

Delirium's Impact on Longevity in Older Adults:
Unveiling the Connection

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SUMMARY

This paper gives background into the acute cognitive impairment known as delirium and how it affects the longevity of older adults. The first section of the paper will introduce the topic of delirium, as it is unfamiliar to most individuals, including many in the medical professions. The introduction covers what delirium is, the complications of delirium, and how it affects the longevity and quality of life of older adults. The next section of the paper covers the background of delirium including the different subtypes of delirium known as hypoactive delirium, hyperactive delirium, and mixed delirium as well as the signs and symptoms associated with each subtype. This section focuses on how to differentiate between the different subtypes as well as the prevalence of each subtype. The final section of the paper gives an overview into how we can prevent and treat delirium from first-line non-pharmacological interventions to modifications in standard pharmacological approaches. At the end of the paper, there is a discussion about why it is important to understand the connection between delirium and its effect on older age.

INTRODUCTION

Mrs. D was eighty years old when she fell down the stairs and awoke in a confused, unmovable state (McCurren and Cronin, 2003). “In the next 48 hours, Mrs. D. became increasingly confused as to time and place. She fearfully questioned caregiving attempts, tried repeatedly to get out of bed, and cried out to people who were not even in the room” (McCurren and Cronin, 2003). The daughter of Mrs. D and the nurses believed Mrs. D was experiencing dementia because Mrs. D mother had suffered from it. The nurses told the daughter that most patients are demented and therefore she didn’t have time for Mrs. D’s behavior (McCurren and Cronin, 2003). Mrs. D was instead experiencing delirium, “one of the most serious and prevalent cognitive disorders among hospitalized elders” (McCurren and Cronin, 2003).

Delirium is an acute change in consciousness and cognition, and is a common manifestation of brain dysfunction, otherwise known as “Acute Brain Failure”, that can occur in up to 80% of the sickest hospitalized patients (Girard, Pandharipande & Ely, 2008; Maldonado, 2017). Delirium may be precipitated by an underlying medical disorder, medications, toxin exposure, substance withdrawal, or from multiple factors including standard care practices such as the use of restraints (Bennett, 2019; Maldonado, 2017). Patients often experience altered arousal, such as reduced consciousness, and altered moods or psychological regulation, such as severe agitation, or symptoms of psychosis with hallucinations and delusions (Wilson et al., 2020). Notably, delirium has consistently been shown to be a predictor of mortality, having an adjusted hazard ratio (HR) of 4.82 the first month after discharge and a HR of approximately 2 at 1-year after discharge (Israni et al., 2018; Dani et al., 2018). Additional complications of delirium include increased likelihood of frailty, or functional decline, and severe psychological distress for survivors often meeting criteria for Post Traumatic Stress Disorder (Dani et al., 2018; Van Munster & De Rooij, 2014; GCBH, 2020; Grover et al., 2019; Williams et al., 2019). There are many complications that come from delirium which is why it is important to understand what delirium is, what factors lead to it, and the impact delirium has on certain population demographics such as older adults.

Although delirium itself is an acute change in cognition that can often lead to a fatal or disastrous outcome, it may be an early indicator for other acute life-threatening illnesses, such as sepsis, and substantially increases the risk of dementia (Chung et al., 2020; Hayden et al., 2018). This understanding that early recognition of delirium could be protective, and even preventative in the case of dementia, has led researchers to call for an increased study of the biology of delirium as a possible target to extend the longevity of older adults (Dani et al., 2018; Hayden et al., 2018). Research shows that delirium is highly preventable with 30-40% being able to be prevented, but currently we lack the tools and knowledge to do so (Ghezzi et al., 2022). This lack of knowledge and tools is why it is so important to understand delirium and how it affects older adults. Targeting delirium may be one of the core strategies in extending the longevity of older adults.

BACKGROUND

Subtypes of Delirium

There are generally considered to be three clinical subtypes of delirium, divided by psychomotor symptoms, into categories of hypoactive, hyperactive, and mixed type delirium (Bowman et al., 2021). Hypoactive delirium is most often known as “quiet delirium” due to the signs and symptoms that include lethargy, depression, and slow responses (Robyn et al., 2019). In hypoactive delirium, the lethargic nature often leads it to be overlooked and more difficult to be recognized, despite being associated with significantly worse outcomes than other delirium types with 1 out of 3 of these patients dying in the hospital (Avelino-Silva et al., 2018; Mulkey et al., 2019). In contrast, hyperactive delirium and mixed delirium are more likely to be identified, although still underdiagnosed, because of the more active symptoms (Mulkey et al., 2019). Despite it being the least recognized delirium subtype, it is the most prevalent with over 50.3% of delirium cases being hypoactive (la Cour et al., 2022). Furthermore, it is the most common delirium in older patients with 54% of older patients having this subtype compared to only 40% of younger patients having hypoactive delirium, making it a key target for mortality improvements to increase longevity in the older adult population (la Cour et al., 2022). The common prevalence but low diagnosis of hypoactive delirium is a problem that underscores the need to better understand how to mitigate delirium risks and provide early intervention in all practice settings across the care continuum.

Another subtype of delirium is hyperactive delirium. Hyperactive delirium is characterized by agitation, restlessness, and emotional lability. It is often mistaken for mania or behavioral symptoms of dementia (Thom et al., 2019). This subtype is found in the least number of cases with only 22.7% of delirium cases being hyperactive delirium. Hyperactive delirium also has the lowest median of days in a state of being delirious. In a study done of the subtypes of delirium, out of 582 patients, only 100 experienced hyperactive delirium (Hayhurst et al., 2018). In those 100 people, they spent on average one day in a state of delirium. On the other hand, 411 patients experienced hypoactive delirium and spent a median average of 3 days in a state of delirium (Hayhurst et al., 2018). Hyperactive delirium is also most likely to be treated with pharmacological agents such as benzodiazepines and neuroleptics (e.g., haloperidol or other antipsychotics), especially when there is a concern for agitation-associated behaviors (Gaetner et al., 2019).

Benzodiazepines have been shown to be an independent risk factor for delirium, yet use of this drug class is currently one of the most common interventions for hyperactive delirium (Hui, 2018; Clegg and Young, 2010). Further, both drug classes can worsen or mask delirium, resulting in profound distress or a poor chance of survival (Gaetner et al., 2019). Changing policies related to care standards so that pharmacotherapy with antipsychotic neuroleptics is reserved for hyperactive patients with severe psychotic symptoms, such as delusions of hallucinations likely to trigger self-harm or harm of others and eliminating use of benzodiazepines except for in critical situations where neuroleptics cannot be used, may be one of the easiest targets to extend longevity in older adults

(Gaetner et al., 2019). Additionally, since the signs and symptoms of hyperactive delirium are more obvious, it is more likely to be treated aggressively, and therefore less likely to be intractable or persistent (Hayhurst et al., 2018). Thus, when it comes to extending longevity of older adults, addressing hyperactive delirium shows strong potential to make meaningful progress when compared to the ease of treating other subtypes.

The final subtype of delirium is mixed delirium. Mixed delirium is when patients are experiencing manifestations of both hypoactive and hyperactive delirium at various times (Acevedo-Nuevo et al., 2018). It is the second most common subtype of delirium with it being reported in 27.7% of delirium cases. Patients with mixed delirium have on average the longest delirium duration, longest ICU stay, and longest hospital stay. Furthermore, mixed delirium patients also have very high ICU and hospital mortality rates. (la Cour et al., 2022). In fact, in a study on mortality of delirium patients, it was found that one out of three critically ill older adult patients who experienced either hypoactive or mixed delirium will die within a 12-month period (Avelino-Silva et al., 2018). In order to expand the longevity of older adults, delirium must be understood as a critical emergency, as opposed to an expected finding in hospital settings, and treated as such. If not, as seen by the high mortality rate, delirium is a deadly condition.

Table 1: Characteristics of 343 Patients based on their different delirium subtypes. (Source: Gual et al., 2018)

Variable	Subtype of Delirium (n=343)		
	Hyperactive (n=143)	Mixed (n=109)	Hypoactive (n=91)
Age	87.5 ± 6.2	87.8 ± 5.4	86.8 ± 6.3
Gender (women)	75	67	61
Previous Hospitalization	55	54	42
Nursing Home Residents	44	38	48
Malnutrition	62	66	50
Death	6	14	17

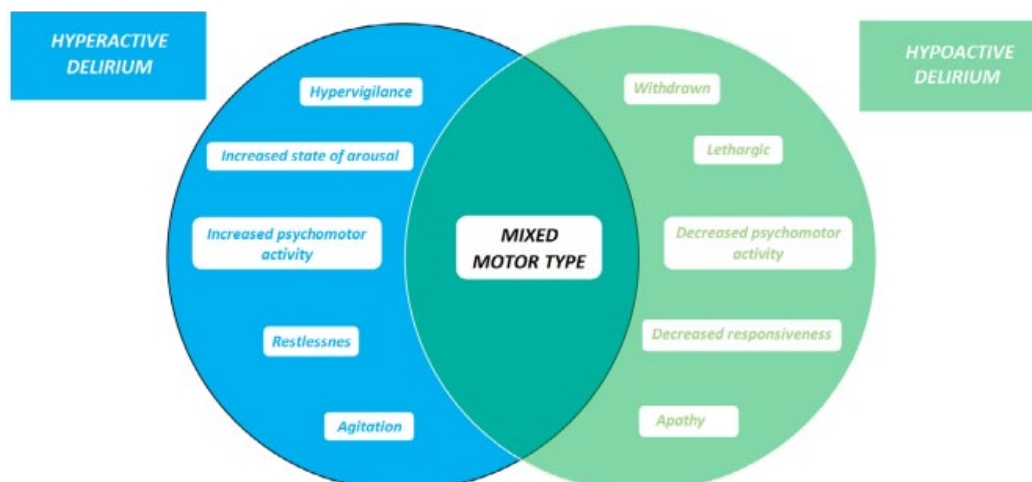


Figure 1: Subtypes of delirium and the corresponding characteristics (Source: Ibrahim et al., 2018)

Signs and Symptoms

The four diagnostic features of delirium include: 1) disturbance in consciousness with reduced attention, 2) change in cognition that is not due to pre-existing dementia, 3) symptoms develop over a short period of time and often fluctuate throughout the day, and 4) evidence that the disturbance is from physiological consequences of another medical condition or treatment, intoxication, or withdrawal symptoms from abstinence of alcohol or substance use (Acevedo-Nuevo et al., 2018).

These signs and symptoms are often overlooked and assumed to be caused by other underlying diseases which is why it's key for healthcare professionals to be knowledgeable about delirium. It is also key to understand what type of delirium is presented, either hyperactive or hypoactive delirium or a mixture of the two. Those with hyperactive delirium display symptoms such as agitation, anxiety, restlessness, hallucinations, delusions, communication difficulties such as speaking loudly and quickly, or aggressive and combative behaviors (Bennett, 2019; Mulkey et al., 2019). Thus, individuals experiencing hyperactive delirium require interventions, such as therapeutic communication to alleviate anxiety and fear, that are intended to reduce stimulation.

In contrast, those with hypoactive delirium exhibit lethargy, increased sleeping especially during the day, withdrawal from social interaction, and even depression (Bennett, 2019). They may also show signs of motor difficulties and slowing of speech or muteness (Mulkey et al., 2019). Hypoactive delirium symptoms can be like those of depression symptoms or oversedation which is why it is often hard to diagnose. Individuals experiencing hypoactive delirium require interventions to promote cognitive stimulation and reduce sedation.

Finally, those with mixed delirium show a combination of hypoactive and hyperactive symptoms at various times, with fluctuations that may be inherent to the

condition or to swings precipitated by pharmacological management of delirium (Mulkey et al., 2019).

Although it is important to be able to differentiate between the types of delirium for individualized treatment strategies, it is equally important to be able to recognize the general symptoms associated with delirium as all types increase the risk for death or severe long-term complications. General symptoms include acute change in awareness, inattention, and changes in baseline cognitive function. Patients often experience altered arousal along with symptoms of psychosis such as hallucinations or delusions, which can be perceived as a series of traumatic events (Wilson et al., 2020). Understanding all the signs and symptoms of delirium, including the individual subtype symptoms, is important for accurate diagnosis and timely treatment of delirium. If we fail to understand what is happening to the patient, we will never be able to treat the patient and therefore promote their longevity.



Figure 2: Signs and Symptoms of Delirium (Source: Sonia, A., 2021)

THE CAUSES OF DELIRIUM

Predisposing Factors

Predisposing factors of delirium are those based on the patients' characteristics. These factors present themselves before admission to the hospital (Jayaswal et al., 2019). The general predisposing factors for delirium are age (either older or very young), cognitive impairment at baseline, psychiatric illnesses or pre-existing brain injury, alcohol or substance use, poor nutritional status, and visual or hearing impairments (Wilson et al., 2020). Each subtype also has its own specific predisposing factors. In hypoactive delirium, the associated predisposing factors include advanced age, prior cognitive impairment, and medication use, especially sedatives (Mulkey et al., 2019). Individuals who develop hypoactive delirium are also shown to experience more frailty than the other subtypes (Ghezzi et al., 2022). The predisposing factors for hyperactive delirium include gender, women are more likely to develop this delirium than men, taking more daily

medications, living in care homes, and having a history of cerebrovascular disease (Ghezzi et al., 2022). The only notable predisposing factor of mixed delirium is that men are more likely to develop it than women (Ghezzi et al., 2022). Although these are all predisposing factors for delirium, some factors have more prevalence than others, meaning they are more likely to lead to delirium.

In an observational and prospective design study, elderly patients with delirium who were admitted to an ICU were assessed with a short informant questionnaire. This questionnaire used a sixteen-item instrument scored on a five-point Likert scale to evaluate their cognitive functioning based on inputs from their caregivers. This questionnaire showed the common predisposing factors among those diagnosed with delirium. The most common predisposing risk factors were history of delirium, tobacco use, and chronic liver disease (Jayaswal et al., 2019). This study showed results similar to other studies. In another study on predisposing factors, it was found that most elderly patients had pre-existing cognitive disorders, earlier diagnosis of dementia, and a history of neurological disease (Magny et al., 2018). Overall, each subtype of delirium has its own predisposing factors. However, the general factors include pre-existing cognitive disorders, older age, and previous diagnosis of dementia or delirium.

Table 2: Out of 230 patients admitted to the ICU, 88 developed delirium. This table shows the distribution of variables in those 88 patients that developed intensive unit care delirium. (Source: Jayaswal et al., 2019)

Variables	Intensive Care Unit Delirium (n=88)	
	Mean	%
Age	56.72	18.90
Male	51	57.95
Female	37	42.05
Hypoactive	49	55.68
Hyperactive	9	10.23
Mixed	30	34.09

Precipitating Factors

These precipitating factors are not often to be subtype specific, which leads to a wide range of factors. Common precipitating factors include acute medical illnesses that result in a high acuity (severe illness) such as stroke, sepsis, or hypoglycemia; trauma such

as head injuries or fractures; surgery, dehydration, use of medications from deliriogenic drug classes, sedation, physical restraints, and stress that is physiologic, psychologic, or both (Wilson et al. 2020). Precipitating factors can also depend on the setting, which is why they vary so much (Magny et al. 2018). There is also typically more than one precipitating factor present when diagnosing patients with delirium, with some patients having 8-10 precipitating risk factors (Wilson et al. 2020).

In a study conducted to identify the most common precipitating factors in delirium patients, it was found that infections have a 49.5% prevalence, followed by metabolic disorders with a 45.7% prevalence, and adverse drug reactions with 30.8% of patients being found with this factor (Magny et al. 2018). Alarming, the use of deep sedation and physical restraints, especially in Intensive Care Units, contributes to an odds ratio of 30.95 for developing delirium, making this condition a form of harm inflicted by routine care in many hospital settings (Pan et al., 2019).

To prevent older adults from experiencing delirium, these precipitating factors must be managed appropriately using evidence-based care standards. Currently, the best interventions for precipitating factors are medication review, mitigating complications through non-pharmacologic approaches, and managing distress (Wilson et al. 2020). Yet, these management strategies alone are not enough to prevent delirium, but rather risk identification and mitigation must also become a focus. Further when care of an older patient with delirium only focuses on the physiologic causes associated with the admitting diagnosis instead of other factors like distress, administered medications, or healthcare practices we severely limit the effectiveness of early intervention (Magny et al. 2018). Delirium in the elderly can't be effectively treated unless all factors are looked at. Further, until all factors are evaluated, the longevity of these elderly patients will remain compromised.

EXTENDING LONGEVITY OF OLDER ADULTS WITH DELIRIUM

Treating the Original Cause

The longevity of older adults at risk for delirium cannot be extended unless we can mitigate risk before delirium occurs, meaning the key focus should be on prevention. Evidence-based approaches to prevent delirium include recognizing and removing precipitating factors and non-pharmacological first-line strategies such as re-orientation and early mobilization (Lee et al. 2020). Some institutions have adopted a model called Hospital Elder Life Program, (HELP) to address six risk factors that commonly are associated with delirium: cognitive impairment, sleep deprivation, immobility, visual impairment, hearing impairment, and dehydration (Wan and Chase 2017). The Hospital Elder Life Program looks at treating delirium from a non-pharmacological approach. It also looks at helping to prevent delirium before it happens. In fact, a recent meta-analysis shows that non-pharmacological approaches help reduce the incidence of delirium significantly. In this analysis it was found that involving the patient's family, primary bedside nurse, and clinical nurse leader in creating a nursing care plan is also very successful when it comes to addressing delirium.

Another strategy, endorsed by the Institute for Healthcare Improvement, referred to as Age-Friendly Health Systems reduces delirium risk via a framework known as the 4 Ms: identification of what matters to patients, assessing mentation (including twice-daily assessment for delirium in hospitalized patients), mobility promotion, and medication strategies that do not impair an individual's mentation or mobility (Kwak et al., 2023). Other aspects that are important in the care plan for the oldest patients might be aided feeding, frequent positioning, and minimizing the use of chemical or physical restraints (Wan and Chase 2017). Although these approaches have been shown to be effective in treating delirium, the most effective strategy to address delirium in older adults requires early detection. Delirium needs early detection to overcome its predictive role in institutionalization and mortality, as each day the healthcare team fails to rescue a patient from the perils of delirium increases the risk of the most severe outcomes (Lauretani et al., 2020). Overall, delirium is an extremely debilitating disease that often leads to mortality. However, if we can treat the original causes, in combination with using programs such as the Hospital Elder Life Program, then those mortality rates could be much lower, allowing older adults to live a longer life.

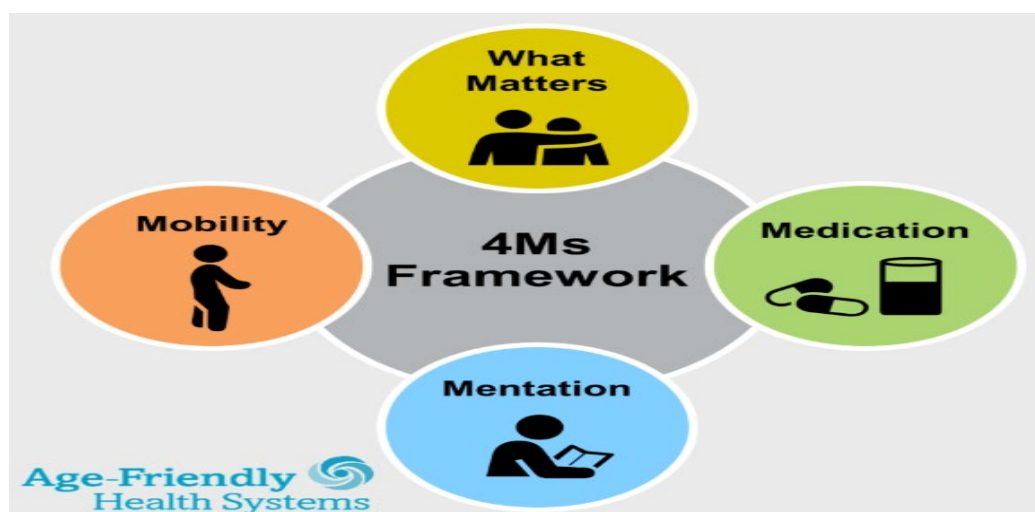


Figure 3: Age Friendly Health System (Source: Delirium Central, 2023)

Pharmacological Approach

Pharmacological treatment is not recommended due to many medications being a precipitating factor in delirium. There are no FDA-approved medications to treat delirium and no pharmacologic interventions to date have been shown to consistently prevent delirium or reduce the duration of delirium (Thom et al, 2019; Palakshappa & Hough, 2021). However, that does not mean that medications cannot be used at all, instead clinicians should be guided in the correct choice of drugs (Lauretani et al., 2020).

Antipsychotics are a common drug class prescribed to patients experiencing delirium, but there has been no evidence that these drugs work in lowering the duration of delirium. In fact, it has been shown that antipsychotics can instead lead to side effects

such as parkinsonism, akathisia, dystonia, and electrical delays in the heart rate along with an overall chance of increase in mortality rates (Wan and Chase, 2017). National Guidelines for delirium management in use in other countries, such as Scotland and the United Kingdom, state that there is insufficient evidence to support a recommendation for routine use of any drug class for prevention or treatment of delirium symptoms unless in the case of intractable distress or significant risk of self-harm or harm to others (SIGN, 2019).

In a study done on different drug classes, it was found that the alpha agonist known as dexmedetomidine was able to lower the duration of delirium, but not prevent it (Burry et al., 2019). This has led to some interest in the use of alpha agonists for the treatment of alcohol withdrawal, a condition known to be a precipitating factor in the development of delirium and one that is often associated with significant agitation, as this benzodiazepine-sparing approach limits delirium risk in two ways.

Other evidence is emerging that the COVID-19 pandemic has had a significant impact on increased hospital-associated precipitating risk factors for delirium that have persisted beyond the acute phase of the pandemic. In a cross-sectional study measuring rates of delirium and related medication prescriptions among older aged hospitalized patients before, during, and after the COVID-19 pandemic it was found that there was both an increase in rates of delirium as well as continuation of antipsychotic and benzodiazepine prescriptions after discharge and these findings persisted 2 years later leading to lasting consequences for older individuals including increased poor cognitive function, frailty, and medication induced adverse effects (Reppas-Rindlisbacher et al., 2023).

As seen in these examples, it is important to be careful in considering pharmacological approaches for treating delirium as often drugs can precipitate or prolong the development or duration of delirium. Despite there being low evidence of drugs being able to treat delirium, they are often still prescribed, perhaps because care teams have inadequate knowledge or competence on how to use non-pharmacological approaches first. Yet in some cases, pharmacological treatment is necessary, especially when it comes to treating hyperactive delirium in patients experiencing aggressiveness. In these cases, clinicians should choose the right medications based on the cluster of symptoms presented by the patient (Lauretani et al., 2020). Governments, health systems, and clinicians all need to commit to implementing evidence-based, non-pharmacological interventions to prevent and mitigate delirium, since pharmacological approaches should overall be avoided due to the risk of side effects and the increase in mortality rate associated with this approach (Reppas-Rindlisbacher et al., 2023). This in some ways brings healthcare back to its most fundamental roots, to provide compassionate care that addresses what matters most for each individual patient, as a strategy to prevent harm and promote longevity.

CONCLUSIONS

Understanding the connection between delirium and its effect on older age individuals is key in extending the longevity of this population demographic. Early recognition of delirium could be protective, and even preventative in the case of dementia, has led researchers to study the role of delirium prevention to significantly extend the longevity of older adults. Khachaturian and colleagues (2020) have even made this a focus of a worldwide public health campaign, known as International Drive to Illuminate Delirium, because in their view delirium represents a true public health emergency and one for which there is an “unparalleled opportunity” to make a potentially meaningful impact on longevity.

Overall, until healthcare teams improve care approaches to delirium, older adults are at risk of not being afforded the same opportunity to live a fulfilling and healthy life as other population demographics after a healthcare encounter. This is due to delirium having such a debilitating impact on cognition, body functioning, and psychological well-being as well as it often being a form of iatrogenic harm that is either precipitated or worsened by common care practices such as the use of deliriogenic medications or restraints. This is why it is important for not only medical professionals, but the general population to be able to recognize and respond to the precipitating risks of delirium to stop delirium before it starts and an ethical imperative to advocate for policy reform that will promote appropriate changes to current standards of care. MacLulich and colleagues (2022) recommend three areas of future delirium research that could support these goals including a focus on delirium-related distress (e.g., qualitative studies on goal concordance to see if health care practices are aligned with patients’ longevity or quality of life goals), delirium epidemiology to provide insights into risk mitigation strategies for various patient populations (e.g., perioperative, emergency), and research to develop standardized care algorithms that “create fine-grained approaches” to different delirium subtypes.

Delirium prevention is an underutilized strategy to stop the onslaught of dementia, life threatening diseases, and overall frailty that is mistakenly attributed to old age as opposed to a potentially preventable manifestation of “acute brain failure”. Unveiling the connection between delirium and longevity has the promise of increasing both the length and quality of life for older adults.

AI INTEGRATION

I used AI in this essay to create a title for my paper. To do this, I used ChatGPT and asked it to give me five titles related to delirium and longevity. Based off the titles it gave me, I picked the current one I have. I only used AI to pick the tile of my paper, I did not use it anywhere else in this paper.

Overall Word Count= 4163

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