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COVID-19 to be a pandemic of “alarming levels of spread and severity.”¹

While the situation is rapidly evolving, this pandemic has already disrupted the world in three major

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Anticipating and Mitigating the Impact of COVID-19 Pandemic on Alzheimer's Disease

The suspension of elective and nonurgent care is occurring in many affected areas. The availability of urgent and intensive care resources becomes compromised when the prevalence of severe cases of COVID-19 exceeds local resources.¹⁰ Individual with ADRD may suffer disproportionately from constraints in resources due to the chronic nature of their illness and their specific care needs.

Workup, Diagnosis, and Clinical Follow-up for ADRD

The workup and diagnosis of ADRD is vulnerable to disruption in several ways. As primary care providers and specialists are being redeployed to address medical emergencies, these physicians are not available to work up neurocognitive disorders. Attending a clinic for one or more appointments and visits for blood work and neuroimaging expose frail individuals to risks that may exceed the benefits of timely evaluation and regular monitoring.

In many jurisdictions, outpatient physicians have transitioned to providing virtual care, completing assessments and follow-ups by telephone or videoconferencing. These modalities may not be adequate to perform the physical and neurological examinations or some of the cognitive tests required when diagnosing MCI or dementia or monitoring their progression. In some cases, it may be possible to provide an initial visit in person and follow-ups remotely. Otherwise, diagnosis and care may have to be deferred or limited.

Medication Management of ADRD

The use of anticholinesterase inhibitors and memantine is common in patients with ADRD. Medications frequently used for the treatment of BPSD include antipsychotic, antidepressant, antiepileptic, and other psychotropic medications.¹¹ Patients who are stable on medications may be impacted if the supply of their medication is disrupted due to missed visits, disruption of pharmacy pickup or delivery, or supply chain problems.

Initiating a new medication during the pandemic may be associated with higher risk, particularly if components of routine screening are disrupted such as in-person clinical assessments, blood work, or electrocardiogram, or the ability to follow up on adverse events in a timely manner. Rare but serious adverse

events associated with medications used in the treatment of ADRD and BPSD e.g., bradycardia, gastrointestinal symptoms, falls, fractures, cardiovascular events, or strokes carry higher morbidity and mortality if access to urgent care is impeded. In the context of social isolation, individuals with ADRD who rely on family or health professionals for reminders or assistance with taking their medications are at risk for sudden discontinuation of medications. The risk-benefit ratio of some medications in dementia may shift towards harm if adequate prescribing and monitoring is not possible.

Nonpharmacologic Management

Common nonpharmacologic interventions for ADRD in general, and BPSD in particular, involve social and physical contact such as social groups, exercise groups, and pet therapy. A limitation on resources and a need for physical distancing will not merely suspend these interventions, it will also result in increased isolation, a lack of physical exercise, decreased social engagement, and a suspension of purposeful activity. While confined at home, many people are now using technology to socialize and even exercise in group; individuals with ADRD may not be able to use electronic tools and software (See below).

Medical Care Following the Pandemic

Resolution of the pandemic may be associated with an increased demand for care that was deferred. Individuals with ADRD and their family may also need assistance to resume care and address complications that arose from the lack of follow-up and monitoring or from the disruption in health-promoting interventions.

(3) Impact of COVID-19 on ADRD Care

The societal response to the pandemic includes travel restrictions and home confinement ("lock-downs"). People are encouraged or required to isolate socially and not to leave their home. Nonessential businesses are shut down. The extent and duration of these social distancing measures is uncertain, but it may be significant and prolonged in some jurisdictions. In this

additional risks. Their higher dependence on caregivers and health care providers eliminates the possibility of physical distancing. In these settings, personal protective equipment (PPE) may be rationed for confirmed or suspected cases or even become unavailable.⁹ When COVID-19 affects LTC homes, it can have a high attack rate and case fatality rate—for example, a case fatality rate of 33.7% 34 fatalities among 101 affected residents has been reported in a Washington State LTC.¹⁴ This home also experienced a significant disruption to staffing, with 50 health care workers reported to be infected.¹⁴ Many staff of LTC work at multiple facilities or in private homes increasing the risk of transmission and disruption of care beyond an impacted facility.

Hospital

Patients with ADRD are hospitalized due to BPSD,

one²¹ and in professional caregivers who have lost a patient.²² All of the above will lead to exhaustion and burnout.

As discussed above, specific aspects of caring for individuals with ADRD are incompatible with physical distancing. Inadequate or unavailable PPE or training related to its use sets the stage for viral transmission. Responding to agitation and threats of violence typically requires urgent interventions that impede proper PPE use and increase further the risk of viral exposure.²³

Many patients with ADRD have “do not resuscitate” status, including advanced directives not to transfer them to an acute medical floor. As a result, in some settings, if these patients develop COVID-19, neurologists, geriatricians, geriatric psychiatrists, or primary care providers will have to practice out of their scope and care, managing the symptoms and distress associated with pneumonia. However, this issue goes beyond COVID-19 and pneumonia. As discussed above, during this pandemic, many patients with ADRD who want to receive the full spectrum of care, including intensive care and intubation, may not be able to access optimal acute care for any medical issue, not just COVID-19. All physicians may have to treat a variety of medical issues that would have otherwise been treated by specialists. Preparatory discussions with patients and family members are needed to clarify the goals of care should these dire circumstances arise; they are particularly crucial if advance discussion of code status have not yet occurred or are not clearly documented.

Health care workers involved in ADRD care are already exposed to suffering and deaths.¹⁴ Their stress and anxiety may be further increased by the current risk to their own safety. The number of cases, deaths and societal impact of COVID-19 has already exceeded those observed during the 2003 epidemic of SARS. As following SARS, we need to be prepared to address the serious and long-term mental health effects of COVID-19 on health care workers, including post-traumatic stress disorder and depression.²⁴

(5) Mental Health, Trauma, and Suicide in COVID-19

The COVID-19 pandemic threatens to disrupt not only the active care of individuals of ADRD, but also the basic routines that promote their mental health.

The pandemic and its social consequences may cause fear, anxiety, and anger. They will disrupt all forms of social interaction, possibly for a prolonged period of time. A lack of physical closeness may lead to increased loneliness and sadness. Exercise is recommended generally and specifically for individuals with ADRD, and confinement reduces access to exercise. Sleep disturbances is common in ADRD and sleep may be further disrupted due to anxiety and loss of social rhythms (“zeitgeists”).²⁵ In turn, lack of activities and sleep loss and stimulation may cause delirium in individuals with ADRD, contributing further to morbidity and mortality.²⁶

Like health care workers, individuals with ADRD may experience the loss of friends and family due to COVID-19. These losses may lead to grief, bereavement, or frank depression, a common feature of ADRD.²⁷ The pandemic and its consequences may also be experienced as a trauma, followed by post-traumatic stress disorder. In turn, stress and trauma can accelerate cognitive decline.²⁸ Age, illness, depression, trauma, and dementia are all risk factors for suicide.²⁹

pandemic for individuals with ADRD, i.e., the

possible participants or their SDM and documentation of this consent process.

Lasting Impact of the COVID-19 Pandemic on ADRD Research Methods

As with any major crisis, the COVID-19 pandemic will have a lasting impact on the way all clinical research, including ADRD research, is carried out. The current challenging situation is forcing researchers to think how they could conduct most research procedures remotely. It will accelerate the adoption of technologies and tools that permit remote assessments.^{38 40}

In the field of ADRD research, we believe it will impact most the traditional neuropsychological and functional assessments on which most primary outcomes for ADRD interventions trials are based.⁴¹ In the long term, ADRD research will also benefit from these technological innovations because they should allow the recruitment and follow-up of much larger samples at reduced costs. Finally, the COVID-19 crisis may expedite the development of non-pharmacological interventions that can be delivered at the home of the participants, e.g., home-based cognitive training or physical exercise, or that use small portable

Solution Design LLC (software for a trial funded by the CAMH Foundation), and HAPPYneuron (soft-

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