**Date:** 1/18/2018  |  **Presenter Name:** Heidi Goddard  

**Article Citation:** Asymptomatic cervical spine fractures: current guidelines can fail older patients. Healy CD, Spilman SK, King BD, Sherrill JE 2nd, Palaez CA. J Trauma Acute Care Surgery. 2017 Jul;83(1):119-125.

**Country(ies):** USA  

**Funding Source(s):** X None Stated

---

### Purpose

**Research Question(s):** X None Stated  

**Hypotheses:** X None Stated

**Study Purpose:**
To investigate the association of neck pain and cervical spine fractures. They investigated if trauma patients aged 55 years or older with known c-spine fractures report pain on presentation or clinical examination.

---

### Methods

**Study Design:** retrospective study

**Outcome(s) [or Dependent Variable]:**

**Intervention [or Independent Variable]:**

**Ethics Review:** X IRB Review  

**Research Setting:** Level 1 adult trauma center in the Midwest at a medium-sized city

**Study Subjects:** All patients aged 55 years or older with a c-spine fracture who presented from March 2012 to February 2016.

**Inclusion Criteria:** Patients had to have an acute fracture of C1-C7.

**Exclusion Criteria:** Patients were excluded if they had a GCS <15, if there were any neurologic deficits, if they had dementia, if they were intoxicated, or if documentation was unavailable prior to CT.

**Study Interventions: n/a**

**Study Groups:** Patients with acute c-spine fractures were separate into two groups:
1. symptomatic, if they had pain documented in the history, review of systems, or on physical exam. If documentation was unclear, patients were considered symptomatic.
2. asymptomatic, if they denied pain and had no tenderness on exam

**Instruments/Measures Used:**

**Data Collection:** Data was collected via chart review of an electronic medical record using a standardized data abstraction form.

**Data Analysis:** Analyses were performed with IBM SPSS Basic Statistics for Windows, version 20.0. Descriptive statistics were examined and reported for continuous data as medians and interquartile ranges;
categorical data were reported as counts and percentages. All statistical tests were two-tailed and based on a 0.5 significance level. Differences between medians were assessed using the Kruskal-Wallis one-way analysis of variance. Differences between nominal variables were assessed using the $X^2$ test.

A priori sample size calculation? □ Yes □ No □ Not Described □ N/A

Statistical analyses used:

Adjustment for potential confounders? □ Yes □ No □ Not Described □ N/A

If yes, list:

Results

Study participants:
2390 patients were age 55 and older with GCS 15, and 1071 (45%) had C-spine imaging. 183 patients (17%) had a c-spine fracture, and 173 (16%) met study criteria. Groups did not differ statistically in terms of sex, age, mechanism of injury, presence of DJD or mortality. More than half were transferred from an outside hospital.

Brief answers to research questions [key findings]:
36 of the 173 patients (21%) were asymptomatic. This was associated with a 79.2% sensitivity (CI 72.4-85) and 59.6% specificity (56.3-62.8). Neck pain had a positive predictive value of 27.6% (CI 25.5-29.9).

In summary: One fifth of pts 55 years and older with a c-spine fracture reported no pain on initial presentation and denied tenderness to palpation on examination – abundance of caution when evaluating older trauma patients

Additional findings:
- Patients without neck pain had a higher median ISS (p=0.001) and longer hospitalization (7 vs 5 days, p=0.008).
- 2/3rds of asymptomatic patients had an injury in another body region (significantly more thoracic or abdominal injuries). Authors note they suspect this distracted from neck pain, but was not tested.
- more than 1/3rd of patients had c-spine fractures at more than one level (not statistically different between the two groups)
- most frequent type across both groups was odontoid (not statistically significant)
- age group most likely to report pain was 75 to 84 (83%), but even the youngest group reported no pain 21% of the time
- 22% of symptomatic patients and 19% of asymptomatic patients required surgical intervention (not statistically different).

Limitations:
The study was limited by imperfect charting. It was also limited in that it required retrospective collection of data. No comparison to younger patients.

Clinical Implications

Applicable?
Feasible?
Clinically relevant?
Comments: Yes, I will be more cautious when examining older patients and also be more liberal with CT imaging. It think this is feasible to implement.
### Level of evidence generated from this study

- **Ia**: evidence obtained from meta-analysis of randomized controlled trials
- **Ib**: evidence obtained from at least one randomized controlled trial
- **IIa**: evidence obtained from at least one well-designed, controlled study without randomization
- **IIb**: evidence obtained from at least one other type of well-designed quasi-experimental study
- **III**: evidence obtained from a well-designed, non-experimental study
- **IV**: expert committee reports; expert opinion; case study; case report

### Additional Comments/Discussion/Notes