

Pain Management

Analgesic prescribing in care home residents: How epidemiological studies may inform clinical practice

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Practice Points

- In the last decade the health profile of care home residents has changed, with greater levels of morbidity and a high prevalence of diagnosed and undiagnosed dementia and memory problems.
- Studies exploring pain in this setting have identified differing rates of prevalence; it is estimated that approximately half of care home residents experience pain to some extent.
- A reactive approach to pain assessment may not be adequate due to individual difficulties in self-reporting pain and limitations in current pain assessment methods and practice.
- Changes in activities of daily living or behaviour, such as presence of agitation, may be indicative of pain, and therefore an improvement in these areas following analgesia could be used as a treatment outcome
- Epidemiological research has identified the most common causes of pain in this population, how each type of pain is experienced differently and the implications for tailored pain management.
- Paracetamol is recommended as the first-line therapy with a stepwise approach to meet patient needs. While opioids and NSAIDs have risks, the latter has a worse safety profile for this population. These recommendations are reflected in current prescribing practices.
- Prescribing for neuropathic pain does not match the prevalence of this type of pain, which may indicate under-treated pain
- People with dementia and cognitive impairment no longer appear to be prescribed fewer analgesics than residents without dementia but may be at risk of under treatment if prescribed medication 'as required'.

Abstract

Care home residents are often frail with multiple co-morbidities and cognitive impairment, most commonly caused by dementia. This population is under-represented in clinical trials, leading to a lack of valid and reliable evidence to inform clinicians' prescribing practice. This paper summarises how epidemiological research conducted in similar populations can inform pain management by describing pain prevalence, risk factors, typical features and functional consequences. This evidence can help overcome the numerous barriers to optimal pain management in care home residents.

Keywords

Analgesics, Pain, Opioid, Acetaminophen, NSAIDs, Nursing Home, Dementia

Care home residents - an increasingly dependent population

As most people age they develop increasing physical and mental co-morbidities. These include frailty, poor mobility, or conditions leading to cognitive impairment, which can make independent living too challenging and lead them to move into a care home. The term care home is used here to describe an institution providing accommodation, full board, round-the-clock staffing (residential home), and sometimes 24-hour nursing care (nursing home). **Data has been drawn from recently published studies that include samples representative of the general care home population; inclusive of those with cognitive impairment, and excluding those living in sheltered or assisted living as typically these residents have different needs.** Despite the ageing population, the number of care home beds has remained stable in recent years [1, 2], but the health profile of residents has changed resulting in increasing levels of morbidity and dependency [3, 4].

The aim of this report is to present current epidemiological data that can be utilised by clinicians working with care home residents. Large cross-sectional studies were used to provide data on analgesic prescribing patterns. Databases such as Minimum Data Set [5] or interRAI instrument [6] indicated the prevalence of pain in older adults. A limitation of these databases is that the quality of observations is dependent upon the carer's ability to assess pain, and pain prevalence is higher when self-report methods are used [7]. Smaller studies provided richer data in terms of how pain is experienced and could help guide treatment decisions [8, 9]. These more detailed care home studies can be harder to set-up and recruiting representative samples of care home residents (particularly those with cognitive impairment) can be challenging, especially when conducting randomised controlled trials. Furthermore, the use of different research protocols that account for the levels of polypharmacy and co-morbidities can impair comparability [10, 11].

Prevalence of pain in care home residents

Pain can be broadly separated into two types: nociceptive, caused by damage to body tissue and usually described as sharp, throbbing or aching or neuropathic, caused by nerve damage and usually described as tingling, burning, or shooting. Pain can be acute or persistent (lasting three months or longer). Typical locations of persistent non-malignant pain in older people include the back, leg, and joints [12].

Due to differences in definitions and methodologies, it is challenging to determine the true prevalence of pain for in care homes. A recent and large study conducted by Lukas and colleagues from 2009-2011 in European nursing homes found that 48.4% of residents experienced pain to some

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3 extent, with assessment involving interview, observation, or prescription of an analgesic [6]. Takai *et*
4 *al.* found similar results of around 40-60% in their systematic review of pain prevalence studies using
5 mixed method assessments [7]. Pain was found to be highest in Finland (73%) and Czech Republic
6 (55.5%), and lowest in Israel (19.8%) and Italy (23%). Inter-country differences may reflect a contrast
7 in nursing home admission criteria [6], or prescribing rates. Twelve per cent of residents stated their
8 pain was not being controlled [6]. A US study found 26.4% of nursing home residents experienced
9 persistent pain, and of those in pain, 23% received no regular analgesic medication [5]. A study
10 conducted in Germany in 2012 reported pain in 73.2% of nursing home residents, with 14.2%
11 receiving no analgesics, and two-thirds of those in pain did not receive analgesic medication that
12 adequately matched the type or severity of their pain (without need for potentially harmful drugs)
13 [13, 14]. Persistent pain affects quality of life, cognition and activities of daily living [15, 16], and it is
14 concerning that residents may be at risk of under-recognition and under-treatment for pain [17-19].
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23 **Assessing pain in care home residents**

24 *Potential barriers*

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29 Verbal self-report is considered the gold standard of pain assessment. Care home clinicians can take
30 a reactive approach, reviewing residents following staff referral for pain, development of a clinical
31 problem or if a resident requests medical attention. This may lead to underestimation of pain
32 prevalence, as it is reliant on self-report, not necessarily accounting for the barriers identified to
33 assessing pain. There is a tendency for older adults to normalise pain as part of ageing, or avoid
34 bothering staff, leading to reluctance to seek treatment [20]. Furthermore they may have difficulties
35 in verbalising their pain, or engaging fully in assessment, due to changes in vision, hearing or
36 cognition [12].
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43 *The impact of dementia*

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46 Although there is a diagnosis rate of only 36.4% in English care homes [6], up to 80% of UK care
47 home residents have a form of dementia or memory problems [21], with similar findings in other
48 European countries [6]. Self-reporting pain can be challenging or impossible for cognitively impaired
49 residents who may lack the memory, abstract thinking or communication ability to tell staff about
50 their pain [22], especially if it is intermittent. Sub-optimal pain assessment and treatment in people
51 with dementia may be due to the belief that those with dementia feel pain less than those without
52 dementia [23]. Reviews (of experimental studies) report mixed effects of dementia on pain
53 perception, but it appears that pain processing is not diminished in people with Alzheimer's disease
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3 [24]. Data from the SNAC-K study in Sweden indicated that the prevalence of pain-related diagnoses
4 was very similar between institutionalised people with dementia and those without dementia (46%
5 vs. 45%) [25]. Pain assessment tools are not always appropriately implemented or reliable indicators
6 of whether an individual is experiencing pain or discomfort [26, 27]. In these circumstances,
7 clinicians or staff may have to rely on physical or behavioural indicators such as grimacing or
8 moaning [26] and if these expressions are not recognised, or if this is not undertaken carefully, then
9 a resident may remain in pain. In recent years there has been a much-needed growth in literature
10 discussing how best to assess pain in people with cognitive impairment [23, 28].
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17 Pain can affect a resident's mood, and they may appear depressed, apathetic, agitated or anxious.
18 Pain can also lead to changes in body language and appetite, impaired psychomotor functioning and
19 diminished quality of sleep [29-31]. It is difficult for observers to distinguish behaviour caused by
20 pain from agitation as a "normal" consequence of dementia [32]; misinterpretation can lead to a
21 prescription of psychotropic medication, which is known to have serious adverse effects and does
22 not address the underlying cause [33]. Husebø and colleagues tested a stepwise approach to pain
23 management in nursing home residents with moderate to severe dementia with agitation and found
24 significant improvements in pain, agitation (especially verbal) and depression [32, 34]. Conversely,
25 for residents with severe dementia, it has been suggested that observation scales may falsely
26 identify pain, as the behaviours measured are indicative of pain but can also result from causes such
27 as psychosocial distress [35].
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36 **Causes of pain in care home residents- what recent epidemiological studies tell us**

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38 Painful diseases commonly affecting care home residents have been identified as musculoskeletal
39 disorders, pressure sores, cancer and neuropathies [33, 36, 37]. Here we examine the prevalence of
40 leading causes of non-malignant pain in care homes considering studies mainly published in the last
41 five years. A recent and global review estimated that 30.2% of the residential care home population
42 are affected by musculoskeletal pain [38], and alongside osteoporosis (19.1%) and back pain,
43 arthritis (21.1%) is one of the most prevalent causes [39, 40]. Risk factors for osteoporosis and
44 osteoarthritis include female gender and old age [41, 42], characteristics typical of care home
45 residents. Osteoporotic back pain usually has a gradual onset as a result of vertebral compression
46 fractures, but can be more acute and severe, and lead to painful fractures [43, 44]. There are two
47 types of nociceptive pain associated with osteoarthritis (generally in the relevant joint): a deep ache
48 in the background, and a more intermittent and severe pain [45, 46]. This pain can be aggravated by
49 walking and weight-bearing, leading to less participation in related activities [47].
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3 Neuropathic pain can result from stroke or diabetes, morbidities commonly found in care homes and
4 those with dementia [48, 49]. This type of pain can be difficult to diagnose, and may be less familiar
5 to medical staff [8]. It is estimated that 26.4% of diabetic patients have painful diabetic peripheral
6 neuropathy [50]. Central pain, caused by stroke, has been argued as the most undertreated type of
7 pain [8]. It often presents as dysaesthesia or allodynia, and can be ongoing or intermittent. Pain
8 characteristics and locations vary, but frequent descriptions are “burning”, “aching” and “pricking”
9 [51, 52]. One study including 275 stroke patients able to self-report found that 45.8% of patients had
10 developed new pain 6 months post-stroke [53]. Intervals between stroke and onset of pain have
11 been reported to be up to 34 months [51]. A study conducted in nursing homes found 10.9% of
12 residents experienced neuropathic pain and 5.6% had possible neuropathic pain. However this study
13 excluded those with cognitive impairment, and used medical records to assess presence of pain, so
14 this figure may be lower than the actual prevalence in the care home population [54].
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23 The SHELTER study found pressure sores in 10.1% of nursing home residents [55]. Pain caused by
24 pressure ulcers can be neuropathic and nociceptive. The prevalence of pain at pressure ulcer sites
25 was found to be 77.2% but in this study, only 39.7% of residents received scheduled analgesics [37].
26 Interestingly, one hospital-based study found that 12.6% of patients with no observable pressure
27 ulcer also felt pain at an ‘at risk’ site despite no obvious tissue damage [56].
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33 Thus epidemiological studies inform us that when assessing care home residents clinicians should
34 bear in mind co-morbidity, have a high index of suspicion regarding pain and adopt a proactive
35 approach to identifying the most common pain-related diagnoses [33, 57].
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39 **Concerns related to prescribing analgesics for the care home population**

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41 Due to the heterogeneous nature of care home residents and their sources of pain [58] as well as a
42 dearth of research [59], there is a limited evidence base for the use of analgesic medication in this
43 population [23]. Medication that is effective in younger people may be beneficial but tolerability and
44 safety for those who are frail, elderly, and potentially cognitively impaired must be considered [60,
45 61].
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50 For nociceptive pain, it is advised that paracetamol (acetaminophen) is used as first-line
51 pharmacologic therapy as it is safe and effective in the management of mild to moderate pain [12,
52 61, 62]. If paracetamol is insufficient then further analgesics can be added in a stepwise approach,
53 introducing topical agents, non-steroidal anti-inflammatory drugs (NSAIDs), adjuvant analgesics and
54 opioids. NSAIDs should be used with caution in older people (risk of gastrointestinal bleeding and
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3 impaired renal functioning) [12, 33, 61]. Anticonvulsants are used for neuropathic pain but are
4 affected by impaired renal function and can cause drowsiness and sedation [12, 33]. Anti-
5 depressants are also used for neuropathic pain and should be titrated from low starting doses [8].
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7 Opioids are advised for use after all other pharmacologic approaches have been tested, including
8 combination therapies, however concerns around the use of opioids in older adults are well
9 documented and include drowsiness, nausea, vomiting and constipation [12]. Current guidance does
10 not distinguish between those with and without cognitive impairment [33, 63] despite a reluctance
11 from clinicians to prescribe opioids to frail and cognitively impaired residents. Moreover, it has been
12 suggested that people with dementia may require a higher dosage of analgesic medication due to
13 lack of placebo effect and the association between pain and agitation [24].
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20 **What epidemiological studies tells us about use of analgesics in care homes**

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23 It is often perceived that care home residents, especially those with dementia, are undertreated for
24 pain [40], and this was typically found in older studies [64, 65]. Current research demonstrates this is
25 not still the case, but most work in this field has come from Nordic countries and may not be
26 representative of other countries. Sandvik *et al.* reported that, in line with a consistent increase in
27 analgesics, prescription rates of regular paracetamol had doubled over the last decade in Norwegian
28 nursing homes to 48.4% [66]. Several studies have shown that people with dementia are more likely
29 to receive paracetamol than people without dementia (45.2% vs. 27.4%) [67, 68]. Worldwide,
30 paracetamol appears to be, by far, the most frequently used analgesic drug in care homes [19, 69,
31 70], with the exception of Germany where dipyron (metamizole) was most commonly prescribed
32 [71]. Dipyron is not approved for chronic pain unless other drugs are not indicated, and is banned
33 in several countries due to its potential to cause blood disorders such as agranulocytosis [72].
34 Prescription of NSAIDs has decreased in the Scandinavian care home population, down from 9.1%-13%
35 in 2003-4, to 2.6%-3.2% in 2011 [4, 66].
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48 A general practice database study of most of the older Danish population found that for home-
49 dwellers, people with dementia used opioids more frequently, however within the nursing home
50 population, people with dementia were less likely to receive opioid medication than residents
51 without dementia [40]. One study reported a significant increase in opioid treatment in Finnish
52 nursing home residents, from 11.8% in 2003 to 22.9% in 2011, with similar prescription rates in
53 England (22.4% in 2009) and Norway (23.8% in 2011) [4, 49, 66]. The Norwegian study also observed
54 an increase in the use of strong opioids from 1.9% in 2000 to 17.9% in 2011 [66]. Pitkala and
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3 colleagues suggested the high prevalence of opioid prescribing may indicate that these drugs are not
4 being used solely for the treatment of moderate to severe pain [4], and it is speculated that opioids
5 may be prescribed to “treat” behavioural symptoms [40]. This could unnecessarily cause negative
6 side effects in older adults, for whom there is a limited evidence base for opioid use [12, 40].
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9 Concerns have been raised regarding whether prescription of analgesic medication is appropriately
10 tailored and sufficiently evaluated to best manage the type of pain experienced by each resident
11 [73]. Despite the suspected prevalence of neuropathic pain in nursing home residents, adjuvant
12 therapies were only prescribed regularly for 3.8% of the study population [66], **possibly indicating**
13 **that this type of pain is being managed inappropriately. While studies including entire populations**
14 **lack problems with selection bias [40], a limitation is that they cannot offer detail on the type or**
15 **severity of the pain.**
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22 Pain relief is often prescribed ‘as required’ (PRN), which is reliant on the assessment skills of care
23 staff, or the ability of the resident to communicate pain. There is limited research exploring actual
24 administration of PRN analgesia however earlier studies have shown that cognitively impaired
25 residents are less likely to receive PRN pain medication [74, 75]. An Irish study found that care home
26 residents with dementia were more likely to be prescribed PRN than regularly scheduled analgesics,
27 also noting a lack of guidelines regarding pain assessment prior to administering pain relief [76].
28 Recent studies (see Table 1) found that 16.0%-90.7% of care home residents were prescribed
29 scheduled or PRN analgesics [70, 76, 77], but when studying only those with a scheduled
30 prescription, the range of prevalence decreased to 32–62.8%, with both upper rates taken from the
31 same Australian study, with authors referencing changes to national pain management guidelines
32 and recent pharmacist review as possible factors influencing the high prescribing rate [69-71, 78], **as**
33 **well as individual physician practice and nursing home variability.** It is worth noting that the low
34 analgesic rate observed in Italy (16%) has been followed by a systemic drive to improve prescribing
35 quality, where antipsychotic drug use is high [77]. These rates appear to represent the extremes of
36 current analgesic prescribing, reported to be 28% in one European database study (minus Italy), and
37 49% in Sweden, with 33% of paracetamol and 48% opioid prescriptions for people with dementia
38 administered PRN [25, 77]. Considering around half of the care home population may be in pain [6,
39 25], this indicates that pain may remain undertreated.
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51 52 **Conclusion**

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55 Identifying pain in care home residents can be challenging due to sensory and communication
56 problems, with a high percentage of residents living with cognitive impairment [6, 12].
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3 Epidemiological studies have provided valuable information on pain prevalence within care homes,
4 estimating that approximately half of the population experience pain [6]. Common pain-related
5 disorders include musculoskeletal disorders, pressure sores, cancers and neuropathies [33, 36, 37].
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7 Taken with more in-depth research it has been possible to estimate the prevalence of pain within
8 each disorder, and how pain is typically experienced. This research could be adapted so that all care
9 home residents undergo detailed assessment for painful conditions to inform tailored pain
10 management programmes.
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15 Recent studies have suggested that analgesic prescribing is the highest it has ever been in care
16 homes, especially for those with dementia who have historically been perceived as undertreated.
17 More research is needed to build a stronger evidence base for analgesic use in the care home
18 population. While paracetamol is the most frequently prescribed analgesic [19, 69, 70], there has
19 been an increase in opioid prescription rates, which may be due to reduced prescription of NSAIDs in
20 response to safety concerns. However residents suffering with neuropathic pain may be at risk of
21 under-treatment, as the level of prescribing for adjuvant medication does not appear to match the
22 prevalence of this type of pain [4, 66].
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29 **Future perspective**

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31 Adequate pain management can improve quality of life and functioning in care home residents, and,
32 particularly for those with dementia, decrease the use of harmful antipsychotic medication, which
33 may be prescribed as a response to pain-induced agitation [34]. Further epidemiological studies may
34 offer a more detailed picture of how quality of life, functioning, and neuropsychiatric symptoms are
35 influenced by either the addition of analgesics or adjuvant medication, an increase in analgesia using
36 an individualised stepwise approach or more rational PRN prescribing.
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Table 1. Key studies published since 2012 on analgesic prescribing to care home residents

Author and year	Year data collection ended	Country	n	Number of care homes	% of residents taking opioids	% of residents taking paracetamol	% of residents taking any analgesic	Administration: regular only (regular) or regular and PRN both
Sandvik <i>et al.</i> , 2016 [66]	2000	Norway	1926	251	10.9	22.7	34.9	regular
Pitkala <i>et al.</i> , 2015 [4]	2003	Finland	1987	nk*	11.8	34.3	-	regular
Sandvik <i>et al.</i> , 2016 [66]	2004	Norway	1163	26	9.8	35.7	45	regular
Kruger <i>et al.</i> , 2012 [78]	2008	Norway	513	7	14.6	-	40.2	regular
Kruger <i>et al.</i> , 2012 [78]	2008	Norway	513	7	-	38.4	-	both
Shah <i>et al.</i> , 2012 [49]	2009	UK	10387	nk	22.4	37.6	-	both
Halvorsen <i>et al.</i> , 2012 [79]	2009	Norway	2986	nk	12.4	40.3	-	regular
Sandvik <i>et al.</i> , 2016 [66]	2009	Norway	850	18	25.1	42.7	53.5	regular
Whitney <i>et al.</i> , 2012 [80]	2010	England	240	7	7.9	-	-	both
Kolzsch, <i>et al.</i> , 2012 [71]	2010	Germany	560	40	-	-	32	regular
Jensen-Dahm <i>et al.</i> , 2015 [40]	2010	Denmark	42291	nk	41	-	-	both
Pitkala <i>et al.</i> , 2015 [4]	2011	Finland	1576	nk	22.9	46.7	-	regular
Sandvik <i>et al.</i> , 2016 [66]	2011	Norway	1858	64	23.8	48.4	57.6	regular
Veal <i>et al.</i> , 2014 [70]	2012	Australia	7309	nk	-	-	90.7	both
Veal <i>et al.</i> , 2014 [70]	2012	Australia	7309	nk	28.1	-	62.8	regular
Onder <i>et al.</i> , 2014 [77]	2013	Europe not including Italy	3608	nk	-	-	28	both
Onder <i>et al.</i> , 2014 [77]	2013	Italy	3179	nk	-	-	16	both

*nk = not known