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Head Office: Level 9, 51 Druitt Street, Sydney NSW 2000, Australia Ph: +61 2 9268 9777 Email: ranzcr@ranzcr.com
New Zealand Office: Floor 6, 142 Lambton Quay, Wellington 6011, New Zealand Ph: +64 4 472 6470 Email: nzbranch@ranzcr.com
Web: www.ranzcr.com ABN 37 000 029 863

Acute Low Back Pain (ALBP) due to Fracture

Algorithm:

Diagnostic accuracy of recommended "red flag" questions for detecting spinal fracture in the 1,172 patients with acute low back pain*

Red flag question	No. (%) red flag positive	Sensitivity (%)	Specificity (%)	Positive LR (95% CI)	Negative LR (95% CI)
Age >70 years	56 (4.8)	50	96	11.19 (4.65-19.48	0.52 (0.23 – 0.82)
Significant trauma (major in young, minor in elderly)	31 (2.6)	25	98	10.03 (2.76-26.36)	0.77 (0.42 – 0.95)
Prolonged use of corticosteroids	8 (0.7)	25	100	48.50 (11.62-165.22	0.75 (0.41 – 0.93)
Sensory level (altered sensation from trunk down)	19 (1.6)	0	98	0.00 (0.00-21.01)	1.02 (1.02 – 1.03)
Clinical diagnosis of fracture	7 (0.6)	50	100	194.00 (52.10-653.61)	0.50 (0.22 – 0.79)

* LR = likelihood; 95% CI = 95% confidence interval.

Diagnostic rule to identify vertebral fracture*

	Criteria for a positive test		
	1 positive feature	≥2 positive features	≥3 positive features
Sensitivity, %	88	63	38
Specificity, %	50	96	100
Positive LR (95% CI)	1.8 (1.1-2.0)	15.5 (7.2-24.6)	218.3 (45.6-953.8)
Post-test probability of vertebral fracture, (%)			
Pre-test probability 0.5%	1	7	52
Pre-test probability 3%	5	32	87

* Four features were included in the rule: female sex, age >70 years, significant trauma (major in young patients, minor in elderly patients), and prolonged use of corticosteroids.
LR = likelihood ratio; 95% CI = 95% confidence interval

Inclusions:

- Adults (>18 years); AND
- Patients presenting to primary care practitioners about acute low back pain

Exclusions:

- None

Summary Statement:

Henschke et al studied adults with ALBP drawn from 170 Australian primary care practitioners (including 73 general medical practitioners, 77 physiotherapists, and 30 chiropractors). This study attempted to create CDRs that would help primary care practitioners identify patients at increased risk of one of the five "serious" causes of ALBP. However, due to the very low prevalence of these five conditions in a primary care patient cohort, valid information only about risk factors for spinal fracture was obtained. The following clinical findings were associated with vertebral fracture:

1. Prolonged use of corticosteroids
2. Age > 70
3. Trauma involving the lower back (minor in the elderly, major in the young)
4. Female gender

When at least 1 of these features was positive, the positive LR was 1.8 (95% CI 1.1–2.0). With at least 2 positive features, the positive LR increased to 15.5 (95% CI 7.2–24.6), and with 3 positive features it increased to 218.3 (95% CI 45.6–953.8). If we presume a pre-test probability of vertebral fracture of ~1% you can use a nomogram to see that it is only when two or more of the features are present that the post-test probability becomes sufficiently high to consider imaging on the initial presentation. When only one feature is present and the pre-test probability is ~1% the post-test probability only rises to ~2%.

This decision tool requires validation in another general practice population and may not be applicable to emergency department and hospital patients.

This list of risk factors represents a type of CDR. In the 8 patients in this study who had fractures as the cause for their low back pain, 1 of the 8 (12.5%) had none of the 4 risk factors. This CDR is a helpful guide in identifying patients who are at greater than average risk of spinal fracture as the cause of their ALBP.

However, some caution needs to be exercised when using this CDR in practice for the following reasons:

1. The CDR (comprised of these risk factors) remains to be externally validated.
2. It is unclear whether the elements of the CDR would work just as well in a hospital inpatient or emergency department population.
3. Finally, it is important to note that 1 of the 8 patients with a final diagnosis of spinal fracture did not have any of the 4 clinical features listed above. Hence, it may be that the presence of risk factors other than those evaluated by the study would improve the sensitivity of the CDR.

Reference:

Henschke N, Maher C, Refshauge K, Herbert R, Cumming R, Bleasel J, et al. Prevalence of and screening for serious spinal pathology in patients presenting to primary care settings with acute low back pain. *Arthritis Rheum*. 2009; 60(10): 3072-80.