

Management of low back pain in Australian emergency departments

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Supplementary file 1. SNOMED CT-AU (EDRS) codes related to low back pain presentations

Description	Codes
Low back pain with non-specific cause	
Acute low back pain (finding)	278862001
Back pain complicating pregnancy (disorder)	91957002
Backache (finding)	161891005
Blunt injury to back (disorder)	424270008
Chronic back pain (finding)	134407002
Chronic low back pain (finding)	278860009
Coccyx sprain (disorder)	209571002
Complaining of low back pain (finding)	161894002
Degeneration of lumbar intervertebral disc (disorder)	26538006
Displacement of lumbar intervertebral disc without myelopathy	20021007
Exacerbation of backache (finding)	135860001
Low back pain (finding)	279039007
Low back strain (disorder)	300956001
Lower back injury (disorder)	282766005
Lumbar spondylosis (disorder)	239880009
Lumbar sprain (disorder)	209565008
Mechanical low back pain (finding)	279040009
Pain in the coccyx (finding)	34789001
Sacral back pain (finding)	61486003
Spasm of back muscles (finding)	203095000
Sprain of ligament of lumbosacral joint (disorder)	209548004
Stiff back (finding)	249921008
Strain of back muscle (disorder)	262965006
Strain of tendon of back (disorder)	262975009
Low back pain with neurological signs and symptoms	
Acute back pain with sciatica (finding)	247366003
Acute sciatica (disorder)	307176005
Chronic sciatica (disorder)	307177001
Injury of lumbar nerve roots (disorder)	24300005
Injury of sciatic nerve (disorder)	86269002
Lumbago with sciatica (finding)	202794004
Lumbago-sciatica due to displacement of lumbar intervertebral disc (disorder)	46960006
Lumbar disc prolapse with radiculopathy (disorder)	202735001
Lumbar radiculopathy (disorder)	128196005
Sciatica (disorder)	23056005
Spinal stenosis of lumbar region (disorder)	18347007
Low back pain due to serious pathology	
Abscess of back (disorder)	309083007
Abscess of back, except buttock (disorder)	19284003
Cauda equina syndrome (disorder)	192970008
Closed fracture lumbar vertebra (disorder)	207957008
Collapse of lumbar vertebra (disorder)	308758008
Compression fracture of lumbar spine (disorder)	426646004
Concussion and edema of lumbar spinal cord (disorder)	212360005
Contusion of back (disorder)	11437003
Contusion of lower back (disorder)	284062002
Crush fracture of lumbar vertebra (disorder)	281933002
Disc prolapse with myelopathy (disorder)	202728009
Discitis (disorder)	2304001
Fracture of coccyx (disorder)	125871005
Fracture of lumbar spine (disorder)	125608002

Fracture of lumbar spine and/or pelvis (disorder)	207986006
Injury of cauda equina (disorder)	230614002
Lumbar disc prolapse with myelopathy (disorder)	202731005
Multiple fractures of lumbar spine and/or pelvis (disorder)	207993005
Open dislocation of coccyx (disorder)	44237008
Open fracture of lumbar vertebra with spinal cord injury	48956000
Open fracture of sacrum AND/OR coccyx with spinal cord	65491009
Traumatic dislocation of joint of lumbar vertebra (disorder)	129166009

SNOMED CT-AU (EDRS), Systematized Nomenclature of Medicine – Clinical Terms – Australian Version (Emergency Department Reference Set).

Supplementary file 2. Frequency (%) of diagnoses of disorders beyond the lumbar spine (n = 7,631) and percentage (%) in relation to the total number of ED presentations (n = 14,024)

Diagnoses	Frequency	%
Renal disorders	2644	18.85%
Flank pain	896	6.39%
Spinal conditions with generic diagnostic codes	757	5.40%
Other musculoskeletal conditions	652	4.65%
Abdominal disorders	504	3.59%
Urinary tract disorders	315	2.25%
Gastrointestinal disorders	237	1.69%
Falls	199	1.42%
Other fractures	198	1.41%
Respiratory system disorders	162	1.16%
Chest wall pain	135	0.96%
Did not wait for treatment	106	0.76%
Skin disorders	76	0.54%
Motor vehicle accident	60	0.43%
Herpes zoster	52	0.37%
Reproductive system disorders	47	0.34%
Neurological condition	46	0.33%
Heart condition	36	0.26%
Viral disease	36	0.26%
Cancer	35	0.25%
Psychiatric disorders	32	0.23%
Appendicitis	25	0.18%
Vascular disorders	24	0.17%
Drug-related disorders	22	0.16%
Systemic infection	20	0.14%
Fever	19	0.14%
Alcohol-related problem	17	0.12%
Anal-related disorders (fissure, spasm, hemorrhage, etc.)	16	0.11%
Generally unwell	16	0.11%
Post-operative related disorders	15	0.11%
Pregnancy	15	0.11%
Rheumatic conditions	15	0.11%
Hematoma	14	0.10%
Liver condition	13	0.09%
No disease	13	0.09%
Diarrhea and vomiting	12	0.09%
Infectious disorders beyond the lumbar spine	12	0.09%
Anemia	10	0.07%
Electrolyte imbalance	10	0.07%
Physical assault	9	0.06%
Generalized weakness (asthenia and cachexia) and lethargy	8	0.06%
Left against medical advice	8	0.06%
Syncope	7	0.05%
Benign paroxysmal positional vertigo	6	0.04%
Cellulitis	6	0.04%

Hematological	6	0.04%
Cloud consciousness	5	0.04%
Social problem	5	0.04%
Complication of catheter	4	0.03%
Dehydration	4	0.03%
Edema	4	0.03%
Insect bite	4	0.03%
Nausea	4	0.03%
Osteomyelitis	4	0.03%
Cramp	3	0.02%
Eye disorders	3	0.02%
Prostate disorders excluding cancer	3	0.02%
Dizziness	2	0.01%
Lymphatic condition	2	0.01%
Orthostatic hypotension	2	0.01%
Pelvic mass	2	0.01%
Spinal fracture (uncertain where)	2	0.01%
Avascular necrosis of bone	1	0.01%
Diabetes mellitus	1	0.01%
Facial swelling	1	0.01%
Further opinion sought	1	0.01%
Hypoxia	1	0.01%
Jaundice	1	0.01%
Lactose intolerance	1	0.01%
Malaria	1	0.01%
Noncompliance with therapeutic regimen	1	0.01%
Numbness	1	0.01%
Nutritional disorder	1	0.01%
Splenomegaly	1	0.01%
Swelling	1	0.01%
Tinnitus	1	0.01%
Victim of trauma	1	0.01%

Supplementary file 3. Medication list as per the ATC Classification System.

Group	ATC code
Analgesics	N02B
Antidepressants	N06A
Antiepileptics	N03A
Non-steroidal anti-inflammatory	
Anti-inflammatory and antirheumatic products, non-steroids	M01A
Anti-inflammatory preparations, non-steroids for topical use	M02AA
Benzodiazepines derivatives and related drugs	N03AE, N05BA, N05CD, N05CF
Corticosteroids for systemic use	H02
Opioids	
Opioid anesthetics	N01AH
Opioids	N02A
Opioids in combination with non-opioid analgesics	N02AJ
Muscle relaxants	M03

ATC, Anatomical Therapeutic Chemical

Supplementary file 4. Number (%) of different types of opioids used in the ED (n= 2539)

Opioids, n (%)	Non-specific LBP (n = 2104)	Radicular LBP (n = 311)	Serious spinal pathology (n = 124)	Total (n = 2539)
Opioid anesthetics (N01AH)				
Fentanyl	39 (1.83)	5 (1.60)	3 (2.38)	47 (1.83)
Opioids (N02A)				
Buprenorphine	16 (0.76)	4 (1.29)	2 (1.61)	22 (0.87)
Codeine	20 (0.95)	2 (0.64)	0 (0.0)	22 (0.87)
Dextropropoxyphene hydrochloride	1 (0.05)	0 (0.0)	0 (0.0)	1 (0.04)
Hydromorphone	11 (0.52)	1 (0.32)	2 (1.61)	14 (0.55)
Methadone	7 (0.33)	0 (0.0)	0 (0.0)	7 (0.28)
Morphine	216 (10.27)	20 (6.43)	21 (16.94)	257 (10.1)
Oxycodone	1167 (55.5)	205 (65.9)	64 (51.6)	1436 (56.6)
Tramadol	54 (2.57)	6 (1.93)	2 (1.61)	62 (2.44)
Opioids in combination with non-opioid analgesics (N02AJ)				
Oxycodone-Naloxone	86 (4.09)	18 (5.79)	3 (2.42)	107 (4.21)
Paracetamol-Codeine	280 (13.3)	41 (13.2)	10 (8.06)	331 (13.0)

Supplementary file 5. Factors associated with arriving by ambulance (n = 5986)

Characteristics	OR (95% CI)	P-value
Gender (male)	0.91 (0.81 to 1.02)	0.12
Age (≥ 65)	2.84 (2.52 to 3.20)	0.0001
Socioeconomic status (1-10, 1 denotes lower socioeconomic status)	1.04 (1.01 to 1.06)	0.0001
Representation within 48 hours (yes)	1.03 (0.58 to 1.84)	0.89
Presentation during working hours (yes)	0.78 (0.69 to 0.87)	0.0001
Triage category (5, less urgent)		
2	6.33 (3.47 to 11.54)	0.0001
3	3.46 (2.19 to 5.47)	0.0001
4	2.48 (1.58 to 3.90)	0.0001
Lumbar spine condition (non-serious LBP)	1.02 (0.77 to 1.34)	0.86

Supplementary file 6. Factors associated with of any lumbar spine imaging (n = 5986)

Characteristics	OR (95% CI)	P-value
Gender (male)	0.85 (0.75 to 0.96)	0.01
Age (≥ 65)	1.79 (1.56 to 2.04)	0.0001
Socioeconomic status (1-10, 1 denotes lower socioeconomic status)	1.01 (0.99 to 1.04)	0.21
Arrived by ambulance (yes)	1.36 (1.19 to 1.56)	0.0001
Representation within 48 hours (yes)	0.74 (0.37 to 1.47)	0.39
Presentation during working hours (yes)	1.18 (1.03 to 1.34)	0.01
Triage category (5, less urgent)		
2	4.72 (2.26 to 9.87)	0.0001
3	3.58 (1.95 to 6.57)	0.0001
4	3.06 (1.68 to 5.59)	0.0001
Lumbar spine condition (non-serious LBP)	0.53 (0.40 to 0.70)	0.0001
ED length of stay (hours)	1.17 (1.14 to 1.20)	0.0001

Supplementary file 7. Factors associated with use of opioids (n = 2395)

Characteristics	OR (95% CI)	P-value
Gender (male)	1.07 (0.89 to 1.30)	0.42
Age (≥ 65)	1.04 (0.84 to 1.29)	0.68
Socioeconomic status (1-10, 1 denotes lower socioeconomic status)	1.03 (0.99 to 1.07)	0.06
Arrived by ambulance (yes)	1.33 (1.06 to 1.66)	0.01
Representation within 48 hours (yes)	0.87 (0.34 to 2.18)	0.76
Presentation during working hours (yes)	0.81 (0.67 to 0.98)	0.03
Triage category (5, less urgent)		
2	5.71 (1.97 to 16.50)	0.001
3	6.72 (3.20 to 14.10)	0.0001
4	4.62 (2.24 to 9.54)	0.0001
Lumbar spine condition (non-serious LBP)	1.65 (1.07 to 2.55)	0.022
ED length of stay (hours)	1.39 (1.31 to 1.48)	0.0001

Supplementary file 8. Factors associated with admission to hospital (n = 5986)

Characteristics	OR (95% CI)	P-value
Gender (male)	0.74 (0.63 to 0.87)	0.0001
Age (≥ 65)	3.05 (2.59 to 3.59)	0.0001
Socioeconomic status (1-10, 1 denotes lower socioeconomic status)	0.97 (0.94 to 1.0)	0.169
Arrived by ambulance (yes)	2.98 (2.53 to 3.51)	0.0001
Representation within 48 hours (yes)	2.07 (1.03 to 4.13)	0.03
Presentation during working hours (yes)	1.74 (1.48 to 2.05)	0.0001
Triage category (5, less urgent)		
2	3.73 (1.48 to 9.38)	0.005
3	2.99 (1.37 to 6.48)	0.006
4	1.83 (0.84 to 3.95)	0.12
Lumbar spine condition (non-serious LBP)	0.23 (0.17 to 0.32)	0.0001
ED length of stay (hours)	1.41 (1.37 to 1.46)	0.0001