adjustment).

#3: X-STRAPS APPLICATION

- Apply X-Straps, using the “push & pull” (Opposing Forces) method, to the corresponding color-coded Velcro anchor points while ensuring to maintain tension on the X-Straps. This integrates anterior and posterior pieces to splint the patient.

USE DIRECT OPPOSING FORCES IN EVERY STEP OF APPLICATION

After a completed proper application, the following criteria must be met:

- Proper capturing of the chin.
- Firm Contact of Chest Support on Upper Sternum.
- Tension on X-Straps.

After XCollar application, you may proceed to secure the patient to the spinal board/vacuum mattress/rescue basket by applying the HEAD RESTRAINT SYSTEM (HRS).

2-STEP HRS APPLICATION:

1 – STACK, SLIDE and STICK – Once patient is on the spinal board, STACK the Occipital Support pieces to desired height as needed to maintain proper alignment. SLIDE the Occipital Support Pad under the head. Pull the clear film strip to STICK the Occipital Support Pad to the spinal board.

2 – SECURING STRAPS APPLICATION – Remove one X-Strap while maintaining tension, then place the black side of the square end to the XCollar Velcro anchor point. Reattach X-Strap. Wrap the securing strap to the spinal board to take off the slack. **DO NOT OVERTIGHTEN.** Repeat on opposite side.

Airway Management

1. Loosen the **Chin Strap**, remove the **X-STRAPS** and loosen the **Side Straps** if necessary.
2. Obtain airway.
3. Re-tighten X-Straps to secure **XCOLLAR**.

For extra-large patients it may be necessary to temporarily unclip the buckle to intubate

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These hands-on steps are recommended by Emegear, LLC when applying the XCollar devices. You must demonstrate these applications to an "Evaluator" prior to applying the device on an injured patient. Please ensure that you feel comfortable applying the device in all situations:

Practice Tips:
During application, use one hand on the XCollar front piece to control the patient's head and avoid unwanted manipulation.
Direct opposing forces must be used during application to control C-Spine.
Practicing "real field" scenarios will ensure a high skill level and ease of use in the field.
Resetting of the XCollar to the "Originally Packaged Configuration" must be done prior to every application.
After application, tension on the X-Straps and Chin Strap may be loosened to increase compliant patient comfort at provider's discretion.

Application Guide

<u>S – A – X Neutral Position Application</u>	
1. SETUP	
	Extend the Front and Back Pieces, then unfold and lock the Back Piece into place.
2. ADJUST	
	Capture the chin between the Chin Strap and Padding, and proceed to encircling the patient to connect the Buckle to the Buckle Receiver.
	Note: To easily connect the buckle, grab the buckle by the Side Strap and place flat against the XCollar to slide it into the Buckle Receiver.
	Adjust Side Straps evenly to patient circumference using Opposing Forces.
	Note: The first Side Strap adjusted should only reduce the free space around the head since proper tightening will be achieved once the second Side Strap is adjusted to the patient's circumference. As you adjust the circumference, proper capturing of the chin should be maintained.
	Extend the Chest Support Piece to the upper sternum while controlling c-spine and pinch Locking Tabs into the lock position.
	Note: Just as with any other splint, we are simply filling the gaps with all adjustments to custom-fit the XCollar to the patient. There should not be patient manipulation during application.
3. X-STRAPS	
	Using Opposing Forces, deploy, and connect the crossing X-Straps to their corresponding color-coded Velcro anchor points.
	Note: Apply X-Straps through the 4 guides underneath the patient's chin while ensuring to maintain tension on the X-Straps.
<u>Supine Position Application</u>	
1. SETUP	
	Extend the Front and Back Pieces, then unfold and lock the Back Piece into place.
2. ADJUST	
	Slide Back Piece at a 45° angle to midline underneath the patient's shoulder blades while employing a "Push-and-Pull" (Opposing Forces) method.
	Note: "Push & Pull" forces entail pulling up on the clothing as you push in the XCollar. Be sure to place the buckle between the XCollar and the floor to facilitate ease of entry and positioning. Ideally you should come from the patient's right shoulder to prevent head movement.
	Pivot the Back Piece to be in-line with the spine and ensure proper placement of the occipital pad directly under the occipital.
	Note: Look for symmetry of the occipital foam padding on both sides of the patient's head for proper placement and also ensure that the sides of the XCollar are lying directly underneath the patient's earlobes.
	Capture the chin between the Chin Strap and Padding, and proceed to encircling the patient to connect the Buckle to the Buckle Receiver.
	Note: To easily connect the buckle, grab the buckle by the Side Strap and place flat against the XCollar to slide it into the Buckle Receiver.
	Adjust Side Straps to patient circumference using Opposing Forces.
	Note: The first Side Strap adjusted should only reduce the free space around the head since proper tightening will be achieved once the second Side Strap is adjusted to the patient's circumference. As you adjust the circumference, proper capturing of the chin should be maintained.
	Extend the Chest Support Piece to the upper sternum while controlling c-spine and pinch Locking Tabs into the lock position.
	Note: Just as with any other splint, we are simply filling the gaps with all adjustments to custom-fit the XCollar to the patient. There should not be patient manipulation during application.
3. X-STRAPS	
	Using Opposing Forces, deploy, and connect the crossing X-Straps to their corresponding color-coded Velcro anchor points.
	Note: Apply X-Straps through the 4 guides underneath the patient's chin while ensuring to maintain tension on the X-Straps.





<u>Supine Application with Heavy Clothing</u>
1. SETUP
Extend the Front and Back Pieces, then unfold and lock the Back Piece into place.
2. ADJUST
Insert the XCollar between clothing layers and slide Back Piece at a 45° angle to midline underneath the patient's shoulder blade while employing a "Push-and-Pull" (Opposing Forces) method.
Note: You will need to intermittently pull on both layers of clothing while pushing in the XCollar.
Continue proper application as per <u>Supine Application</u> .
<u>In Position of Comfort & Prone Application</u>
Properly complete the XCollar <u>SETUP</u> , then capture the chin, encircle the patient, and connect the Buckle to the Buckle Receiver.
Tighten Lateral Side Strap on the side the patient is facing first and then complete the other Side Strap second.
Extend and lock Adjustable Chest Support asymmetrically ensuring padding has good contact on sternum.
Note: Ensure to obtain firm contact with the upper sternum and press the Locking Tabs to prevent losing the obtained adjustment.
Using Opposing Forces, secure X-Strap on the side the patient is facing first, then follow with the other X-Strap second.
Note: Be sure to maintain tension on the X-Straps during application.
<u>Special Circumstances</u>
Extra-large patients: Be sure to loosen the chin strap and extend the buckle Side Strap past its normal setting.
Note: When you move the Buckle onto the hooks of the Velcro you must ensure there is enough Velcro matting that it will still hold securely.
Small patients: Pre-adjust the Chin Strap to its smallest setting and pre-adjust the right Side Strap (sliding piece) of the XCollar to the smallest setting.
Note: This is a shortcut that will become more evident with experience of what sizes can be pre-adjusted.
Limited access and low-visibility: Applications require familiarity of textured tabs, straps, and confidence obtained with experienced use of the XCollar.
It is up to the provider's discretion to decide to apply the XCollar when treating a patient with severe facial trauma.
Note: If the XCollar cannot be applied without manipulating the patient, follow local protocols and maintain manual c-spine until proper application is possible.
<u>Airway Management</u>
BLS Airway: Loosen the Chin Strap to allow proper sealing of a BVM. Use "EC clamp" holding technique making the E under the XCollar Chin Piece.
ALS Airway: Remove X-Straps, loosen Buckle Side Strap to allow modified Jaw Thrust and proceed with intubation.
Note: For ALS airway management, the goal is to get the chin support of the XCollar away from underneath the chin, so that we may open the patient's airway as needed. Also note that for extra-large patients, it might be required to unclip the Side Strap Buckle to obtain an airway.
After ALS airway is secured retighten XCollar to help maintain a secured airway by minimizing movement of the head.
<u>Head Restraint System Application</u>
Build the correct amount of padding for occipital support to maintain an in-line position, and then stick the pad to the carrying device.
Temporarily detach X-Strap and attach Securing Strap (black side facing down) on the XCollar Velcro anchor points, then reattach the X-Strap and repeat on opposite side.
Attach Securing Straps to the carrying device without applying tension.
Note: If there is too much slack on the Securing Straps, it may be necessary to wrap another loop around the carrying device to adjust properly.
<u>XCollar Removal</u>
<ul style="list-style-type: none">• Undo the X-Straps.• Loosen the Buckle Side Strap.• Unclip and Pivot the Buckle to remove.
<p style="text-align: center;">www.training.xcollar.com</p>





Skills Verification Sheet

Name:	Agency:	Date:
General XCollar Application		
S – A – X Neutral Position Application		
1. SETUP		√
Extends the Side Pieces; Unfolds and Locks the Back Piece.		
2. ADJUST		√
Encircles the patient and connects the Buckle, while maintaining the chin secured between the Chin Strap (front) and Padding (below).		
Adjusts Side Straps to patient circumference using a “push & pull” (Opposing Forces) method.		
Extends the anterior Chest Piece to upper chest without distracting the c-spine and locks it in place.		
3. X-STRAPS		
Deploys the X-Straps, places them between the 4 guides maintaining tension, using a “push & pull” (Opposing Forces) method.		
		√
Attaches the X-Straps to the matching color coded Velcro.		
Ensures the XCollar is securely and properly applied.		
In Position of Comfort & Prone Application		
Properly completes the S-A-X points of General XCollar Application.		
Tightens Lateral Side Strap on the side the patient is facing first and the other Side Strap second.		
		√
Extends and locks Adjustable Chest Support asymmetrically ensuring padding has good contact on upper sternum.		
Secures X-Strap on the side the patient is facing first and then the other X-Strap second.		
Supine Position Application		
Properly completes the S-A-X points of General XCollar Application.		
Slides Back Piece at a 45 degree angle to midline between shoulder blades.		
Pushes on the XCollar and pulls on clothing to properly position Back Support.		
		√
Ensures proper placement of the occipital pad without patient manipulation.		
Airway Management		
Loosens the Chin Strap to allow proper sealing of a BVM mask using “EC clamp” holding technique making the E under the XCollar Chin Piece.		
Demonstrates the steps of removal in reverse application order to allow advanced airway insertion.		
Head Restraint System Application		
		√
Uses the correct amount of padding for occipital region to keep patient in proper in-line position.		
Detaches X-Strap and attaches Securing Strap on the Velcro and reattaches the X-Strap (repeat on opposite side).		
Attaches Securing Straps to the carrying device without pulling tension.		
Evaluator’s Name:		√
<i>By signing this form, the “Evaluator” is verifying that the Provider named at the top of this page has successfully demonstrated all manipulative skills required by this training course and this Skills Verification Sheet in accordance with the manufacturer recommendations. Emegear, LLC may not be held liable for any hands-on skills verification since they are not being verified by manufacturer-approved instructors.</i>		
	Signature:	
	Date:	

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Manipulative Training Standards

Instructor and Operator Manipulative Skills Evaluation Criteria

1. Follow the Operator or the Instructor Manipulative Skills Check List.
2. A minimum of 80% of the total possible score must be obtained in order to pass.
3. Timely application is required in order to demonstrate the student's proper skill level:

The following time limits must be used as a reference to evaluate the students:

- a- XCollar application in Neutral Position with the patient seated. Max time: 1.0 min.
- b- XCollar application in Neutral Position with the patient supine. Max time: 1.5 min.
- c- XCollar application "In Position Found" with the patient supine. Max time: 2.0 min.
- d- XCollar application in Neutral Position supine with heavy clothing. Max time: 3.0 min.
- e- XCollar and Head Restraint System (HRS) application on Spinal Board. Max time: 4.0 min.
- f- Full spinal immobilization with XCollar, HRS and Spinal Board (Straps). Max time: 5.0 min.

Criteria for immediate corrective action:

- a- Uneven bilateral adjustment: if side straps have been adjusted unevenly the student may correct by loosening one side and tightening the other to improve symmetry.
- b- Too much pressure or tension on the straps making the patient uncomfortable: loosening slightly on the straps as necessary would be appropriate.
- c- Chest Piece adjusted down too much: When the Chest Piece (CP) is adjusted downwards the padding must always protect the patient's skin. If the CP has been adjusted too far down the edges of the plastic may apply pressure on the Clavicles. The user may release the locks by holding them up and retracting the chest piece upwards.
- d- If the XCollar has been applied with not enough tension, the level of immobilization obtained is reduced. The user may retighten any of the straps to secure the splint firmly.

Criteria to determine if additional practice is needed prior to completion of final manipulative evaluation:

- a- Chin has not been properly captured between padding and Chin Strap.
- b- Timely application is not achieved (more than 20% over referenced time limit).
- c- Excessive manipulation of the patient during application.
- d- Not being able to demonstrate airway management maneuvers.
- e- Failure to complete the final manipulative evaluation with a minimum score of 80%

