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COVID-19 in Older Adults: An Update for Emergency Providers

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Box 1: Patient Scenario 1

The wife of an 84-year-old community-dwelling Black man with moderately severe Alzheimer's disease calls to the primary care provider to report that the patient and she were exposed to a family member now hospitalized for COVID-19. The two received community testing: both were positive for COVID-19. His medical history is significant for hyperlipidemia, orthostatic hypotension, and Vitamin D deficiency. His medications include donepezil, atorvastatin, and Vitamin D. At baseline the patient is independent with his self-care but needs assistance with his instrumental activities of daily living, corresponding to a [Clinical Frailty Scale](#) (CFS) of 4. The patient now has a temperature of 100.1, fatigue, a poor appetite and has taken to bed. He is alert, interactive and appears to be at baseline cognition according to his wife. While his advance directive is "DNR/DNI", he wants hospitalization if required.

- In this situation and considering non-ED alternatives, do the potential benefits of ED transfer outweigh the potential harm?
- What systems should be used to address his needs?

BACKGROUND

As of December 14, 2020, 16.5 million cases of COVID-19 have been reported in the United States.¹ Test positivity rates of 15% or higher are noted in 19 states.² While our county is in crisis now, even with the rollout of a vaccine, this pandemic is predicted to increase dramatically over the next four months. There have been 300,477 deaths in the United States of America,¹ with the forecasted total deaths of 502,000 by April 1, 2021.³ At the time of this publication, COVID-19 became the leading cause of death in America.⁴ While people 65 years of age and older represent 14.4% of the total cases, they account for 80.5% of the deaths.⁵ The mortality rate increases with advancing age. Emergency Department (ED) visits decreased during the Spring 2020 secondary to lockdowns and some older adults delaying care for common illnesses and conditions to avoid interacting with the health care system.⁶ ED visits subsequently have increased and now focus on both those with COVID-19, as well as others in need. Individuals over age 65 have 3-fold higher rates of hospitalization for COVID-19 than younger adults.⁷ Multiple vulnerable sub-populations of older people have been impacted: people with

underlying medical conditions, including dementia; African-Americans; members of Hispanic communities; residents of assisted living communities and skilled nursing facilities; people living in rural communities; people with socio-economic vulnerabilities; people of lower socio-economic status; and people who are homebound. Since our March 2020 Journal of Geriatric Emergency Medicine paper, a national public health disaster has unfolded. This manuscript presents two common case scenarios to illustrate the central role of the ED in the diagnosis, acute management, and community care coordination of complex older adults in this rapidly changing situation.

Box 2: Patient Scenario 2

A 78-year-old Palestinian-American man with moderate vascular dementia is transferred from a local assisted living center for fever of 102.4 and poor oral intake for one day. His medical history is significant for diabetes mellitus, hypertension, severe aortic stenosis and a 2020 hospitalization for urosepsis. At baseline he needs stand-by assistance to ambulate with his walker. He can feed himself, but otherwise needs assistance with all self-care, corresponding to a CFS score of 6 or even 7. He takes six medications.

Supplemental History: The patient had some hematuria one week prior to the ED visit and was treated empirically with an oral cephalosporin antibiotic. There have been numerous cases of COVID-19 among other residents at the patient's assisted living center. His advance directives indicate "DNR; apply all other measures." His sister is on her way to the ED, where no visitors allowed. The ICU at this site is full; there is one medical bed. The ED has 14 beds, but 8 of them are holding patients who await beds in the hospital.

His Temp in the ED is 102.0, RR 28, oxygen saturation 88%, HR of 110, and BP 110/70. He is sleepy but followed commands of the staff with prompts. It is difficult to tell if he did or did not have rales on auscultation of his chest. His aortic stenosis murmur is prominent. Labs and imaging are pending.

- How would his co-morbid conditions affect his prognosis in the context of COVID-19?
- What factors should the ED staff consider in deciding to allow his sister into the ED?
- If he does not require intensive care or cardiac monitoring, how could the ED team construct a disposition plan that balances (patient and community) benefits and harms?

CLINICAL PRESENTATIONS OF COVID-19 IN OLDER ADULTS

One of the challenges of diagnosing COVID-19 is the tremendous variation in symptoms and illness severity experienced by those infected with the SARS-CoV-2 virus. Overall, 80 to 90% of individuals are asymptomatic or have a mild illness but a small proportion of patients develop a severe, life-threatening infection causing acute respiratory distress syndrome (ARDS) which can progress to multiorgan failure.⁸ Like other members of the Coronaviridae family, SARS-CoV-2 affects the respiratory and gastrointestinal systems.⁹ As a result, common symptoms include those seen in viral illnesses (fevers, chills, rigors, myalgias, fatigue), respiratory illnesses (rhinorrhea, sore throat, cough, wheezing, shortness of breath) and gastrointestinal illnesses (nausea, vomiting and diarrhea).¹⁰ It has been demonstrated, in non-COVID-19 infections, that older adults may present with non-specific symptoms such as generalized weakness, falls, or delirium; and without typical symptoms of an infection, such as fever.¹¹ From a systematic review of studies conducted early in the COVID-19 pandemic, it initially appeared that older adults with COVID-19 usually had common viral symptoms, including fever (83.6%), cough (62.7%) and shortness of breath (25.5%)¹² (See Table 1.)

incidentally found.¹³ More recently, a multicenter study conducted across 7 EDs in the United States demonstrated that older adults often lack the common symptoms of COVID-19 infection.¹⁴ Fever, cough, and shortness of breath were present in approximately half of all older ED patients with COVID-19, and non-specific symptoms were very common, with 30% presenting with generalized weakness, 28% with delirium, 11% with falls and 9% with dizziness or syncope (See Table 1.)¹⁴

Differences between these studies may be due to institutional guidelines governing who gets tested due to limited test availability and/or lack of provider knowledge that older adults may present with non-specific symptoms. Older adults may lack the typical symptoms due to physiologic changes associated with aging. For example older adults are less likely to have a fever in response to an infection, secondary to a decrease in basal temperature and a decline in immune system efficacy.¹⁵ This is particularly true for residents of long-term care facilities (LTCF), for which there are specific definitions for fever.¹⁶ (Box 3) Additionally, it is possible that symptoms are present but underreported in individuals with dementia or delirium. Indeed, Kennedy/Helfand et al reported that over a third of patients with COVID-19 associated delirium did not have fever or shortness of breath.¹⁴

Table 1: Presenting Symptoms of COVID-19 Infection Among Older Adults

Symptoms	Neumann-Podczaska et al ¹²	Kennedy/Helfand et al ¹⁴
Fever	83.6%	56%
Cough	62.7%	50%
Shortness of breath	25.5%	51%
Fatigue*	19.9%	26%
Hypoxia (oxygen saturation <90%)	NR	40%
Weakness	NR	30%
Delirium	NR	28%
Fatigue and Myalgias*	8.0%	NR
Myalgias*	4.6%	12%
Chest pain/tightness	15.3%	6%
Sputum production	17.7%	NR
Diarrhea	13.0%	16%
Anorexia	8.4%	15%
Fall	NR	11%
Dizziness/syncope	NR	9%
Sore Throat	NR	6%
Acute Respiratory Failure	NR	7%
Abdominal pain	NR	8%
Headache	NR	6%
Others	20.6%	13%

Subsequently, a single center study reported that 24% of older adults diagnosed with COVID-19 in their emergency department (ED) presented with syncope, near syncope or fall as a main symptom, and that fever or respiratory symptoms in these patients were only

Box 3: Infectious Disease Society of America Definition for Fever of Long-Term Care Facilities

1. Single oral temperature >100°F (>37.8°C) or
2. Repeated oral temperatures >99 ° F (>37.5°C) or
3. Increase in temperature >2°F (>1.1°C) over baseline temperature.

Timely diagnosis of COVID-19 infection is critical to early initiation of therapy and to prevent disease transmission. Therefore, clinicians must be attentive to these non-specific symptoms and include COVID-19 in the differential of older adults with generalized weakness, falls, and delirium; especially in those who are 75 years or older, from a long-term care facility or with baseline cognitive impairment.^{14,15}

DIAGNOSIS

It is apparent that neither the presence nor absence of any specific signs or symptoms can accurately identify infection with SARS-CoV-2 virus.¹⁶ Formal laboratory diagnosis is made by reverse transcription polymerase chain reaction testing (RT-PCR). The sensitivity of these tests was primarily evaluated in hospitalized patients with significant illness burden. Tests may fail to detect disease in those with lower antibody levels who express only mild or asymptomatic disease.¹⁷ Test accuracy is also dependent on the quality and timing of testing, with false negative testing ranging from 20-67% of patients.¹⁸ Studies have not commented on the impact of age on sensitivity of RT-PCR or serologic testing.¹⁹ No studies exist on testing sensitivity following the non-specific presentations common in older adults such as delirium or falls.

The median COVID-19 incubation period increases with age and is estimated at 4.0 days (95% CI: 3.5-4.4)

in patients aged under 30, 5.8 days (95% CI: 5.6-6.0) for persons aged between 30 and 59, and 7.7 days (95% CI: 6.9-8.4) for persons aged greater than or equal to 60.²⁰ Transmission does occur during this incubation period. Since older adults can have a longer COVID-19 incubation period, it is essential to increase suspicion and detection to minimize disease under-diagnosis. Older adults therefore require a longer period of isolation and observation to determine if they are free of disease. This extends the quarantine period in the older adult population from 14 to 17 days.²¹ Since symptom resolution is delayed in the older adult population serial testing may be required to confirm lack of active infection, especially for those in long-term or communal care facilities.²²

Antibody tests have limited sensitivity for prior infection as the duration of antibody rise is unknown. These tests are therefore of limited utility in any diagnostic framework.

IMAGING

Chest imaging has been well described in COVID-19 patients. Importantly, radiological changes may not be noted in the first few days of illness. Infection cannot be ruled out without reference to the day of illness.^{23, 24}

Computed tomography of the chest is the gold standard for the diagnosis of COVID-19 interstitial pneumonia, showing typical findings in COVID-19 patients regardless of their age. Furthermore, anomalies diagnostic of COVID-19 on CT chest are associated with increased mortality.²⁶

LABS

D-dimer, CD4 cells, and CD cells/D-dimer ratio with cut-off values of 0.65 (mg/L), 268 (cell/ μ L) and 431 are predictive of severe or critical illness in older adults with COVID-19.²⁷ Lymphopenia is significantly associated with mortality.²⁸

Biomarkers associated with adverse clinical outcomes based on meta-analyses of three independent studies:²⁹

1. Troponin (> 99 th % per test) - 13.7 Odds Ratio (OR) on risk of mortality
2. D-dimer ($> 1\mu\text{g/mL}$) - 6 OR mortality, 3.4 OR on risk of disease severity
3. Lymphopenia ($< 0.8 \times 10^9/\text{L}$) - 2.2 OR mortality, 1.1-3 OR higher level of care, 4.2 OR disease severity
4. LDH ($> 250 \text{ U/L}$) - 3.2 OR mortality, 1 OR higher level of care, 5.5 OR disease severity
5. CRP ($\geq 125 \text{ mg/L}$) - 4.5 OR mortality, 6.5 OR disease severity
6. Creatinine ($> 133\mu\text{mol/L}$) - 2.8 OR mortality
7. AST ($> 40 \text{ U/L}$) - 3.3 OR mortality, 3.6 OR disease severity
8. ALT ($> 40 \text{ U/L}$) - 2.1 OR mortality, 2.1 OR disease severity

9. Neutrophils ($> 8,000/\text{mm}^3$) - 5.6 OR mortality
10. Thrombocytopenia ($< 150,000/\text{mm}^3$) - 7.3 OR mortality, 1.1 OR higher level of care, 1.8 OR disease severity
11. WBC ($> 10,000/\text{mm}^3$) - 4.3 OR mortality, 3.4 OR disease severity
12. Lactate (≥ 2) - a lactate ≥ 2 has been demonstrated in other disease processes to be associated with poor outcomes and mortality. If the lactate is ≥ 4 , an assessment should be performed for severe sepsis.
13. Ferritin ($> 300 \text{ ng/ml}$) - 9.1 OR mortality.

TREATMENT

Evidence of effective treatment is constantly evolving; therapeutic management remains primarily supportive. No specific treatment modalities exist based on chronologic age. Although older adults are disproportionately affected by COVID-19 and suffer the highest mortality of any demographic, they are also more likely to be excluded from trials seeking to establish treatments or preventative vaccination for COVID-19.³⁰

As with all older adults, the principles of geriatric care should be applied early in the care of those with COVID-19 infection. Comorbidities and functional status may play a relevant role in survival and should be assessed. Age and polypharmacy place older adults at high risk of QTc prolongation and therapies that increase risk should be carefully evaluated prior to administration in this population. Nutritional status should be established in older adults with COVID-19.³¹ Frail or undernourished patients are candidates for nutritional support.³² The effects of social isolation, depression, and progression on cognitive impairment must be considered and addressed in all older patients presenting with COVID-19 symptoms or infections.³³ Emergency physicians should consider these important measures part of a comprehensive discharge plan essential to the support of this vulnerable population. Advance care planning and goals of care discussions are both “principles of geriatric care” AND essential in management of older people with COVID-19. Institutional policies and protocols addressing these issues should be deployed to optimize care, decrease repeat ED visits, and both standardize and simplify the discharge process from the ED.

IMPLICATIONS FOR THOSE WITH SOCIAL VULNERABILITIES

Recent studies have demonstrated that social determinants of health play a major role in morbidity and mortality.³⁴ Individuals who are unable to pay their rent or mortgage, or who are unable to afford enough food to feed themselves or their family are often unable to purchase needed medications, equipment, or treatments for chronic or acute conditions.

Not all required or recommended COVID-19 interventions involve medical care. Some include equipment or home modifications to adapt a person’s

living space such as heaters, air conditioners, fixing holes in the floor, railings or bannisters for stairs, LED lighting or other changes. Individuals with limited or fixed incomes may not be able to afford such safety measures.

Twenty-seven percent of U.S. adults over age 60 live alone.³⁵ Some of these individuals have families that live elsewhere; others do not have social supports or people in their lives that they can count on for financial or care needs. This is in contrast to many other countries in which a higher percentage of the older population lives in extended family households, and family members care for older relatives when needed.

The United States does not have a comprehensive, carefully planned, integrated system of care for people as they age. Health systems, public health agencies, community and social programs are separately administered, regulated, and staffed; workers in one sector are often unaware of programs and services in other sectors. This leads to a lack of coordination, adverse events during care transitions, duplication of services, and wasted resources.³⁶ It also results in gaps in services and non-medical issues such as transportation being one of the top reasons cited by older adults for failure to keep medical appointments.³⁷

IMPLICATIONS FOR OLDER ADULTS WITH COMORBIDITIES

Older adults with COVID-19 infections who have multiple comorbid illnesses and underlying uncontrolled medical conditions have a higher rate of admission to the intensive care unit and a higher mortality rate.³⁸ The Clinical Frailty Scale has been used to guide decision-making in older adults who present to the ED with COVID-19.³⁹ Severe or very severe levels of frailty on the Clinical Frailty Scale on admission to the hospital correlated with prolonged hospitalization and death among a large cohort of older adults with COVID-19 in a United Kingdom/ Italy study early in the pandemic.⁴⁰ The Centers for Disease Control (CDC) has listed several conditions which pose increased risk of severe illness (hospitalization, ICU, intubation, or death) from COVID-19.⁴¹ The list includes: cancer, chronic kidney disease, COPD, heart conditions, immunocompromised state, obesity, pregnancy, sickle cell disease, smoking and Type 2 diabetes mellitus. The CDC site does not comment about those who have multiple comorbid conditions.

IMPLICATIONS FOR OLDER ADULTS WITH DEMENTIA

Older adults with cognitive impairment will pose unique needs when presenting to the ED.⁴² The use of personal protective equipment by clinicians may be disorienting for the person with dementia. Dementia increases the risk for delirium during an ED visit.¹⁴ Dementia also lowers the threshold for sensory overload. Distress and disruptive behaviors are common for individuals with dementia during ED visits. These behaviors may represent unmet needs in those with dementia. Most institutions have implemented policies that prevent visitors with the goal of reducing transmission of COVID-19.

No-visitor policies to reduce transmission of COVID-19 is a standard safety policy throughout health care systems during this pandemic. But caregivers for persons with dementia are *not* visitors.⁴³ Caregivers for older adults are a critical part of the care team. These care partners provide essential medical and emotional support; they can aid in diagnosis and treatment. Caregivers can support care by feeding and mobilizing, alleviating fear and anxiety, assisting with communication, detecting delirium early, and acting as an advocate for the patient. Rehospitalization increases if caregivers are not involved in developing person-centered discharge plans and helping with adherence to treatment plans. EDs should consider the harms and benefits of caregivers being with older patients with cognitive impairment, while acknowledging the caregiver as an essential member of the care team.

Frequent monitoring and clear communication will be important to remind persons with dementia and their caregivers of hygienic practices both in the ED and home care setting. Check with caregivers for alternative plans for care management if the primary caregiver should also become ill.

The Alzheimer's Association has a 24/7/365 Helpline (1-800-272-3900) for care partners and health professionals, and local chapters that can provide additional support and resources (www.alz.org/help-support/resources/helpline).

IMPLICATIONS FOR OLDER ADULTS WHO HAVE MENTAL HEALTH NEEDS

EDs are a major entry point into the mental health care system. People with mental health disorders presenting to the ED have a higher risk of COVID-19 infection than people without them.⁴⁴ Severe mental illness, substance use, homelessness, and poor access to care put people at higher risk for COVID-19 complications.⁴⁵ Some patients may delay emergency care during the pandemic. CDC reports COVID-19 has been associated with mental health challenges related to the morbidity and mortality caused by the disease and to mitigation activities including social distancing and stay-at-home orders.⁴⁶ Unpaid caregivers who care for older adults have a higher incidence of adverse mental and behavioral health conditions compared with others. Promoting coping and resilience, and clear transitions communication should be utilized when managing these persons in the ED.

Care of people with behavioral health concerns and with suspected or confirmed COVID-19 presenting to the ED should include:

- using existing local behavioral health crisis team to mitigate unnecessary visits to the ED.
- ensuring a thorough medical evaluation of people who present with behavioral health crisis.
- discouraging use of restraints.
- evaluating for signs of domestic violence for older adults with intellectual and developmental disabilities.

- considering the risk/benefit allowing the caregiver at bedside to help with patient history/ alleviate patient anxiety.
- ensuring all behavioral health patients have phone access to community resources.
- collaborating with caregivers to identify caregiver fatigue and provide community resources.^{47, 48}

IMPLICATIONS FOR TRANSFERS OF PATIENTS FROM LONG TERM CARE FACILITIES

Over 42% of COVID-19 deaths in the US have occurred in nursing homes or long-term care facilities, an indication of how vulnerable this patient population is to the virus.⁴⁹ They are at increased risk of both exposure and serious illness if infected because of their baseline co-morbidities; their congregate-living environment; and receiving prolonged, personal care from staff. In the first well-publicized outbreak in a United States facility, of the 120 residents at LifeCare Center in Kirkland, WA, 63 tested positive for COVID-19; 13 died in the hospital with confirmed COVID-19 and 11 died at the center without results of postmortem testing.⁵⁰ Over four dozen staff members were also infected.

Long-term care facilities, including skilled nursing facilities (SNFs) and assisted living facilities, have limited family visitation and curtailed congregate meals and activities within facilities since March 2020. Regular testing of staff has been mandated since August 2020.⁵¹ Despite these measures, outbreaks in facilities continue to occur and track with rates of community spread.⁵²

Most SNFs can provide oxygen, IV medications, and nebulizer treatments. Assisted living facilities have less nurse staffing, less clinician presence, and fewer resources to provide care. In an outbreak situation, even facilities that can provide higher levels of care may find it difficult to maintain the staffing needed to care for multiple acutely ill patients. A majority of SNF patients have dementia, with implications for both clinical presentation and ability to communicate. Open communication between clinical providers in the facility and ED staff can avoid some transfers, can aid management of patients in the ED, and can identify patients who could be transferred directly back to the facility for ongoing care.⁵³

GOAL SETTING, ADVANCE CARE PLANNING, & PALLIATIVE CARE

The COVID-19 pandemic has taught us, once again, that acute illness may happen at any time, regardless of underlying conditions or risks. While individuals with certain underlying diagnoses such as diabetes or COPD, as well as those who are older may be at higher risk for more severe disease, younger and previously 'healthy' people have also become seriously ill.

Several national organizations such as Vital Talk, The Conversation Project, The Schwartz Center for Compassionate Care and others have promoted goal setting and advance care planning for people at every age and before they become ill. However, these steps

are often ignored until illness strikes. Moreover, individuals living with dementia or other cognitive challenges may have a somewhat limited ability to make their own independent, thoughtful decisions about their health and care. While some of these older adults may have a designated health care proxy or agent, some do not.

When illness such as COVID-19 happens suddenly and potentially without warning, there is often inadequate time for decision-making about choices such as whether or not to transfer to the hospital or a higher level of care, whether to accept intubation, resuscitation, ventilator support, certain medications, etc.⁵⁴ The complexities of these issues may be magnified by limited visitation and social interaction with family members or care partners during the pandemic.

In some cases, it may be possible to give a reasonably accurate prognosis to the person or legally designated decision-maker; in other cases, it may not. The variability in morbidity and mortality has been identified by many health care professionals, including epidemiologists and other public health experts. This has made prognostication difficult to impossible in many cases.

Making decisions to forego certain types of care and life support may be difficult. In particular, moving from aggressive care and treatment to a palliative care model may feel to some people like 'giving up' instead of providing intensive care and services to prevent and manage symptoms and promote comfort and quality of life (<https://www.capc.org/>). However, with so many COVID-19 cases and surges that are taxing the health care system, providing comprehensive palliative care services to individuals who prefer such care may help meet their needs and may also allow the system to provide more acute and urgent services to those who may benefit most. Documents or guides for decision-making in specific settings such as nursing homes are available (<http://decisionguide.org/>).

TRANSITIONS OF CARE & DISCHARGE CONSIDERATIONS IN THE COVID-19 ERA: RISKS, BENEFITS, & ALTERNATIVES

Disposition planning is more complex in the COVID-19 era. Providers must consider local transmission and resource limitations in a dynamic assessment of the harms and benefits of admission and discharge. Simultaneously, necessity and regulatory reform have driven rapid innovation in alternatives to admission through nontraditional sites of care, augmented home care, and enhanced transition models.⁵⁵

COVID-19 taxes ED and inpatient resources through increased volume, increased acuity, and sometimes decreased staffing. The hazards of hospitalization are compounded in obvious and subtle ways, most notably with:

- Greater risk, and decreased detection, of delirium due to isolation (no visitor or volunteer policies) and less nursing and provider attention.
- Functional decline due to decreased mobility and PT/OT.

- Increased risk of chemical and/or physical restraint use to control distressed behaviors due to limited resources to employ non-pharmacological measures.
- Inpatient transmission of COVID-19 to and from vulnerable older adults.

Hospitalization may offer less benefit as certain diagnostic tests and procedures, formerly readily available to inpatients, may be less available. An enduring benefit to admission is the safety it affords older adults without sufficient outpatient support. This may be more relevant given the disintegration of paid and informal support networks wrought by the pandemic.

The pandemic has expanded post-ED options through expanded access and novel models, including: ED observation units; Transfer to Relief Healthcare Facilities;⁵⁶ ED-to-SNF transfer through waiver of the three-day rule;⁵⁵ “COVID Recovery Centers”⁵⁷ which receive COVID-19-positive patients after ED/hospital care or directly from Long-term care facilities. Transfer of COVID-19 -positive or suspected patients to communal living settings is informed by local and state guidelines governing mitigation efforts summarized in the CMS COVID states toolkit.⁵⁸

Augmented home care and transition models have also expanded. These include hospital-at-home, community paramedicine, and greater telehealth capacity. The CDC stresses the importance of assessing functional capacity and home support in their guidance for implementing home care.⁵⁹ For discharged COVID-19 patients, systems have initiated specialized transition programs which reduce re-hospitalizations.⁶⁰ Many include remote case management, protocolized follow up, and telehealth. For homebound older adults (essentially *all* because of public health restrictions), the expansion of value-based care has incentivized at-risk organizations to assist with ED discharge planning/admission avoidance for complex older adults.⁶¹

Pre-pandemic, hospitalization was often considered the safest disposition the ED could provide. COVID alters this option and illustrates the necessity for a solid transition from the ED to the next site of care. Current realities also dictate shared decision making with patients and/or surrogates regarding the shifting risks, benefits, and alternatives involved in post-ED care planning.

PREVENTING “BOUNCE-BACKS”: PATIENTS FROM ASSISTED LIVING FACILITIES (ALF)

ED staff must understand that all residential care for older people is not the same. In making discharge decisions, ED staff must consider the different levels of care and support that are provided by the institution to which the individual patient is returning. A critical nuance for ED providers is recognition of the special risks and transition needs of ALF residents. Per recent CDC data, COVID infection is very common among ALF residents and carries a mortality rate of 21%.⁶² Functional impairment is a strong predictor of mortality with COVID-19.⁶³ ALF residents are very likely to

return to the ED unless discharge planning includes consideration of outpatient clinical and functional support.

ALFs are not designed to provide the medical or functional support required to manage large numbers of ill and highly contagious older adults:

- **Clinical:** ALFs typically have no on-site medical provider, and often no nurse. They do not provide intravenous (IV) therapy, have no pharmacies, and may have difficulty getting oxygen quickly and in sufficient supply.
- **Functional:** Though ALFs vary, most cannot care for residents who require activities of daily living (ADL) assistance or who cannot walk or stand to transfer. These supports are further diminished by pandemic-related staff shortages.
- **Infection Control Challenges:** Advanced infection prevention and control measures are difficult to ensure in most ALFs because of the high incidence of cognitive impairment, complicating efforts to prevent transmission with masking and social distancing. Most residents require some hands-on assistance. PPE shortages are common.⁶⁴
- **Continuum of Care:** Pre-pandemic, the average length of stay in ALFs prior to death or placement in skilled nursing was 2.5 to 3 years. COVID-19 has decreased movement into SNF’s, leaving ALFs managing a higher need population with fewer resources.

These vulnerabilities inform ED practices to construct safe transitions. ED providers must assess patients’ current functional and medical needs and communicate with the facility to ascertain the ability to provide needed care. ED or hospital administration may regularly communicate with referring facilities to discuss COVID-19 transmission, ALF clinical and support capacity, and ED and hospital resources. Many states have established Regional Rapid Response teams to assist affected facilities. These teams, often tertiary-care based, may be highly leveraged relationships for EDs seeking to coordinate with and support treatment-in-place at local ALFS.^{65,66}

TELE-TRIAGE & TELE-HEALTH

Many patients fear contracting COVID-19 in the ED and are anxious about ED and hospital-imposed separation from their loved ones. ED avoidance by patients probably accounts for many of the excess deaths in 2020, that is, people not seeking care for heart attacks, strokes, and other serious conditions.^{67,68} Tele-triage and tele-health are critically important tools to help vulnerable patients receive their care at home whenever possible⁶⁹ and to know that if they are asked to come to the ED for further care, they should be seen emergently.

Tele-Triage:

Tele-Triage programs use phone and other technologies to estimate the urgency of the patient’s symptoms. A number of health care systems, including

Jefferson in Philadelphia, Advocate Aurora Health in Wisconsin and the University of North Carolina, have incorporated tele triage into their acute unscheduled care delivery system.⁷⁰ Patients can have a video visit with an emergency medicine specialist from their home, car, or triage area of the ED to initiate care and determine if emergency department in-person care is needed. The Emergency Triage, Treat, and Transport (ET3) program, a program of the Center for Medicaid and Medicare Innovations (CMMI), will launch in forty counties January 2021. It will enable payments to providers and EMS to develop options other than transporting to the ED.⁷¹ Tele-triage is ripe to expand as a sustainable manner to make emergency care safer.

Tele-Health:

Tele-Health is a broad term for health care that supports the patient via telephone or computer interactions. More than triage and care initiation can be accomplished via tele-health platforms. Driven by the imperative to reduce exposures of COVID, and to treat patients where they live whenever possible, a number of leading health care systems including Mayo Clinic,⁷² Dartmouth-Hitchcock,⁶⁹ and University of Wisconsin Medicine⁷³ have developed innovative approaches to treating vulnerable patients via tele-health. It is better to move the information than the patient: this is particularly true for patients who frequently experience iatrogenic care transitions, such as skilled nursing and long-term care residents.⁵³ Importantly, tele-health services are now billable services with reimbursement equivalent to in-person ED provider billing rates.⁷⁴ Driven by the need to provide safer and higher value emergency care, now is the time to further develop innovative systems of emergency tele-triage and tele-health. The imperative to treat patients as close to home as possible will remain after the pandemic.

COVID-19 VACCINES

On December 11, 2020 the U.S. Food and Drug Administration issued an Emergency Use Authorization (EAU) of the Pfizer-BioNTech COVID-19 vaccine.⁷⁵ The FDA determined that the totality of data available provides evidence that the Pfizer-BioNTech COVID-19 vaccine may be effective in preventing COVID-19. The data further supports that the known and potential benefits outweigh the known and potential risks. The CDC's Advisory Committee on Immunization Practices added its support for the vaccine shortly afterwards. The two-dose regimen conferred 95% protection against COVID-19 in persons aged 16 years and older.⁷⁶ Over 40% of the participants were over age 55 and the age range was from 16- 91 years. The Moderna vaccine will be considered for EAU in late December. Table 2 describes practical issues regarding three COVID-19 vaccines. These initial vaccines will each require two doses, separated by 3 or 4 weeks, based on each manufacturer's recommendations. The most common side effects of the vaccine during all of the clinical trials were local injection site pain, tiredness, headache, muscle pain, chills, joint pain, and fever.^{75,76,77} These side effects may last several days. More people experienced the side effects after the second dose.

The Pfizer-BioNTech vaccine is contraindicated in individuals with a known history of a severe allergic

reaction to any component of the Pfizer-BioNTech COVID-19 vaccine.⁷⁸ Appropriate medical treatment used to manage immediate allergic reactions must be immediately available in the event of an acute anaphylactic reaction following vaccine administration. Older adults included in the Pfizer-BioNTech⁷⁶ and in the AstraZenica- Oxford⁷⁷ trials were less likely to have local pain at the injection site, and likewise were less likely than younger adults to report feeling feverish, muscle aches and headaches.

Table 2: Practical Points on 3 COVID-9 Vaccines

	Pfizer	Moderna	AstraZenica-Oxford
Design:	Messenger RNA technology	Messenger RNA technology	Based on a chimpanzee adenovirus vectored vaccine with spike protection.
Dosage Nuances:	Two doses, 3 weeks apart	Two doses, 4 weeks apart	Probably two does, 4 weeks apart
Storage:	Ultracold Minus 70 Celsius dry ice deep freeze cooler	Frozen at Minus 20 Celsius	Refrigerated
Refrigeration:	No more than 5 days	One month	Yes
Safety:	Pain at injection site, fatigue, chills, fever. No serious side effects.	Pain at injection site, muscle aches, headache.	Pain (20-35%) fever, muscle aches less likely in older adults. Fatigue or at least one systematic symptom in 65% older adults.
Effectiveness:	Over 90% Among 65+ 94% effective	95% Duration of immune response 4 months.	Up to 90%, depending on dose. Studied in 240 adults age >70 without severe co-morbidities.

Older adults included in the two published trials were healthy and without severe or uncontrolled medical co-morbidities.^{76,77} Those with a CFS of 4 or greater were excluded from the AstraZenica- Oxford

trial. The Pfizer-BioNTech study did not use the term frailty in its description of the participants. This seriously limits our knowledge of the safety and efficacy of the vaccine on most older people living in long-term

care who, in general, would have a CFS score of 5 or greater (i.e., dependent for most ADL needs). The Advisory Committee on Immunization Practices' Interim Recommendations for allocating initial supplies of the COVID-19 vaccine defined health care workers and long-term care residents as the priority populations for the initial Phase 1a of the COVID-19 vaccine.⁷⁹ Due to the exclusion of populations with frailty in the trials it is unknown how frail and vulnerable older adults will respond to the vaccine.

Additional information on the COVID-19 vaccine is described on the CDC website.⁸⁰ A few points deserve comment. The first in the series of the two recommended dosages of these vaccines will not result in immediate immunity. The antibody response to the Astra-Zenica Oxford COVID-19, for example, was measured at 30 days. Those who received a second shot had better immunity than those who received only one dose. Those who receive the vaccine will need to continue to wear a mask, use social distancing practices, and to wash their hands regularly.⁸¹ We do not yet have full information if the COVID-19 vaccine protects against asymptomatic infections and possible viral shedding. Health care workers and residents of long-term care facilities who receive the COVID-19 vaccine will need to continue to follow CDC guidance regarding infection protection measures. While the published trials describe results of participants over 60 and 120 days, there is no current evidence on the duration of protection. In short, while the vaccine provides hope for a mitigation of this pandemic, careful immunization safety monitoring following vaccination will guide public health officials. ED providers should be aware of the CDC Immunization Safety Office and the Vaccine Adverse Event Reporting System.⁸²

Plans for widespread population vaccination are developing daily. Hospitals and other health care sites are currently stocking vaccine for use in their workers. CVS Health and Walgreens have partnered in the distribution efforts with plans to vaccinate more than 3 million residents of nursing homes and other long-term care facilities.



Box 4: Patient Scenario 1 Follow-Up

Q1: In this situation and considering non- ED alternatives, do the potential benefits of ED transfer outweigh the potential harm?

A1: Inquire further to define the social support in place to assist this couple who have COVID-19 concurrently. Is there enough food and supplies in the home to allow for care to continue in this setting? Are there family members available to drop off food (using social distancing) at the front porch? Is the wife able to manage the extra caregiving roles that the patient will require? A tele- health visit could further guide the assessment of this patient by identifying how he interacts with the provider, his attention and level of consciousness, as compared to his baseline. Hospital at Home or Community Paramedicine may be considered in some communities. In this case, we recommended ED evaluation, however the patient's wife chose to hold off. We followed the patient carefully.

Q2: What systems should be used to address his needs?

A1: Home health could be accessed to assess the patient's needs over time. Since the patient is home bound, a face-to-face visit can be conducted by telehealth during the pandemic. His pulse oximetry can be monitored on his home nursing visits. Home oxygen can be implemented if required. Regular check ins with the primary provider and her/ his office can monitor the patient's needs. In short, home care, home oxygen and tele- health are systems-based strategies to address the continued needs of vulnerable home-bound older adults who have COVID-19 and remain clinically stable.

KEY POINTS FOR ED PROVIDERS

1. Projections for continued high mortality from COVID-19 will extend into the first quarter of 2021 with older adults being particularly vulnerable.
2. Comorbid health conditions and frailty are risk factors for poor outcomes of hospitalization, the need for mechanical ventilation, ICU care, and death.
3. Older adults who live in long-term care settings are a particular risk during the COVID-19 pandemic.
4. A negative COVID-19 screening test does not rule out COVID infection in a symptomatic older adult.
5. About a quarter of older adults with COVID-19 present to the ED with delirium.
6. Tele-health and home-based programs provide additional care options for ED providers, beyond admitting the older COVID-19 patient to the hospital.
7. Collaboration with community long-term care settings can prevent the need to transfer older residents to the ED and can support safe care transitions from the ED and hospital during the pandemic.

8. The COVID-19 vaccine will be implemented in long term care settings, although clinical trials excluded older adults with frailty and multiple comorbid illnesses.
9. The CDC has a safety monitoring system to monitor the post-release side effects of those who receive the COVID-19 vaccine.
10. The individual's wishes and preferences should always guide healthcare decisions, including in the context of COVID-19 infection.

Box 5: Patient Scenario 2 Follow-Up

Q1: How would his co-morbid conditions affect his prognosis in the context of COVID-19?

A1: We do not have enough information to know if the patient has COVID-19 or not. His lab tests are pending. It would be reasonable to assume that he has sepsis perhaps related to a urinary tract infection. There is no information provided on the prevalence of COVID-19 in his community. His co-morbid illnesses include dementia, valvular heart disease, a prior admission for urosepsis and a recent episode of hematuria (with no information on the cause). His need for assistance with self-care adds to his vulnerability during an acute illness. His level of consciousness is noted as "sleepy": if this is new or abnormal for him, it may indicate delirium and he should be assessed further. The compounding of his multiple medical illnesses and his dementia make his prognosis worse. The CFS can guide clinicians in the clinical assessment and risk for poorer outcomes of older adults with COVID-19. The patient's values, goals and wishes as defined by his decision-maker can guide his care.

Q2: What factors should the ED staff consider in deciding to allow his sister into in the ED?

A1: The decision to have the sister come to his bedside in the ED would be guided by local policies. It is essential to determine if he has decisional capacity (based on the pre-morbid description, it seems unlikely.) If he does not, it is essential to determine the correct decision-maker. Once identified, the ED staff would elicit the patient's goals in the context of his medical condition. His treatment plan would then align with his goals and preferences. Many ED sites have integrated with palliative care using tele-health tools early in the course of care. The patient's sister may feel helpless and anxious during the time of his ED workup and while test results are pending. She may feel frustrated and angry that her loved one is sick and completely alone. The ED staff can express support for the patient and his sister.

Q3: If he does not require intensive care or cardiac monitoring, how could the ED team construct a disposition plan that balances (patient and community) harm and benefit?

A1: This patient with life-limiting illness has unmet palliative care needs. The ED provider or system may begin to address these by identifying the correct substitute decision maker, initiating a goals of care discussion, and aggressively treating symptoms. Decisions regarding admission or utilization of other resources during times of scarcity are best made per pre-considered protocols, not by individual providers on a case-by-case basis.

CONCLUSION

The ED is the transition zone between community and health care resources during this historic COVID-19 pandemic. Older adults have been particularly vulnerable during this pandemic. Systems-based practices can help to coordinate care during this critical time.

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MISSION

Improve emergency health care for older adults by providing open access, peer-reviewed, quality education and dissemination platform giving providers in all disciplines the evidence they need to enhance emergency care of older adults.

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APPENDIX 1- ADDITIONAL RESOURCES

- 1) Center for Disease Control and Prevention (CDC)- COVID-19 www.cdc.gov/coronavirus/2019-ncov/index.html
- 2) Johns Hopkins- COVID Resource Center coronavirus.jhu.edu/
- 3) Alzheimer's Association www.alz.org/
- 4) Vital Talk www.vitaltalk.org/
- 5) Geriatric Emergency Department Collaborative (GEDC) www.gedcollaborative.com/
- 6) University of Washington Institute for Health Metrics and Evaluation www.healthdata.org/
- 7) American College of Emergency Physicians (ACEP) www.acep.org/

APPENDIX 2- KEY POINTS FOR OLDER ADULTS & THEIR FAMILY CAREGIVERS

1. Social isolation and loneliness during the COVID-19 pandemic increase depression, poor health outcomes, and poor quality of life.
2. Stay engaged in meaningful activities which can be done, while avoiding gathering with others.
3. Your doctor's office can guide you with telehealth visits to make it less burdensome.
4. Family caregivers face extra burden during the pandemic and many community services are no longer available.
5. If you develop symptoms of shortness of breath, fever, or cough, call your health provider.
6. Don't put off important chronic health problems during the pandemic.
7. The COVID-19 vaccine will become available to older adults who are not in long-term care after the first priority groups have been vaccinated.
8. You will still need to wear a facemask after you receive the COVID- 19 vaccine.
9. Completing an advance directive will allow your health care to match with what's most important to you.
10. Behind each facemask or shield or gown is a caring health professional who is working tirelessly to provide excellent care for each patient.

APPENDIX 3- DISCLAIMER

The situation with COVID-19 is changing rapidly and many national and state websites are providing daily or more frequent updates. Please check those websites daily for any updated information and check the date that the website was most recently revised.

The content provided above is current as of 12-14-2020.

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