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Care delivery models for chronic pain

Appendices

October 2021

NSW GOVERNMENT

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Contents

Appendix 1: Data methods

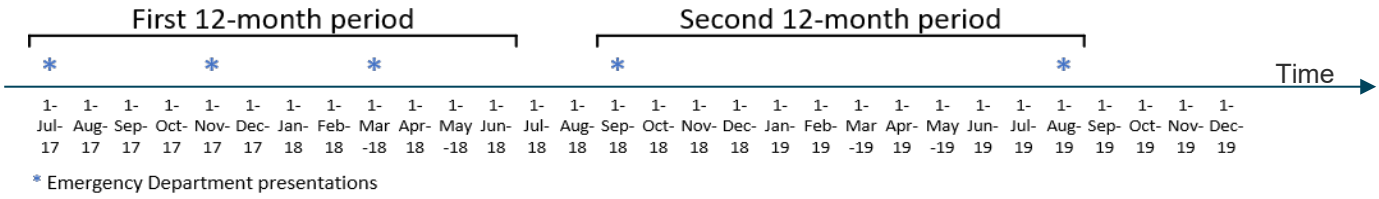
Quantitative data were drawn from:

- NSW Emergency Department Data Collection (EDDC) and (APDC), accessed via the Hospital Performance Dataset (HoPeD), NSW Ministry of Health Secure Analytics for Population Health Research and Intelligence. HoPeD was established under clause 17(2) of the Health Administration Regulation 2017. HoPeD comprises linked administrative data on emergency department presentations, inpatient admissions, and deaths, and was prepared by the Centre for Health Record Linkage (CHeReL).[1]
- Patient Outcomes in Pain Management 2019 Mid Year Report, Electronic Persistent Pain Outcomes Collaboration (ePPOC), University of Wollongong.[2]

Emergency department (ED) presentations for chronic pain were identified using a selection of codes from the International statistical classification of diseases and related health problems, 10th revision, Australian modification (ICD-10-AM) and from the Systematized nomenclature of medicine – Clinical terms – Australian version (SNOMED CT-AU) (Table 1 and Table 2). ICD-10-AM codes were mapped to the ICD-9-CM classification system to account for the fact that some EDs were using ICD-9-CM in the earlier years of the analysis. ICD-10-AM and SNOMED CT-AU codes were grouped into chronic pain categories based on the new ICD-11 classification system. ED presentations for chronic pain were identified based on the principal diagnosis, which is the diagnosis or condition established after assessment to be responsible for the person presenting to the ED.

To identify people with chronic pain who attended an ED frequently, we created 12-month periods of ED presentations, not constrained to a calendar or financial year. Anyone who presented to an ED seven or more times within a 12-month period, with at least three of those presentations noting a chronic pain-related principal diagnosis code (Table 1 and Table 2), was classified as having chronic pain and attending an ED frequently. To create the 12-month periods, we identified the first ED presentation by a person (the index presentation) and looked forward 12 months to calculate the total number of presentations in that 12-month period. The person's next 12-month period commenced at their next ED presentation after the end of the previous 12-month period. Each 12-month period was assigned to the financial year in which it started. For example, if someone presented to an ED five times on 1 July 2017, 1 November 2017, 1 March 2018, 1 September 2018 and 1 August 2019, they would have two 12-month periods of ED presentations. Their first 12-month period starts at their first ED presentation on 1 July 2017 and ends on 30 June 2018, includes three presentations, and is assigned to the financial year 2017-18. Their second 12-month period starts on 1 September 2018 (their first ED presentation *after* the end of their previous 12-month period) and ends on 31 August 2019, includes two presentations, and is assigned to the financial year 2018-19 (Figure 1).

Figure 1: Creation of 12-month periods of emergency department presentations



A threshold of seven or more ED presentations within 12 months was used based on literature examining where patient characteristics diverge.[3] This threshold was also used in a NSW patient-based study examining whether frequent attendance recurred in subsequent years.[4]

For ED trend data, analysis was restricted to 82 public EDs in NSW that reported continuously and collected reasonably complete diagnosis information since 2009-10. In 2018-19, these 82 EDs accounted for approximately 85% of all NSW public hospital ED activity. For ED data in 2018-19, all NSW public EDs in the EDDC were included.

ED analysis was also restricted to unplanned presentations to avoid capturing ED presentations for chronic pain that were planned or pre-arranged. Unplanned presentations are defined as a presentation type of 'emergency', 'unplanned return visit for continuing condition', 'person in transit', 'dead on arrival', 'disaster', and 'current admitted patient'. Planned presentations are defined as a presentation type of 'return visit – planned', 'outpatient clinic', 'privately referred, non-admitted person', 'pre-arranged admission: without ED workup', 'pre-arranged admission: with ED workup'. In 2018-19, unplanned presentations accounted for about 97% of all ED presentations.

Admitted patient episodes for chronic pain were identified using a selection of codes from ICD-10-AM (Table 1). Admitted patient episodes for chronic pain were identified based on the principal diagnosis.

ED presentations and admitted patient episodes for opioid harm were identified based on ICD-10-AM and SNOMED CT-AU codes provided in an Australian Institute of Health and Welfare report on opioid harm.[5] Some additional codes were added following clinical code review (Table 3).

Data limitations

In ED data, diagnoses are recorded by medical, nursing or clerical personnel at the point of care, by keyword searching or selecting from tables of limited diagnoses. These personnel are not trained in clinical coding and there may be variation across EDs in coding practices. An analysis of ED data at Northern Sydney Local Health District (LHD) found that a substantial number of ED presentations with a chronic pain-related presenting problem did not receive a chronic pain-related principal diagnosis. Among a sample of about 6,500 ED presentations with a chronic pain-related presenting problem, about 55% were coded with a chronic-pain related principal diagnosis code.

ED presentations for chronic pain may be underestimated in this analysis, where only principal diagnosis codes were available. ED presentations for chronic pain are likely undercounted where the underlying condition was coded as the principal diagnosis (e.g. Crohn's disease) rather than the chronic pain symptom. This limitation requires further investigation but is not in scope for this report. Northern Beaches Hospital opened in October 2018, but its data is not included in the EDDC. The impact of this on the results was found to be small (Appendix 5).

Table 1: Chronic pain-related diagnosis codes, International Statistical Classification of Diseases and Related Health Problems, 10th revision, Australian modification (ICD-10-AM), with additional mapping to ICD-9-CM and ICD-11

ICD-10-AM code	Description	ICD-9-CM map	Category (ICD-11)
F45.4	Persistent somatoform pain disorder	307.80, 307.89	Chronic primary pain
G43.0	Migraine without aura [common migraine]	346.10, 346.11	Chronic headache and orofacial pain
G43.1	Migraine with aura [classical migraine]	346.00, 346.01	Chronic headache and orofacial pain
G43.3	Complicated migraine	346.80, 346.81	Chronic headache and orofacial pain
G43.8	Other migraine	346.80, 346.81	Chronic headache and orofacial pain
G43.9	Migraine, unspecified	346.90, 346.91	Chronic headache and orofacial pain
G44.0	Cluster headache syndrome	784.0	Chronic headache and orofacial pain
G44.1	Vascular headache, not elsewhere classified	784.0	Chronic headache and orofacial pain
G44.2	Tension-type headache	307.81	Chronic headache and orofacial pain
G44.3	Chronic post traumatic headache	784.0	Chronic headache and orofacial pain
G44.4	Drug-induced headache, not elsewhere classified	784.0	Chronic headache and orofacial pain
G44.8	Other specified headache syndromes	784.0	Chronic headache and orofacial pain
G50.1	Atypical facial pain	350.2	Chronic primary pain
G54.6	Phantom limb syndrome with pain	353.6	Chronic neuropathic pain
G58.10	Complex regional pain syndrome type I, unspecified site	337.20	Chronic primary pain
G58.11	Complex regional pain syndrome type I, upper limb	337.21	Chronic primary pain
G58.12	Complex regional pain syndrome type I, lower limb	337.22	Chronic primary pain
G58.19	Complex regional pain syndrome type I, other specified site	337.29	Chronic primary pain
K86.0	Alcohol-induced chronic pancreatitis	577.1	Chronic visceral pain
K86.1	Other chronic pancreatitis	577.1	Chronic visceral pain
M25.50	Pain in a joint, multiple sites	719.49	Chronic musculoskeletal pain
M25.51	Pain in a joint, shoulder region	719.41	Chronic musculoskeletal pain
M25.52	Pain in a joint, upper arm	719.42	Chronic musculoskeletal pain
M25.53	Pain in a joint, forearm	719.43	Chronic musculoskeletal pain
M25.54	Pain in a joint, hand	719.44	Chronic musculoskeletal pain
M25.55	Pain in a joint, pelvic region and thigh	719.45	Chronic musculoskeletal pain
M25.56	Pain in a joint, lower leg	719.46	Chronic musculoskeletal pain
M25.57	Pain in a joint, ankle and foot	719.47	Chronic musculoskeletal pain
M25.58	Pain in a joint, other site	719.48	Chronic musculoskeletal pain

ICD-10-AM code	Description	ICD-9-CM map	Category (ICD-11)
M25.59	Pain in a joint, site unspecified	719.40	Chronic musculoskeletal pain
M54.2	Cervicalgia	723.1	Chronic primary pain
M54.3	Sciatica	724.3	Chronic neuropathic pain
M54.4	Lumbago with sciatica	724.2	Chronic neuropathic pain
M54.5	Low back pain	724.2	Chronic primary pain
M54.6	Pain in thoracic spine	724.5	Chronic primary pain
M54.80	Other dorsalgia, multiple sites in spine	724.5	Chronic primary pain
M54.81	Other dorsalgia, occipito-atlanto-axial region	723.1	Chronic primary pain
M54.82	Other dorsalgia, cervical region	723.1	Chronic primary pain
M54.83	Other dorsalgia, cervicothoracic region	723.1	Chronic primary pain
M54.84	Other dorsalgia, thoracic region	724.1	Chronic primary pain
M54.85	Other dorsalgia, thoracolumbar region	724.2	Chronic primary pain
M54.86	Other dorsalgia, lumbar region	724.2	Chronic primary pain
M54.87	Other dorsalgia, lumbosacral region	724.2	Chronic primary pain
M54.88	Other dorsalgia, sacral and sacrococcygeal region	724.2	Chronic primary pain
M54.89	Other dorsalgia, site unspecified	724.5	Chronic primary pain
M54.90	Unspecified dorsalgia, multiple sites in spine	724.5	Chronic primary pain
M54.91	Unspecified dorsalgia, occipito-atlanto-axial region	723.1	Chronic primary pain
M54.92	Unspecified dorsalgia, cervical region	723.1	Chronic primary pain
M54.93	Unspecified dorsalgia, cervicothoracic region	723.1	Chronic primary pain
M54.94	Unspecified dorsalgia, thoracic region	724.1	Chronic primary pain
M54.95	Unspecified dorsalgia, thoracolumbar region	724.2	Chronic primary pain
M54.96	Unspecified dorsalgia, lumbar region	724.2	Chronic primary pain
M54.97	Unspecified dorsalgia, lumbosacral region	724.2	Chronic primary pain
M54.98	Unspecified dorsalgia, sacral and sacrococcygeal region	724.2	Chronic primary pain
M54.99	Unspecified dorsalgia, site unspecified	724.5	Chronic primary pain
M79.10	Myalgia, multiple sites	729.1	Chronic musculoskeletal pain
M79.11	Myalgia, shoulder region	729.1	Chronic musculoskeletal pain
M79.12	Myalgia, upper arm	729.1	Chronic musculoskeletal pain
M79.13	Myalgia, forearm	729.1	Chronic musculoskeletal pain
M79.14	Myalgia, hand	729.1	Chronic musculoskeletal pain
M79.15	Myalgia, pelvic region and thigh	729.1	Chronic musculoskeletal pain
M79.16	Myalgia, lower leg	729.1	Chronic musculoskeletal pain
M79.17	Myalgia, ankle and foot	729.1	Chronic musculoskeletal pain

ICD-10-AM code	Description	ICD-9-CM map	Category (ICD-11)
M79.18	Myalgia, other site	729.1	Chronic musculoskeletal pain
M79.19	Myalgia, site unspecified	729.1	Chronic musculoskeletal pain
M79.20	Neuralgia and neuritis, unspecified, multiple sites	729.2	Chronic neuropathic pain
M79.21	Neuralgia and neuritis, unspecified, shoulder region	729.2, 354.4, 354.5, 354.8, 354.9, 723.4	Chronic neuropathic pain
M79.22	Neuralgia and neuritis, unspecified, upper arm	729.2, 354.4, 354.5, 354.8, 354.9, 723.4	Chronic neuropathic pain
M79.23	Neuralgia and neuritis, unspecified, forearm	729.2, 354.0, 354.1, 354.2, 354.3, 354.4, 354.5, 354.8, 354.9	Chronic neuropathic pain
M79.24	Neuralgia and neuritis, unspecified, hand	729.2, 354.0, 354.1, 354.2, 354.3, 354.4, 354.5, 354.8, 354.9	Chronic neuropathic pain
M79.25	Neuralgia and neuritis, unspecified, pelvic region and thigh	729.2, 355.0, 355.1, 355.7, 355.8, 724.4	Chronic neuropathic pain
M79.26	Neuralgia and neuritis, unspecified, lower leg	729.2, 355.3, 355.4, 355.5, 355.6, 355.71, 355.79, 355.8, 355.9	Chronic neuropathic pain
M79.27	Neuralgia and neuritis, unspecified, ankle and foot	729.2, 355.3, 355.4, 355.5, 355.6, 355.71, 355.79, 355.8, 355.9	Chronic neuropathic pain
M79.28	Neuralgia and neuritis, unspecified, other site	729.2, 355.9	Chronic neuropathic pain
M79.29	Neuralgia and neuritis, unspecified, site unspecified	729.2, 355.9	Chronic neuropathic pain
M79.60	Pain in limb, multiple sites	729.5	Chronic primary pain
M79.61	Pain in limb, shoulder region	729.5	Chronic musculoskeletal pain
M79.62	Pain in limb, upper arm	729.5	Chronic musculoskeletal pain
M79.63	Pain in limb, forearm	729.5	Chronic musculoskeletal pain
M79.64	Pain in limb, hand	729.5	Chronic musculoskeletal pain
M79.65	Pain in limb, pelvic region and thigh	729.5	Chronic musculoskeletal pain
M79.66	Pain in limb, lower leg	729.5	Chronic musculoskeletal pain
M79.67	Pain in limb, ankle and foot	729.5	Chronic musculoskeletal pain
M79.69	Pain in limb, site unspecified	729.5	Chronic primary pain
M79.70	Fibromyalgia, multiple sites	729.1	Chronic primary pain
M79.71	Fibromyalgia, shoulder region	729.1	Chronic primary pain
M79.72	Fibromyalgia, upper arm	729.1	Chronic primary pain

ICD-10-AM code	Description	ICD-9-CM map	Category (ICD-11)
M79.73	Fibromyalgia, forearm	729.1	Chronic primary pain
M79.74	Fibromyalgia, hand	729.1	Chronic primary pain
M79.75	Fibromyalgia, pelvic region and thigh	729.1	Chronic primary pain
M79.76	Fibromyalgia, lower leg	729.1	Chronic primary pain
M79.77	Fibromyalgia, ankle and foot	729.1	Chronic primary pain
M79.78	Fibromyalgia, other	729.1	Chronic primary pain
M79.79	Fibromyalgia, site unspecified	729.1	Chronic primary pain
R07.2	Precordial pain	786.51	Chronic primary pain
R07.3	Other chest pain	786.51, 786.52, 786.59	Chronic primary pain
R07.4	Chest pain, unspecified	786.50	Chronic primary pain
R10.1	Pain localised to upper abdomen	789.01, 789.02, 789.06	Chronic visceral pain
R10.2	Pelvic and perineal pain	625.9, 608.9	Chronic visceral pain
R10.3	Pain localised to other parts of lower abdomen	789.03, 789.04, 789.05	Chronic visceral pain
R10.4	Other and unspecified abdominal pain	789.00, 789.07, 789.09	Chronic visceral pain
R30.9	Painful micturition, unspecified	788.1	Chronic visceral pain
R51	Headache	784.0	Chronic headache and orofacial pain
R52.2	Chronic pain	780.9	Chronic primary pain
R52.9	Pain, unspecified	780.9	Chronic primary pain

Table 2: Chronic pain-related diagnosis codes, Systematized Nomenclature of Medicine – Clinical Terms – Australian version (SNOMED CT-AU), with additional mapping to ICD-11

SNOMED CT-AU code	Description	Category (ICD-11)	SNOMED CT-AU code	Description	Category (ICD-11)
330007	Occipital headache	Chronic headache and orofacial pain	202479004	Acromioclavicular joint pain	Chronic musculoskeletal pain
2733002	Heel pain	Chronic musculoskeletal pain	202480001	Elbow joint pain	Chronic musculoskeletal pain
3548001	Brachial plexus neuropathy	Chronic neuropathic pain	202482009	Wrist joint pain	Chronic musculoskeletal pain
4473006	Migraine with aura	Chronic headache and orofacial pain	202487003	Sacroiliac joint pain	Chronic musculoskeletal pain
4969004	Sinus pain	Chronic headache and orofacial pain	202490009	Ankle joint pain	Chronic musculoskeletal pain
9991008	Abdominal colic	Chronic visceral pain	202794004	Lumbago with sciatica	Chronic neuropathic pain
10601006	Pain in lower limb	Chronic musculoskeletal pain	203509009	Clavicle pain	Chronic musculoskeletal pain
12584003	Bone pain	Chronic musculoskeletal pain	225565007	Perineal pain	Chronic visceral pain
16269008	Neuralgia	Chronic neuropathic pain	230461009	Headache disorder	Chronic headache and orofacial pain

SNOMED CT-AU code	Description	Category (ICD-11)	SNOMED CT-AU code	Description	Category (ICD-11)
16644004	Radial neuropathy	Chronic neuropathic pain	230465000	Migraine aura without headache	Chronic headache and orofacial pain
18193002	Hypochondriasis	Chronic primary pain	230477005	Chronic post-traumatic headache	Chronic headache and orofacial pain
18876004	Pain in finger	Chronic musculoskeletal pain	230654000	Painful legs and moving toes	Chronic musculoskeletal pain
20793008	Scapulalgia	Chronic musculoskeletal pain	231517009	Somatoform autonomic dysfunction	Chronic primary pain
21005005	Burning epigastric pain	Chronic visceral pain	235494005	Chronic pancreatitis	Chronic visceral pain
21018002	Inflammatory neuropathy	Chronic neuropathic pain	235841007	Chronic nonspecific abdominal pain	Chronic visceral pain
21522001	Abdominal pain	Chronic visceral pain	235952002	Alcohol-induced chronic pancreatitis	Chronic visceral pain
22253000	Pain	Chronic primary pain	237067000	Chronic pelvic pain of female	Chronic visceral pain
23056005	Sciatica	Chronic neuropathic pain	239166000	Persistent wound pain	Chronic primary pain
25064002	Headache	Chronic headache and orofacial pain	239733006	Anterior knee pain	Chronic musculoskeletal pain
30473006	Pelvic pain	Chronic visceral pain	240107001	Viral myalgia	Chronic musculoskeletal pain
30989003	Knee pain	Chronic musculoskeletal pain	243338005	Nerve root compression syndrome	Chronic neuropathic pain
31297008	Somatoform disorder	Chronic primary pain	247373008	Ankle pain	Chronic musculoskeletal pain
31681005	Trigeminal neuralgia	Chronic neuropathic pain	247398009	Neuropathic pain	Chronic neuropathic pain
34789001	Pain in the coccyx	Chronic musculoskeletal pain	247400008	Painful arms and moving fingers	Chronic primary pain
35678005	Arthralgia of multiple joints	Chronic musculoskeletal pain	267096005	Frontal headache	Chronic headache and orofacial pain
37057007	Psychosomatic disorder	Chronic primary pain	267104002	C/O: a pain	Chronic primary pain
37796009	Migraine	Chronic headache and orofacial pain	267949000	Shoulder joint pain	Chronic musculoskeletal pain
38654001	Recurrent biliary colic	Chronic visceral pain	267952008	Arthralgia of the pelvic region and thigh	Chronic musculoskeletal pain
41413006	Temporal headache	Chronic headache and orofacial pain	268650001	Somatoform autonomic dysfunction - gastrointestinal tract	Chronic primary pain
43364001	Abdominal discomfort	Chronic visceral pain	271681002	Stomach ache	Chronic visceral pain
43478001	Abdominal tenderness	Chronic visceral pain	271857006	Loin pain	Chronic musculoskeletal pain
45326000	Shoulder pain	Chronic musculoskeletal pain	272027003	C/O - a headache	Chronic headache and orofacial pain
47933007	Foot pain	Chronic musculoskeletal pain	272047006	C/O - loin pain	Chronic musculoskeletal pain
49218002	Hip pain	Chronic musculoskeletal pain	274287009	O/E - abdominal pain	Chronic visceral pain
49650001	Dysuria	Chronic visceral pain	274288004	O/E - epigastric pain	Chronic visceral pain
53057004	Hand pain	Chronic musculoskeletal pain	274665008	Chronic intractable pain	Chronic primary pain

SNOMED CT-AU code	Description	Category (ICD-11)	SNOMED CT-AU code	Description	Category (ICD-11)
54586004	Lower abdominal pain	Chronic visceral pain	274667000	Jaw pain	Chronic headache and orofacial pain
56097005	Migraine without aura	Chronic headache and orofacial pain	274668005	Non-cardiac chest pain	Chronic primary pain
56608008	Pain in wrist	Chronic musculoskeletal pain	274671002	Pelvic and perineal pain	Chronic visceral pain
57676002	Arthralgia	Chronic musculoskeletal pain	278860009	Chronic lower back pain	Chronic primary pain
59292006	Hemiplegic migraine	Chronic headache and orofacial pain	279016001	Cervicogenic headache	Chronic headache and orofacial pain
61486003	Sacral back pain	Chronic musculoskeletal pain	279028009	Ovarian pain	Chronic visceral pain
64309007	Disorder of trigeminal nerve	Chronic neuropathic pain	279038004	Thoracic back pain	Chronic primary pain
68962001	Myalgia	Chronic musculoskeletal pain	279039007	Low back pain	Chronic primary pain
71303008	Atypical facial pain	Chronic primary pain	279040009	Mechanical low back pain	Chronic primary pain
71760005	Cervico-occipital neuralgia	Chronic neuropathic pain	279043006	Pain in buttock	Chronic musculoskeletal pain
71850005	Abdominal pain worse on motion	Chronic visceral pain	279066007	Foot joint pain	Chronic musculoskeletal pain
72274001	Nerve root disorder	Chronic neuropathic pain	279069000	Musculoskeletal pain	Chronic musculoskeletal pain
73063007	Colicky pain	Chronic visceral pain	279070004	Muscle tension pain	Chronic musculoskeletal pain
74323005	Pain in elbow	Chronic musculoskeletal pain	279093005	Cramping pain	Chronic visceral pain
74704000	Abdominal pain through to back	Chronic visceral pain	279981003	Peripheral neuropathic pain	Chronic neuropathic pain
78514002	Thigh pain	Chronic musculoskeletal pain	285365001	Pain in toe	Chronic musculoskeletal pain
79922009	Epigastric pain	Chronic visceral pain	285387005	Left sided abdominal pain	Chronic visceral pain
81680005	Neck pain	Chronic musculoskeletal pain	285388000	Right sided abdominal pain	Chronic visceral pain
82423001	Chronic pain	Chronic primary pain	287045000	Pain in left upper limb	Chronic musculoskeletal pain
82991003	Generalised aches and pains	Chronic primary pain	287046004	Pain in right upper limb	Chronic musculoskeletal pain
83132003	Upper abdominal pain	Chronic visceral pain	287047008	Pain in left lower limb	Chronic musculoskeletal pain
90834002	Pain in limb	Chronic musculoskeletal pain	287048003	Pain in right lower limb	Chronic musculoskeletal pain
95655001	Ophthalmic migraine	Chronic headache and orofacial pain	288225004	Myalgia/myositis - multiple	Chronic musculoskeletal pain
95668009	Pain in face	Chronic primary pain	288241003	Pain in limb - multiple	Chronic musculoskeletal pain
102482005	Growing pains	Chronic musculoskeletal pain	298292009	Pain on movement of skeletal muscle	Chronic primary pain
102556003	Pain in upper limb	Chronic musculoskeletal pain	298731003	Pain of sternum	Chronic musculoskeletal pain
102570003	Inguinal pain	Chronic primary pain	298857005	Shoulder joint painful on movement	Chronic musculoskeletal pain

SNOMED CT-AU code	Description	Category (ICD-11)	SNOMED CT-AU code	Description	Category (ICD-11)
102613000	Localised abdominal pain	Chronic visceral pain	298858000	Shoulder joint - painful arc	Chronic musculoskeletal pain
102614006	Generalised abdominal pain	Chronic visceral pain	298929004	Elbow joint - painful on movement	Chronic musculoskeletal pain
102616008	Painful mouth	Chronic headache and orofacial pain	299018007	Wrist joint painful on movement	Chronic musculoskeletal pain
102619001	Pain in oesophagus	Chronic visceral pain	299112005	Finger joint painful on movement	Chronic musculoskeletal pain
103005006	Inadequate analgesia	Chronic primary pain	299199000	Thumb joint painful on movement	Chronic musculoskeletal pain
111985007	Chronic abdominal pain	Chronic visceral pain	299308007	Hip joint painful on movement	Chronic musculoskeletal pain
119416008	Epigastric discomfort	Chronic visceral pain	299377003	Knee joint painful on movement	Chronic musculoskeletal pain
128187005	Vascular headache	Chronic headache and orofacial pain	299447008	Ankle joint - painful on movement	Chronic musculoskeletal pain
128189008	Mononeuropathy	Chronic neuropathic pain	299513007	Foot joint - painful on movement	Chronic musculoskeletal pain
128200000	Complex regional pain syndrome	Chronic primary pain	299633000	Toe joint painful on movement	Chronic musculoskeletal pain
128210009	Thoracic outlet syndrome	Chronic neuropathic pain	300953009	Pain in axilla	Chronic primary pain
134407002	Chronic back pain	Chronic primary pain	300954003	Pain in calf	Chronic musculoskeletal pain
135860001	Exacerbation of backache	Chronic primary pain	300955002	Pain in thumb	Chronic musculoskeletal pain
161891005	Backache	Chronic primary pain	301365009	Pain of head and neck region	Chronic headache and orofacial pain
161894002	C/O - low back pain	Chronic primary pain	301715003	Left upper quadrant pain	Chronic visceral pain
162042000	Abdominal wall pain	Chronic visceral pain	301716002	Left lower quadrant pain	Chronic visceral pain
162046002	Central abdominal pain	Chronic visceral pain	301717006	Right upper quadrant pain	Chronic visceral pain
162049009	Left flank pain	Chronic visceral pain	301754002	Right lower quadrant pain	Chronic visceral pain
162050009	Right flank pain	Chronic visceral pain	304542004	Nonspecific abdominal pain	Chronic visceral pain
162051008	Right iliac fossa pain	Chronic primary pain	307177001	Chronic sciatica	Chronic neuropathic pain
162052001	Left iliac fossa pain	Chronic primary pain	307225003	Perianal pain	Chronic visceral pain
162053006	Suprapubic pain	Chronic visceral pain	310483003	C/O - pain in toe	Chronic musculoskeletal pain
162147009	C/O pelvic pain	Chronic visceral pain	310484009	C/O - pain in hallux	Chronic musculoskeletal pain
162299003	Generalised headache	Chronic headache and orofacial pain	314212008	Abdominal pain - cause unknown	Chronic visceral pain
162301005	Bilateral headache	Chronic headache and orofacial pain	367475009	Lesion of ulnar nerve	Chronic neuropathic pain
162307009	Aching headache	Chronic headache and orofacial pain	373621006	Chronic pain syndrome	Chronic primary pain
191952007	Somatoform autonomic	Chronic primary pain	386738004	Multiple somatic complaints	Chronic primary pain

SNOMED CT-AU code	Description	Category (ICD-11)	SNOMED CT-AU code	Description	Category (ICD-11)
	dysfunction - respiratory tract				
191956005	Psychogenic hyperventilation	Chronic primary pain	398057008	Tension headache	Chronic headache and orofacial pain
193030005	Migraine variants	Chronic headache and orofacial pain	425473004	Pain radiating to left shoulder	Chronic neuropathic pain
193031009	Cluster headache	Chronic headache and orofacial pain	425860006	Pain radiating to lower abdomen	Chronic visceral pain
193039006	Complicated migraine	Chronic headache and orofacial pain	426142001	Pain radiating to right shoulder	Chronic neuropathic pain
197458008	Acute recurrent pancreatitis	Chronic visceral pain	431237007	Chronic headache disorder	Chronic headache and orofacial pain
202472008	Hand joint pain	Chronic musculoskeletal pain	439469002	Recurrent abdominal pain	Chronic visceral pain

Table 3. Opioid harm diagnosis codes

Opioid harm	ICD-10-AM	ICD-9-CM	SNOMED CT-AU
Opioid poisoning	T40.0-T40.4 and T40.6	965.00, 965.01, 965.09, 965.02	11196001, 242828004, 297199006, 295174006
Opioid dependence	F11.2-F11.4	304.00, 304.01, 304.02, 304.03, 304.70, 304.71, 304.72, 304.73, 292.0	231477003
Other mental and behavioural disorders due to use of opioids	F11.0, F11.1, F11.5-F11.9	305.50, 305.51, 305.52, 305.53, 292.89, 292.83, 292.9	75544000, 77721001, 87132004

Appendix 2: Literature review methods

PubMed search terms

((chronic pain[MeSH Terms] OR pain*[Title] OR “chronic pain”[Title/Abstract] OR CNCP[title/abstract])
AND ((Models, Organizational[MeSH Terms] OR organizational innovation[MeSH Terms] OR Delivery of Health Care, Integrated[MeSH Terms] OR Delivery of Health Care/organization & administration[MeSH Terms] OR "model of care"[Title/Abstract] OR "care model*"[Title/Abstract] OR "care delivery model"[Title/Abstract] OR "organization of care"[Title/Abstract] OR "organization model"[Title/Abstract] OR "organizing health"[Title/Abstract] OR "healthcare delivery model"[Title/Abstract] OR "collaborative care"[Title/Abstract] OR "integrated care"[Title/Abstract] OR "Primary Health Care/methods"[Mesh] OR "value model"[Title/Abstract] OR "value care"[Title/Abstract] OR "high-value"[Title/Abstract] OR "low-value"[Title/Abstract] OR "high value"[Title/Abstract] OR "low value"[Title/Abstract] OR "pain program*"[Title] OR "pain service*"[Title] OR "pain clinic*"[Title] OR "pain centre"[Title] OR "pain center"[Title] OR "Multidisciplinary pain"[title/abstract] OR integrated[Title] OR multidisciplinary[Title] OR unidisciplinary[Title/abstract] OR interdisciplinary[title/abstract] OR "stepped care"[Title/Abstract] OR "matched care"[Title/Abstract] OR biopsychosocial[Title] OR “Psychologically informed”[Title/Abstract] OR Sociopsychobiomedical[Title] OR Biopsychological[Title] OR "outpatient pain"[Title/Abstract])))
AND ((("randomized controlled trial"[pt] OR "controlled clinical trial"[pt] OR "randomized"[tiab] OR "placebo"[tiab] OR "clinical trials as topic"[mesh:noexp] OR "randomly"[tiab] OR “control group*”[Title/Abstract] OR “concurrent control*”[Title/Abstract] OR "trial"[ti])
OR ((systematic[Title] AND review[Title]) OR (Systematic Review[Filter]) OR (“meta-analysis”[Title/Abstract]) OR (“meta analyses”[Title/Abstract]) OR (Meta-Analysis[Filter])))
AND (english[Filter])) NOT (animals[mh] NOT humans[mh] AND (english[Filter]))
Filters: English, from 2010 – 2020
=**566 hits** on 14 September 2020

Google search terms

Chronic pain models of care
+ Australia
+ Systematic review

Table 1: Inclusion and exclusion criteria

Inclusion	Exclusion
• Chronic pain (described as chronic pain OR pain lasting longer than three months) • Organisational models of care (the way the care is delivered e.g. multidisciplinary care) • Primary aim of the study is the organisation of care (e.g. multidisciplinary vs unidisciplinary care/usual care) • All indications • Studies are systematic reviews, randomised controlled trials (RCTs) or studies with a concurrent control group • Paediatric and adult studies • Publication date 1 Jan 2010 to 15 October 2020.	• Studies assessing effectiveness of individual interventions for pain management e.g. exercise vs opioids • Active treatment for cancer pain (people who have survived cancer and are undergoing chronic pain management are included) • Observational studies without a concurrent control group, non-randomised studies, letters, comments, study protocols, conference abstracts, editorials, pilot studies • Study focus on education of specialists rather than care for patients • Prevention.

Inclusion	Exclusion
	Exclusion criteria added for full text screening: • Sample size (less than 20 participants in each arm) • Primary purpose of the paper is assessing an intervention as part of care (e.g. multidisciplinary care alone vs multidisciplinary care with opioids).

Source	Summary
Peer reviewed sources	
The feasibility and effectiveness of a new practical multidisciplinary treatment for low-back pain: A randomized controlled Trial Wippert, et al. 2019 [6]	• Feasibility and effectiveness of a new practical multidisciplinary treatment for low back pain, using an RCT (n=439, age 18-65 year). • Intervention: 12 weeks of multidisciplinary sensorimotor training (SMT) (three weeks centre-based and nine weeks homebased). • Control group: (regular routines in ambulatory setting). • Model: multidisciplinary care. • Results: a significantly stronger reduction of mental health complaints (anxiety, vital exhaustion) in people with higher-pain than those with lower pain in multidisciplinary treatment. • Compared to regular routines, the self-management-multidisciplinary treatment led to a clinically relevant reduction of pain-disability and significant mental health improvements. Low-cost exercise programs may provide enormous relief for therapeutic processes, rehabilitation aftercare, and thus, cost savings for the health system. • Conclusion: this study shows that a self-management program with reinforcing components could be of high clinical relevance in the treatment of unspecific low-back pain. Further, the presented program may be suitable for the medical supply in rural or socioeconomic weak areas.
Automated self-management (ASM) vs. ASM-enhanced collaborative care for chronic pain and mood symptoms: The CAMMPS randomized clinical trial Kroenke, et al. 2019 [7]	• RCT conducted in six primary care clinics with 294 patients with chronic musculoskeletal pain, with at least moderate levels of depression and anxiety. • Intervention: automated self-management-enhanced collaborative care (ASM+CC) for chronic pain and mood symptoms. ASM consisted of automated symptom monitoring and prompted use of pain and mood self-management modules. • Control: automated self-management (ASM). • Model: self-management. • Results: both the ASM and ASM+CC groups had moderate pain, anxiety, and depression. • ASM+CC: this arm received the ASM intervention plus the addition of collaborative care management by a nurse-physician team. • Conclusion: both arms produced moderate improvements in pain and mood symptoms. However, the model combining collaborative care led by a nurse-physician team with web-based self-management was superior to self-management alone.

Source	Summary
Is sleep disturbance in patients with chronic pain affected by physical exercise or ACT-based stress management? - A randomized controlled study Wiklund, et al. 2018 [8]	• RCT including adults with chronic benign neck, low back, and/or generalised pain (n=299). • The study compared the results of a physical exercise program with an acceptance and commitment therapy (ACT)-based stress-management program on sleep disturbance amongst a sample of 299 participants randomly assigned to exercise, ACT-based stress management (ACT-bsm), or an active control group. • Treatments lasted 7-8 weeks. • Intervention 1: the physical exercise intervention was a group activity for 8 weeks. One hour twice a week; the exercise was supervised by a physiotherapist. A physician attended the first training session. • Intervention 2: the ACT-based stress-management program consists of seven weekly two-hour sessions and offers a mix of lectures and experience-based exercises such as role-play and mindfulness. • The active control group met once a week, two hours each time for seven weeks in a conference room at the hospital. • Results: the mixed model analyses revealed that exercise had a positive effect on insomnia compared with the control group and the effect remained after 12 months. • Conclusions: no clear treatment effect was found for the ACT-bsm. Pain intensity decreased significantly both in the exercise group and in the control group. For the two psychological variables (i.e. symptoms of anxiety and depression) significant improvements were found over time but no group differences. The treatment effects for Insomnia severity index (ISI) and pain intensity did not reach clinical significance per definitions presented in other relevant studies.
Quality of life improved by multidisciplinary back school program in patients with chronic non-specific low back pain: A single blind randomized controlled trial Morone, et al. 2011 [9]	• A single blind RCT with three- and six-month follow-up was performed in a rehabilitation centre to evaluate the effects of the back school program on quality of life (primary outcome), disability and pain perceptions (secondary outcomes) in patients with chronic and non-specific low back pain. (n=74). • Treatment group participated in an intensive multidisciplinary back school program including brief education and active back exercise (n=41). • The control group received medical assistance (n=19). • Results: quality of life significantly improved over time more in back school program, both in physical and mental composite score of SF-36. We also observed a significant improvement in disability scores along time (P<0.001) in back school program. Moreover, pain perception score Visual analogue scale (VAS) showed a reduction in both groups, but it was significantly lower in back school program at end of treatment and both follow-ups. • Conclusion. The back school program can be considered an effective treatment in people with chronic non-specific low back pain.
Self-management of persistent neck pain: Two-	• An RCT with two-year follow-up to compare long-term effects of (a) a multicomponent pain and stress self-management

Source	Summary
year follow-up of a randomized controlled trial of a multicomponent group intervention in primary health care Gustavsson, et al. 2011 [10]	group intervention (PASS) and (b) individually-administered physical therapy (IAPT) on patients with persistent tension-type neck pain in a primary health care (PHC) setting. • PASS consisted of seven weekly group sessions of 1.5 hours each, and a booster session at 20 weeks after the initial session. • IAPT entailed individual sessions in accordance with current practice and was not a standardised treatment procedure. • Results: the study included 156 participants (PASS n=77, IAPT n=79). Between baseline, 10-week, 20-week, one-year, and two-year follow-up, significant time-by-group interaction effects were found in favour of PASS regarding the primary outcomes ability to control pain (P<0.001) and self-efficacy for performing activities in spite of pain (P=0.002), and the secondary outcome catastrophic thinking (P<0.001) but not in neck pain-related disability. • Conclusions: the initial treatment effects of a self-management group intervention were largely maintained over a two-year follow-up period. There was a tendency to have superior long-term effects as compared to individually-administered physical therapy. This was found in the treatment of persistent tension-type neck pain in terms of pain control, self-efficacy, and catastrophising.
Examination of an internet-delivered cognitive behavioural pain management course for adults with fibromyalgia: A randomized controlled trial Friesen, et al. 2017 [11]	• The present study sought to explore the efficacy and acceptability of a previously-developed internet-delivered cognitive behavioural pain management course, the pain course for adults with fibromyalgia (FM). The five-lesson course was delivered over eight weeks and was provided with brief weekly contact, via telephone and secure email, with a guide throughout the course. • Participants were randomised either to the pain course (n=30) or to a waiting-list control group (n=30). • Symptoms were assessed at pre-treatment, post-treatment and four-week follow-up. • Completion rates (87%) and satisfaction ratings (86%) were high. • Improvements were significantly greater in the treatment group for depression, pain and fear of pain, compared to the control group. • Conclusions: the current findings add to existing literature and highlight the specific potential of internet-delivered cognitive behavioural pain management programs for adults with FM, especially as a part of stepped-care models of care. Future research directions are described.
Effect of integrated care for sick listed patients with chronic low back pain: Economic evaluation alongside a randomised controlled trial Lambeek, et al. 2010 [12]	• Aim: to evaluate the cost effectiveness, cost utility, and cost-benefit of an integrated care program compared with usual care for sick-listed patients with chronic low back pain. • Design: economic evaluation alongside a RCT with 12-months follow-up. • Setting: primary care (10 physiotherapy practices, one occupational health service, one occupational therapy practice) and secondary care (five hospitals) in the Netherlands, 2005-9.

Source	Summary
	• Participants 134 adults aged 18-65 sick-listed because of chronic low back pain: 66 were randomised to integrated care and 68 to usual care. • Interventions: usual care and integrated care. • Main outcome measures: the primary outcome was duration until sustainable return to work. The secondary outcome was quality adjusted life years (QALYs), measured using EuroQol. • Conclusion: the costs of an integrated care program for patients sick-listed because of chronic low back pain were lower than for usual care. From a societal perspective 12 months of integrated care was more cost effective than usual care. This applied to a selected group of patients with chronic-specific and (non-)specific low back pain, all of whom were judged appropriate for this kind of psychosocial treatment. The integrated care program has large potential to significantly reduce societal costs and improve quality of life and function. The success and failures of implementing the integrated care program need to be investigated to determine the boundary conditions for nationwide application.
A systematic review assessing non-pharmacological conservative treatment studies for people with non-inflammatory multi-joint pain: clinical outcomes and research design considerations Comer, et al. 2018 [13]	• Systematic review of papers related to adults suffering from non-inflammatory multi-joint pain (MJP) including randomised and non-randomised trials (n=4). • Results: all interventions significantly improved pain, function and quality of life in the short term. • There was limited reporting of measures for absenteeism, presenteeism and psychosocial outcomes. • Study concluded that the evidence was weak and there is insufficient high-quality trial data to determine the effectiveness of treatments for non-inflammatory MJP. • Face-to-face multidisciplinary team rehabilitation interventions may reduce pain, increase function and improve symptom control for people with MJP, and spa-based treatments may result in short-term reductions in symptoms but have limited longer-term benefits.
Clinical practice guidelines for the management of chronic musculoskeletal pain in primary healthcare: A systematic review Ernstzen, et al. 2017 [14]	• A systematic review. • Aim: the study aimed to systematically identify and appraise the available evidence-based clinical practice guidelines (CPGs) for the management of chronic musculoskeletal pain (CMSP) in adults presenting in primary healthcare settings. • Results: of the 1,082 records identified, 34 were eligible, and 12 CPGs were included based on the inclusion and exclusion criteria. • The methodological rigour of CPG development was highly variable, and the median domain score was 66%. The median score for ‘stakeholder involvement’ was 64%. The lowest median score was obtained for the domain ‘applicability’ (48%). • There was inconsistent use of frameworks to aggregate the level of evidence and the strength of the recommendation in the included CPGs. The scope and content of the included CPGs focused on opioid prescription.

Source	Summary
	• Six of the 12 CPGs focused on the prescription of opioids and two focused specifically on the management of musculoskeletal pain. • Conclusion: numerous CPGs that are applicable for the primary healthcare of CMSP exists, varying in their scope and methodological quality. This study highlights specific elements to enhance the development and reporting of CPGs, which may play a role in the uptake of guidelines into clinical practice.
The CONECSI (COping with NEuropathiC Spinal cord Injury pain) trial: Results of a randomized controlled trial of a multidisciplinary cognitive behavioural program for coping with chronic neuropathic pain after spinal cord injury Heutink, et al. 2012 [15]	• Aim: the COping with NEuropathiC Spinal cord Injury pain (CONECSI) trial was to evaluate a multidisciplinary cognitive behavioural treatment program for persons with chronic neuropathic pain after a spinal cord injury (SCI). • Intervention: the intervention consisted of educational, cognitive and behavioural elements. The program consisted of 10 sessions of three hours for 10 weeks and a comeback session three weeks after the 10 sessions. Each meeting was supervised by a psychologist and a physiotherapist (the trainers) from the local centre in three centres and by a nurse practitioner and a physiotherapist from the local centre in one centre. The program comprises educational, cognitive, and behavioural elements targeted at coping with chronic neuropathic pain. • Design: 61 patients were randomly allocated to either intervention group or the waiting list control group. • Primary and secondary outcomes: Primary outcomes were pain intensity and pain-related disability; the secondary outcomes were mood and anxiety, participation in activities and life satisfaction. These variables were assessed at baseline, and at three- and six-month follow-ups. • Results: significant change in both two primary outcome measures (t1 and t2) and 2/4 secondary outcome measures in both t1-t2 and t1-t3). Significant intervention effects (Time X Group interactions) were found for anxiety and participation in activities, but not for the primary outcomes. Subsequent paired t tests showed significant changes in the intervention group that were not seen in the control group: decrease of pain intensity, pain-related disability, anxiety, and increase of participation in activities. • Conclusion: this study implies that a multidisciplinary cognitive behavioural program might have beneficial effects on people with chronic neuropathic SCI pain.
Does telephone-delivered exercise advice and support by physiotherapists improve pain and/or function in people with knee osteoarthritis? Telecare randomised controlled trial Hinman, et al. 2020 [16]	• Aim: evaluate a physiotherapist-led telephone-delivered exercise advice and support intervention for people with knee osteoarthritis. • Design: participant-blinded, assessor-blinded RCT. • Participants: 175 people were randomly allocated to (1) existing telephone service (≥1 nurse consultation for self-management advice) or (2) exercise advice and support (5-10 consultations with a physiotherapist trained in behaviour change for a personalised strengthening and physical activity program) plus the existing service. • Outcomes: primary outcomes were overall knee pain (Numerical Rating Scale, range 0–10) and physical function

Source	Summary
	(Western Ontario and McMaster Universities Osteoarthritis Index, range 0–68) at six months. Secondary outcomes, cost-effectiveness and 12-month follow-up were included. • Results: 65 (94%) and 158 (90%) participants were retained at 6 and 12 months, respectively. At six months, exercise advice and support resulted in greater improvement in function (mean difference 4.7 (95% CI1.0 to 8.4)), but not overall pain (0.7, 0.0 to 1.4). Of the 14 secondary outcomes, 8 favoured exercise advice and support at 6 months, including pain on daily activities, walking pain, pain self-efficacy, global improvements across multiple domains (overall improvement, improved pain, improved function and improved physical activity) and satisfaction. By 12 months, most outcomes were similar between groups. Exercise advice and support cost $A514 per participant and did not save other health service resources. • Conclusion: telephone-delivered physiotherapist-led exercise advice and support modestly improved physical function but not the co-primary outcome of knee pain at six months. Functional benefits were not sustained at 12 months. The clinical significance of this effect is uncertain.
Patient outcomes in dose reduction or discontinuation of long-term opioid therapy: A systematic review Frank, et al. 2017 [17]	• Aim: the aim of this systematic review was to synthesise studies of the effectiveness of strategies to reduce or discontinue long-term opioid therapy (LTOT) and patient outcomes after dose reduction among adults prescribed LTOT for chronic pain. • Outcome measures: patient outcomes were pain severity, function, quality of life, opioid withdrawal symptoms, substance use, and adverse events. • Results: 67 studies (11 randomised trials and 56 observational studies) examining 8 intervention categories including interdisciplinary pain programs, buprenorphine assisted dose reduction, and behavioural interventions, were found. Study quality was good for 3 studies, fair for 13 studies, and poor for 51 studies. • Many studies reported dose reduction, but rates of opioid discontinuation ranged widely across interventions and the overall quality of evidence was very low. Among 40 studies examining patient outcomes after dose reduction (very low overall quality of evidence), improvement was reported in pain severity (eight of eight fair-quality studies), function (five of five fair-quality studies), and quality of life (three of three fair-quality studies). • Interdisciplinary pain programs had a mean opioid discontinuation rate of 87%. • Limitation: heterogeneous interventions and outcome measures; poor-quality studies with uncontrolled designs. • Conclusion: very low-quality evidence suggests that several types of interventions may be effective to reduce or discontinue LTOT and that pain, function, and quality of life may improve with opioid dose reduction.
Multidisciplinary care for opioid dose reduction in patients with chronic non-	• Systematic review of 95 studies to identify existing literature on multidisciplinary care programs that evaluate the impact on opioid use and synthesise how the programs work.

Source	Summary
cancer pain: A systematic realist review Sud, et al. 2020 [18]	• Program duration was variable, with the shortest program running 1-5 days, to the longest program of 14 months. • 33 types of healthcare providers and staff were identified. Besides physicians, the most common were psychologists (n=42), physiotherapists (n=37) and nurses (n=28). • 44 (57.9%) programs had a required opioid tapering protocol. • Three intervention components that consistently patterned with successful programs as well as counterfactual cases: (1) pain relief via physical interventions; (2) patient behaviour modification; and (3) changing the opioid prescribing pattern via changing the prescriber.
Patterns of sickness absence a decade after pain-related multidisciplinary rehabilitation Busch, et al. 2011 [19]	• RCT to examine the patterns of sickness absence 10 years after participation in 3 treatment groups (physiotherapy, cognitive behavioural therapy and behavioural medicine rehabilitation) in comparison to a control group receiving treatment-as-usual for patients with chronic pain (n=214). • Interventions: physiotherapy, cognitive behavioural therapy (CBT) or behavioural medicine rehabilitation. • Control: treatment-as-usual. • Model: multidisciplinary. • Results: patients in the behavioural medicine group had an average of 42.98 fewer sickness absence days per year as compared to the control group. (95% confidence interval -82.4 to -3.52, P=0.03). • In physiotherapy, the annual sickness absence was reduced by 17.05 days compared to the control group, and the corresponding decrease for CBT was 12.57 days, but the reductions were not statistically different from the control.
Sustainability of return to work in sick-listed employees with low-back pain. Two-year follow-up in a randomized clinical trial comparing multidisciplinary and brief intervention Jensen, et al. 2012 [20]	• RCT to compare two interventions in sick-listed employees to facilitate return to work (RTW) for patients with low back pain, including a two-year follow up (n=351). • Interventions: brief and multidisciplinary intervention. • Model: multidisciplinary. • Results: 80.0% and 77.3% of patients RTW for at least 4 weeks continuously, and the percentages with RTW at the 104th week were 61.1% and 58.0% in the brief and multidisciplinary intervention groups, respectively. • At the 104th week, 16.6% and 18.8% were on sick-leave in the 2 groups, respectively, and about 12% were employed in modified jobs or participated in job training. The number of weeks on sick-leave in the first year was significantly lower in the brief intervention group (median 14 weeks) than in the multidisciplinary intervention group (median 20 weeks), but during the second year the number of weeks on sick-leave were not significantly different between intervention groups.

Early interventions to promote work participation in people with regional musculoskeletal pain: a systematic review and meta-analysis
Cochrane, et al. 2017 [21]
	• Systematic review of 20 studies to determine the effectiveness of early multidisciplinary interventions in promoting work participation and reducing work absence in adults with regional musculoskeletal pain.
	• The interventions were grouped into categories:
	  ○ Back school programs
	  ○ Case-manager-led programs
	  ○ A focus on increasing physical activity in combination with multidisciplinary input

Source	Summary
	○ Psychosocial intervention, psychosocial in combination with exercise, workplace or conventional clinical management ○ Stepped care approaches. • At 12-months follow-up, moderate quality evidence suggests that programs involving a stepped care approach (4 studies) were more effective than the comparisons in promoting return to work (hazard ratio (HR) 1.29 (95% confidence interval (CI) 1.03 to 1.61), p=0.03), whereas case management (2 studies) was not (HR 0.92 (95% CI 0.69 to 1.24), p=0.59). • Eight studies collected direct health costs and indirect work- and benefits-related costs. Three studies reported cost savings in health service costs and limiting productivity losses; five studies reported no overall benefits. • Conclusion: there is uncertainty as to the effectiveness of early multicomponent interventions owing to the clinical heterogeneity and varying health and social insurance systems across the trials.
A meta-epidemiological appraisal of the effects of interdisciplinary multimodal pain therapy dosing for chronic low back pain Dragioti, et al. 2019 [22]	• Systematic review of 47 studies to examine the influence of interdisciplinary multimodal pain therapy (IMPT) dosage on pain, disability, and return to work, quality of life, depression and anxiety in patients with non-specific chronic low back pain. • All the 47 included studies were RCTs published 1990-2017. Most studies were conducted in Europe (n=34; 74%). • For each outcome, subgroup analysis was conducted for IMPT dosage by length, contact, and intensity. There were larger effect size for pain and disability in RCTs with long length, non-daily contact, and low intensity of treatment. Larger and significant effect size were also observed for quality of life in RCTs with short length, non-daily contact, and low intensity of treatment. • However, these findings were not confirmed by the meta-regression analysis. The summary relative-odds ratio was not significant, indicating that the length, contact, and intensity of treatment did not have an overall effect on the investigated outcomes.
Health-related quality of life improvements among women with chronic pain: Comparison of two multidisciplinary interventions Bjornsdottir, et al. 2015 [23]	• Observational longitudinal cohort study to measure the effect of two multidisciplinary pain management programs on quality of life for women with chronic pain (n=122). • Interventions: ○ Traditional multidisciplinary pain management (TMPM) program ○ Neuroscience education and mindfulness-based cognitive therapy (NEM) ○ Treatments were led by a specialised inter-professional pain management team; physical therapists, a psychologist, a psychiatric nurse, a sport therapist, a rehabilitation physician, a medical massage therapist and access to a nutritionist for specific counselling. • Control: waitlist. • Results: ○ Significant changes in pain intensity (p<0.001) and quality of life (p<0.001) among women receiving both

Source	Summary
	interventions, while NEM participants reported significant improvements in sleep (8.0 versus 4.4 in TMPM; p=0.008). • Pain intensity improved more among TMPM participants (21.8 versus 17.2mm; p=0.013 adjusted).
Comparative effectiveness of conservative interventions for nonspecific chronic spinal pain: Physical, behavioural/psychologically informed, or combined? A systematic review and meta-analysis O'Keeffe, et al. 2016 [24]	• Aim: this review aimed to assess the comparative effectiveness of physical, behavioural/psychologically informed, and combined interventions on pain and disability in patients with nonspecific chronic spinal pain (NSCSP). • Sample size: 24 studies were included. • Results: no statistically-significant differences were found for pain and disability between physical and behavioural/psychologically informed groups in the medium- and long-term. • No statistically-significant differences were found for pain and disability in the single study comparing behavioural/psychologically informed and combined interventions. • Although a small statistically-significant difference was found for pain and disability between the physical and combined group, favouring the combined group, this difference was small. This suggests that there are only small differences between physical, behavioural/psychologically informed, and combined interventions for reducing pain and disability in NSCSP patients. • Limitation: the simple categorisation of interventions into physical, behavioural/psychologically informed, and combined could be considered a limitation of this review, because these interventions may not be easily differentiated to allow accurate comparisons to be made.
Comparative effectiveness of an interdisciplinary pain program for chronic low back pain, compared to physical therapy alone Davin, et al. (2019) [25]	• Design: observational cohort study. • Aim: this study compared the effectiveness of physical therapy alone to interdisciplinary treatment approach with chronic low back pain. • Methods: 117 adult patients who completed an interdisciplinary pain program (IPP) for individuals with ≥3 months of back pain were compared to 214 adult patients with similar characteristics who completed physical therapy. • Results: propensity score matching generated 81 IPP and 81 PT patients. Patients enrolled in the IPP had significantly greater improvement in Mood Disorder Questionnaire (MDQ) scores upon completion compared to patients in PT (15.8 vs. 7.1, P<0.001). The majority of IPP patients reached the threshold for clinically meaningful change of ≥10 point reduction (60.5%) compared to 34.6% of PT patients, P<0.01. Patients in the IPP also showed statistically- and clinically-significant improvement in social role satisfaction, fatigue, and sleep disturbance. • Conclusion: the superiority of an IPP compared to traditional PT for individuals with chronic low back pain (CLBP) has been shown. Individuals in the IPP had significantly greater reductions in overall disability after treatment.

Source	Summary
	• In general: CLBP patients in an IPP demonstrated greater functional improvements compared to similar patients participating in PT. This study highlights the impact of two nonpharmacological approaches to managing CLBP, with the greatest benefits demonstrated in an IPP.
Group interprofessional chronic pain management in the primary care setting: A pilot study of feasibility and effectiveness in a family health team in Ontario Angeles, et al. 2013 [26]	• Aim: using a sample of 63 participants with the mean age of 55±14.1 years, of which 62.3% were females, the authors evaluated the feasibility of an interprofessional primary care-based program for patients living with chronic pain. The authors also examined the potential impact of such a program on quality of life and health resource utilisation. • Method: a mixed-methods evaluation (randomised controlled trial with waiting list control and semi structured interviews) of an eight-week series of small group sessions exploring multifactorial aspects of pain management was performed. • Study groups: participants were randomly assigned to early intervention (EI) or delayed intervention (DI) groups. All participants received the intervention. The DI group served as a control group for comparison with the EI group. • Intervention: the program consisted of two-hour group sessions once per week for eight weeks. • Results: there was no significant difference in the mean change in SF-36v2 summary scores between the EI and DI groups. However, the SF-36v2 subscale score for bodily pain was significantly improved in the EI group compared with the DI group after six months of observation (mean difference=13.1 points; P<0.05). There was also significant improvement in this score when both groups were pooled and aggregate preintervention and postintervention scores were compared. There was a significant decrease in the mean number of clinic visits in the six-month period following the intervention compared with the six-month period before the intervention (P=0.043). • Conclusion: an interprofessional program in primary care for patients living with chronic pain may lead to improvements in quality of life and health resource utilisation. The challenges to the feasibility of the program and its evaluation are recruitment and retention of patients, leading to the conclusion that the program, as it was conducted in the present study, is not appropriate for this setting.
Treatment of low back pain: Randomized clinical trial comparing a multidisciplinary group-based rehabilitation program with oral drug treatment up to 12 months Tavafian, et al. 2014 [27]	• Aim: examine the effects of a multidisciplinary treatment program on health-related quality of life of Iranian patients living with chronic low back, at 12-months follow-up. • Design: RCT. • Sample: 87 patients in an intervention group and 91 patients in a control group were assessed at 12 months follow-up. • Intervention: the intervention was a group-based multidisciplinary rehabilitation program which continued by monthly motivational consultation by telephone 6-12 months after intervention. • Results: there were significant differences between the two groups in all domains of the SF-36 scale, as well as Quebec Disability scale (QDS) and Roland and Morris Disability Questionnaire (RMDQ) (P<0.05). Also, there were differences

Source	Summary
	within each group over time in the SF-36 domains and disability measurements (P<0.05). The physical function mean score differed significantly when the interaction between groups and time points was examined (P=0.02). • Conclusion: this study indicates that the multidisciplinary program could improve the domains of health-related quality of life and disability in chronic low back pain patients for up to 12 months.
Return to work in patients with chronic musculoskeletal pain: Multidisciplinary intervention versus brief intervention: A randomized clinical trial Brendbekken, et al. 2017 [28]	• Design: a randomised clinical trial. • Aim: The effect of a new multidisciplinary intervention (MI) program to a brief intervention (BI) program on return to work (RTW), fully and partly, at a 12-month and 24-month follow-up in patients on long-term sick-leave due to musculoskeletal pain were compared. • Methods: 284 Patients with mean age 41.3 years (53.9% women) who were sick-listed with musculoskeletal pain and referred to a specialist clinic in physical rehabilitation were randomised to MI (n=141) or BI (n=143). • Results: the number of patients with full-time RTW developed similarly in the two groups. The patients receiving MI had a higher probability to partly RTW during the first 7 months of the follow up, compared to the BI-group. • Conclusions: there were no differences between the groups on full-time RTW during the 24 months. However, the results indicate that MI hastens the return-to-work process in long-term sick-leave through the increased use of partial sick-leave.
Multidisciplinary biopsychosocial rehabilitation for chronic low back pain: Cochrane systematic review and meta-analysis Kamper, et al. 2015 [29]	• Systematic review and random effects meta-analysis of RCTs. • 41 trials with 6,858 participants who had a mean duration of pain of more than one year who had often failed previous treatment. • Multidisciplinary rehabilitation programs resulted in better outcomes with respect to long-term pain and disability compared with usual care or physical treatments. Patients participating in these programs were more likely to be at work in the long term.
Telecare collaborative management of chronic pain in primary care: A randomized clinical trial Kroenke, et al. 2014 [30]	• Randomised trial comparing a telephone delivered collaborative care management intervention to usual care (SCOPE – the Stepped care to Optimize Pain care Effectiveness). • 250 patients with chronic (>3 months) musculoskeletal pain of at least moderate intensity. Referrals came from five primary care clinics. • Patients were randomised either to an intervention group or to usual care. • Control group (126 participants) received usual care from their primary physicians. • Model: telecare collaborative care. • Patients in the intervention group reported a 30% improvement in their pain at 12 months. Secondary pain outcomes also improved.
A comparative meta-analysis of unidisciplinary psychology	• Comparative meta-analysis of unidisciplinary and interdisciplinary treatments to determine if there were

Source	Summary
and interdisciplinary treatment outcomes following acceptance and commitment therapy for adults with chronic pain Vowles, et al. 2019 [31]	differences in treatment effect size at post treatment and follow ups of up to one year. • Acceptance and commitment therapy (ACT) was the intervention studied. • 29 studies met inclusion criteria. • Model: unidisciplinary (psychology) and interdisciplinary. • 13 studies reported outcomes for unidisciplinary and 15 reported outcomes for interdisciplinary. • At both post-treatment and follow-up, interdisciplinary ACT had a greater effect size for physical disability, psychosocial impact and depression compared to unidisciplinary ACT. • There were no significant differences by type of treatment for the remaining three outcome variables: pain-related anxiety, pain intensity and pain acceptance.
The effectiveness of interdisciplinary intensive outpatient programs in a population with diverse chronic pain conditions: a systematic review and meta-analysis Bujak, et al. 2019 [32]	• Systematic review and meta-analysis. • The intervention included group and individual CBT, pain education, stress, mood and pain self-management, biofeedback and relaxation training, occupational and physical therapy. • Model: interdisciplinary intensive outpatient programs. • Participating in these programs appears to improve quality of life (QOL), decrease pain intensity and depressive symptoms. Further research indicated. • Data from 12 studies showed a significant decrease on depression scores. • Seven studies reported on QOL with a positive effect. • Overall intensive pain programs for adults with chronic pain can effectively reduce pain intensity, catastrophising, depression and QOL. This is maintained at six-month follow up.
Cost-effectiveness and cost-benefit analyses of a multidisciplinary intervention compared with a brief intervention to facilitate return to work in sick-listed patients with low back pain. Jensen, et al. 2013 [33]	• Randomised clinical trial of two interventions (brief and multidisciplinary) and subsequent validation study to validate subgroup results (n=351). • The brief intervention resulted in fewer sick-leave and was less expensive than the multidisciplinary intervention. • Return to work rates were similar for both interventions.
App-based multidisciplinary back pain treatment versus combined physiotherapy plus online education: A randomized controlled trial. Toelle, et al. 2019 [34]	• RCT. • Participants included 101 adults with non-specific back pain ranging from six weeks to one year. Participants were randomly assigned to the intervention or control group. • The intervention group was provided with three-month access to the Kaia app. • The control group was provided with six physiotherapy sessions and online education. • Model: multidisciplinary back pain app. • Patients were reviewed at 12 weeks. The intervention group reported significantly lower back pain than the control group.
Treatment efficacy, clinical utility, and cost-effectiveness of multidisciplinary biopsychosocial rehabilitation treatments for	• Systematic review of the current literature on the treatment efficacy, clinical utility, and cost-effectiveness of multidisciplinary biopsychosocial rehabilitation (MBR) for non-specific lower back pain. • 13 studies were reviewed.

Source	Summary
persistent low back pain: A systematic review Salathe, et al. 2018 [35]	• Articles dealing with the efficacy, utility, or cost-effectiveness of intensive (more than 25 hours per week) MBR encompassing at 3 three health domains and cognitive behavioural therapy-based psychological education were included. • Model: multidisciplinary biopsychosocial rehabilitation (MBR). • Positive changes in pain intensity and disability were reported post MBR. Mixed results were observed on health-related quality of life. MBR overall resulted in cost savings. • Further research needed to determine the impact of MBR on cost effectiveness and sick-leave.
Effectiveness of models used to deliver multimodal care for chronic musculoskeletal pain: A rapid evidence review Peterson, et al. 2018 [36]	• Systematic review including 11 publications of 9 studies (8 RCTS (n=3816) and one retrospective cohort study). • Most were of fair or good quality. • Model: multimodal • Nine multimodal models were identified. • The most common model (n=5) involved coupling a decision-support component (most commonly algorithm-guided treatment and/or stepped care) with proactive ongoing treatment monitoring. • These models have the best evidence of providing clinically relevant improvement in pain intensity and pain-related function over 9 to 12 months. • The ability to rank models from best to worst is limited by heterogeneity in outcome assessment methods, patient populations, and setting.

Treatment of low back pain: Second extended follow up of an original trial (NCT00600197) comparing a multidisciplinary group-based rehabilitation program with oral drug treatment alone up to 30 months
Tavafian, et al. 2017 [37]
	• RCT to examine the follow-up effects of a multidisciplinary group-based rehabilitation program to reduce disability, pain and improve quality of life for people with chronic lower back pain (n=165).
	• Intervention:
	  ○ Group-based multidisciplinary rehabilitation program: five two-hour group sessions followed by monthly booster sessions and monthly telephone counselling; delivered by physiotherapists, rheumatologists, psychologists and health education specialists
	  ○ Oral medication prescribed as necessary.
	• Control: oral medication prescribed as necessary.
	• Model: multidisciplinary (group-based).
	• Results:
	  ○ Intervention group had consistently better outcomes in terms of all variables (physical function, role physical, bodily pain, health general, vitality, role emotional, mental health) except for social function at all follow-up time points. In the intervention group only, mental health was significant (P=0.01).

Group-based multimodal exercises integrated with cognitive-behavioural therapy improve disability, pain and quality of life of subjects with chronic neck pain: A randomized	• RCT to evaluate the effect of a group-based multidisciplinary rehabilitation program on disability, pain and quality of life for patients with chronic neck pain (n=170). • Intervention: ○ Multidisciplinary group-based program: once a week for ten weeks; multimodal exercises combined with psychologist-lead cognitive behaviour therapy sessions

Source	Summary
controlled trial with one-year follow-up Monticone, et al. 2017 [38]	○ 60-minute sessions with a psychologist once a week for ten weeks ○ Ergonomic advice provided in a booklet. • Control: ○ General exercise/physiotherapy group: once a week for ten weeks ○ Ergonomic advice provided in a booklet format. • Model: multidisciplinary, multimodal (group-based). • Results: ○ Outcome measures were disability, kinesiophobia, catastrophising, pain intensity and quality of life ○ Significant effects (p-value<0.001) were found over time and between groups for all outcome measures ○ Significant improvements were found for both groups for all outcome measures except kinesiophobia and catastrophising, which did not change in the control group; however, the improvements were significantly greater for the multidisciplinary group. • At 12-month follow-up, a clinically meaningful between-group difference of 12.4 Neck Disability Index points was found for disability.
Six-and 12-month follow-up of an interdisciplinary fibromyalgia treatment programme: Results of a randomised trial Martin, et al. 2012 [39]	• RCT to assess the efficacy of a six-week interdisciplinary treatment compared to standard pharmacologic care for patients with fibromyalgia (n=153). • Intervention: ○ Interdisciplinary treatment (psychological, medical, educational and physiotherapeutic (PSYMEPHY)); 12 sessions. • Control: standard pharmacologic therapy. • Model: interdisciplinary. • Results: ○ Six months after the intervention, significant improvements in quality of life (p=0.04), physical function (p=0.01), and pain (p=0.03) were seen in the PSYMEPHY intervention group (n=54) compared with controls (n=56). ○ Twelve months after the intervention, patients in the PSYMEPHY intervention group (n=58) maintained statistically significant improvements in quality of life, physical functioning, pain, and symptoms of anxiety and depression, and were less likely to use maladaptive passive coping strategies compared to baseline.
Efficiency of three treatment strategies on occupational and quality of life impairments for chronic low back pain patients: Is the multidisciplinary approach the key feature to success? Ronzi, et al. 2017 [40]	• RCT to compare the effectiveness of three treatment strategies for chronic low back pain with varying biomechanical intensity and multidisciplinary approach (n=159). • Interventions: ○ Functional Restoration Program (FRP) ○ Ambulatory Individual Physiotherapy (AIP) ○ Mixed strategy. • Model: multidisciplinary. • Results: ○ The effects of treatment conditions were compared using an intention-to-treat approach: number of days'

Source	Summary
	sick-leave during the 12 months following treatment, quality of life and social ability ○ The comparison of outcomes improvement showed no statistical difference between the three groups. The 12-month follow-up data showed a significant improvement for almost all outcomes in the FRP and the mixed groups and for less than half of outcomes in the AIP group. ○ Sick-leave duration significantly decreased during the 12 months following treatment in the three groups. • There was no significant difference quality of life, social ability, and personal beliefs between the three groups.
How have chronic pain management programs progressed? A mapping review Lewis, et al. 2019 [41]	• Mapping review of 104 studies to determine the most common content and structure of inpatient pain management programs (and changes over time – from 1970s to 2010s). • 20 studies represented outputs from the same clinic using the same pain management program; therefore, independent programs from 84 studies were included in the description of program content. • Most of the studies were prospective (n=35; 33%) or retrospective (n=31; 30%) studies with a single cohort. RCTs (n=17; 16%), prospective non-randomised controlled trials (n=15; 14%), and retrospective comparison studies (n=7; 7%). • The majority of the programs were classified as using a multidisciplinary approach (n=62; 73%) with primarily a mixed format that included time on both group and individual components (n=45; 53%). • Almost all programs included a physical therapist (n=52; 96%) and a physician (n=51; 94%), while most programs also included a psychologist (n=43; 80%), nurse (n=37; 69%), and occupational therapist (n=35; 65%). Social workers (n=17; 31%) and exercise/recreation therapists (n=13; 24%) were also common. • The use of an interdisciplinary approach increased from 21% (n=6) in the1970s-1980s to 45% (n=13) in the 2010s. • The most common group components were education and exercise/physical therapy; and individually were exercise/physical therapy and psychotherapy/counselling. • The most common program duration was four weeks (n=30; 37%), with an average of 3.9 weeks across all programs.
Effect of a long-lasting multidisciplinary program on disability and fear-avoidance behaviours in patients with chronic low back pain: Results of a randomized controlled trial Monticone, et al. 2013 [42]	• RCT to compare the efficacy of a cognitive behaviour therapy (CBT) based multidisciplinary program with exercise training only for patients with chronic low back pain (n=90). • Interventions: ○ CBT-based multidisciplinary program: 60-minute sessions weekly for five weeks (instructive phase); and 60-minute sessions monthly for one year (reinforcement phase) ○ Exercise training: multimodal motor program: two 60-minute sessions for five weeks (10 sessions in total for instructive phase); patients asked to continue exercise twice weekly for 60-minute sessions for one year, with telephone support from staff (reinforcement phase).

Source	Summary

	• Control: exercise training only (as described above).
	• Model: multidisciplinary, multimodal.
	• Results:
	  ○ Specific outcome measures were disability, fear-avoidance behaviours, pain, and quality of life
	  ○ The linear mixed model analysis showed a remarkable group, time, and interaction effect for group time in all of the primary and secondary outcomes (P always <0.001).
	• The majority of the patients in the experimental group achieved a reliable and clinically significant improvement, whereas the majority of those in the control group experienced no change.

Efficacy and cost-effectiveness: A study of different treatment approaches in a tertiary pain centre Vanhaudenhuyse, et al. 2015 [43]	• RCT to assess the effectiveness of four treatments for chronic pain including cost-effectiveness benefits (n=527). • Control: patients who were not able to participate in any intervention group for various reasons such as difficulty with travel, lack of interest and comprehension. • Model: multidisciplinary, multimodal. • Results: ○ Significant decrease in anxiety as the result of physiotherapy/psycho-education treatment (p=0.04) as well as the result of self-hypnosis/self-care treatment (p<0.001), while decrease in depression was observed only after self-hypnosis/self-care treatment (p<0.001). • The degree of pain interference diminished between the pre and post-assessment for both physiotherapy/psychoeducation treatment (p<0.001) and self-hypnosis/ self-care treatment (p<0.001). Diminution of pain intensity between pre- and post-assessment was observed only for self-hypnosis/self-care treatment (p<0.001).

Telephone-delivered cognitive-behavioral therapy for pain management among older military veterans: a randomized trial
Carmody, et al. 2013 [44]
	• RCT to investigate the effectiveness of telephone-delivered cognitive-behavioural therapy compared with telephone-delivered pain education for military veterans with chronic pain (n=98).
	• Interventions:
	  ○ Telephone-delivered cognitive-behaviour therapy (T-CBT): 12 sessions over 20 weeks
	  ○ Telephone-delivered pain education (T-EDU), 12 sessions over 20 weeks.
	• Model: telehealth, primary care.
	• Results:
	  ○ Specific outcome measures included mental and physical functioning, pain behaviour, pain intensity, pain-coping strategies, and affective distress.
	• No significant difference found between the two treatments groups on any outcome measures.

Multidisciplinary intervention and acceptance and commitment therapy for return-to-work and increased employability among patients with mental illness and/or	• RCT to evaluate the effects of two vocational rehabilitation programs for patients on long-term sick-leave due to mental illness and/or chronic pain (n=427, one-third on sick-leave for pain-related conditions and one-third pain-related conditions combined with psychiatric disorders). • Interventions:

Source	Summary
chronic pain: A randomized controlled trial Berglund, et al. 2018 [45]	○ Multidisciplinary team management: multidisciplinary assessment and individual rehabilitation management; multidisciplinary team configuration – psychologist, a physician, an occupational therapist and a social worker ○ Acceptance and Commitment Therapy (ACT) ○ Sessions were typically 60 minutes and took place at the clinic (with options for home, work and elsewhere available) for both the interventions. • Control: no intervention (but free to receive the usual assistance and care provided by their regular contact with the insurance company. • Model: multidisciplinary approach. • Results: ○ Participants in the multidisciplinary team management group received on average 4.4 sessions delivered by the physician, occupational therapist and social worker, and 4.7 sessions with the physiologist who delivered ACT ○ Participants in the ACI group received on average eight sessions with the psychologist. • Participants in the multidisciplinary team group reported having return to work odds ratio (OR) 3.31 (95% CI 1.39-7.87) compared to the control group in adjusted models. • Participants in the ACT group reported having increased employability OR 3.22 (95% CI 1.13–9.15) compared to the control group in adjusted models.
Effectiveness of multidisciplinary therapy on symptomatology and quality of life in women with fibromyalgia Carbonell-Baeza, et al. 2011 [46]	• RCT to assess the effects of a 3-month multidisciplinary intervention in women with fibromyalgia (n=75). • Interventions: ○ Multidisciplinary intervention: pool and land-based exercise, psychological sessions based on Acceptance and Commitment Therapy); three sessions per week for 12 weeks. • Control: participants asked to not change their activity levels or medication for 12 weeks (control). • Model: multidisciplinary. • Results: ○ Outcome measures were fibromyalgia symptoms, anxiety and depression, pain management and self-esteem ○ No significant differences between or within groups in all the variables analysed except for the subscale 'Fibromyalgia impact questionnaire' (FIQ) scores. • Significant improvement in FIQ total score ($p<0.001$), fatigue ($p=0.001$), stiffness ($p<0.001$), anxiety ($p=0.011$) and depression ($p=0.008$) in the intervention group, whereas, in the control group there was a significant worsening in the subscale depression ($p=0.006$).
Randomized trial of chronic pain self-management program in the community or clinic for low-income primary care patients Turner, et al. 2018 [47]	• RCT to evaluate two low-cost approaches for providing pain management education and support to patients in communities with limited access to resources (n=111). • Interventions: ○ Community: nine one-hour group meetings were held at a local library – every two weeks for three months, then

Source	Summary
	monthly for three months; the same session was offered twice weekly ○ Clinic: the health educator held six-monthly one-on-one meetings for 30 to 45 minutes ○ All participants selected personal goals for physical activities, aiming for 30 minutes of light to moderate exercise on most days, and with attention to safety. • Model: primary care, self-management. • Results: ○ Outcome measure was the five Times-Sit-to-Stand test (5XSTS) and physical function measures included the 6-Minute Walk test (6 MW), Borg Perceived Effort Test (Borg Effort) after completion of the 6 MW14, 50-ft Speed Walk test (50FtSW); and the 12-Item Short-Form Survey Physical. • Participants in both intervention arms performed the 5XSTS test faster (−4.9 s, P=0.001) and improved scores on Borg Effort (−1, P=0.02), PSFS (1.6, P<0.001), and SDMT (5.9, P<0.001). Only the clinic arm increased the 6 MW (172.4 ft, P=0.02) and SF-12 PCS (6.2 points, P<0.001). 50ftSW did not change (P = 0.15).
Evaluation of the interdisciplinary PSYMEPHY treatment on patients with fibromyalgia: A randomized control trial Martin, et al. 2014 [48]	• RCT to assess the efficacy of a 6-week interdisciplinary treatment 'PSYMEPHY (coordinated PSYchological, Medical, Educational, and PHYsiotherapeutic components interventions) compared with standard pharmacologic care for patients with fibromyalgia (n=93). • Interventions: ○ Six weeks of PSYMEPHY; group-based (n=12 in each group); two-weekly sessions for 105 minutes; delivered by a team that included a physician, a clinical psychologist, and a physiotherapist experienced in chronic pain management • Control: standard pharmacologic care for patients with fibromyalgia. • Model: interdisciplinary approach. • Results: ○ Specific measures included Fibromyalgia impact questionnaire' (FIQ) as a disease specific health-related quality of life, visual analog scale to assess pain intensity, and the Coping with chronic pain questionnaire (CAD-R) ○ Six months after the intervention, significant improvements in total FIQ score (P=0.04), and pain (P=0.03) were seen in the PSYMEPHY group compared with controls. • Twelve months after the intervention, all patients in the PSYMEPHY group maintained statistically significant improvements in total FIQ score, and pain, and showed an improvement in fatigue, rested, anxiety, and current pain compared with baseline.
Inpatient-based intensive interdisciplinary pain treatment for highly impaired children with severe chronic	• RCT to investigate the efficacy of an inpatient-based intensive interdisciplinary pain treatment for children with paediatric chronic pain (n=104). • Interventions:

Source	Summary
pain: Randomized controlled trial of efficacy and economic effects Hechler, et al. 2014 [49]	○ Manualised, intensive and interdisciplinary treatment approach consisting of a team of paediatricians, clinical psychologists, child and adolescent psychiatrists, paediatric nurses, physiotherapists, occupational therapists, and social workers ○ Six treatment modules: (1) education and a realistic goal determination; (2) acquisition of pain coping strategies; (3) treatment of co-occurring emotional distress; (4) family therapy; (5) optional therapy-related drug treatment or physiotherapy; and (6) relapse prevention; 5-8 hours per day for 3 weeks. • Control: waitlist. • Model: interdisciplinary, inpatient. • Results: ○ Significantly more children in the intervention group were assigned to improvement (55% compared to 14%; Fisher P<0.001; 95% confidence interval for incidence difference: 0.21% to 0.60%) ○ Although immediate effects were achieved for disability, school absence, depression and catastrophising; pain intensity and anxiety did not change until short-term follow-up ○ More than 60% of the children in both groups improved long-term. • Parents reported significant reductions in all economic parameters.
The efficacy of electronic health-supported home exercise interventions for patients with osteoarthritis of the knee: Systematic review Schafer, et al. 2018 [50]	• Systematic review of seven studies to compare the efficacy of eHealth-supported home exercise interventions with no and/or other interventions for patients with osteoarthritis of the knee. • All studies were two-group RCTs. A total of 742 participants were randomized in intervention (n=376) or control (n=366) groups. • Interventions included exercises supported by mHealth (Internet-based programs or mobile apps) and telephone-supported exercises. Exercise interventions most commonly included strengthening exercises, walking or physical activity reinforcement. The eHealth component included education on topics such as exercise, healthy diet, pain management, and self-management. • Pooling the data of individual studies demonstrated beneficial short-term (pain SMD=−0.31, 95% CI −0.58 to −0.04, low quality; QoL SMD=0.24, 95% CI 0.05-0.43, moderate quality) and long-term effects (pain −0.30, 95% CI −0.07 to −0.53, moderate quality; physical function 0.41, 95% CI 0.17-0.64, high quality; and QoL SMD=0.27, 95% CI 0.06-0.47, high quality). • eHealth-supported exercise interventions resulted in less pain, improved physical function, and health-related QOL compared with no or other interventions; however, these improvements were small (SMD<0.5) and may not make a meaningful difference for individual patients.

Source	Summary
The effect of an integrated multidisciplinary rehabilitation programme alternating inpatient interventions with home-based activities for patients with chronic low back pain: A randomized controlled trial Schmidt, et al. 2020 [51]	• RCT to compare the effectiveness of an integrated rehabilitation program with an existing rehabilitation program for patients with chronic low back pain (n=165). • Intervention: o Integrated rehabilitation program: (1) pre-admission day, (2) two-week home-based activities, (3) two-week inpatient stay, (4) four-week home-based activities, (5) first two-day inpatient booster session, (6) six-week home-based activities, (7) second two-day inpatient booster session, and (8) 26-week follow-up (a total of 15 inpatient days). • Control: o Four-week inpatient stay and 26-week follow-up (a total of 21 inpatient days), usual practice for 15 years. • Both rehabilitation programs comprised multidisciplinary inpatient rehabilitation based on the biopsychosocial approach and included the same 38 clinical activities, and contact hours. • Model: multidisciplinary, integrated. • Results: o Primary outcome was back-specific disability (Oswestry disability index). Secondary outcomes included pain intensity (Numerical Rating Scale), pain self-efficacy (Pain Self-Efficacy Questionnaire), health-related quality of life (EuroQol-5 Domain 5-level (EQ-5D)), and depression (Major Depression Inventory). • The between-group difference in the Oswestry disability index score when adjusting for the corresponding baseline score was -0.28 (95% confidence interval (CI): -4.02, 3.45) which was neither statistically nor clinically significant. No significant differences were found in the secondary outcomes.
Reboot online: A randomized controlled trial comparing an online multidisciplinary pain management program with usual care for chronic pain Smith, et al. 2019 [52]	• RCT to compare an online multidisciplinary pain management with usual care for patients with chronic pain (n=80) • Intervention: o ‘Reboot online’: 8-lesson multidisciplinary pain management program; online lessons completed over 16 weeks, with a 2-week gap between each lesson. • Control: usual care (treatments already commenced at intake assessment and patients were permitted to engage in any new interventions for chronic pain management). • Model: multidisciplinary, online. • Results: o Primary outcome measures: Pain Self-Efficacy Questionnaire (PSEQ) and Brief Pain Inventory (BPI). o Reboot online was significantly more effective than usual care at increasing pain self-efficacy (g¼0.69) at post-treatment and were maintained at follow-up • Reboot online was significantly more effective than usual care on several secondary measures at post-treatment and follow-up, including movement-based fear avoidance and pain-related disability, but it did not significantly reduce pain interference or depression compared with usual care.

Source	Summary

Controlled 3-year follow-up of a multidisciplinary pain rehabilitation program in primary health care
Westman, et al. 2010 [53]
	• RCT to assess the long-term effects of a structured multidisciplinary rehabilitation program for patients with musculoskeletal pain in primary health care with traditional unstructured treatment (n=89).
	• Interventions: patients were offered a multidisciplinary program including one or more of the following interventions:
	  ○ Six-week group rehabilitation program
	  ○ Three-way communication – patient/general practitioner/psychologist (or social worker)
	  ○ Individual treatment – physiotherapy and short-term psychotherapy
	  ○ Workplace-based intervention.
	• Control: routine treatment from a general practitioner.
	• Model: multidisciplinary, primary care.
	• Results:
	  ○ Slightly higher work capacity in the experimental group after three years, but the difference was not statically significant (p¼0.595)
	  ○ Fewer primary health care visits at three-year follow-up than at baseline in both the experimental and the control group.
	  ○ Analgesic consumption decreased in both groups during the three-year follow up. The consumption decreased significantly in the experimental group odds ratio (OR) 0.39 (95 % CI: 0.16–0.93; p¼0.034) but not in the control group OR 0.46 (95 % CI: 0.18–1.22; p¼0.12).
	• There was no significant difference between the groups with regard to the SF-36, the Coping Strategies Questionnaire, the Pain Catastrophising Scale, the Tampa Scale for Kinesiophobia), negative life events, job strain and pain.

Employment status five years after a randomised controlled trial comparing multidisciplinary and brief intervention in employees on sick leave due to low back pain Pedersen, et al. 2017 [54]	• RCT to evaluate differences in employment status, during a five-year follow-up period in patients on sick-leave due to low back pain who had participated in a trial comparing a brief and a multidisciplinary intervention (n=464). • Intervention: ○ Multidisciplinary intervention: comprehensive interview with a case manager covering aspects of their work, private life and health; tailored rehabilitation plan with multidisciplinary team including the rehabilitation physician, a specialist in clinical social medicine, a physiotherapist, a social worker and an occupational therapist. • Control: treatment and rehabilitation with a general practitioner. • Model: multidisciplinary. • Results: no statistically significant differences in the mean weeks spent within the different employment statuses between the two intervention groups.
A systematic review of multidisciplinary outcomes in the management of chronic low back pain Ravenek, et al. 2010 [55]	• A systematic review of 11 studies to update the evidence for the multidisciplinary treatment of chronic low back pain to improve employment outcomes; and assess what knowledge supports occupational therapy as contributing to a multidisciplinary approach in the treatment.

Source	Summary
	• Of the articles, 2 were rated as high quality and 10 were rated as low quality. Of the 10 low quality articles, 3 approached high quality. • The composition of the multidisciplinary team in the studies included in this review varied considerably. The only common profession was physiotherapy. • Multidisciplinary rehabilitation differed in treatment domain combinations and included at least two of the following domains: biological, psychological, social, or occupational. • Seven studies evaluated the effect of multidisciplinary treatment on functional status in patients with chronic low back pain. Six of the studies found that there was no significant difference between intervention and control groups in improving functional status. • There is conflicting evidence (five trials) for the effectiveness of multidisciplinary treatment when sick-leave is used as an employment outcome. • There is no demonstrable effect (five trials) for multidisciplinary treatment when percentage of people who returned to work is used as an employment outcome. • There is conflicting evidence (two trials) that multidisciplinary treatment is effective for patients with chronic low back pain when using days off work as an employment outcome. • There is conflicting evidence (12 trials) for the effectiveness of multidisciplinary treatment to improve employment outcomes. • Only one study found a significant difference for pain reduction using multidisciplinary treatment. Eight studies did not find an effect of multidisciplinary treatment on reducing pain.
Effectiveness of primary care interventions using a biopsychosocial approach in chronic low back pain: A systematic review van Erp, et al. 2019 [56]	• Systematic review of seven studies on the effectiveness of primary care multidisciplinary biopsychosocial (BPS) interventions for patients with chronic low back pain. • BPS intervention is a multicomponent intervention including at least (1) a biological component; and (2) a psychological or social component. • All interventions were of low intensity (≤16 hours), except for one BPS intervention of which consisted of 35 hours of contact time. The total duration of included BPS interventions ranged from 6 to 12 weeks. • All studies measured functional disability (RMDQ or ODI) and pain (NRS, Modified Von Korff Scale [MVKS], or VAS. Only four studies measured sick-leave. • All studies reported that patients in both groups (BPS intervention and education/advice) improved the level of functional disability and pain over time. Between groups, one high-quality RCT showed significant differences at short term for functional disability and pain in favour of the BPS intervention (mean RMDQ score 1.1 (95% confidence interval [CI] 0.38 to 1.17); mean MVKS score 4.2%, (95% CI 0.40 to 8.10), mean MVKS pain score 6.8% (95% CI 3.31 to 10.20). • All studies reported that patients in both groups (BPS intervention and physical activity therapy) improved the level of functional disability and pain over time. Between groups, one study with low methodological quality showed short-term

Source	Summary
	statistically and clinically important differences for functional disability in favour of the BPS intervention (mean ODI score -9.7 [95% CI -12.7 to -6.7].

Effectiveness of integrative medicine group visits in chronic pain and depressive symptoms: A randomized controlled trial
Gardiner, et al. 2019 [57]
	• RCT to determine the effectiveness of integrative medical group visits (IMGV) compared to primary care provider (PCP) visit in patients with chronic pain and depression (n=159).
	• Intervention:
	  ○ IMGV intervention: 9 weekly 2.5 hour in person IMGV sessions, 12 weeks online platform access followed by a final IMGV at 21 weeks.
	• Control: patients asked to visit their PCP.
	• Model: integrative medical, self-management.
	• Results:
	  ○ There were no differences in pain or depression at any time point
	  ○ At nine weeks, the IMGV group had fewer ED visits (RR 0.32, 95% CI: 0.12, 0.83) compared to controls.
	• At 21 weeks, the IMGV group reported reduction in pain medication use (Odds Ratio: 0.42, CI: 0.18–0.98) compared to controls.

Multidisciplinary-based rehabilitation (MBR) compared with active physical interventions for pain and disability in adults with chronic pain: A systematic review and meta-analysis Casey, et al. 2020 [58]	• Systematic review of 27 studies to examine the effectiveness of multidisciplinary-based rehabilitation (MBR) in comparison with active physical interventions for adults with chronic pain. • No significant difference between MBR and active physical interventions in the medium term (10 studies, low-quality evidence; n=1068; SMD=−0.20; 95% CI:−0.37 to −0.03; I2=39%; P=0.02). • Statistically significant differences in favour of MBR were found for pain intensity and disability at short-term follow-up (standardised mean difference=0.53 and 0.50) and long-term follow-up (standardised mean difference=0.56 and 0.77), but the quality of the evidence was low.

Comparing the effectiveness of mindfulness-based stress reduction and multidisciplinary intervention programs for chronic pain: A randomized comparative trial
Wong, et al. 2011 [59]
	• RCT to compare the clinical effectiveness of the Mindfulness-based stress reduction (MBSR) program with a multidisciplinary pain intervention (MPI) program in terms of pain intensity, pain-related distress, quality of life, and mood in patients with chronic pain (n=39).
	• Intervention:
	  ○ MBSR: 8 weekly group sessions, each of 2.5 hours, with a 7-hour “retreat” session; instructive, inductive, and experiential modes of learning were used to carry out the intervention and to convey the information content.
	• Control:
	  ○ MPI: 8 weekly, 2.5-hour group sessions with a nurse coordinator; sessions took the form of instructional lectures on basic understanding of chronic pain, factors that increase or decrease chronic pain, and effective ways for participants to signal their chronic pain to others. One session was conducted by a registered physiotherapist on exercises for chronic pain; one session was conducted by a registered dietician for advice on healthy diet and weight control.
	• Self-management, multidisciplinary.
	• Results:

Source	Summary
	○ The pain intensity and pain-related distress of both groups improved significantly from baseline. For the MBSR group, pain intensity measured by 11-point NRS reduced by 0.57units and pain-related distress reduced by 0.37units. For the MPI group, pain intensity reduced by 0.61units and pain-related distress reduced by 1.08units ○ The mean SF-12 physical component (PCS12) immediately after the 8-week intervention of both MBSR and MPI did not significantly differ from baseline. However, there were statistically-significant increases in the PCS12 within both the MBSR and MPI groups at three-month (Wald statistic=4.62, P=0.032) and six-month (Wald statistic= 10.503, P=0.001) post intervention, when compared with the scores at baseline. • No statistically significant differences were observed in overall results between the MBSR and MPI groups.
Psychological and work-related outcomes after inpatient multidisciplinary rehabilitation of chronic low back pain: A prospective randomized controlled trial Hampel, et al. 2019 [60]	• RCT investigated the long-term effects (12 months post rehabilitation) of a standard inpatient multidisciplinary rehabilitation program for patients with chronic low back pain (n=583). • Intervention: ○ Combined pain competence and depression prevention training (embedded in a standard inpatient multidisciplinary rehabilitation program). • Control: pain competence training. • Model: multidisciplinary. • Results: ○ The intervention group showed an improvement in the work ability index (WAI) 12 months after rehabilitation (t0-t3: p <0.001, d = 0.42. • Only participants with high levels of depressive symptoms had statistically and clinically significant benefits from rehabilitation (depressive symptoms: t0-t3high level: p<0.001, d=−1.26; pain self-efficacy: t0-t3high level: p<0.001, d=0.44).
Multidisciplinary biopsychosocial rehabilitation for chronic low back pain Kamper, et al. 2014 [29]	• Systematic review of 41 studies on the effectiveness of multidisciplinary biopsychosocial rehabilitation (MBR) for patients with low back pain compared to usual care and with physical treatments. • Methodological quality ratings ranged from 1–9 out of 12, and 13 of the 41 included studies were assessed as low risk of bias. • Pooled estimates from 16 RCTs provided moderate to low quality evidence that MBR is more effective than usual care in reducing pain and disability, with standardised mean differences (SMDs) in the long term of 0.21 (95% CI 0.04 to 0.37) and 0.23 (95% CI 0.06 to 0.4) respectively. • Moderate to low quality evidence of no difference on work outcomes (odds ratio (OR) at long term 1.04, 95% CI 0.73 to 1.47). • Pooled estimates from 19 RCTs provided moderate to low quality evidence that MBR was more effective than physical treatment for pain and disability with standardised mean

Source	Summary
	differences in the long term of 0.51 (95% CI -0.01 to 1.04) and 0.68 (95% CI 0.16 to 1.19) respectively. • Moderate to low quality evidence of an effect on work outcomes (OR at long term 1.87, 95% CI 1.39 to 2.53). There was insufficient evidence to assess whether MBR interventions were associated with more adverse events than usual care or physical interventions. • Patients with chronic LBP receiving MBR are likely to experience less pain and disability than those receiving usual care or a physical treatment.
Does a three-month multidisciplinary intervention improve pain, body composition and physical fitness in women with fibromyalgia? Carbonell-Baeza, et al. 2011 [61]	• RCT to determine the effects of a 3-month multidisciplinary intervention on pain, body composition and physical fitness in women with fibromyalgia (FM) (n=75). • Intervention: ○ Low-moderate intensity 3-month (three times/week); multidisciplinary (pool, land-based and psychological sessions); sessions were carefully supervised by a fitness specialist and by a physical therapist; educational sessions were conducted by a psychologist; groups of 10–12 women. • Control: usual care – no changes to their activity levels and medication for 12 weeks. • Model: multidisciplinary. • Results: ○ Pain threshold in the control group significantly decreased (negative) in anterior cervical R ($p<0.001$) and L ($p=0.002$), whereas in the intervention group, the threshold pain significantly increased (positive) in the anterior cervical R ($p<0.001$) and L ($p=0.012$) and in the lateral epicondyle R ($p=0.010$) ○ No significant improvement attributed to the training was observed in the rest of physical fitness or body composition variables.
Treatment of chronic low back pain: a randomized, clinical trial comparing group-based multidisciplinary biopsychosocial rehabilitation and intensive individual therapist-assisted back muscle strengthening exercises Dufour, et al. 2010 [62]	• Stratified randomised single-blinded clinical trial to compare the efficacies of two active therapies for chronic low back pain (n=286). • Intervention: multidisciplinary biopsychosocial rehabilitation. • Control: individual therapist-assisted back muscle strengthening exercises. • Model: multidisciplinary care. • Results: for both groups significant improvements were observed with regard to pain, disability, and most of the quality of life dimensions. • There were some statistically significant differences between the groups relating to secondary end points, Roland-Morris disability questionnaire, and in the MOS 36-Item Short-Form Health Survey the 'physical functioning' dimension and the 'physical component summary'. • Conclusions: both groups showed long-term improvements in pain and disability scores, with only minor statistically significant differences between the groups.
Subgroup analyses on return to work in sick-listed employees with low back	• Randomised trial 351 of employees sick-listed for 3 to 16 weeks due to low back pain.

Source	Summary
pain in a randomised trial comparing brief and multidisciplinary intervention Stapelfeldt, et al. 2011 [63]	• Intervention: clinical examination and advice plus multidisciplinary intervention (comprised assignment of a case manager, who made a rehabilitation plan in collaboration with the patient and a multidisciplinary team). • Control: clinical examination and advice. • Model: multidisciplinary care. • Results: the multidisciplinary intervention group ensured a quicker return to work than control in a subgroup with low job satisfaction, notably when claimants were excluded. The opposite effect was seen in the subgroup with high job satisfaction. • Conclusions: multidisciplinary intervention seemed more effective than brief intervention in subgroups of patients with low job satisfaction, no influence on work planning and feeling at risk of losing their jobs.
Randomised controlled trial of integrated care to reduce disability from chronic low back pain in working and private life Lambeek, et al. 2010 [64]	• RCT (n=134 adults aged 18-65 sick-listed for at least 12 weeks owing to low back pain). • Intervention: integrated care (a workplace intervention based on participatory ergonomics, involving a supervisor, and a graded activity program based on cognitive behavioural principles). • Control: usual care. • Model: integrated care program. • Results: the median duration until sustainable return to work was 88 days in the integrated care group compared with 208 days in the usual care group (P=0.003). • Integrated care was effective on return to work (hazard ratio 1.9). • After 12 months, patients in the integrated care group improved significantly more on functional status compared with patients in the usual care group (P=0.01). • Improvement of pain between the groups did not differ significantly.
Multidisciplinary intensive functional restoration versus outpatient active physiotherapy in chronic low back pain: a randomized controlled trial Roche-Leboucher, et al. 2011 [65]	• Randomised parallel group comparative trial of patients with chronic back pain (n=132). • Intervention: functional restoration program (OT, psychiatrist, psychologist and occupational physician). • Control: active individual therapy. • Model: multidisciplinary program. • Results: in both groups, at one-year follow-up, intensity of pain, flexibility, trunk muscle endurance, Dallas daily activities and work and leisure scores, and number of sick-leave days were significantly improved compared to baseline. • Conclusion: both programs are efficient in reducing disability and sick-leave days, the intervention is more effective in reducing sick-leave days.
Multidisciplinary intervention in patients with musculoskeletal pain: A randomized clinical trial Brendbekken, et al. 2016 [66]	• RCT of adults referred to a specialist clinic (n=284). • Intervention: multidisciplinary intervention (using the novel Interdisciplinary Structured Interview with a Visual Educational Tool). • Control: brief intervention (on effects on mental and physical symptoms, functioning ability, use of health services and coping). • Model: multidisciplinary care.

Source	Summary
	• Results: both groups reported improvements in mental and physical symptoms, including pain, and improved functioning ability at 3 and 12 months. • Significant interactions between group and time were found on mental symptoms (anxiety ($p<0.05$), depression ($p<0.01$), somatization ($p<0.01$)) and functioning ability ($p<0.01$) due to stronger effects in the intervention group at three months. • At 3 and 12 months, the intervention group reported significantly less use of health services (general practitioner ($p<0.05$)).
Treatment of low back pain: First extended follow up of an original trial (NCT00600197) comparing a multidisciplinary group-based rehabilitation program with oral drug treatment alone up to 24 months Tavafian, et al. 2017 [67]	• 24-months follow-up data of a RCT. This paper describes 83% (165 of 197) of the original study participants. • Intervention: group-based multidisciplinary rehabilitation program and monthly motivational coaching. • Model: multidisciplinary care. • Results: among the respondents, both intervention and control groups were the same at baseline except for education level and mental health which was better in the intervention group ($P<0.05$). • As a result, the intervention group had consistently better outcomes regarding all variables, except for social function, at all follow-up times.
Treatment of chronic low back pain: a randomized clinical trial comparing multidisciplinary group-based rehabilitation program and oral drug treatment with oral drug treatment alone Tavafian, et al. 2011 [68]	• Randomised clinical trial of people with chronic low back pain (n=197). • Intervention: multidisciplinary group-based rehabilitation program with oral drug treatment. • Control: oral drug treatment alone. • Model: multidisciplinary care. • Results: there were significant differences within each group by time in terms of all subscales of 36-item Short-form ($P<0.01$) except for mental health ($P=0.7$). • There were significant differences between groups in terms of all domains of SF-36 scale except for general health ($P=0.06$), social function ($P=0.08$) and role emotional ($P=0.7$). • The disability of patients in the intervention group was improved over time significantly. • Group-based multidisciplinary program could improve most domains of quality of life in chronic low back pain patients in the six-month period. However, there were no significant differences between two groups in sub scales such as general health, social function and role emotional.
Functional multidisciplinary rehabilitation versus outpatient physiotherapy for non specific low back pain: randomized controlled trial Henchoz, et al. 2010 [69]	• RCT for non-specific back pain (n=109). • Intervention: multidisciplinary rehabilitation • Control: outpatient physiotherapy. • Model: multidisciplinary care. • Results: Oswestry disability index was significantly improved for the intervention group. • Work status was significantly improved after functional multidisciplinary rehabilitation only. • Secondary outcome results were more contrasted.
Systematic review on intensive interdisciplinary	• Systematic review on children with chronic pain (10 studies included, one RCT and 9 non-randomised studies). • Intervention: intensive interdisciplinary pain treatment.

Source	Summary
pain treatment of children with chronic pain Hechler, et al. 2015 [70]	• Control: all nine non-RCTs did not have a control group. • Model: interdisciplinary care • Results: at post-treatment, there were large improvements for disability, and small to moderate improvements for pain intensity and depressive symptoms. • The positive effects were maintained at short-term follow-up. • Findings demonstrated extreme heterogeneity.
Interdisciplinary rehabilitation of patients with chronic widespread pain: Primary endpoint of the randomized, nonblinded, parallel-group IMPROvE trial Amris, et al. 2014 [71]	• Randomised, non-blinded, parallel-group trial on patients with chronic widespread pain (n=192). • Intervention: group-based multicomponent treatment course. • Control: waiting list control group. • Model: group-based multicomponent care. • Results: primary endpoints were partly achieved with a statistically significant improvement in assessment of motor and process skills activities of daily living motor (group mean difference: 0.20) and activities of daily living process (0.20) ability measures, whereas no difference in the SF-36 MCS (1.14 [95% CI: -1.52 to 3.81], P=.40) was observed. • Conclusions: the intervention resulted in observable improvement of functional ability in a subgroup of patients at six-month follow-up.
A systematic review and meta-analysis of unguided electronic and mobile health technologies for chronic pain-is it time to start prescribing electronic health applications? Moman, et al. 2019 [72]	• Systematic review for chronic pain (n=17 RCTs were included). • Intervention: eHealth and mHealth interventions. • Control: usual care. • Model: telehealth. • Results: both eHealth and mHealth interventions had a significant effect on pain intensity at short- and intermediate-term follow-up. • A significant but small effect was observed for depression at short- and intermediate-term follow-up and self-efficacy at short-term follow-up. • A significant effect was observed for pain catastrophising at short-term follow-up.
Return to work in employees on sick leave due to neck or shoulder pain: A randomized clinical trial comparing multidisciplinary and brief intervention with one-year register-based follow-up Moll, et al. 2018 [73]	• RCT on employees on sick-leave due to neck or shoulder pain (n=168). • Intervention: multidisciplinary intervention. • Control: brief intervention. • Model: multidisciplinary care. • Results: in the intervention group, 50 participants (59%) experienced 4 or more continuous weeks of return to work while 48 (58%) returned to work in the control group during the 1 year of follow-up. • Results showed a statistically non-significant tendency towards a lower rate of return to work in the intervention group. • There were no statistically significant differences in secondary outcomes between the multidisciplinary intervention (MDI) and brief intervention (BI) groups. • Conclusion: both groups performed equally with respect to both primary and secondary outcomes.
The effect of an integrated multidisciplinary rehabilitation programme for	• A single-centre, pragmatic, two-arm parallel, RCT in patients with chronic low back pain (n=165). • Intervention: integrated rehabilitation program.

Source	Summary
patients with chronic low back pain: Long-term follow up of a randomised controlled trial Schmidt, et al. 2021 [74]	• Control: existing rehabilitation program. • Model: integrated care. • Results: The mean difference (integrated program minus existing program) in disability was -0.53 (95% CI -4.08 to 3.02); p = 0.770). • No statistically significant differences were found in the secondary outcomes. • Conclusion: The integrated program was not more effective in reducing long-term disability in patients with chronic low back pain than the existing program.
One-year follow-up in employees sick-listed because of low back pain: randomized clinical trial comparing multidisciplinary and brief intervention Jensen, et al. 2011 [75]	• RCT on employees sick-listed with low back pain (n=351). • Intervention: multidisciplinary intervention (brief intervention with the expertise of a team and the assignment of a case manager). • Control: brief intervention (clinical examination and advice offered by a rehabilitation physician and a physiotherapist). • Model: multidisciplinary care. • Results: return to work was achieved by 125 (71.0%) participants in the multidisciplinary and 133 (76.0%) participants in the control group. • Multiple linear regression analysis displayed no differences in secondary outcomes, except for the mental health score (SF36), which was a little higher in the intervention group. • Conclusion: hospital-based multidisciplinary intervention may be no better than brief intervention in this setting.
Effectiveness of interdisciplinary interventions in paediatric chronic pain management: a systematic review and subset meta-analysis Liossi, et al. 2019 [76]	• Systematic review and subset meta-analysis in paediatric patients with chronic pain. • Intervention: interdisciplinary interventions (intervention co-ordinated by two or more healthcare professionals of different disciplines). • Control: usual care. • Model: interdisciplinary care. • Results: patients in interdisciplinary interventions reported significantly lower pain intensity 0 to 1 month post-intervention compared to the control. • Within-groups analysis showed significant improvements pre- to post-intervention in pain intensity, functional disability, anxiety, depression, catastrophising, school attendance, school functioning, and pain acceptance for the intervention group. • Few differences were found between interventions delivered in inpatient vs outpatient settings. • Significant heterogeneity due mainly to differing outcome variables and intervention content was found in most analyses. • Conclusions: overall, interdisciplinary interventions show promise.
CADTH Rapid Response Reports Gauthier, et al. 2019 [77]	• CADTH Rapid Response Report: Summary with Critical Appraisal on patients with chronic non-malignant pain. Two systematic reviews, two RCTs and one economic evaluation were included. • Intervention: multidisciplinary treatment programs. • Model: multidisciplinary care.

Source	Summary
	• Results: findings regarding clinical effectiveness and quality of life, anxiety and depression showed that multidisciplinary treatment programs were associated with significant improvements from baseline in pain and function or disability. • The difference between the intervention and control groups for this outcome did not always reach statistical significance. • No relevant cost-effectiveness studies were identified.
Long-term outcomes and costs of an integrated rehabilitation program for chronic knee pain: A pragmatic, cluster randomized, controlled trial Hurley, et al. 2012 [78]	• A cluster randomised control study. • 418 people with chronic knee pain were recruited from five primary care surgeries. • Participants were randomised to usual care or the ESCAPE knee pain program. ESCAPE is a rehabilitation program combining patient education, self-management strategies and exercise. • Model: rehabilitation program. • The primary outcome measure was physical function. At 30 months the intervention group reported better physical function. Low health care costs were also reported compared to the control group. • At 30 months 68% of the original participants were available for follow up.
Self-management intervention for chronic pain in older adults: A randomised controlled trial. Nicholas, et al. 2013 [79]	• RCT included 141 chronic pain patients aged >65 years. • Self-management versus the Exercise-Attention Control (EAC) group. • The pain self-management group was significantly improved on measures of pain distress, disability, mood, unhelpful pain beliefs, and functional reach. • Authors conclusions: In the short term at least, cognitive-behavioural therapy-based PSM was more effective than exercises and usual care.
Psychological therapies (remotely delivered) for the management of chronic and recurrent pain in children and adolescents Fisher, et al. 2019 [80]	• Cochrane systematic review including eight studies (n=371). • Model: telehealth. • Interventions: remotely delivered psychological therapies for the management of chronic and recurrent pain in children and adolescents. • Headache severity was reduced post-treatment. For mixed pain conditions, we found only one beneficial effect: psychological therapies reduced pain intensity post-treatment. No effects were found for reducing pain at follow-up in either analysis. • Overall, psychological therapies delivered remotely, primarily via the internet, confer benefit in reducing the intensity or severity of pain after treatment across conditions. • There is considerable uncertainty around these estimates of effect and only 8 studies with 371 children contribute to the conclusions.

Appendix 3: Experiential evidence

A purposive sample of six sites was identified through the ACI Pain Management Network, and 30-minute semi-structured virtual interviews were conducted with representatives from the nominated pain clinics and a regional service. The purpose of the interviews was to describe how care is organised and delivered in regional NSW and public pain clinics, and what works in different contexts. Individual case presentations (coined 'vignettes') were developed for each case using a standard format and several rounds of feedback and revision with the representative. An iterative cross-case comparison was used to identify similarities and differences in delivering pain services across different contexts.

Pain clinics and service delivery in NSW

Local vignette – Northern NSW LHD (NNSWLHD)

Interdisciplinary model in a rural setting – David Beveridge, Nurse Practitioner

What are the main services provided by your pain clinic?

The clinic is based at Lismore Base Hospital. Up to 14 group programs are delivered remotely to people living in Tweed, Grafton, Ballina and Casino.

We see 87% of people within 30 days of referral. There is less than 10% do not arrive (DNA).

On referral, patients are provided with an educational media link with information on living with chronic pain. They are triaged to the most appropriate type of assessment - either a single practitioner, combined disciplines or full multidisciplinary review.

The nurse practitioner coordinates a case conference to discuss recommendations from the assessment. Conducting the case conference on a separate day appears to improve engagement.

Treatment is delivered through group interventions, which focus on self-management, cognitive behavioural strategies and functional restoration. Medium and high-intensity groups are available, with virtual delivery implemented in response to the COVID-19 pandemic for low-intensity programs. The sessions are semi-structured and responsive to the needs and preferences of the group. Teaching methods have varied and become less prescriptive over the years. Following completion of the group intervention, we conduct a one and three-month review.

Referrals are made to providers in the community, preferably with skills and experience in pain management. This ensures consistency around language and approach – which circumvents people receiving conflicting advice and support.

What is the structure of your pain clinic?

The multidisciplinary team includes a pain specialist, anaesthetist, nurse practitioner, psychologist, physiotherapist, and administration officer.

What aspects of your service deliver the best results?

We draw on ePPOC data to review, refine and improve the service. Questionnaires are conducted at the end of all groups and feedback informs quality improvement efforts. ePPOC data is also used to benchmark and drive care.

'You need to ask more questions and give less answers. The person with pain is the expert in their own life. We are just walking with them on their journey for a while. I gain more knowledge and insight from the person, by understanding their experiences. I ask the group when it's ending, "if you were in a group coming after you, what would you want to know?" David.

The service was very quick to adapt in response to COVID-19 and offer telehealth. The practitioner role is essential in supporting people to feel comfortable using the technology, and therefore fully engaged in treatment.

What tips do you have for others?

- Assessments conducted face-to-face are ideal, and then treatment can be delivered virtually. Step through how to click the Skype invitation, turn on the microphone and camera, so patients can be fully engaged when using telehealth.
- Consider how to apply the evidence in the local setting and context. You have a body of knowledge that you can draw on and use in different settings and with different people.

Chronic pain clinics and service delivery in NSW

Local vignette – South Eastern Sydney LHD

Interdisciplinary model – Scott Swinson, Senior Physiotherapist

What are the main services provided by your pain clinic?

The Pain Management Unit offers multidisciplinary assessments and individual medical specialist and allied health (psychology and physiotherapy) assessments. We receive over 600 referrals per year.

We are able to provide effective interventions for patients with chronic pain as evidenced by our ePPOC data. This is predominately done in two different intensity group programs.

- ACTIVATE: a high intensity program delivered 3-4 days a week over 4 weeks.
- ENERGISE: a moderate intensity program delivered 2 short days a week over 4 weeks.

Supplementary group sessions are also run weekly.

- WOW (Walking outside Weekly): a group session outside in a local park with stretching.
- Strength and mindfulness: a group session held outside in a local park.

Compulsory attendance at a pain information session has been implemeneted prior to multidisciplinary team (MDT) or individual assessment. This two-hour session intiates treatment, and provides people with education, pain management strategies, manages expectations for future encounters.

Comprehensive three-hour MDT assessments include an initial joint assessment with a pain specialist and physiotherapist, followed by a separate physical assessment and psychological assessment. The MDT discusses the assessment and together decide on the best managagement approach. At the end of the assessment feedback is provided to the patient by all parties and appropriate appointments and refererals made.

What is the structure of your pain clinic?

The multidisciplinary team (MDT) includes one FTE pain consultant, 1.6 FTE psychologist, 1.6 FTE physiotherapist, and 1 FTE Nursing Unit Manager and 0.8 FTE of Administration Support.

What aspects of your service deliver the best results?

Offering limited individual clinical psychology and/or physiotherapy sessions enables us to provide patients with pain management strategies for those who may not be suitable for a group pain program or for those requiring additional support and preparation prior to participating in a group program.

"We are strong advocates for the patients, we build rapport and relationships and tailor interventions and strategies to the person and their specific pain, needs and preferences. Everyone is different." Scott.

The integration of the 'Cognitive Functional Approach' for both individual and group physiotherapy sessions appears to improve outcomes for our patients, especially those with back pain.

What tips do you have for others?

- An interdisciplinary model allows cross over between disciplines. You cannot be too rigid in your area of expertise and boundaries.
- Consider how to increase sharing of interventions, approaches and resources across pain clinics in NSW.
- The Pain Management Unit is integrated with the acute pain service at St George Hospital. Ward rounds are conducted and if a patient is in need of multidisciplinary support then an outpatient referral with the Pain Management Unit is recommended.

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Pain clinics and service delivery in NSW

Local vignette – Bega Valley Chronic Pain Management

Community-based chronic pain management – Steve Brigham, Psychologist

What is important to know about pain clinic?

There is no comprehensive pain clinic at South East Regional Hospital (SERH) or as a private facility in the NSW Far South Coast.

The 'Bega Valley' chronic pain management group program is only delivered twice yearly due to availability of resources, both financial and staffing. Funding from COORDINARE, the South Eastern NSW PHN (Primary Health Network), provides a private psychologist, who has pain experience, to co-facilitate the program with a physiotherapist from South East Regional Hospital, using hospital facilities.

The waitlist to access the program is normally 2-6 months, with patients contacted a few weeks prior to commencement of the next scheduled group. Assessment is based on referral information, questionnaire and telephone interview.

What organisational model is used at your clinic?

Group-based, self-management interventions are run by a multidisciplinary allied health team.

What are the main services provided by your pain clinic?

The two group-based self-management interventions for 10 participants per group are run by a multidisciplinary allied health team; the main facilitators are the private psychologist and the LHD physiotherapist, with input from a pharmacist and an occupational therapist. The program focuses on integrating individually tailored physical activities and exercise and psychological strategies, including cognitive pain management strategies, dealing with flare-ups, coping skills, stress management, relaxation and mindfulness, improving sleep, setting goals and maintaining change.

The group-based program is delivered over six weeks (with a pre-group education group session, and four- and 12-week follow-up group sessions).

Advantages of group-based interventions include being able to cover more material in a concentrated timeframe and the support and interpersonal learnings participants gain from each other.

Referrals are from the General Practitioner; on average there are 2-3 referrals each month.

The program has also been adapted as an online version funded by COORDINARE and facilitated by a psychologist and exercise physiologist, also with input from a local pharmacist.

Funding security is a current challenge because funding is reviewed annually. The program would be strengthened, if supported by a broader multidisciplinary public-based pain clinic.

What aspects of your service deliver the best results?

"We try our best to individualise our service provision within the parameters of a structured program. The core aim is for people to develop self-management of their pain - reducing its impact on each of their lives – activities, self-concept, and quality of life." Steve.

What tips do you have for others?

- While the program is pre-designed and structured, and therefore able to be adapted or replicated by other facilitators, it can also be delivered in a manner that is responsive to the needs and circumstances of different people.
- Measurement of people's progress and their evaluation of the program are essential. In both programs, we conduct these after the six-week and second follow-up stages.

NSW GOVERNMENT | AGENCY FOR CLINICAL INNOVATION

Pain clinics and service delivery in NSW

Local vignette – Building capacity across the state

Capacity initiatives for pain services: Michael Nicholas and Paul Wrigley

What is important to know about pain services?

In the last 20 years chronic pain has become recognised as a significant health priority, with one in five adults living with chronic pain, and chronic pain conditions being amongst the top 10 conditions for years lived with disability. A lack of appropriately skilled health care resources has compounded these problems.

What model is used in NSW?

Based on the statewide pain management plan, with with its tiered multidisciplinary resources, training in basic pain management skills and mentoring has been provided to health care professionals from multiple disciplines across NSW. Research underpinning the development and evaluation of pain management services has played a key role in this model.

What are the main services provided?

Health professional training and education: an interactive course on the key skills required to assess patients with chronic pain and to train them in pain self-management strategies was developed by the Pain Management and Research Centre (PMRC) at the Royal North Shore Hospital - the 'lead centre' responsible for coordinating pain research and clinical training. This innovative course has been delivered via in-person and online versions by PMRC staff since 2012. The online, webinar style courses have been conducted with groups of community health care providers in regional areas across the state with funding support from PHNs, with the Pain Management Network Manager providing the coordination. Ongoing support depends on local funding and resources. This capability model is scalable and has been delivered nationally and internationally. In 2017 this training was adapted to build the capacity to teach pain self-management skills to people from non-English speaking backgrounds using non-clinical health workers who speak the community languages. The resources have been translated into Chinese, Arabic, Greek, Italian, Vietnamese, and Macedonian. These in-person courses have enabled brief pain management programs to be successfully delivered in these communities in Newcastle, western and southern Sydney, and Wollongong. Their outcomes are consistent with those offered in English in regional areas.

Research: Pain leaders in NSW have also been working with an International Taskforce and the WHO to develop the ICD-11 (International Classification of Diseases), which codes chronic pain more effectively than the currently used ICD-10. This new coding system for chronic pain will improve the identification of patients with chronic pain and facilitate the monitoring and appropriate targeting of resources for their care. A trial of this has started at RNSH.

Another research initiative is aiming to improve access to community care coordination with training in pain management skills for the existing coordinators. The project is focusing on people with chronic pain who frequently attend emergency departments. The project, if successful, is intended for use across NSW.

What aspects deliver the best results?

Building capacity through training and focusing on organisational supports are essential to the long-term sustainable and effective delivery of pain services.

"Many of the barriers to good pain management are not primarily scientific or medical, but organisational. It is crucial to integrate clinical services, within a program of education, training and research to tackle the challenge of providing state-wide access to effective pain services", said Paul.

"There are a core group of skills that you can train people to do, and if they do these things, you will get results. By training people to deliver pain services in

the community, including to those with limited English, means we improve access to services" said Michael.

What tips do you have for others?

- Many of the barriers to good pain management are not primarily scientific or medical, but organisational.
- Pain is invisible if it doesn't get coded correctly.

Pain clinics and service delivery in NSW

Local vignette – Hunter New England LHD

Interdisciplinary model for children with complex pain – Susie Lord, Specialist Pain Medicine Physician

What is important to know about the pain clinic?

The service runs clinics two days per week for children with complex pain, who are aged up to 16 years at referral, and who live in the Hunter, New England, Mid-North Coast, or Far North Coast areas. The team includes a pain specialist, social worker, physiotherapist and clinical psychologist

The team strives to deliver equitable, family-centred, trauma-informed and culturally safe care. The triage policy is designed to advantage the most disadvantaged children. For example, ePPOC data showed that in the 12-months to mid-2020, 0% of children attending the service were from high-advantage areas; instead 55% lived in areas in the two lowest socioeconomic bands.

What organisational model is used at your clinic?

Guided by the sociopsychobiomedical framework, the team uses a trauma-informed and tailored approach. Those with complex needs are managed on-team until able to manage independently, or with support of the primary care providers available close to home.

What are the main services provided by your pain clinic?

The triage policy priorities children with frequent emergency and hospital admissions, potentially-avoidable surgery or hazardous medication use. Given the intersection between pain impact and social determinants of health, the team otherwise prioritises Aboriginal children, those in out-of-home care or from refugee backgrounds.

All together, the team sees children and their families for the initial in-depth assessment. Despite having to meet a number of new people at once, children's feedback suggests it is 'worth it'; they appreciate feeling deeply heard and not having to repeat their story to multiple clinicians.

Subsequent appointments are tailored – with different configurations of the interdisciplinary team, the child, parent(s) or everyone. Primary care- and school-liaison are important components. Responsive advice to families is offered by email between appointments.

The service has utilised telehealth since 2013; this increased in response to COVID-19. Telehealth examination might seem challenging, but a scavenger hunt for equipment, and coaching children to perform their own neuro-sensory examination, is both engaging and informative. Although telehealth reduces travel burden, some families prefer to meet clinicians face-to-face to develop relationships and trust; for children with significant trauma experiences and distress, this is vital.

What aspects of your service deliver the best results?

Relationships – it's the only thing that can deliver good pain care.

"Families sense the respect we have for complex life experiences; you don't get pain through an easy life. People have complex stories. People can feel scared to share stories. We need to listen to people and help them feel safe and comfortable. That's the foundation of the work we do".

What tips do you have for others?

- Early referral of children with pain predicted to become chronic may be high value.
- An identified Aboriginal position on service is a key enabler of team cultural learning.
- ePPOC is helpful for clinical improvement but should not be mandatory to access service. Literacy support may be needed.
- Social determinants of pain and health must be assessed and addressed to achieve equitable outcomes.

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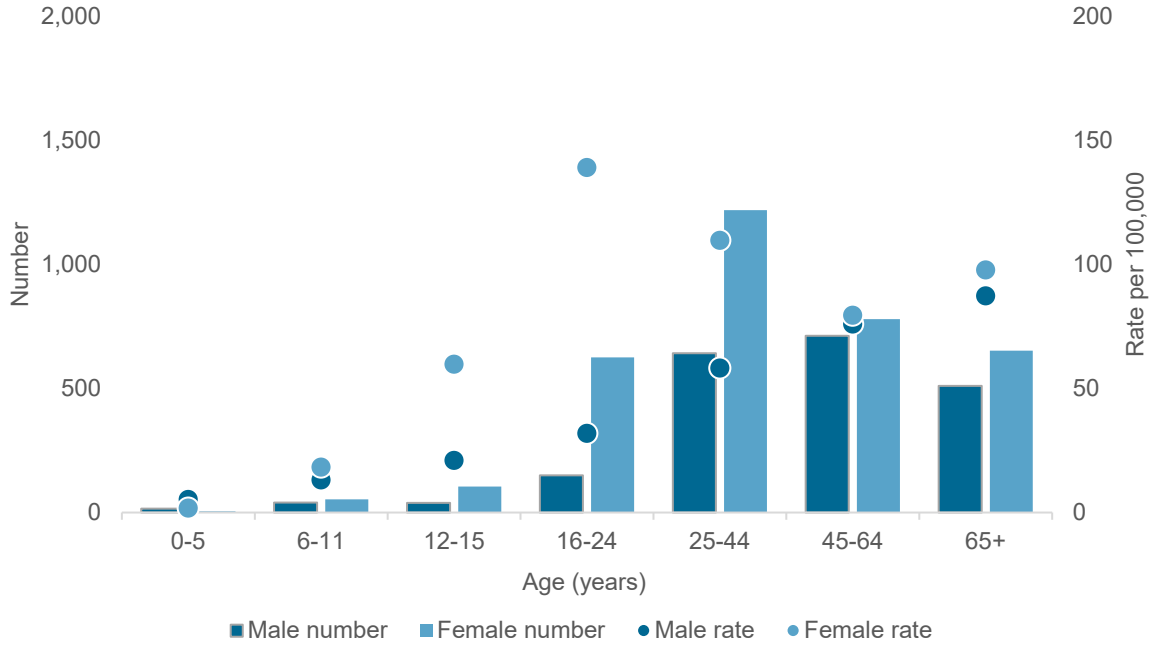
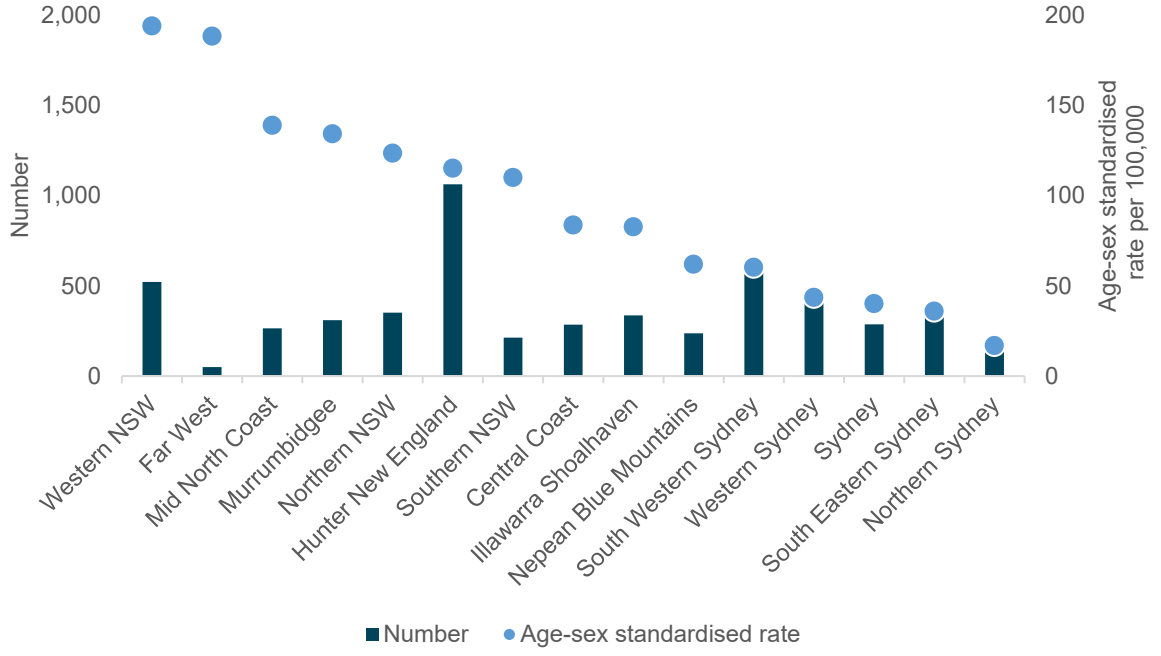
Appendix 4: Additional figures

Figure 1. Frequent emergency department attenders with chronic pain* by age and sex, NSW 2018-19



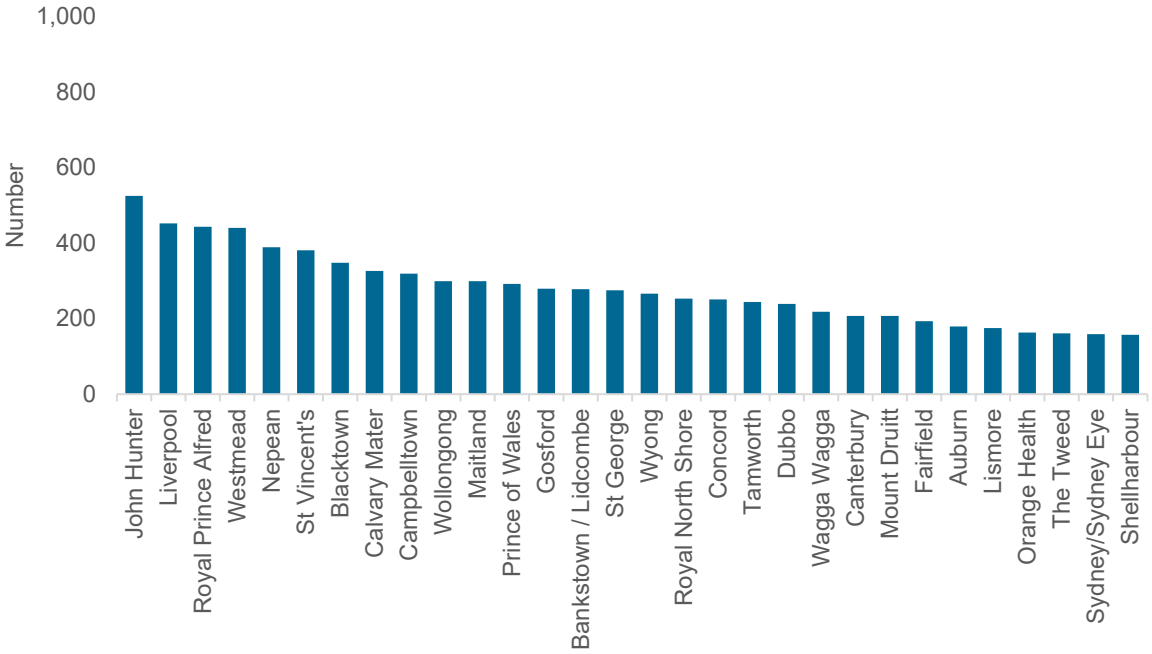
* People who presented to an ED 7 or more times within 12 months and at least 3 presentations had a chronic pain-related principal diagnosis.

Figure 2. Frequent emergency department attenders with chronic pain* by local health district of residence, NSW 2018-19



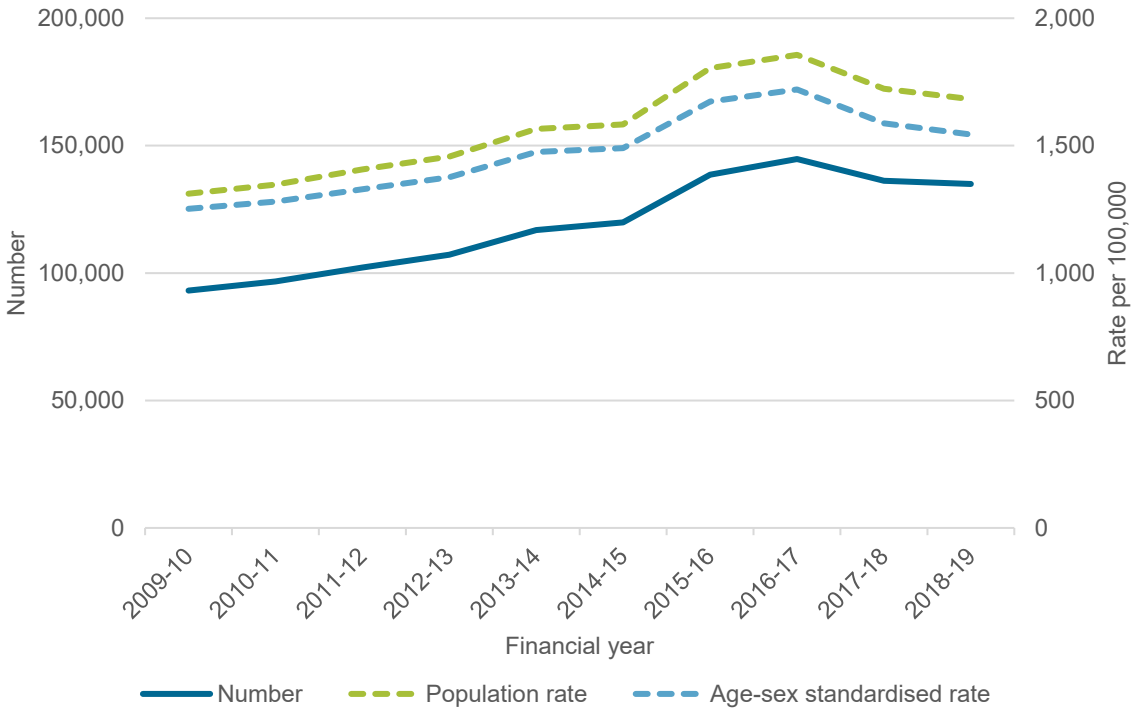
* People who presented to an ED 7 or more times within 12 months and at least 3 presentations had a chronic pain-related principal diagnosis.

Figure 3. Frequent emergency department attenders with chronic pain* by emergency departments visited, NSW 2018-19



* People who presented to an ED 7 or more times within 12 months and at least 3 presentations had a chronic pain-related principal diagnosis. Notes: some people presented to more than one ED. They are counted at each ED they presented to. The 30 EDs with the highest number of frequent ED attenders are shown.

Figure 4. Admitted patient episodes with chronic pain-related code as the principal diagnosis, NSW public and private hospitals 2009-10 to 2018-19



Appendix 5: Data sensitivity analyses

Chronic pain frequent ED attendance sensitivity analysis

A sensitivity analysis was conducted on the definition of frequent ED attendance by people with chronic plain. For the report, the definition was: 7 or more ED presentations within 12 months and at least 3 of those ED presentations had a chronic pain-related principal diagnosis. Among a consistent cohort of 82 public EDs, there were 4,605 people who met this definition in 2018-19. We maintained the rule of at least 7 or more ED presentations within 12 months; but modified the number of ED presentations that had a chronic pain-related principal diagnosis, from at least 3, to at least 1 or at least 7. In 2018-19, the number of people that met these definitions were 13,424 and 804 respectively (Table 1).

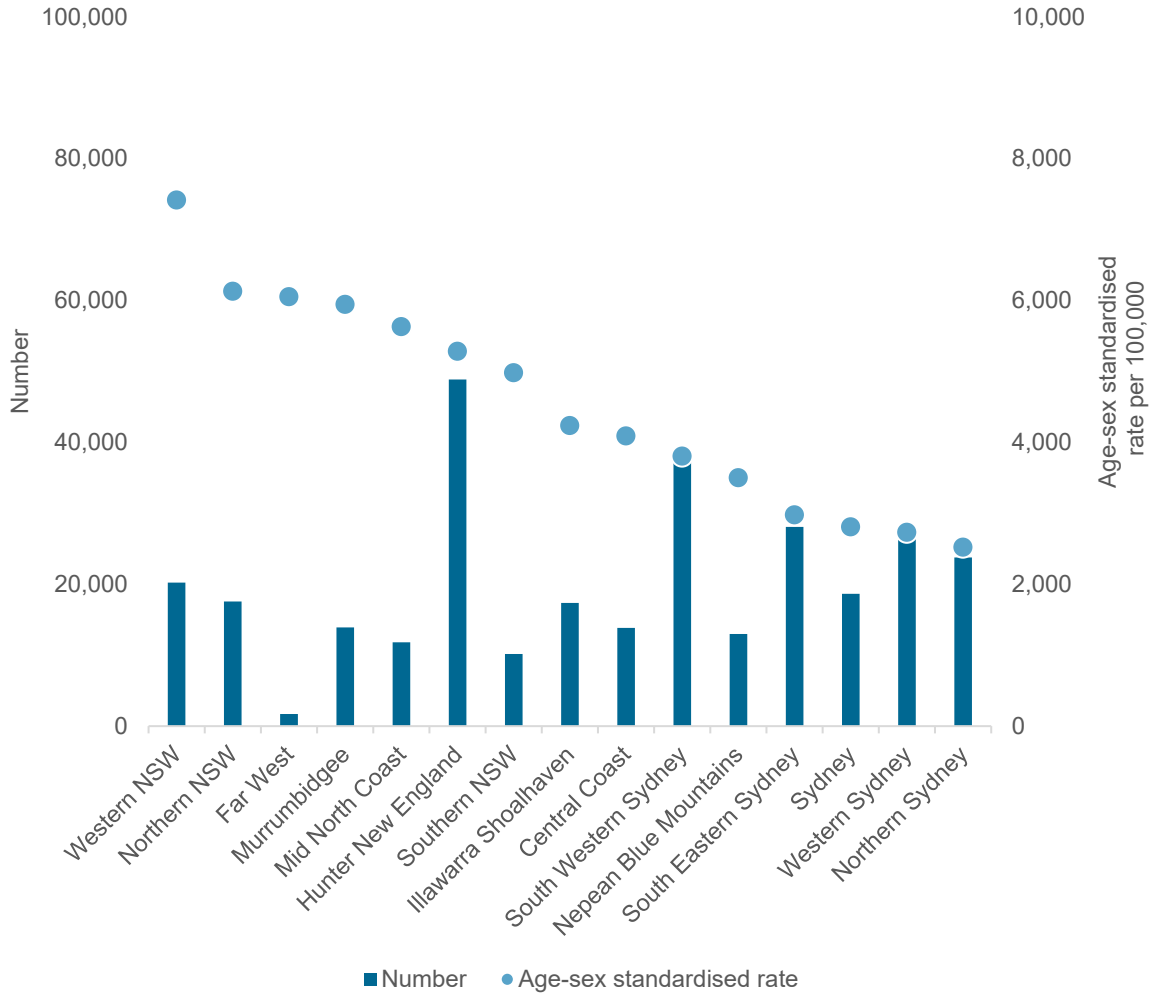
Table 1. Chronic pain cohort based on different definitions, 2009-10 to 2018-19

	Seven or more ED presentations within 12 months		
Financial year	**One+ chronic pain-related principal diagnosis**	**Three+ chronic pain-related principal diagnosis**	**Seven+ chronic pain-related principal diagnosis**
2009-10	8,346	2,417	335
2010-11	8,445	2,449	345
2011-12	8,696	2,642	373
2012-13	9,567	3,123	472
2013-14	10,117	3,462	600
2014-15	10,590	3,571	585
2015-16	10,781	3,694	596
2016-17	11,643	3,909	601
2017-18	12,436	4,210	721
2018-19	13,424	4,605	804

Northern Beaches Hospital sensitivity analysis

In 2017-18, there were 24,374 unplanned emergency department presentations for a chronic pain-related principal diagnosis in Northern Sydney LHD. In 2018-19, when Northern Beaches Hospital opened but its data was not included in the EDDC, there were 21,111 presentations. In 2018-19, Northern Sydney LHD had the lowest rate of unplanned ED presentations for a chronic pain-related principal diagnosis (Care delivery models for chronic pain report, Figure 3). Consistent with this, in 2017-18, Northern Sydney LHD also had the lowest rate (Figure 1).

Figure 1: Number and rate of unplanned emergency department presentations for a chronic pain-related principal diagnosis by local health district of residence, NSW 2017-18



Glossary

ACT	Acceptance and commitment therapy
APDC	NSW Admitted Patient Data Collection
ASM	Automated self-management
ASM+CC	Automated self-management-enhanced collaborative care
BPS	Biopsychosocial
CBT	Cognitive behaviour therapy
CHeReL	Centre for Health Record Linkage
CPG	Clinical practice guidelines
DI	Delayed intervention
EI	Early intervention
ED	Emergency department
EDDC	NSW Emergency Department Data Collection
ePPOC	Electronic Persistent Pain Outcomes Collaboration
FIQ	Fibromyalgia impact questionnaire
FM	Fibromyalgia
HoPeD	Hospital Performance Dataset
ICD-9-CM	International Classification of Diseases, Ninth Revision, Clinical Modification
ICD-10-AM	International statistical classification of diseases and related health problems, 10th revision, Australian modification
ICD-11	International Classification of Diseases 11th Revision
IMGV	Integrative medical group visits
IPP	Interdisciplinary pain program
LTOT	Long term opioid therapy
MBR	Multidisciplinary biopsychosocial rehabilitation
MBSR	Mindfulness-based stress reduction
MJP	Multi joint pain
MPI	Multidisciplinary pain intervention
NSCSP	Nonspecific chronic spinal pain
PASS	Pain and stress self-management group intervention
PSM	Pain self-management
PSYMEPHY	Psychological, medical, educational and physiotherapeutic
QOL	Quality of life
RCT	Randomised controlled trial
RTW	Return to work
SNOMED CT-AU	Systematized nomenclature of medicine – Clinical terms – Australian version
TMPM	Traditional multidisciplinary pain management

References

1. Irvine K, Hall R, Taylor L. Centre for health record linkage: Expanding access to linked population data for NSW and the ACT, Australia. Int J Popul Data Sci. 2020 10/19;4(2). DOI: 10.23889/ijpds.v4i2.1142
2. University of Wollongong Australia. Electronic persistent pain outcomes collaboration [Internet]. Australia; University of Wollongong [cited 10 June 2021]. Available from: https://www.uow.edu.au/ahsri/eppoc/
3. Doupe MB, Palatnick W, Day S, et al. Frequent users of emergency departments: developing standard definitions and defining prominent risk factors. Ann Emerg Med. 2012 Jul;60(1):24-32. DOI: 10.1016/j.annemergmed.2011.11.036
4. Lago L, Westley-Wise V, Mullan J, et al. Here one year, gone the next? Investigating persistence of frequent emergency department attendance: a retrospective study in Australia. BMJ Open. 2019 Jun 22;9(6):e027700. DOI: 10.1136/bmjopen-2018-027700
5. Australian Institute of Health and Welfare. Opioid harm in Australia and comparisons between Australia and Canada [Internet]. Canberra: AIHW; 2018 [cited 13 April 2021]. Available from: https://www.aihw.gov.au/getmedia/605a6cf8-6e53-488e-ac6e-925e9086df33/aihw-hse-210.pdf.aspx?inline=true
6. Wippert PM, Drießlein D, Beck H, et al. The feasibility and effectiveness of a new practical multidisciplinary treatment for low-back pain: A randomized controlled trial. J Clin Med. 2019 Dec 31;9(1). DOI: 10.3390/jcm9010115
7. Kroenke K, Baye F, Lourens SG, et al. Automated self-management (ASM) vs. ASM-enhanced collaborative care for chronic pain and mood symptoms: The CAMMPS randomized clinical trial. J Gen Intern Med. 2019 Sep;34(9):1806-14. DOI: 10.1007/s11606-019-05121-4
8. Wiklund T, Linton SJ, Alföldi P, et al. Is sleep disturbance in patients with chronic pain affected by physical exercise or ACT-based stress management? - A randomized controlled study. BMC Musculoskelet Disord. 2018 Apr 10;19(1):111. DOI: 10.1186/s12891-018-2020-z
9. Morone G, Paolucci T, Alcuri MR, et al. Quality of life improved by multidisciplinary back school program in patıents with chronic non-specific low back pain: A single blind randomized controlled trial. Eur J Phys Rehabil Med. 2011 Dec;47(4):533-41.
10. Gustavsson C, Denison E, von Koch L. Self-management of persistent neck pain: Two-year follow-up of a randomized controlled trial of a multicomponent group intervention in primary health care. Spine (Phila Pa 1976). 2011 Dec 1;36(25):2105-15. DOI: 10.1097/BRS.0b013e3182028b04
11. Friesen LN, Hadjistavropoulos HD, Schneider LH, et al. Examination of an internet-delivered cognitive behavioural pain management course for adults with fibromyalgia: A randomized controlled trial. Pain. 2017 Apr;158(4):593-604. DOI: 10.1097/j.pain.0000000000000802

12. Lambeek LC, Bosmans JE, Van Royen BJ, et al. Effect of integrated care for sick listed patients with chronic low back pain: economic evaluation alongside a randomised controlled trial. BMJ Open 2010 Nov 30;341:c6414. DOI: 10.1136/bmj.c6414

13. Comer C, Smith TO, Drew B, et al. A systematic review assessing non-pharmacological conservative treatment studies for people with non-inflammatory multi-joint pain: Clinical outcomes and research design considerations. Rheumatol Int. 2018 Mar;38(3):331-41. DOI: 10.1007/s00296-017-3876-1

14. Ernstzen DV, Louw QA, Hillier SL. Clinical practice guidelines for the management of chronic musculoskeletal pain in primary healthcare: a systematic review. Implement Sci. 2017 Jan 5;12(1):1. DOI: 10.1186/s13012-016-0533-0

15. Heutink M, Post MW, Bongers-Janssen HM, et al. The CONECSI trial: Results of a randomized controlled trial of a multidisciplinary cognitive behavioral program for coping with chronic neuropathic pain after spinal cord injury. Pain. 2012 Jan;153(1):120-8. DOI: 10.1016/j.pain.2011.09.029

16. Hinman RS, Campbell PK, Lawford BJ, et al. Does telephone-delivered exercise advice and support by physiotherapists improve pain and/or function in people with knee osteoarthritis? Telecare randomised controlled trial. Br J Sports Med. 2020 Jul;54(13):790-7. DOI: 10.1136/bjsports-2019-101183

17. Frank JW, Lovejoy TI, Becker WC, et al. Patient outcomes in dose reduction or discontinuation of long-term opioid therapy: A systematic review. Ann Intern Med. 2017 Aug 1;167(3):181-91. DOI: 10.7326/m17-0598

18. Sud A, Armas A, Cunningham H, et al. Multidisciplinary care for opioid dose reduction in patients with chronic non-cancer pain: A systematic realist review. PLoS One. 2020;15(7):e0236419. DOI: 10.1371/journal.pone.0236419

19. Busch H, Bodin L, Bergström G, et al. Patterns of sickness absence a decade after pain-related multidisciplinary rehabilitation. Pain. 2011 Aug;152(8):1727-33. DOI: 10.1016/j.pain.2011.02.004

20. Jensen C, Jensen OK, Nielsen CV. Sustainability of return to work in sick-listed employees with low-back pain. Two-year follow-up in a randomized clinical trial comparing multidisciplinary and brief intervention. BMC Musculoskelet Disord. 2012 Aug 25;13:156. DOI: 10.1186/1471-2474-13-156

21. Cochrane A, Higgins NM, FitzGerald O, et al. Early interventions to promote work participation in people with regional musculoskeletal pain: a systematic review and meta-analysis. Clin Rehabil. 2017 Nov;31(11):1466-81. DOI: 10.1177/0269215517699976

22. Dragioti E, Björk M, Larsson B, et al. A meta-epidemiological appraisal of the effects of interdisciplinary multimodal pain therapy dosing for chronic low back pain. J Clin Med. 2019 Jun 18;8(6). DOI: 10.3390/jcm8060871

23. Björnsdóttir SV, Arnljótsdóttir M, Tómasson G, et al. Health-related quality of life improvements among women with chronic pain: Comparison of two multidisciplinary interventions. Disabil Rehabil. 2016;38(9):828-36. DOI: 10.3109/09638288.2015.1061609

24. O'Keeffe M, Purtill H, Kennedy N, et al. Comparative Effectiveness of Conservative Interventions for Nonspecific Chronic Spinal Pain: Physical, Behavioral/Psychologically

Informed, or Combined? A Systematic Review and Meta-Analysis. J Pain. 2016 Jul;17(7):755-74. DOI: 10.1016/j.jpain.2016.01.473

25. Davin S, Lapin B, Mijatovic D, et al. Comparative effectiveness of an interdisciplinary pain program for chronic low back pain, compared to physical therapy alone. Spine (Phila Pa 1976). 2019 Dec 15;44(24):1715-22. DOI: 10.1097/brs.0000000000003161

26. Angeles RN, Guenter D, McCarthy L, et al. Group interprofessional chronic pain management in the primary care setting: A pilot study of feasibility and effectiveness in a family health team in Ontario. Pain Res Manag. 2013 Sep-Oct;18(5):237-42. DOI: 10.1155/2013/491279

27. Tavafian SS, Jamshidi AR, Mohammad K. Treatment of low back pain: Randomized clinical trial comparing a multidisciplinary group-based rehabilitation program with oral drug treatment up to 12 months. Int J Rheum Dis. 2014 Feb;17(2):159-64. DOI: 10.1111/1756-185x.12116

28. Brendbekken R, Eriksen HR, Grasdal A, et al. Return to work in patients with chronic musculoskeletal pain: Multidisciplinary intervention versus brief intervention: A randomized clinical trial. J Occup Rehabil. 2017 Mar;27(1):82-91. DOI: 10.1007/s10926-016-9634-5

29. Kamper SJ, Apeldoorn AT, Chiarotto A, et al. Multidisciplinary biopsychosocial rehabilitation for chronic low back pain. Cochrane Database Syst Rev. 2014 Sep 2(9):Cd000963. DOI: 10.1002/14651858.CD000963.pub3

30. Kroenke K, Krebs EE, Wu J, et al. Telecare collaborative management of chronic pain in primary care: a randomized clinical trial. JAMA. 2014 Jul 16;312(3):240-8. DOI: 10.1001/jama.2014.7689

31. Vowles KE, Pielech M, Edwards KA, et al. A Comparative Meta-Analysis of Unidisciplinary Psychology and Interdisciplinary Treatment Outcomes Following Acceptance and Commitment Therapy for Adults with Chronic Pain. J Pain. 2020 May-Jun;21(5-6):529-45. DOI: 10.1016/j.jpain.2019.10.004

32. Bujak BK, Regan E, Beattie PF, et al. The effectiveness of interdisciplinary intensive outpatient programs in a population with diverse chronic pain conditions: A systematic review and meta-analysis. Pain Manag. 2019 Jul;9(4):417-29. DOI: 10.2217/pmt-2018-0087

33. Jensen C, Nielsen CV, Jensen OK, et al. Cost-effectiveness and cost-benefit analyses of a multidisciplinary intervention compared with a brief intervention to facilitate return to work in sick-listed patients with low back pain. Spine (Phila Pa 1976). 2013 Jun 1;38(13):1059-67. DOI: 10.1097/BRS.0b013e31828ca0af

34. Toelle TR, Utpadel-Fischler DA, Haas KK, et al. App-based multidisciplinary back pain treatment versus combined physiotherapy plus online education: A randomized controlled trial. NPJ Digit Med. 2019;2:34. DOI: 10.1038/s41746-019-0109-x

35. Salathé CR, Melloh M, Crawford R, et al. Treatment efficacy, clinical utility, and cost-effectiveness of multidisciplinary biopsychosocial rehabilitation treatments for persistent low back pain: A systematic review. Global Spine J. 2018 Dec;8(8):872-86. DOI: 10.1177/2192568218765483

36. Peterson K, Anderson J, Bourne D, et al. Effectiveness of models used to deliver multimodal care for chronic musculoskeletal pain: A rapid evidence review. J Gen Intern Med. 2018 May;33(Suppl 1):71-81. DOI: 10.1007/s11606-018-4328-7

37. Tavafian SS, Jamshidi AR, Mohammad K. Treatment of low back pain: Second extended follow up of an original trial (NCT00600197) comparing a multidisciplinary group-based rehabilitation program with oral drug treatment alone up to 30 months. Int J Rheum Dis. 2017 Dec;20(12):1910-6. DOI: 10.1111/1756-185x.12540

38. Monticone M, Ambrosini E, Rocca B, et al. Group-based multimodal exercises integrated with cognitive-behavioural therapy improve disability, pain and quality of life of subjects with chronic neck pain: A randomized controlled trial with one-year follow-up. Clin Rehabil. 2017 Jun;31(6):742-52. DOI: 10.1177/0269215516651979

39. Martín J, Torre F, Padierna A, et al. Six-and 12-month follow-up of an interdisciplinary fibromyalgia treatment programme: Results of a randomised trial. Clin Exp Rheumatol. 2012 Nov-Dec;30(6 Suppl 74):103-11.

40. Ronzi Y, Roche-Leboucher G, Bègue C, et al. Efficiency of three treatment strategies on occupational and quality of life impairments for chronic low back pain patients: Is the multidisciplinary approach the key feature to success? Clin Rehabil. 2017 Oct;31(10):1364-73. DOI: 10.1177/0269215517691086

41. Lewis GN, Bean D, Mowat R. How have chronic pain management programs progressed? A mapping review. Pain Pract. 2019 Sep;19(7):767-84. DOI: 10.1111/papr.12805

42. Monticone M, Ferrante S, Rocca B, et al. Effect of a long-lasting multidisciplinary program on disability and fear-avoidance behaviors in patients with chronic low back pain: Results of a randomized controlled trial. Clin J Pain. 2013 Nov;29(11):929-38. DOI: 10.1097/AJP.0b013e31827fef7e

43. Vanhaudenhuyse A, Gillet A, Malaise N, et al. Efficacy and cost-effectiveness: A study of different treatment approaches in a tertiary pain centre. Eur J Pain. 2015 Nov;19(10):1437-46. DOI: 10.1002/ejp.674

44. Carmody TP, Duncan CL, Huggins J, et al. Telephone-delivered cognitive-behavioral therapy for pain management among older military veterans: a randomized trial. Psychol Serv. 2013 Aug;10(3):265-75. DOI: 10.1037/a0030944

45. Berglund E, Anderzén I, Andersén Å, et al. Multidisciplinary intervention and acceptance and commitment therapy for return-to-work and increased employability among patients with mental illness and/or chronic pain: A randomized controlled trial. Int J Environ Res Public Health. 2018 Oct 31;15(11). DOI: 10.3390/ijerph15112424

46. Carbonell-Baeza A, Aparicio VA, Chillón P, et al. Effectiveness of multidisciplinary therapy on symptomatology and quality of life in women with fibromyalgia. Clin Exp Rheumatol. 2011 Nov-Dec;29(6 Suppl 69):S97-103.

47. Turner BJ, Liang Y, Simmonds MJ, et al. Randomized trial of chronic pain self-management program in the community or clinic for low-income primary care patients. J Gen Intern Med. 2018 May;33(5):668-77. DOI: 10.1007/s11606-017-4244-2

48. Martín J, Torre F, Aguirre U, et al. Evaluation of the interdisciplinary PSYMEPHY treatment on patients with fibromyalgia: A randomized control trial. Pain Med. 2014 Apr;15(4):682-91. DOI: 10.1111/pme.12375

49. Hechler T, Ruhe AK, Schmidt P, et al. Inpatient-based intensive interdisciplinary pain treatment for highly impaired children with severe chronic pain: Randomized controlled trial

of efficacy and economic effects. Pain. 2014 Jan;155(1):118-28. DOI: 10.1016/j.pain.2013.09.015

50. Schäfer AGM, Zalpour C, von Piekartz H, et al. The efficacy of electronic health-supported home exercise interventions for patients with osteoarthritis of the knee: Systematic review. J Med Internet Res. 2018 Apr 26;20(4):e152. DOI: 10.2196/jmir.9465

51. Schmidt AM, Schiøttz-Christensen B, Foster NE, et al. The effect of an integrated multidisciplinary rehabilitation programme alternating inpatient interventions with home-based activities for patients with chronic low back pain: a randomized controlled trial. Clin Rehabil. 2020 Mar;34(3):382-93. DOI: 10.1177/0269215519897968

52. Smith J, Faux SG, Gardner T, et al. Reboot online: A randomized controlled trial comparing an online multidisciplinary pain management program with usual care for chronic pain. Pain Med. 2019 Dec 1;20(12):2385-96. DOI: 10.1093/pm/pnz208

53. Westman A, Linton SJ, Ohrvik J, et al. Controlled 3-year follow-up of a multidisciplinary pain rehabilitation program in primary health care. Disabil Rehabil. 2010;32(4):307-16. DOI: 10.3109/09638280903095924

54. Pedersen P, Nielsen CV, Jensen OK, et al. Employment status five years after a randomised controlled trial comparing multidisciplinary and brief intervention in employees on sick leave due to low back pain. Scand J Public Health. 2018 May;46(3):383-8. DOI: 10.1177/1403494817722290

55. Ravenek MJ, Hughes ID, Ivanovich N, et al. A systematic review of multidisciplinary outcomes in the management of chronic low back pain. Work. 2010;35(3):349-67. DOI: 10.3233/wor-2010-0995

56. van Erp RMA, Huijnen IPJ, Jakobs MLG, et al. Effectiveness of primary care interventions using a biopsychosocial approach in chronic low back pain: A systematic review. Pain Pract. 2019 Feb;19(2):224-41. DOI: 10.1111/papr.12735

57. Gardiner P, Luo M, D'Amico S, et al. Effectiveness of integrative medicine group visits in chronic pain and depressive symptoms: A randomized controlled trial. PLoS One. 2019;14(12):e0225540. DOI: 10.1371/journal.pone.0225540

58. Casey MB, Smart KM, Segurado R, et al. Multidisciplinary-based rehabilitation (MBR) compared with active physical interventions for pain and disability in adults with chronic pain: A systematic review and meta-analysis. Clin J Pain. 2020 Nov;36(11):874-86. DOI: 10.1097/ajp.0000000000000871

59. Wong SY, Chan FW, Wong RL, et al. Comparing the effectiveness of mindfulness-based stress reduction and multidisciplinary intervention programs for chronic pain: A randomized comparative trial. Clin J Pain. 2011 Oct;27(8):724-34. DOI: 10.1097/AJP.0b013e3182183c6e

60. Hampel P, Köpnick A, Roch S. Psychological and work-related outcomes after inpatient multidisciplinary rehabilitation of chronic low back pain: A prospective randomized controlled trial. BMC Psychol. 2019 Feb 15;7(1):6. DOI: 10.1186/s40359-019-0282-3

61. Carbonell-Baeza A, Aparicio VA, Ortega FB, et al. Does a 3-month multidisciplinary intervention improve pain, body composition and physical fitness in women with fibromyalgia? Br J Sports Med. 2011 Dec;45(15):1189-95. DOI: 10.1136/bjsm.2009.070896

62. Dufour N, Thamsborg G, Oefeldt A, et al. Treatment of chronic low back pain: A randomized, clinical trial comparing group-based multidisciplinary biopsychosocial rehabilitation and intensive individual therapist-assisted back muscle strengthening exercises. Spine (Phila Pa 1976). 2010 Mar 1;35(5):469-76. DOI: 10.1097/BRS.0b013e3181b8db2e

63. Stapelfeldt CM, Christiansen DH, Jensen OK, et al. Subgroup analyses on return to work in sick-listed employees with low back pain in a randomised trial comparing brief and multidisciplinary intervention. BMC Musculoskelet Disord. 2011 May 25;12:112. DOI: 10.1186/1471-2474-12-112

64. Lambeek LC, van Mechelen W, Knol DL, et al. Randomised controlled trial of integrated care to reduce disability from chronic low back pain in working and private life. BMJ Open. 2010 Mar 16;340:c1035. DOI: 10.1136/bmj.c1035

65. Roche-Leboucher G, Petit-Lemanac'h A, Bontoux L, et al. Multidisciplinary intensive functional restoration versus outpatient active physiotherapy in chronic low back pain: A randomized controlled trial. Spine (Phila Pa 1976). 2011 Dec 15;36(26):2235-42. DOI: 10.1097/BRS.0b013e3182191e13

66. Brendbekken R, Harris A, Ursin H, et al. Multidisciplinary intervention in patients with musculoskeletal pain: A randomized clinical trial. Int J Behav Med. 2016 Feb;23(1):1-11. DOI: 10.1007/s12529-015-9486-y

67. Tavafian SS, Jamshidi AR, Shay B. Treatment of low back pain: First extended follow up of an original trial (NCT00600197) comparing a multidisciplinary group-based rehabilitation program with oral drug treatment alone up to 24 months. Int J Rheum Dis. 2017 Dec;20(12):1902-9. DOI: 10.1111/1756-185x.12468

68. Tavafian SS, Jamshidi AR, Mohammad K. Treatment of chronic low back pain: A randomized clinical trial comparing multidisciplinary group-based rehabilitation program and oral drug treatment with oral drug treatment alone. Clin J Pain. 2011 Nov-Dec;27(9):811-8. DOI: 10.1097/AJP.0b013e31821e7930

69. Henchoz Y, de Goumoëns P, So AK, et al. Functional multidisciplinary rehabilitation versus outpatient physiotherapy for non specific low back pain: Randomized controlled trial. Swiss Med Wkly. 2010;140:w13133. DOI: 10.4414/smw.2010.13133

70. Hechler T, Kanstrup M, Holley AL, et al. Systematic review on intensive interdisciplinary pain treatment of children with chronic pain. Pediatrics. 2015 Jul;136(1):115-27. DOI: 10.1542/peds.2014-3319

71. Amris K, Wæhrens EE, Christensen R, et al. Interdisciplinary rehabilitation of patients with chronic widespread pain: Primary endpoint of the randomized, nonblinded, parallel-group IMPROvE trial. Pain. 2014 Jul;155(7):1356-64. DOI: 10.1016/j.pain.2014.04.012

72. Moman RN, Dvorkin J, Pollard EM, et al. A systematic review and meta-analysis of unguided electronic and mobile health technologies for chronic pain: Is it time to start prescribing electronic health applications? Pain Med. 2019 Nov 1;20(11):2238-55. DOI: 10.1093/pm/pnz164

73. Moll LT, Jensen OK, Schiøttz-Christensen B, et al. Return to work in employees on sick leave due to neck or shoulder pain: A randomized clinical trial comparing multidisciplinary and brief intervention with one-year register-based follow-up. J Occup Rehabil. 2018 Jun;28(2):346-56. DOI: 10.1007/s10926-017-9727-9

74. Schmidt AM, Laurberg TB, Moll LT, et al. The effect of an integrated multidisciplinary rehabilitation programme for patients with chronic low back pain: Long-term follow up of a randomised controlled trial. Clin Rehabil. 2021 Feb;35(2):232-41. DOI: 10.1177/0269215520963856

75. Jensen C, Jensen OK, Christiansen DH, et al. One-year follow-up in employees sick-listed because of low back pain: Randomized clinical trial comparing multidisciplinary and brief intervention. Spine (Phila Pa 1976). 2011 Jul 1;36(15):1180-9. DOI: 10.1097/BRS.0b013e3181eba711

76. Liossi C, Johnstone L, Lilley S, et al. Effectiveness of interdisciplinary interventions in paediatric chronic pain management: A systematic review and subset meta-analysis. Br J Anaesth. 2019 Aug;123(2):e359-e71. DOI: 10.1016/j.bja.2019.01.024

77. Gauthier K, Dulong C, Argáez C. CADTH rapid response reports. Multidisciplinary treatment programs for patients with chronic non-malignant pain: A review of clinical effectiveness, cost-effectiveness, and guidelines – an update. Ottawa (ON): Canadian Agency for Drugs and Technologies in Health; 2019.

78. Hurley MV, Walsh NE, Mitchell H, et al. Long-term outcomes and costs of an integrated rehabilitation program for chronic knee pain: a pragmatic, cluster randomized, controlled trial. Arthritis Care Res (Hoboken). 2012 Feb;64(2):238-47. DOI: 10.1002/acr.20642

79. Nicholas MK, Asghari A, Blyth FM, et al. Self-management intervention for chronic pain in older adults: A randomised controlled trial. Pain. 2013 Jun;154(6):824-35. DOI: 10.1016/j.pain.2013.02.009

80. Fisher E, Law E, Dudeney J, et al. Psychological therapies (remotely delivered) for the management of chronic and recurrent pain in children and adolescents. Cochrane Database of Systematic Reviews. 2019 (4). DOI: 10.1002/14651858.CD011118.pub3