

# DISCRIMINATE SPINAL IMMOBILIZATION

## How Lee County (Fla.) EMS implemented a new paradigm of cervical spine management

By Michael G. Hamel, NREMT-P, CCEMT-P, FP-C

As EMS professionals we're obligated to adhere to the principle of *primum non nocere*—"first, do no harm." But as the EMS industry becomes more protocol driven, the ability to think outside the box is often discouraged. Practices that seem like common sense become less common and, for many providers, the notion of doing no harm can be complex. This notion can be magnified when individuals or departments repeatedly accept a lower standard of performance until that lower standard becomes the normal. This behavior is known as *normalization of deviance*. In EMS, normalization of deviance can be defined as performing de facto procedures that appear to be absent of harm or deemed safe by tradition when in fact they are not. Providers end up performing "automatic" procedures that may not be beneficial or may have undesirable patient outcomes.

This is especially true for spinal immobilization procedures. For example, applying a cervical collar (C-collar) and strapping an 85-year-old kyphotic patient to a long spine board, when the only examination finding is a scalp laceration secondary to a ground level trip-and-fall, may not be the best course of action.

Likewise, fully immobilizing an altered mental status patient with a closed head injury who has a stomach full of alcohol and suboptimal airway protective reflexes may also be a poor choice treatment modality. For

more than 30 years, EMS professionals in the United States have settled for spinal immobilization techniques that have been supported by little to no evidence, but now some systems are calling the techniques into question.

### IMPROVING IMMOBILIZATION

In late 2011, Lee County Public Safety/EMS (LCEMS) located in Fort Myers, Fla., set out to reduce iatrogenic insult caused by traditional immobilization practices. LCEMS first examined the C-collars used in the system to determine if any weaknesses could

be identified. The agency found that the deployed collar was inadequate in terms of its ability to splint a patient's cervical spine (C-spine) and restrict overall head movement.

A group of experienced paramedics further discovered that patient's lateral head movement, although limited, wasn't rendered immobile. The team also noted the traditional collar created an inadvertent "wedge" space between the patient's head and torso in most cases.

Although the conclusion of this wedge could not be studied thoroughly in the out-of-hospital environment, it was clear to the team the wedge had the potential to create C-spine distraction—obviously counterproductive to the patient suspected of having a vertebral or spinal cord injury.

The agency then examined other collars on the market to evaluate their ability to splint the C-spine. None of them were found to be better than the collar already in use. Discouraged but not defeated, the team continued to research alternatives and eventually discovered the XCollar by Emegear. The XCollar, with its unique C-spine splinting capability, immediately caught the agency's attention. But for various reasons unassociated to the project, the XCollar was not fully appreciated, and was ultimately placed in a drawer.

### NEW DEVICE, NEW GUIDELINE

In mid-2012, amid continued pressure from team members determined to continue the quest for clinical excellence in spinal immobilization, representatives from Emegear were asked to visit Fort Myers to present the XCollar. The presentation was well received. The XCollar's ability to splint the C-spine became more impressive to our team.



The XCollar secures the patient's head to the torso above C-1 and below C-7 on two points anterior and posterior. Photo courtesy Lee County EMS.

The team clearly able to appreciate how the head of a patient is splinted to the torso above C-1 and below C-7 on two points anterior and two points posterior. This engineering noticeably prevents cervical spine distraction while completely restricting head movement.

Now fully engaged, the team went back to work. First garnering the support of the Lee County medical director, the team then sought the backing of the Lee Memorial Hospital Trauma Services Manager. The XCollar was demonstrated to the trauma, neurosurgical, orthopedic and emergency services at Lee Memorial Hospital.

The hospital parties were supportive of the project and deemed the device to be a better method of cervical splinting. Additionally, the ED staff members expressed their optimism with the project—it was a way to reduce ED overcrowding.

The hope was that “fully immobilized” patients who previously required a bed could be sent to triage with this new device in place. This wasn’t only attractive to the ED, but also gave way to the hope that EMS units could return to service faster.

Simultaneous to this effort, our team labored to incorporate the new C-spine splinting concepts in a clinical guideline that would reduce the application of long spine boards and other extrication devices in patients who didn’t warrant such devices. The protocol was drafted and approved in the summer of 2012.

This guideline, for the first time in LCEMS history, would allow the field provider, based upon the patient’s clinical presentation and exam, to forgo full immobilization methods in favor of an evidence-based, XCollar-only controlled extrication or immobilization. In other words, the agency would break away from the dogmatic and de facto spinal immobilization practices of the past and embark on a new clinical paradigm: C-spine splinting and discriminate spinal immobilization.

### FIELD TESTING

In September 2012, LCEMS conducted the discriminate spinal immobilization field trial. The field trial lasted six-months and was performed by the department’s field training officers (FTOs) following a four-hour in-service. The in-service training for the field trial was provided by the manufacturer and included both didactic and practical sessions.

The department, supported by several position statements<sup>1,2</sup> and a large study on spinal immobilization deficiencies,<sup>3</sup> worked diligently to overcome the skepticism of a long-standing “past practice” that anyone in a motor vehicle crash or a victim of a fall needed to be fully immobilized.

Remaining open-minded and with a high degree of confidence in the science, the medical director continually expressed his overwhelming desire to improve patient outcome through evidence-based, goal-directed spinal immobilization care. This would ultimately serve as the foundation for the procedure in place today.

### PROTOCOL APPROVAL

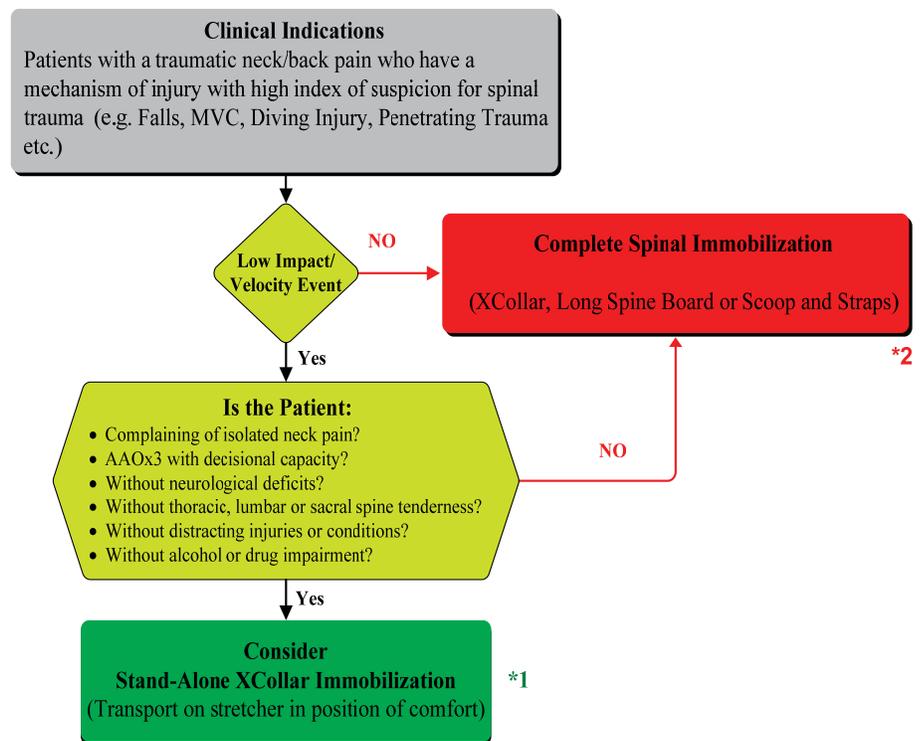
With the field trial complete, the team gained the approval from the Lee County Protocol Committee in February 2013. In

March 2013, the Lee County Medical Care Council unanimously approved the “XCollar and Discriminate Spinal Immobilization Guideline.” (See Figure 1.) The guideline went live in the third quarter of 2013.

Emegear returned to Lee County following the field trial and provided XCollar factory training, offering several sessions every day for a three-week period. This training touched over 250 field providers and 24 EMS supervisors.

More than 300 primary providers in the county were trained. When factory training was complete, the LCEMS Field Training Supervisors and FTOs—using the agency’s Mobile Simulation Lab—made rounds to the various fire districts and hospitals to educate their respective staffs.

At the April 2013 LCEMS in-service, the training department presented a lecture on



**PEARLS**

\*1 XCollar is a unique cervical splinting system designed to splint the Cervical Spine by securing the head to the torso of the patient above C-1 and below C-7; on two points anterior and two points posterior. The splinting system utilizes bilateral and vertical adjustments to obtain a customized fit for both the desired circumference and height of large adults and pediatric patients; working to increase patient safety by minimizing potential Cervical Spinal distraction and injury.

\*2 XCollar has an Integrated Head Restraint System (HRS), which replaces the use of head blocks, towels or tape. KED and HID are not required and can be deferred when using the XCollar.

**XCollar Guideline—Discriminate Spinal Immobilization Courtesy Lee County EMS**

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the new cervical spine splinting paradigm, discriminate spinal immobilization guideline and the intra-county collaborative. In addition to discussing the initiative, EMTs and paramedics were able to practice their newfound knowledge in a large-scale practical session. As with the previous training sessions, the members were engaged and expressively grateful for the opportunity to be on the cutting edge of evidence-based medicine in the world of C-spine splinting.

On May 1, 2013, LCEMS went live, ahead of schedule, with the countywide discriminate spinal immobilization procedure. Although early in the data collection, this cultural shift appears to be successful in terms of doing no harm. No red flags or under-triaged patients have been identified or reported by our hospital partners. Furthermore, a retrospective chart review over the first four months since implementation has demonstrated an 88% decrease in the use of the KED and a 56% decrease in the use of long spine boards.

Although these numbers are promising, the positive feedback received from the field providers is even more encouraging. In other words, the standalone XCollar application is fast becoming the standard of care in Lee County for low impact/low velocity traumatic events.

“Lee County EMS prides itself in providing evidence-based, current, and best practice prehospital medicine,” says medical director Joseph D. Lemmons, DO, FACOEP, FACCWS. “I have been most impressed with the revolutionary cervical spine splinting device developed by Emegear. The early data regarding the acceptance and appreciation of the XCollar by hospitals and prehospital providers has been favorable.”

Lee County Public Safety/EMS remains committed to achieving clinical excellence in spinal immobilization and other areas where evidence-based medicine encourages innovation. **JEMS**

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### ABOUT LEE COUNTY PUBLIC SAFETY/EMS (LCEMS)

LCEMS is a Florida-certified ground ALS provider. Lee County paramedics and EMTs provide care on-scene and during transport to the most appropriate medical facility in Southwest Florida. LCEMS covers more than 1,000 square miles, including 75 islands that dot the coastline. LCEMS currently operates 36 ALS transport ambulances, two ALS non-transport units and six ALS district supervisors. In 2012, LCEMS was dispatched to more than 83,000 emergency calls. LCEMS has for 20 years provided an ongoing comprehensive training program for its employees. The training incorporates every aspect of medical specialties common to prehospital emergency medical care. Visit the LCEMS website at [www.safelee.org](http://www.safelee.org).