

## Delirium in nursing homes: the continued case of B.M.

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This article considers current contemporaneous practical issues of delirium care in nursing homes with reference to a hypothetical case study B.M.

I introduce the diagnosis and management of delirium-superimposed-on-dementia (DSD), being relatively common in patients in advanced phases of illness of many nursing home residents. General principles are discussed, although this article applies mainly to higher income countries. There is inevitably much palliative and end-of-life care in nursing homes, necessitating rigorous advance care planning. Nursing home residents are especially prone to acquiring infections. Urinary tract infections (UTIs) are traditionally the most commonly treated infection among nursing home residents and, indeed, the accurate diagnosis of a UTI poses significant and distinctive challenges in the nursing home setting. There is no denying, however, that recently the global coronavirus (SARS-CoV-2) pandemic has posed an existential threat to both staff and residents of nursing homes.

Resident-focused factors are striking. Psychotropic drugs are the most frequently prescribed medications in European nursing homes, but medication errors in nursing homes in general are relatively prevalent. Contributing factors to a high burden from pain for residents include *residents belief set* that age-related pain is inevitable, as well as under-recognition of pain and inappropriate pain assessment by clinicians. Dehydration is associated with frailty, poor cognition, falls, delirium, disability, and mortality. Issues relating to the environment also matter. It is also impossible to ignore the organisational constraints on the provision of high quality care. Faced with widespread staffing shortages, and many economies in financial distress, one partial solution is to retain current staff longer in nursing homes. Research on nursing home staffing has expanded beyond just staffing levels to include multiple other staffing issues of concern.

**Key words:** delirium, dementia, nursing homes, delirium-superimposed-on-dementia, risk factors

Received: November 12, 2022  
Published: March 14, 2023

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**How to cite this article:** Rahman S.  
Delirium in nursing homes: the continued  
case of B.M. Journal of Gerontology and  
Geriatrics 2023;71:30-36. <https://doi.org/10.36150/2499-6564-N593>

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di Gerontologia e Geriatria (SIGG)



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## INTRODUCTION

*“So the next time one of your residents acts out, or seems unusually grumpy, or is pressing on your last nerve, try to remember this:*

*‘That person has been through it’.*

*Most residents would gladly return to where they were before, if only they could. Even if such a move might appear to be more than a little unsafe”.*

(O’Connor, 2022) <sup>1</sup>.

No one care setting should be more advantageous than another to an individual, when it comes to delirium identification and management. There are important considerations for equality, equity and quality of delirium care across the different healthcare settings. Any one of us might perhaps be later be a resident of a nursing home in the future. Nursing home residents are usually characterised by very old age, multimorbidity, and severe disability. Many have dementia. For the purposes of this article, case B.M. is now with a history of dementia, and living in a nursing home. I will describe some issues relating to delirium in nursing homes drawing on some of the current literature. This will emphasise general concepts and themes. It is possible that B.M. may endure recurrent bouts of delirium in the nursing home, and with each episode he runs the danger of accelerated further cognitive decline <sup>2</sup>.

Both physical health and mental health can influence wellbeing. Nursing home staff are often reported to be ill-prepared to look after residents with any cognitive or behavioural problem. Early recognition of delirium is essential in order to treat the underlying disease and improve outcomes. Delirium can be commonly hypoactive or mixed, as well as hyperactive. Without an active screening hypoactive delirium can go undetected, or passed off as someone *blissfully sleeping*. This would be a mistake, of course, in a nursing home. As is notoriously well known, hypoactive delirium can look a lot like end-of-life, and that is a whole subject in itself.

Delirium is a strong predictor of mortality and its incidence in elderly residents hospitalised because of SARS-CoV-2 is important. Preventative efforts could become more targeted with more precise information about the risk indicators. Non-pharmacological delirium prevention must be integrated in daily care in nursing homes <sup>3</sup>, where residents require specific specialist high quality care. Increased life expectancy and higher prevalence rates of chronic conditions, coupled with a decline in sheer numbers of potential family informal carers, are causing nursing homes to become even more important as care providers. Preparation for end-of-life is essential, and yet advance care planning intervention studies in nursing homes in this context are comparatively few and heterogeneous. Essential implementation considerations relate to the involvement and education of nurses, physicians and leaders <sup>4</sup>. This optimistically is a problem to be cracked, and meticulous care and support planning might avoid dramatic crises in a nursing resident's life. The issue to address this societal problem in low- and middle-income countries is also a top moral priority.

Like hospitalised older adults, nursing home residents can have acute medical problems too which are managed in the nursing home but which could cause

delirium. Delirium is the *canary in the mineshaft*. Because there is also a high prevalence of risk factors for delirium in long-term nursing home residents, including cognitive impairment, immobility, sensory impairment, and medication use, delirium would be expected to be associated with adverse events such as falls and functional decline <sup>5</sup>. Delirium in nursing homes is therefore a major healthcare issue.

## INITIAL DIFFICULTIES

Delirium in any setting of long-term care remains an important challenge for the workforce for many reasons. A lack of education and general ignorance of delirium across all healthcare settings, in particular about the benefits of its prompt recognition and treatment, have consistently emerged in the literature as a strong cultural barrier to diagnosis. At an organisational level, poor leadership, both clinical and strategic, might be “exacerbating factors”. The combined low strategic and financial priority to diagnosing delirium at all might be an important factor preventing improvement in diagnosis <sup>6</sup>. Delirium may *unintentionally* fall within some sort of *blind spot* of some healthcare professionals. The fluctuating course of both the hyperactive and the hypoactive form, as well as the varying manifestations of delirium symptoms, sometimes can make it difficult to detect delirium. The hypoactive form in particular is often overlooked by care workers in nursing homes, as the symptoms, such as inactivity and drowsiness, might not be recognised as especially ‘unusual’ or even as delirium symptoms <sup>7</sup>. There is one further highly important further barrier to the detection of delirium: the misconception that delirium is altogether benign and merely part of the ‘normal aging process’.

The response? Delirium screening needs to be incorporated to daily patient assessment. It is the nursing staff – and relatives or friends when available – who are able to detect subtle behavioural and cognitive changes in the residents, as they are the professionals that spend the most time with them. It seems entirely reasonable for care staff to think to themselves the answer on a daily basis to the question: “*Is this resident more confused or sleepy than before?*” (the single question in delirium). Clinicians might use the “4-DSD” tool, found to have good or acceptable sensitivity and sensitivity for DSD or severe dementia <sup>8</sup>.

Since delirium might not be recorded or identified as such in medical records, standardised documentation might be essential to ensure accuracy and to avoid compromising patient care. An active use of predictive models in geriatric care might be necessary. Environmental modifications for people with delirium, such as

reducing stressful noises, or excess stimulus and appropriate lighting through day and night, are appropriate for all residents anyway, as much as for people with a known dementia. The delirium episode is, by definition, an acute change that could have a significant impact on the friends and family, and an ability to receive care. An occupational therapist should have a critical role in training and informing the carer <sup>9</sup>.

The management of DSD, including non-pharmacological and pharmacological approaches, with particular attention to the importance of all parts of the multidisciplinary team including occupational therapists, is described in full elsewhere <sup>10</sup>. It is worth noting that the evidence base markedly needs improving in this area. A multicomponent intervention typically involves a specific focus on six specific areas, which are well-known risk factors for delirium in the elderly: cognitive impairment; dehydration; hearing impairment; immobility; sleep deprivation, and visual impairment.

## THE RESIDENT

A summary of some major 'at risk' groups of residents, regarding delirium, is shown in Figure 1.

### WHICH OF MY RESIDENTS IS PARTICULARLY AT RISK OF DEVELOPING DELIRIUM?

In the setting of acute illness, because of frailty and high burden of chronic disease, nursing home residents are particularly vulnerable to disruptions in transitions of care such as medication interruptions. Before the onset of symptoms of a full syndromal delirium, there are often subsyndromal clinical *warning signs* of incipient delirium. If these early warnings are identified, and the cause identified early (e.g., UTI), a full-blown syndrome might be avoided <sup>11</sup>. The evolution of symptoms, and its heterogeneity, has eluded detailed scrutiny thus far. In reality it can be difficult, in advanced dementia, to tell the difference between BPSD (behavioural and psychological symptoms of dementia) and features of a hyperactive delirium. Clinicians are becoming increasingly aware of the negative effects of DSD on clinical outcomes, yet relatively little is known about the residents', family carers' and staff members' personal experiences of DSD <sup>12</sup>. Amongst nursing home staff, there is a perceived need for a greater level of psychiatric and psychological involvement, particularly in relation to non-pharmacological management techniques, staff support, and dealing with family conflict.

It could be that as B.M.'s dementia progressed over time, his sleep quality worsened, and that he completely lost any sense of circadian rhythmicity. He now sleeps with a dimly-lit night light. Dementia might disrupt the

Dementia  
Sleep problems  
Dehydration  
Pain  
Medication  
Acute fracture  
Infections

**Figure 1.** Especial 'threats' to B.M.'s health and wellbeing regarding delirium.

structure and functions of sleep whatever they are. For many residents of nursing homes, awakening due to noise and odd lights is standard practice. Nursing homes implement such segmented sleeping routines to address various care challenges (e.g., incontinence), even though evidence from various measures identifies disturbed sleep as, possibly, a contributor to many types of physical, emotional, and cognitive decline, including risk for frailty, morbidity, and even mortality. There is a relatively high prevalence of hearing and visual impairment in nursing home residents. An unnecessary 'own goal' is not having hearing aids with functioning batteries. Residents with delirium tend to have a higher prevalence of sensory deficits. There is a good case for routine screening and specific interventions by a multidisciplinary team to implement optimal management of sensory impairments, and hence prevention and the management of the residents with delirium <sup>13</sup>.

Our resident, B.M., forgets to drink sometimes, unless he is prompted. Dehydration is under-recognised and poorly managed in nursing homes. Further research is required to improve assessment and management of dehydration and the authors have made recommendations to focus endeavours <sup>14</sup>. Dehydration is a failure to maintain adequate amounts of body water because of either poor fluid intake or pathological loss of body fluids. Dehydration is associated with frailty, poor cognition, falls, delirium, disability, and mortality. It therefore should not be ignored. Subcutaneous hydration has been reported in recent decades as an easy and safe method for parenteral hydration among geriatric patients with mild-to-moderate dehydration or at risk of dehydration, and yet this intervention is still reported to be underused <sup>15</sup>.

Pain is highly prevalent among nursing homes residents. B.M. cannot reliably communicate pain. The association between inadequate pain control and delirium has been studied repeatedly in the acute postoperative hip fracture population, but there is little evidence from the nursing home setting as yet. They might all nonetheless share a common neurological mechanism. Contributing factors to a high burden from pain for residents include *residents' belief set* that age-related pain is inevitable and that one does not want to be a burden for the carers, as well as under-recognition of pain (possibly relating to lack of adequate articulation of pain from individuals with dementia) and inappropriate pain assessment by clinicians.

### MEDICATION RECONCILIATION

B.M. rarely has access to geriatricians, and a medication review is infrequently carried out. Once even B.M. was discharged from hospital with an antipsychotic, and this persisted on his drug chart until a healthcare assistant queried why. Prescribed medications are a major precipitating, but also treatable, factor for delirium in older adults. In particular, drugs with anticholinergic properties are associated with an increased incidence and severity of delirium. Based on evidence for cholinergic deficiency in people with dementia and the evidence that the cholinergic system is likely to be involved in delirium, it is plausible to assume that the use of drugs with anticholinergic properties increases the risk of delirium in residents with pre-existing dementia.

Clegg and Young (2011) found in their systematic review that prescribed medications are a risk factor in the development of delirium; narcotics and sedatives were especially found to be associated with increased risk of delirium, but also anticholinergic drugs presented an independent risk of delirium<sup>16</sup>. *Z-drugs* are frequent in older residents and this significantly contributes to a higher occurrence of drug-related geriatric symptoms and syndromes. Opioids are useful to reduce pain in nursing home residents. Clinicians often face challenges in managing the benefits of opioids against potential side effects such as falls and delirium. Lower use of opioids in nursing home residents with dementia may reflect undertreatment of pain or greater use of alternative treatment strategies.

Psychotropic drugs (hypnotics, antidepressants, antipsychotics) are the most frequently prescribed medications in Western nursing homes<sup>17</sup>. Psychotropic drugs are often prescribed without proper symptom assessment, without any clear indications, and treatment persists for longer than recommended. Closer attention should be paid to follow-up of psychotropic drug treatment in nursing homes, and especially for long-term use of antipsychotics, since the duration of

such treatment should be as short as possible<sup>18</sup>. Medication errors in nursing homes are prevalent. Governance and regulatory processes must be followed at all times. Adverse drug events, especially those that may have been preventable, are among the most serious concerns about medication use in nursing homes. Enhanced surveillance and reporting systems for adverse drug events in nursing homes are required, and educational efforts about the optimal use of drug therapies in older residents who are frail are essential. At a biological level, older adults are especially prone to side-effects and drug interactions due to physiological changes like reduced kidney, cognitive and sensory function, and altered pharmacokinetics and pharmacodynamics. This observation alone emphasises the inherently specialist nature of pharmacological delirium management in the older adult.

### ACUTE FRACTURE (ORTHOGERIATRICS)

Suppose B.M., with the curtains permanently drawn across his windows, falls out of bed while spitting on the floor due to his advanced dementia. Residents suffering from a hip fracture are often frail; suffering multiple comorbidities, and are often subjected to polypharmacy. The pre-fracture functional level of hip fracture residents has been found to be a strong and consistent predictor of short- and long-term rehabilitation outcome. Some evidence suggests that admitting patients with hip fractures to an orthogeriatric care unit directly from the emergency department had a positive effect on activities of daily living up to twelve months after surgery<sup>19</sup>. Hip fractures in the nursing home lead to infections and pressure ulcers, functional decline, and poor quality of life. The persistence of peri-operative pain following hip fracture is a risk factor for the occurrence of delirium, poor functional prognosis, and the development of secondary chronic pain. Current practise suggests that one would perhaps want a low bed for B.M. in case he fell, to lessen the impact of any fall. However, one would not like to impose bed bars on B.M.'s bed in case he got entangled in them during a bout of hyperactivity.

### INFECTIOUS DISEASES

B.M. occasionally gets constipation, and the nurses feel whenever that happens a UTI soon follows. Long-term care residents have an increased risk of acquiring infections and of experiencing more severe disease course and outcomes. Among the most commonly reported infections that can cause outbreaks are: chest infections, gastrointestinal infections, UTIs and skin and soft tissue infections. An inspection of skin and nails, and even teeth, can be helpful. Aspiration pneumonia in particular can be difficult to diagnose, because usually the moment of aspiration cannot be observed or the

aspiration occurs *silently*. Urinary tract infections (UTIs) are the most commonly treated infection among nursing home residents. However, accurate diagnosis of a UTI poses significant and distinctive challenges in the nursing home setting. Much of this difficulty arises due to the prevalence of asymptomatic bacteriuria (ASB) among nursing home residents. ASB is common in the resident population, and residents with ASB can have no specific (e.g., dysuria) or non-specific (e.g., fever) signs or symptoms of a UTI. They might then receive a course of antibiotics due to ASB, promoting potentially resistance to antibacterial drugs (20). From one point of view, delirium could be the first sign of a latent infection; on the other side an inappropriate treatment of delirium either non-medical such a bed constraints or medical such as inappropriate use of antipsychotics could increase the risk of delirium.

A full discussion of SARS-CoV-2 and delirium is beyond the scope of this article, but it is worth noting that delirium has been a common, early occurring, and lethal manifestation of COVID-19 in older adults presenting to the emergency department <sup>21</sup>.

## THE ENVIRONMENT

### STAFFING ISSUES

Faced with widespread staffing shortages, one partial solution is to retain current staff *longer* in nursing homes. Nursing homes are increasingly recognised as a critical part of the health care ecosystem. Research on nursing home staffing has expanded beyond just staffing levels to include multiple other staffing issues of concern. Relatively high levels of agency staff can influence quality of care. Staff, say off-sick with COVID, have a massive effect on rotas, of course, making person-centred care difficult to pursue.

### IMPACT OF THE COVID PANDEMIC

SARS-CoV-2 has had a devastating impact on many nursing homes, with some interesting jurisdictional distinctions. Most residents suffer from moderate-severe dementia, which means that they do not understand the meaning of social isolation. The protracted effect of the SARS-CoV-2 pandemic has been devastating for nursing homes. Residents struggle with the absence of relatives and their visits. An attempt has been made to replace direct contacts with the use of tablet computers. This adaptation can have limited benefit for residents with dementia, who may have other care needs, such as caress, a massage, and a nearby voice. It is now widely accepted that one of the common presenting symptoms of older people affected by SARS-CoV-2 is delirium.

It is evident that SARS-CoV-2 affects older adults differently to younger adults. The nature of the visibility of expression of SARS-CoV-2 in older residents arguably justifies strong efforts at case finding in nursing homes, possibly prioritising residents with suggestive combinations of clinical signs including dyspnoea, falls, anorexia and/or delirium. The recent collective experience with SARS-CoV-2 and nursing homes makes it clear that adequate PPE (and training in its use), quick diagnostic testing and measures to alleviate staff shortages <sup>22</sup>. Many residents with dementia and other forms of cognitive impairment will not be able to tolerate wearing a mask or cooperate with *social distancing* <sup>23</sup>. Agitated patients, wandering around, potentially infecting others, also poses a risk which necessitates a proportionate response. Reduced social interaction associated with lockdown during the SARS-CoV-2 pandemic could further increase the risk for worsening mental health outcomes. Stress among long term care staff could lead to poorer mental health amongst residents, increasing the risk for delirium and behavioural problems. Isolation, lack of family contact, and lack of stimulation from social activities within the home in reality can lead to boredom, loneliness, and depression.

### 'TERMINAL DELIRIUM'

There is inevitably much palliative and end-of-life care being delivered in nursing homes. The proposition is that delirium and death are strongly inter-related in the construct of "terminal delirium" <sup>24</sup>. Delirium is extremely common in patients in advanced phases of illness, and one of the most frequent complications encountered in palliative care. Delirium is often in palliative care the direct consequence of complex different factors acting often together, such as a medical condition and consequent metabolic imbalances and organ failures or substance intoxication or withdrawal <sup>25</sup>. A timely approach to informing the patient's family about the delirium should be ensured <sup>26</sup>.

## TRANSFER TO THE EMERGENCY ROOM

B.M. might need to go to hospital as an emergency admission, even though he has desperately been avoiding doing so in the current pandemic. His immediate family have always said that they do not want him to die there. One key group of emergency department attendees is the nursing home resident. Nursing home residents are typically transferred to the emergency department when resident acuity or complexity progresses beyond the capacity of what nursing home staff can reasonably



or comfortably address. Both family members and staff described nursing home residents with dementia as receiving poor post-operative care from hospital staff who seemed unfamiliar with dementia and delirium. Assessing quality of care might include carer measures on the quality of the transfer, pain management measures in the first month or return to walking<sup>27</sup>. In a recent analysis of older patients admitted from nursing homes to a geriatric department of a national hospital, approximately one-third of acute admissions of nursing home residents may be medication-related admissions. This study urged unsurprisingly the implementation of interventions for the optimal use of medication among nursing home residents are needed<sup>28</sup>.

## CONCLUSIONS

In an ideal world, to understand how delirium impacts on nursing homes, we need to understand the spectrum of how delirium presents itself in nursing homes, how staff go about identifying it, and how ultimately they might go about preventing and treating it. We also need to listen carefully to the experiences of all those involved, not least the residents and all carers, paid and unpaid. There are various factors which are far beyond the scope of this chapter, details of which would have become outdated rapidly. These will range from state-of-the-art diagnostic techniques to identify residents experiencing delirium, to more cumbersome details about the infrastructure, funding and definition of nursing homes at large. Delirium appears to be the ‘canary in the mineshaft’ often for other underlying issues in dementia, dehydration and medicines reconciliation as “person-centred factors”, and staffing and COVID as recent “environment” factors.

Delirium is a very human condition, with human consequences, not least in nursing homes. Whilst this chapter has inevitably provided a snapshot of delirium in nursing homes, the first point is to notice that this field is ‘work in progress’, and ever-changing demands and expectations have to be reconciled with the desperate need to treat all residents at risk of delirium fairly with the highest quality of respect and care.

### Conflict of interest statement

The authors declare no conflict of interest.

### Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

### Author contributions

The authors contributed equally to the work.

## Ethical consideration

No ethical approval is required for this manuscript.

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