ATS Toolkit for Older Adults

C. Adrian Austin, Lauren Pollack, Leah Witt

CRITICAL CARE

Key Points

1. In older patients with critical illness, pre-ICU functional disability and presence of frailty are associated with worse outcomes, including greater short and long-term mortality.
2. Multiple studies have demonstrated that treatments provided to older patients with critical illness are often incongruent with their care preferences - eliciting individual care preferences from older patients and their health care proxies in order to ensure that the treatments received are aligned is a vital component of delivering exceptional critical care.
3. Pre-ICU cognitive impairment and ICU-associated delirium are associated with worse outcomes in older patients following critical illness.
4. Newly acquired or progressive cognitive impairment is common in older adults who are survivors of critical illness.

Websites/Tools

https://www.acep.org/patient-care/adept/
https://www.icudelirium.org/

Functional Disability

Ferrante, L. E. et al. Functional trajectories among older persons before and after critical illness. JAMA Intern Med 175, 523–529 (2015).

- **More information:** This longitudinal study characterized pre-ICU functional trajectories among older adults and analyzed the relationship between pre-ICU functional trajectories and mortality. Pre-ICU functional trajectories of mild to moderate disability and severe disability were associated with more than double (adjusted HR, 2.41; 95% CI, 1.29-4.50) and triple (adjusted HR, 3.84; 95% CI, 1.84-8.03) the risk of death within 1 year of ICU admission compared to those with minimal pre-ICU disability.
- **Bottom line:** Consider evaluating pre-ICU function when evaluating critically ill older patients, in order to identify functional trajectories to help inform discussions of prognosis and goals of care.

Ferrante, L. E. et al. Factors Associated with Functional Recovery among Older Intensive Care Unit Survivors. Am. J. Respir. Crit. Care Med. 194, 299–307 (2016).

- **More information:** This longitudinal study of 186 patients over age 70 who survived a critical illness with increased disability, aimed at identifying predictors of functional recovery. Factors associated with recovery included functional self-efficacy (a measure of confidence in performing various activities) and higher BMI (hazard ratios of 1.05

(95% CI, 1.02-1.08) and 1.07 (95% CI, 1.03-1.12 respectively). Those with pre-ICU hearing and vision impairment were less likely to recover (HR0.38 (95% CI 0.22-0.66) and 0.59 (95% CI 0.37 - 0.95) respectively).
- **Bottom line:** Future studies may target these factors with the goal of increasing the likelihood of recovery among older ICU survivors.

Hope, A. A., Gong, M. N., Guerra, C. & Wunsch, H. Frailty Before Critical Illness and Mortality for Elderly Medicare Beneficiaries. J Am Geriatr Soc 63, 1121–1128 (2015).

- **More information:** This retrospective cohort study used Medicare claims data to categorize the pre-ICU health of older patients and determine associations with short- and long-term mortality. These patients were categorized into the following groups: “Cancer”, “Chronic Organ Failure”, “Frailty”, and “Robust”. Patients with pre-ICU frailty had higher hospital and 3-year mortality than other groups of patients.
- **Bottom line:** Future research may focus on both assessment strategies for pre-ICU frailty in the critically ill elderly population and on approaches to modify ICU treatment to improve outcomes in this high-risk patient population.

Ehlenbach, W. J., Larson, E. B., Curtis, J. R. & Hough, C. L. Physical Function and Disability After Acute Care and Critical Illness Hospitalizations in a Prospective Cohort of Older Adults. J Am Geriatr Soc 63, 2061–2069 (2015).

- **More information:** In this longitudinal study critical illness hospitalization, was associated with persistent functional impairment in older adults. The odds of dependence in one or more ADLs was higher after acute care and critical illness hospitalizations (OR = 2.0, 95% CI = 1.2-3.2) and after critical illness hospitalization OR = 7.9, 95% CI = 2.5-25.7).
- **Bottom line:** Outpatient clinicians who care for older adults after hospitalization should consider assessing for declines in physical function and development of new disability. Future studies are needed to evaluate in-hospital interventions aimed at maintaining physical function (e.g. early mobility programs for critically ill individuals and post-hospitalization interventions such as rehabilitation programs).

Brummel, N. E. et al. Understanding and reducing disability in older adults following critical illness. Crit. Care Med. 43, 1265–1275 (2015).

- **More information:** This high-yield review article describes the epidemiology of disability in older survivors of critical illness as well as expert opinion on steps that can be taken to make the ICU a more “friendly” place for older adults.
- **Bottom line:** In older adult survivors of critical illness, disability in ADLs, IADLs, and mobility is common, as is newly acquired cognitive impairment. Geriatric care models which address immobility and delirium may complement ICU-focused models such as the ABCDEs.

Delirium and Cognition

Pisani, M. A. et al. Days of delirium are associated with 1-year mortality in an older intensive care unit population. Am. J. Respir. Crit. Care Med. 180, 1092–1097 (2009).

- **More information:** A prospective cohort study that examined the association of days of ICU delirium with 1 year mortality in adults age 60 and older at a 14 bed urban ICU. After adjusting for age, severity of illness, comorbid conditions, psychoactive medication use, and baseline cognitive and functional status, the number of days of ICU delirium was significantly associated with time to death within 1 year post-ICU admission (hazard ratio, 1.10; 95% confidence interval, 1.02-1.18).
- **Bottom line:** More days of delirium are associated with increased risk of 1 year mortality. Efforts should be made to reduce the incidence and duration of delirium.

Girard, T. D. et. al. Haloperidol and Ziprasidone for the Treatment of Delirium in Critical Illness. NEJM. 379(26), 2506-2516 (2018)

- **More information:** A randomized, double-blind, placebo-controlled trial, that assigned patients with acute respiratory failure or shock and hypoactive or hyperactive delirium to receive intravenous boluses of haloperidol, ziprasidone (maximum dose, 40 mg daily), or placebo. The use of haloperidol or ziprasidone, as compared with placebo, had no significant effect on the primary end point (odds ratios, 0.88 [95% CI, 0.64 to 1.21] and 1.04 [95% CI, 0.73 to 1.48], respectively).
- **Bottom line:** Antipsychotics do not treat delirium, but there may be a role for their use in management of severe agitation or distress.

Ely, et al. Evaluation of delirium in critically ill patient: validation of the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU). Crit Care Med. 7: 1370-9 (2001)

- **More information:** Prospective cohort study testing the Confusion Assessment Method for ICU Patients (CAM-ICU) in the adult medical and coronary ICUs of a US university-based medical center. Compared to the reference standard for diagnosing delirium, the CAM-ICU is at least 93% sensitive and 98% specific even in older adults.
- **Bottom line:** The CAM-ICU is a reliable and quick method to assess for delirium in the ICU and can be utilized in older adults.

Ferrante, L. E. et al. Pre-Intensive Care Unit Cognitive Status, Subsequent Disability, and New Nursing Home Admission among Critically Ill Older Adults. Ann Am Thorac Soc 15, 622–629 (2018)

- **More information:** A prospective cohort study conducted from 1998 to 2013 with monthly assessments of disability. In the multivariable analysis, moderate cognitive impairment was associated with nearly a 20% increase in disability over the 6-month follow-up period (adjusted relative risk, 1.19; 95% confidence interval, 1.04-1.36), and minimal impairment was associated with a 16% increase in post-intensive care unit disability (adjusted relative risk, 1.16; 95% confidence interval, 1.02-1.32).
- **Bottom line:** Among older adults, impairment in pre-intensive care unit cognitive status was associated with an increase in post-intensive care unit disability over the 6 months

after a critical illness; moderate cognitive impairment doubled the likelihood of a new nursing home admission.

Guerra, C., Linde-Zwirble, W. T. & Wunsch, H. Risk factors for dementia after critical illness in elderly Medicare beneficiaries. Crit Care 16, R233 (2012).

- **More information:** A cohort study using claims data that examined a random 5% sample of Medicare beneficiaries who received intensive care in 2005 and survived to hospital discharge, with three years of follow-up. After accounting for known risk factors, having an infection (adjusted hazard ratio (AHR) = 1.25; 95% CI, 1.17 to 1.35), or a diagnosis of severe sepsis (AHR = 1.40; 95% CI, 1.28 to 1.53), acute neurologic dysfunction (AHR = 2.06; 95% CI, 1.72 to 2.46), and acute dialysis (AHR = 1.70; 95% CI, 1.30 to 2.23) were all independently associated with a subsequent diagnosis of dementia.
- **Bottom line:** Among ICU events; infection or severe sepsis, neurologic dysfunction, and acute dialysis were independently associated with a subsequent diagnosis of dementia.

Palliative Care

Heyland, D. K. et al. Admission of the very elderly to the intensive care unit: family members' perspectives on clinical decision-making from a multicenter cohort study. Palliat Med 29, 324–335 (2015).

- **More information:** A multi-center cohort study that surveyed family members of patients over age 80 admitted to an ICU for over 24 hours to elicit values surrounding communication and treatment decisions. There was incongruity between family members' values and preferences for end-of-life care of their elderly relatives and the actual care received.
- **Bottom line:** Strategies are needed that encourage patients and families to establish treatment preferences, periodically review those preferences, and communicate them to physicians.

Somogyi-Zalud, E., Zhong, Z., Hamel, M. B. & Lynn, J. The use of life-sustaining treatments in hospitalized persons aged 80 and older. J Am Geriatr Soc 50, 930–934 (2002).

- **More information:** A multicenter prospective cohort study of hospitalized patients over age 80 that aimed at characterizing care preferences and use of life sustaining treatments. When surveyed, 70% of patients who died had reported a preference for comfort-focused care, however the majority (63% of those who died) received one or more life-sustaining treatments before death.
- **Bottom line:** There is often a lack of congruence between the preferences expressed by patients and families and that treatments that received. It is important to elicit care preferences from patients and their families and ensure that treatments recommended are aligned.

Triage

Sprung, C. L. et al. The Eldicus prospective, observational study of triage decision making in European intensive care units. Part II: intensive care benefit for the elderly. Crit. Care Med. 40, 132–138 (2012).

- **More information:** A prospective, observational study of triage decisions from Sept 2003 through Mar 2005 involving 11 ICU's in seven European countries. Logistic regression showed a greater mortality reduction for accepted vs. rejected patients corrected for disease severity for elderly patients (age >65 [odds ratio 0.65, 95% confidence interval 0.55-0.78, p < .0001]) than younger patients (age <65 [odds ratio 0.74, 95% confidence interval 0.57-0.97, p = .01]).
- **Bottom line:** Despite the fact that elderly patients have more intensive care unit rejections than younger patients and have a higher mortality when admitted, the mortality benefit appears greater for the elderly. Age should not be the only factor in triage decisions given that older adults can derive great benefit from ICU care.

Social Determinants of Health

Baldwin, M. R. et al. Race, Ethnicity, Health Insurance, and Mortality in Older Survivors of Critical Illness. Crit. Care Med. 45, e583–e591 (2017).

- **More information:** A retrospective cohort study of older ICU survivors aimed at assessing whether minority race or ethnicity and health insurance coverage are associated with higher mortality. Those with federal or state insurance coverage only had higher mortality rates than those with additional commercial insurance. The disparity was greatest among Medicaid beneficiaries discharged to skilled-care facilities who survived at least 1 year.
- **Bottom Line:** Disparities in insurance coverage may be associated with increased risk of death among older ICU survivors.

Reviews of the Literature

Brummel, N. E. & Ferrante, L. E. Integrating Geriatric Principles into Critical Care Medicine: The Time Is Now. Ann Am Thorac Soc 15, 518–522 (2018).

PULMONARY

Key Points

Lung aging begins in the third decade, initiating a gradual decline in maximal pulmonary function throughout the remainder of life

Respiratory organ aging = degradation of lung parenchyma, weakening of respiratory muscles, and distortion of the thorax

Numerical age ≠ physiologic age. Individuals with chronic lung diseases have a higher burden of "geriatric syndromes": frailty, functional impairment, falls, urinary incontinence, and social isolation

Websites

COPD Foundation (patient education, inhaler teaching): https://www.copdfoundation.org/

Live Better (Pulmonary Rehabilitation resource): http://livebetter.org/

AHRQ Lung Cancer Screening Decision Aid: https://effectivehealthcare.ahrq.gov/decision-aids/lung-cancer-screening/static/lung-cancer-screening-decision-aid.pdf

Prepare for Your Care: https://prepareforyourcare.org/welcome

USPSTF Lung Cancer Screening Recommendations: https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/lung-cancer-screening

Aging physiology

Janssens JP, Pache JC, Nicod LP. Physiological changes in respiratory function associated with ageing. European Respiratory Journal. 1999 Jan 1;13(1):197-205.

- **More information:** A review article that summarizes the age-associated changes in the respiratory system.
- **Bottom line:** Multiple changes occur with aging and they include: Decrease in gas exchange surface area, decreased static elastic recoil of the lungs, increased RV and FRC, decreased chest wall compliance and decreased respiratory muscle strength. Importantly, ageing diminishes the respiratory system reserve in cases of acute illness.

BUSH, A. 2016. Lung Development and Aging. Annals of the American Thoracic Society, 13, S438-S446.

- **More information:** A review article that summarizes the impacts of antenatal and childhood events on lung function later in life.
- **Bottom line:** Multiple childhood and antenatal exposures can lead to decreased adult lung function. These include: maternal/ paternal asthma, maternal smoking, childhood asthma, respiratory infections, grandmaternal smoking, antenatal smoke or pollution exposure and early childhood exposure to tobacco and other pollutants.

LUOTO, J. A., ELMSTÅHL, S., WOLLMER, P. & PIHLSGÅRD, M. 2015. Incidence of airflow limitation in subjects 65–100 years of age. European Respiratory Journal, ERJ-00635-2015.

- **More information:** Retrospective cohort study comparing fixed ratio definition of obstruction to LLN for definition of obstruction in older adults and their associations with mortality.
- **Bottom line:** LLN is likely a better alternative than fixed-ratio in older adults as it has a lower risk of false-positivity without missing subjects at increased risk of mortality.

VAZ FRAGOSO, C. A., MCAVAY, G., VAN NESS, P. H., CASABURI, R., JENSEN, R. L., MACINTYRE, N., GILL, T. M., YAGGI, H. K. & CONCATO, J. 2015. Phenotype of normal spirometry in an aging population. American journal of respiratory and critical care medicine, 192, 817-825.

- **More information:** Prospective cohort study as part of the COPDGene study comparing LLN for obstruction definition vs GOLD-defined values.
- **Bottom line:** Patients with LLN-defined normal spirometry but GOLD defined respiratory impairment did not have clinically meaningful respiratory disease suggesting that this may be a more accurate measure of lung disease in older adults.

Svartengren M, Falk R, Philipson K. Long-term clearance from small airways decreases with age. European Respiratory Journal. 2005;26:609–15.

- **More information:** Prospective study examining airway clearance in 46 healthy adults.
- **Bottom line:** Small airway clearance over 21 days decreases with age. This may partially explain the high prevalence of respiratory symptoms in older adults.

Lung transplant

Singer, J. P. et al. Frailty Phenotypes, Disability, and Outcomes in Adult Candidates for Lung Transplantation. Am. J. Respir. Crit. Care Med. 192, 1325–1334 (2015).

- **More information:** A multicenter cohort study examining the prevalence and predictive validity of frailty in lung transplant candidates. Just over a quarter of lung transplant candidates were frail using Fried's frailty phenotype, and frailty was associated with an increased risk of delisting or death before transplant.
- **Bottom line:** Frailty assessment may provide important morbidity and mortality risk information above and beyond typically captured clinical measures and the lung allocation score.

General/Dyspnea NOS

Fragoso CA, Enright PL, McAvay G, Van Ness PH, Gill TM. Frailty and respiratory impairment in older persons. The American journal of medicine. 2012 Jan 1;125(1):79-86.

- **More information:** Study of 3578 older adults evaluating the cross-sectional and longitudinal associations between frailty and respiratory impairment.
- **Bottom line:** Frailty and respiratory impairment are strongly related and increase the risk of death when both are present.

HUIJNEN, B., VAN DER HORST, F., VAN AMELSVOORT, L., WESSELING, G., LANSBERGEN, M., AARTS, P., NICOLSON, N. & KNOTTNERUS, A. 2006. Dyspnea in elderly family practice patients. Occurrence, severity, quality of life and mortality over an 8-year period. Family practice, 23, 34-39.

- **More information:** Prospective cohort study examining prevalence of dyspnea in older adults. Over 23% of subjects in an outpatient setting had moderate to severe dyspnea at baseline.
- **Bottom line:** Dyspnea is common. Complains of dyspnea should warrant a workup for etiology.

MINER, B., TINETTI, M. E., VAN NESS, P. H., HAN, L., LEO-SUMMERS, L., NEWMAN, A. B., LEE, P. J. & VAZ FRAGOSO, C. A. 2016. Dyspnea in Community-Dwelling Older Persons: A Multifactorial Geriatric Health Condition. Journal of the American Geriatrics Society, 64, 2042-2050.

- **More information:** Cross-sectional study of 4413 community dwelling adults. FEV1 <LLN, LVEF <45%, unable to perform a single chair stand, depressive symptoms and obesity all had a strong association with moderate to severe dyspnea.
- **Bottom line:** Several cardiorespiratory and non-cardiorespiratory impairments are associated with dyspnea suggesting this is a multifactorial geriatric health condition which warrants a multimodal treatment approach.

Interstitial Lung Disease

Meyer KC, Danoff SK, Lancaster LH, Nathan SD. Management of idiopathic pulmonary fibrosis in the elderly patient. Chest. 2015 Jul 1;148(1):242-52.

- **More information:** This is a review article about how to approach an older adult with IPF.
- **Bottom line:** Most people with IPF are older adults. It is critical to consider co-morbidities in IPF management, provide patient-centered care and supportive care, refer patients for transplant typically up until age 75, and have a careful discussion about expected benefits and adverse effects of anti-fibrotic therapy.

Patterson KC, Shah RJ, Porteous MK, Christie JD, D'Errico CA, Chadwick M, Triano MJ, Deshpande C, Rossman MD, Litzky LA, Kreider M. Interstitial lung disease in the elderly. Chest. 2017 Apr 1;151(4):838-44.

- **More information:** In this prospective cohort study of ILD, 24% of ILD patients were >70 and most common diagnoses in this older adult population were IPF and unclassifiable ILD
- **Bottom line:** ILD is common in the elderly, and while IPF is the most frequently observed diagnosis, many cases are unclassifiable, and smaller fractions are CTD and HP.

Lancaster LH, de Andrade JA, Zibrak JD, Padilla ML, Albera C, Nathan SD, Wijsenbeek MS, Stauffer JL, Kirchgaessler KU, Costabel U. Pirfenidone safety and adverse event management in idiopathic pulmonary fibrosis. European respiratory review. 2017 Dec 31;26(146):170057.

- **More information:** In a study of expanded data from pooled clinical trials and the early access program, adverse drug reaction resulting in dose modification or interruption was more common in patients age 80 and older (32.7%) as compared to patients younger than 65 (18%)
- **Bottom line:** Older adults may experience more adverse events from pirfenidone.

COPD

Fried TR, Fragoso CA, Rabow MW. Caring for the older person with chronic obstructive pulmonary disease. JAMA. 2012 Sep 26;308(12):1254-63.

- **More information:** This is a case discussion of an older adult with multimorbidity, polypharmacy and severe COPD. This article comprehensively discusses a multidisciplinary approach for caring for these patients, including assessments for psychosocial risks, functional impairments and palliative care needs.
- **Bottom line:** Excellent primer for caring for the older adult with COPD. If you read nothing else, read this!

Ito K, Barnes PJ. COPD as a disease of accelerated lung aging. Chest. 2009 Jan 1;135(1):173-80.

- **More information:** This review article approaches COPD from a geroscience perspective and explores the mechanisms by which COPD is a disease of accelerated aging. Posited mechanisms include oxidative stress and telomere attrition, which are augmented by environmental toxins such as pollution and tobacco smoke.
- **Bottom line:** COPD shares many mechanistic similarities with the biology of aging.

Lahousse L, Ziere G, Verlinden VJ, Zillikens MC, Uitterlinden AG, Rivadeneira F, Tiemeier H, Joos GF, Hofman A, Ikram MA, Franco OH. Risk of frailty in elderly with COPD: a population-based study. Journals of Gerontology Series A: Biomedical Sciences and Medical Sciences. 2015 Sep 9;71(5):689

- **More information:** In this population-based cohort study of 2,142 participants aged 74.7 +/- 5.6 years in the Rotterdam Study, the frailty prevalance was significantly higher in people with COPD (10.2%, 95% CI 7.6-13.5%) compared to those without COPD (3.5%, 95% CI 2.6%-4.4%), adjusted for age, sex, smoking and corticosteroids among other potential confounding variables.
- **Bottom line:** People with COPD are more frail! We extrapolate these findings to mean they need your geriatric skillset. Assess their function for activities of daily living (ADLs) (e.g. bathing, dressing, feeding, walking) and instrumental activities of daily living (IADLs) (e.g. medication management, grocery shopping and housekeeping). Ask about falls and how durable medical equipment (e.g. shower chair, grab bars).

Lange P, Celli B, Agustí A, Boje Jensen G, Divo M, Faner R, Guerra S, Marott JL, Martinez FD, Martinez-Camblor P, Meek P. Lung-function trajectories leading to chronic obstructive pulmonary disease. New England Journal of Medicine. 2015 Jul 9;373(2):111-22.

- **More information:** The authors compared participants from three cohorts (Framingham Offspring Cohort, Copenhagen City Heart Study and Lovelace Smokers Cohort) and stratified them by lung function when they joined the cohort as well as presence/absence of COPD, then determined rate of FEV1 decline. They saw that there were varying trajectories of lung function decline-- of those who developed COPD at the end of the observation period, half had a normal FEV1 before age 40 and a rapid decline thereafter and the other half had a low FEV1 in early adulthood and a mean decline
- **Bottom line:** COPD is not an obligate disease of accelerated aging. For some people, they do not achieve expected normal FEV1 but experience a normal age-related decline in FEV1.

Tseng CW, Yazdany J, Dudley RA, DeJong C, Kazi DS, Chen R, Lin GA. Medicare Part D plans' coverage and cost-sharing for acute rescue and preventive inhalers for chronic obstructive pulmonary disease. JAMA internal medicine. 2017 Apr 1;177(4):585-8.

- **More information:** the authors analyzed 2015 CMS data for Part D coverage for 21 inhalers in 7 treatment classes. Most inhalers were covered but had high out-of-pocket costs. Use of a single inhaler each month had a projected annual out of pocket cost of at least $900 under a standard Part D plan.
- **Bottom line:** Out-of-pocket inhaler costs for seniors are extremely high! Ask your patients about inhaler costs and consider ways to cut costs (e.g. combination inhalers or cheaper therapeutic alternatives)

Ergan B, Akgun M, Pacilli AM, Nava S. Should I stay or should I go? COPD and air travel. European Respiratory Review. 2018 Jun 30;27(148):180030.

- **More information:** This review article discusses the possible risks to travelers with COPD, due to decreased atmospheric pressure in the airplane cabin which results in decreased arterial oxygen tension and increased hypoxia, leading to increased work of breathing and myocardial oxygen demand.
- **Bottom line:** Travel is a critical part of wellbeing, so providers should be equipped to advise patients about safe travel practices.

Palliative care/Advance care planning in COPD

Au DH, Udris EM, Fihn SD, McDonell MB, Curtis JR. Differences in health care utilization at the end of life among patients with chronic obstructive pulmonary disease and patients with lung cancer. Archives of Internal Medicine. 2006 Feb 13;166(3):326-31. Bush A. Lung development and aging. Annals of the American Thoracic Society. 2016 Dec;13(Supplement 5):S438-46.

- **More information:** A retrospective cohort study evaluating health care resource utilization at the end of life among VA internal medicine clinic patients with lung cancer and COPD. In the last 6 months of life, patients with COPD were more likely to have had

a primary care visit and been admitted to an ICU but less likely to receive palliative medications compared to patients with lung cancer.

- **Bottom line:** This study raises the question of whether patients with COPD receive life-prolonging care that is in excess of their preferences. Offering palliative care to patients with COPD may improve end-of-life care while reducing costs by minimizing unwanted ICU care.

Celli, B. R., Cote, C. G., Marin, J. M., Casanova, C., Montes de Oca, M., Mendez, R. A., Pinto Plata, V. & Cabral, H. J. 2004. The body-mass index, airflow obstruction, dyspnea, and exercise capacity index in chronic obstructive pulmonary disease. New England Journal of Medicine, 350, 1005-1012.

- **More information:** In patients with COPD, the BODE index, which incorporates measures of BMI, airflow obstruction, dyspnea, and exercise capacity, performed better at predicting mortality than FEV1 alone.
- **Bottom line:** While the FEV1 remains an essential tool for disease staging in COPD, other variables provide useful information that can improve the comprehensibility of the evaluation of patients with COPD. The BODE index is a practical tool of potentially widespread applicability.

Ekström MP, Bornefalk-Hermansson A, Abernethy AP, Currow DC. Safety of benzodiazepines and opioids in very severe respiratory disease: national prospective study. Bmj. 2014 Jan 30;348:g445.

- **More information:** A longitudinal cohort study evaluating associations between use of opioids or benzodiazepines and hospital admission or mortality in patients starting long-term oxygen therapy for COPD. Benzodiazepines and opioids were not associated with increased admission, however benzodiazepines and opioids in doses of >= 30 morphine equivalents per day were associated with increased mortality.
- **Bottom line:** Lower dose opioids were not associated with increased risk of hospital admission or death in patients with respiratory failure associated with COPD, supporting the safety of regular low dose systemic opioids to reduce breathlessness in severely ill patients with respiratory compromise and hypercapnia.

Puhan MA, Garcia-Aymerich J, Frey M, ter Riet G, Antó JM, Agustí AG, Gómez FP, Rodríguez-Roisín R, Moons KG, Kessels AG, Held U. Expansion of the prognostic assessment of patients with chronic obstructive pulmonary disease: the updated BODE index and the ADO index. The Lancet. 2009 Aug 29;374(9691):704-11.

- **More information:** The authors aimed to calibrate the BODE index (see above) using two distinct cohorts of COPD patients, and to validate a simplified version for use in primary care settings. They showed that the original BODE index did not accurately predict mortality in the two different COPD cohorts and that the calibrated version performed better. The simplified ADO index (age, dyspnea, airflow obstruction) was similarly accurate to the calibrated BODE index.

- **Bottom line:** Both the updated BODE and ADO indices could lend support to the prognostic assessment of patients with COPD in specialized and primary-care settings.

Lung cancer screening

Tanoue, L., Tanner, N., Gould, M., Silvestri, G. Lung Cancer Screening. American Journal of Respiratory and Critical Care Medicine. 2015 Jan 01; 191(1)

- **More information:** The USPSTF recommends lung cancer screening with low-dose CT chest in adults age 55-80 with a 30 pack-year smoking history who are still smoking or who have quit within the past 15 years.
- **Bottom line:** Lung cancer screening should be considered and discussed with older adults.