20 things Prescribers and Patients Should Question in Post-Acute and Long-Term Care

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1

Don't insert percutaneous feeding tubes in individuals with advanced dementia. Instead, offer oral assisted feedings.

Strong evidence exists that artificial nutrition does not prolong life or improve quality of life in patients with advanced dementia. Substantial functional decline and recurrent or progressive medical illnesses may indicate that a patient who is not eating is unlikely to obtain any significant or long-term benefit from artificial nutrition. Contrary to what many people think, tube feeding does not ensure the patient's comfort or reduce suffering; it may cause fluid overload, diarrhea, abdominal pain, local complications, less human interaction and may increase the risk of aspiration. Assistance with oral feeding is an evidence-based approach to provide nutrition for patients with advanced dementia and feeding problems.

2

Don't use sliding scale insulin (SSI) for long-term diabetes management for individuals residing in the nursing home: SSI is a reactive way of treating hyperglycemia after it has occurred rather than preventing it.

Good evidence exists that SSI is neither effective in meeting the body's physiologic insulin needs nor is it efficient in the long-term care (LTC) setting in medically stable individuals. Use of SSI is associated with more frequent glucose checks and insulin injections, leads to greater patient discomfort and increased nursing time and resources. With SSI regimens, patients may be at risk from wide glucose fluctuations or hypoglycemia when insulin is given when food intake is erratic.

3

Don't obtain urine tests until clinical criteria are met

Asymptomatic bacteriuria (ASB) and/or pyuria is common in patients in PALTC and is the major driver for overuse of antibiotics for Urinary Tract Infections (UTI), leading to an increased risk of adverse drug events, resistant organisms, and infection due to Clostridioides difficile. Due to the high rate of bacterial colonization of urine in older adults, it is important to avoid obtaining a urinalysis or urine culture unless the patient has signs or symptoms suggestive of UTI such as dysuria, and one or more of the following: frequency, urgency, suprapubic pain or gross hematuria. An additional concern is that the finding of bacteriuria/pyuria without urinary symptoms (ASB) may lead to an erroneous assumption that a UTI is the cause of an acute change of status, hence failing to detect or delaying the timely detection of an alternative source of infection.

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4

Don't prescribe antipsychotic medications for behavioral and psychological symptoms of dementia (BPSD) in individuals with dementia unless management of potential underlying causes fails to respond to best treatment practices. Only use for symptoms that severely impact quality of life or safety from self and/or others, in lowest dose possible and with frequent re-assessment for necessity and efficacy.

Careful differentiation of cause of the symptoms (physical or neurological versus psychiatric, psychological) may help better define appropriate treatment options. The therapeutic goal of the use of antipsychotic medications is to treat patients who present an imminent threat of harm to self or others, or are in extreme distress – not to treat nonspecific agitation or other forms of lesser distress. Treatment of BPSD in association with the likelihood of imminent harm to self or others includes assessing for and identifying and treating underlying causes (including pain; constipation; and environmental factors such as noise, being too cold or warm, etc.), ensuring safety, reducing distress and supporting the patient's functioning.

If treatment of other potential causes of the BPSD is unsuccessful, antipsychotic medications can be considered, taking into account their significant risks compared to potential benefits. When an antipsychotic is used for BPSD, it is advisable to obtain informed consent.

Refer to F-758: Free from Unnecessary Psychotropic Medications/PRN Use. https://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/downloads/som107ap_pp_guidelines_ltcf.pdf

5

Don't routinely prescribe lipid-lowering medications in individuals with a limited life expectancy

Hypercholesterolemia is an important risk factor for all-cause mortality, coronary heart disease mortality, hospitalization for myocardial infarction or unstable angina in persons with known CAD (i.e., secondary prevention) and among those up to age 75 years without prior CV events (i.e., primary prevention), for whom statins may have additional benefits. The strength of association between cholesterol and events is weaker in those with advanced age, and competing risks play a greater role particularly among those with frailty, comorbidity, physical or cognitive decline, or limited life expectancy. Both primary and secondary prevention should aim to achieve a net-benefit, balancing potential harm(s) of polypharmacy and side effects, and in some cases discontinuation may be reasonable. However, discontinuation of secondary prevention statin therapy should only be done after careful discussion of risk/benefit. Among high risk patients (i.e. with diabetes or multiple CV risk factors), without functional decline in whom there is a benefit to continuation of therapy but who develop side effects, consideration could be given to dose reduction.

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6

Don't place an indwelling urinary catheter to manage urinary incontinence.

Bacteremia are most commonly caused by UTIs in the post-acute and long-term care (PALTC) setting, the majority of which are catheter-related. The federal Healthcare Infection Control Practices Advisory Committee (HICPAC) recommends minimizing urinary catheter use and duration of use in all patients. Specifically, HICPAC recommends not using a catheter to manage urinary incontinence in the PALTC setting. Appropriate indications for indwelling urinary catheter placement include acute retention or outlet obstruction, to assist in healing of deep sacral or perineal wounds in patients with urinary incontinence, and to provide comfort at the end of life if needed.

7

Don't recommend screening for breast, colorectal or prostate cancer if life expectancy is estimated to be less than 10 years.

Many patients residing in the LTC setting are elderly and frail, with multimorbidity and limited life expectancy. Use of screening tests in patients with the shortest life expectancies is common even though they are the least likely to survive long enough to benefit from the intervention and the most likely to suffer complications of the intervention. Preventive cancer screenings have both immediate and longer term risks (e.g., procedural and psychological risks, false positives, identification of cancer that may be clinically insignificant, treatment-related morbidity and mortality). Benefits of cancer screening occur only after a lag time of 10 years (colorectal or breast cancer) or more (prostate cancer). Discussing the lag time ("When will it help?") with patients is at least as important as discussing the magnitude of any benefit ("How much will it help?"), and it is critical to elicit whether the patient's values and goals include pursuing a treatment if an abnormality is found. Prostate cancer screening by prostate-specific antigen testing is not recommended for asymptomatic patients because of a lack of life-expectancy benefit. One-time screening for colorectal cancer in older adults who have never been screened may be cost-effective; however, it should not be considered after age 85 and for most LTC patients older than 75 the burdens of screening likely outweigh any benefits.

8

Don't obtain a C. difficile toxin test to confirm "cure" if symptoms have resolved.

Patients residing in PALTC are particularly at risk for CDI due to advanced age, frequent hospitalizations and frequent antibiotic exposure. Only symptomatic patients with diarrhea should be tested for C. difficile. Furthermore, C. difficile tests may remain positive for as long as 30 days after symptoms have resolved. False positive "test-of-cure" specimens may complicate clinical care and result in additional courses of inappropriate anti-C. difficile therapy as well as prolonged isolation. To limit the spread of C. difficile, care providers in the PALTC setting should concentrate on early detection of symptomatic patients and the consistent use of proper infection control practices including the use of gloves, hand hygiene (with an alcohol-based hand rub or soap and water), contact precautions, and environmental cleaning with a sporicidal agent.

20 things Prescribers and Patients Should Question in Post-Acute and Long-Term Care

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9

Don't recommend aggressive or hospital-level care for frail individuals without a clear understanding of the individual's goals of care and the possible benefits and burdens

Hospital-level care has known risks, including delirium, infections, side effects of medications and treatments, disturbance of sleep, and loss of mobility and function. Multiple studies have shown an increase in cognitive decline following hospitalization, especially admissions involving intensive care and those in which delirium was identified. These risks are often more significant for patients in the PALTC setting, who are more likely to be frail, have multimorbidity, functional limitations, and dementia. Therefore, for some frail older adults, the balance of benefits and harms of hospital-level care may be unfavorable. To avoid unnecessary hospitalizations, care providers should engage in advance care planning by defining goals of care for the patient and discussing the risks and benefits of various interventions, including hospitalization, in the context of prognosis, preferences and indications. Patients who opt for less-aggressive treatment options are less likely to be subjected to unnecessary, unpleasant and invasive interventions and the risks of hospitalization. Advance directives such as the Physician Orders for Life Sustaining Treatment (POLST) paradigm form and Do Not Hospitalize (DNH) orders communicate a patient's preferences about end-of-life care.

10

Don't initiate aggressive antihypertensive treatment in frail individuals ⩾60 years of age. For frail individuals with hypertension, multiple medical comorbidities, and limited life expectancy, use clinical judgment, incorporate patient/family preferences, and evaluate risk/benefit in deciding on medication(s) and the intensity of control

There is strong evidence for the treatment of hypertension in older adults. Achieving a goal SBP of 150mm Hg reduces stroke incidence, all-cause mortality and heart failure, and data supports treating more aggressively to a goal SBP of <140mm Hg in community-dwelling individuals ⩾75 years of age with elevated cardiovascular risk. However, more data is needed to guide treatment of hypertension in frail older adults in the post-acute and long-term care setting. Target SBP and DBP levels should be based on shared decision-making with the patient, with particular consideration of physiologic age and the presence of underlying coronary artery disease. Antihypertensive therapy may not be appropriate to initiate in some patients with severe frailty or geriatric syndromes, as moderate or high-intensity treatment of hypertension has been associated with an increased risk of serious falls and injury in frail older adults, and low BP targets have added risk for syncope in the context of dehydration, especially during periods of high ambient heat, diminished thirst sensitivity, as well as polypharmacy with other medications (Parkinson's, etc). Using a reliable, representative method of taking blood pressures with special attention to orthostatic hypotension is important, as orthostatic hypotension has been associated with increased mortality and cardiovascular events. Careful initiation of a single agent with subsequent monitoring and evaluation for side effects can decrease the risk of adverse outcomes.

20 things Prescribers and Patients Should Question in Post-Acute and Long-Term Care

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11

Don't continue hospital-prescribed stress ulcer prophylaxis with ProtonPump Inhibitor (PPI) therapy in the absence of an appropriate diagnosis in the post-acute and long-term care (PALTC) population.

In the absence of an appropriate diagnosis for the use of PPI's long-term in PALTC populations, stop hospital prescribed medications for stress prophylaxis, as literature does not support PPI use for stress ulcer prophylaxis outside the Intensive Care Unit setting. It is important to determine the indication for use and balance potential harm versus benefit recognizing potential adverse events with long-term PPI use, including pneumonia, fracture, chronic kidney disease and bacterial infections such as Clostridioides difficile.

12

Don't order routine follow up chest imaging for post-acute and long-term care patients with community acquired pneumonia whose symptoms have resolved within 5–7 days.

Radiographic findings tend to lag behind clinical response. Obtaining routine follow up chest radiograph in patients with CAP who have responded to prescribed therapy is therefore not indicated and does not improve care outcomes. This approach is similar to that outlined by the American Thoracic Society (ATS) and Infectious Diseases Society of America (IDSA), both of whom recommend not obtaining a follow-up chest radiograph in patients whose symptoms have resolved within five to seven days.

13

Don't routinely prescribe or continue sedative hypnotics such as Restoril or Ambien, diphenhydramine (Benadryl), benzodiazepines, or Serotonin Modulators (Trazadone) for long-term treatment of sleep disorders in geriatric populations. Consider the use of nonpharmacological interventions (e.g., physical activity, a regular schedule or cognitive behavioral therapy.).

Use of diphenhydramine (or other first generation antihistamines), benzodiazepines or sedative hypnotics with anticholinergic side effects should be avoided as the data suggests these drugs may cause confusion and delirium in the short term, and some have been associated with an increased risk of dementia with long-term use. These drugs are associated with a five-fold increase in adverse cognitive events, an increase in adverse psychomotor events and are associated with an increased risk of falls. The 2019 updated Beers criteria for potentially inappropriate medications for use in older adults recognized these medications as problematic.

20 things Prescribers and Patients Should Question in Post-Acute and Long-Term Care

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14 Don't routinely prescribe or continue acetyl cholinesterase inhibitors or N-Methyl-D-Aspartate antagonists in patients with advanced dementia.

Use of acetyl cholinesterase inhibitors in mild to moderate dementia or NMDA antagonists in moderate to severe dementia may help with Behavioral and Psychological Symptoms of Dementia (BPSD) but have not been shown to prolong life. Once an individual is institutionalized, review of the risks and benefits of the medications should be reviewed periodically and de-prescribed when no longer demonstrating benefit to the patient. Acetyl cholinesterase inhibitors can worsen anorexia and NMDA receptor agonists are not indicated with severe renal insufficiency, both of which could be present in the older population.

15 Don't provide long-term opioid therapy for chronic non-cancer pain in the absence of clear and documented benefits to functional status and quality of life.

Post-acute and long-term care practitioners should prescribe opioids based on thoughtful inter-professional assessment indicating a clear indication for opioid use. Periodic review to evaluate risk factors for potential harms of long-term opioid therapy should be incorporated into the individualized plan of care. For patients on long term opioid therapy for chronic pain (not for cancer, palliative care, or end-of-life), tapering plans should be individualized and should minimize symptoms of opioid withdrawal while maximizing pain treatment. Clinicians should offer alternative behavioral therapies, non-opioid analgesics and other non-pharmacologic treatments whenever available and appropriate.

16 Don't treat general musculoskeletal pain with muscle relaxants.

Muscle relaxants are frequently prescribed as part of opioid-sparing pain regimens in the context of societal concerns about opioid misuse and addiction. However, muscle relaxants are often used inappropriately to treat general musculoskeletal pain, a common complaint of patients in post-acute and long-term care (PALTC). Muscle relaxants are not first line agents for musculoskeletal pain. Moreover, they on the Beers List of Potentially Inappropriate Medications in Older Adults given their high risk of (1) side effects, such as drowsiness, dizziness, falls, hypotension, confusion, and blurred vision and (2) unanticipated hospitalizations and death. For these reasons, muscle relaxants must be avoided in nursing home patients.

17 Don't prescribe iron supplements for more than once a day use.

Iron supplementation is crucial for managing iron deficiency anemia, but unnecessarily frequent dosing can reduce absorption, increase gastrointestinal side effects, and lead to poor patient adherence. Recent evidence supports that alternate-day or once-daily dosing is as effective as more frequent dosing for improving iron stores. This approach minimizes side effects, such as constipation, nausea, and abdominal discomfort, while effectively correcting iron deficiency. Limiting iron supplementation to alternate-day or once-daily enhances treatment outcomes and patient adherence.

20 things Prescribers and Patients Should Question in Post-Acute and Long-Term Care

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18

Don't combine multiple medications with anticholinergic activity.

Anticholinergic medications are often used to treat conditions such as rhinitis, insomnia, overactive bladder, diarrhea, muscle spasms, and Parkinson's Disease. However, overwhelming evidence demonstrates anticholinergic medications are associated with serious side effects in older adults, including confusion, dizziness, dry mouth, blurry vision, constipation, urinary retention, decreased perspiration, and sedation. Anticholinergic medications are also associated with delirium, falls, and risk of developing dementia. Thus, in medical care of older adults, it is critical to avoid using anticholinergic medications – especially combinations of anticholinergics – and to prescribe widely available alternative pharmaceutical treatments.

19

Don't use aspirin for primary prevention of atherosclerotic cardiovascular disease in patients aged 70 years or older.

Aspirin is frequently indicated to prevent and manage cardiovascular disease (CVD). However, its use for the primary prevention of CVD in adults aged 70 and older has not been shown to be of net benefit. Clinical trials have found that the higher risk of serious bleeding complications outweigh the limited cardiovascular benefit. Systematic review and meta-analyses demonstrated that aspirin does not significantly reduce total cardiovascular mortality among adults aged 70 and older. The American College of Cardiology, American Heart Association, and U.S. Preventive Services Task Force thus recommend against the initiation of aspirin for primary prevention in older adults > 70 years old and recommend consideration of discontinuing aspirin in patients > 75 years old with no clear indication. Rather, alternative strategies are recommended, such as a healthy diet and regular exercise to reduce CVD risk, with decisions made based on a patient-centered approach.

20

Don't utilize molecular testing to replace urine culture for diagnosing and determining treatment for urinary tract infection.

Urinary tract infections (UTIs) are diagnosed by the presence of clinical symptoms, assessment, and laboratory testing. Urine culture is the gold standard for laboratory determination of microorganism identification, antimicrobial susceptibility, and organism-specific count. Molecular testing-based technology, such as urine polymerase-chain reaction (PCR) testing, provides analytics of DNA from both live and non-viable organisms and cannot reliably discern between pathogenic and colonizing agents in urine samples. Furthermore, genetic resistance markers detected on molecular testing do not necessarily predict antimicrobial resistance and sensitivity. Molecular testing is currently not FDA-approved for diagnosing UTIs and lacks clinical validity and evidence showing improved patient outcomes. Molecular testing is substantially more expensive than standard urine tests. With antibiotic stewardship being a needed cornerstone in combating evolving bacterial resistance and with high rates of asymptomatic bacteriuria in post-acute, long-term care residents, casting wide nets to identify the presence of bacterial DNA can lead to reactionary overprescribing of antibiotics, misdiagnosis, unnecessary testing and patient stress.

20 things Prescribers and Patients Should Question in Post-Acute and Long-Term Care

Choosing Wisely Reference Materials

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1

Teno JM, Gozalo PL, Mitchell SL, Kuo S, Rhodes RL, Bynum JP, Mor V. Does feeding tube insertion and its timing improve survival? J Am Geriatr Soc. 2012 Oct;60(10):1918-21.

Hanson LC, Ersek M, Gilliam R, Carey TS. Oral feeding options for people with dementia: a systematic review. J Am Geriatr Soc. 2011;59(3):463-72.

Palecek EJ, Teno JM, Casarett DJ, Hanson LC, Rhodes RL, Mitchell SL. Comfort feeding only: a proposal to bring clarity to decision-making regarding difficulty with eating for persons with advanced dementia. J Am Geriatr Soc. 2010;58(3):580.

Sorrell JM. Use of feeding tubes in patients with advanced dementia: are we doing harm? J Psychosoc Nurs Ment Health Serv. 2010 May;48(5):15-8.

Sampson EL, Candy B, Jones L. Enteral tube feeding for older people with advanced dementia. Cochrane Database Syst Rev. 2009 Apr 15; (2):CD007209.

Gillick MR, Volandes AE. The standard of caring: why do we still use feeding tubes in patients with advanced dementia? J Am Med Dir Assoc. 2008 Jun;9(5):364-7.

Ganzini L. Artificial nutrition and hydration at the end of life: ethics and evidence. Palliat Support Care. 2006 Jun;4(2):135-43.

Li I. Feeding tubes in patients with severe dementia. Am Fam Physician. 2002 Apr 15;65(8):1605-11.

Gieniuse M, Sinvani L, Kozikowski a, Patel V, Nouryan C, Williams M, Kohn N, Pekmezaris, Wolf-Kliein G. Percutaneous Feeding Tubes in Individuals with Advanced Dementia: Are Physicians "Choosing Wisely"? Journal AmGerSociety. 2018 January; (66) 1.

Tabuenca A, Trallero J, Orna J, Breton, M. Clinical Nutrition. 2019 April;2(38)2.

Gillick MR. Rethinking the role of tube feeding in patients with advanced dementia. N Engl J Med. 2000;342:206-10.

Goldberg L., Altman K. The role of gastrostomy tube placement in advanced dementia with dysphagia: a critical review. Clinical Interventions in Aging. 2014;9:1733–1739. doi: 10.2147/cia.s53153

2

Sue Kirkman M, Briscoe VJ, Clark N, Florez H, Haas LB, Halter JB, Huang ES, Korytkowski MT, Munshi MN, Odegard PS, Pratley RE, Swift CS. Consensus Development Conference on Diabetes and Older Adults. Diabetes in older adults: a consensus report. J Am Geriatr Soc. 2012 Dec;60(12):2342-56.

American Geriatrics Society 2012 Beers Criteria Update Expert Panel. American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc. 2012 Apr;60(4):616-31.

Haq J. Insulin sliding scale, does it exist in the nursing home. JAMDA. 2010 Mar;11(3):B14.

Hirsch IB. Sliding scale insulin—time to stop sliding. JAMA. 2009;301(2):213-14.

American Medical Directors Association. Diabetes management in the long-term care setting clinical practice guideline. Columbia, MD:AMDA 2008, revised 2010.

Pandya N, Thompson S, Sambamoorthi U. The prevalence and persistence of sliding scale insulin use among newly admitted elderly nursing home patients with diabetes mellitus. J Am Med Dir Assoc. 2008 Nov;9(9):663-9.

Umpierrez GE, Palacio A, Smiley D. Sliding scale insulin use: myth or insanity? Am J Med. 2007;120(7):563-67.

Golightly LK, Jones MA, Hamamura DH, Stolpman NM, McDermott MT. Management of diabetes mellitus in hospitalized patients: efficiency and effectiveness of sliding-scale insulin therapy. Pharmacotherapy. 2006;26(10):1421-32.

Queale WS, Seidler AJ, Brancati FL. Glycemic control and sliding scale insulin use in medical inpatients with diabetes mellitus. Arch Intern Med. 1997;157(5):545-52.

Munshi et al. Management of Diabetes in Longterm Care and Skilled Nursing Facilities: A Position Statement of the American Diabetes Association. Diabetes Care 2016;39:308-318/DOI: 10.2337/dc15-2512

3

Stone ND, Ashraf MS, Calder J, Crnich CJ, Crossley K, Drinka PJ, Gould CV, Juthani-Mehta M, Lautenbach E, Loeb M, MacCannell T, Malani TN, Mody L, Mylotte JM, Nicolle LE, Roghmann MC, Schweon SJ, Simor AE, Smith PW, Stevenson KB, Bradley SF. Surveillance definitions of infections in long-term care facilities: revisiting the McGeer Criteria. Infec Control Hosp Epidemiol. 2012; 33(10):965-77.

Arinzon Z, Peisakh A, Shuval I, Shabat S, Berner YN. Detection of urinary tract infection (UTI) in long-term care setting: is the multireagent strip an adequate diagnostic tool? Arch Gerontol Geriatr. 2009 Mar-Apr;48(2):227-31.

High KP, Bradley SF, Gravenstein S, Mehr DR, Quagliarello VJ, Richards C, Yoshikawa TT. Clinical practice guideline for the evaluation of fever and infection in older adult residents of long-term care facilities: 2008 update by the Infectious Diseases Society of America. J Am Geriatr Soc. 2009 Mar;57(3):375-94. 3 4 5 6

Rowe T, Jump R, Andersen B, Banach D, Bryant K, Doernberg S, Loeb M, Morgan D, Morris A, Murthy R, Nace D, Crnich C. (2022). Reliability of nonlocalizing signs and symptoms as indicators of the presence of infection in nursing-home residents. Infection Control & Hospital Epidemiology, 43(4), 417-426. doi:10.1017/ice.2020.1282

Ducharme J, Neilson S, Ginn JL. Can urine cultures and reagent test strips be used to diagnose urinary tract infection in elderly emergency department patients without focal urinary symptoms? CJEM. 2007 Mar;9(2):87-92.

Ashraf MS, Gaur S, Bushen OY, Chopra T, Chung P, Clifford K, Hames E, Hertogh CMPM, Krishna A, Mahajan D, Mehr DR, Nalls V, Rowe TA, Schweon SJ, Sloane PD, Trivedi KK, van Buul LW, Jump RLP; Infection Advisory Subcommittee for AMDA—The Society of Post-Acute and Long-Term Care Medicine. Diagnosis, Treatment, and Prevention of Urinary Tract Infections in Post-Acute and Long-Term Care Settings: A Consensus Statement From AMDA's Infection Advisory Subcommittee. J Am Med Dir Assoc. 2020 Jan;21(1):12-24.e2. doi: 10.1016/j.jamda.2019.11.004. PMID: 31888862.

Nace D, Perera S, Hanlon J, Saracco S, Anderson G, Schweon S, Klein-Fedyshin M, Wessel C, Mulligan M, Drinka P, Crnich C. The Improving Outcomes of UTI Management in Long-Term Care Project (IOU) Consensus Guidelines for the Diagnosis of Uncomplicated Cystitis in Nursing Home Residents. J Am Med Dir Association. 2018(19) 765-769.

4

Maust, D. T., Kim, H. M., Seyfried, L. S., Chiang, C., Kavanagh, J., Schneider, L. S., & Kales, H. C. (2015). Antipsychotics, other psychotropics, and the risk of death in patients with dementia: number needed to harm. JAMA psychiatry, 72(5), 438–445. https://doi.org/10.1001/jamapsychiatry.2014.3018
American Medical Directors Association. Dementia in the long term care setting clinical practice guideline. Columbia, MD: AMDA 2012.
Perkins, R. Evidence-based practice interventions for managing behavioral and psychological symptoms of dementia in NH residents. Ann LTC. 2012:20(12):20-4.
Flaherty J, Gonzales J, Dong B. Antipsychotics in the treatment of delirium in older hospitalized adults: a systematic review. JAGS. 2011;59:S269-76.
American Medical Directors Association. Delirium and acute problematic behavior clinical practice guideline. Columbia, MD: AMDA 2008.
Ozbolt LB, Paniagua MA, Kaiser RM. Atypical antipsychotics for the treatment of delirious elders. J Am Med Dir Association. 2008;9:18–28.
Schneeweiss S, Setoguchi S, Brookhart A, Dormuth C, Wang PS. Risk of death associated with the use of conventional versus atypical antipsychotic drugs among elderly patients. CMAJ 2007;176(5): 627–32.
Gill SS, Bronskill SE, Normand SL, Anderson GM, Sykora K, Lam K, Bell CM, Lee PE, Fischer HD, Herrmann N, Gurwitz JH, Rochon PA. Antipsychotic drug use and mortality in older adults with dementia. Ann Intern Med. 2007;146(11):775–86.
Schneider LS, Dagerman KS, Insel P. Risk of death with atypical antipsychotic drug treatment for dementia: meta-analysis of randomized placebo-controlled trials. JAMA. 2005;294(15):1934–1943.
Schneider LS, Tariot PN, Dagerman KS. Effectiveness of atypical antipsychotic drugs in patients with Alzheimer's disease. N Engl J Med. 2006;355(15):1525–38.
Sink KM, Holden KF, Yaffe K. Pharmacological treatment of neuropsychiatric symptoms of dementia: a review of the evidence. JAMA. 2005;293:596–608.
U.S. Food & Drug Administration. Atypical antipsychotic drugs information. [Internet]. 2016 May 10. [Cited 2022 Jul 14]. Available from https://www.fda.gov/drugs/postmarket-drug-safetyinformation-patients-and-providers/atypical-antipsychotic-drugs-information.

5

Dalleur O, Spinewine A, Henrard S, Losseau C, Speybroeck N, Boland B. Inappropriate prescribing and related hospital admissions in frail older persons according to the STOPP and START criteria. Drugs Aging. 2012 Oct;29(10):829-37.
Schiattarella GG, Perrino C, Magliulo F, Ilardi F, Serino F, Trimarco V, Izzo R, Amato B, Terranova C, Cardin F, Militello C, Leosco D, Trimarco B, Esposito G. Statins and the elderly: recent evidence and current indications. Aging Clin Exp Res. 2012 Jun;24(3 Suppl):47-55.
Maraldi C, Lattanzio F, Onder G, Gallerani M, Bustacchini S, De Tommaso G, Volpato S. Variability in the prescription of cardiovascular medications in older patients: correlates and potential explanations. Drugs Aging. 2009 Dec;26 Suppl 1:41-51
Schatz IJ, Masaki K, Yano K, Chen R, Rodriguez BL, Curb JD. Cholesterol and all-cause mortality in elderly people from the Honolulu Heart Program: a cohort study. Lancet. 2001 Aug 4;358(9279):351-5.
Weverling-Rijnsburger AW, Blauw GJ, Lagaay AM, Knook DL, Meinders AE, Westendorp RG. Total cholesterol and risk of mortality in the oldest old. Lancet. 1997 Oct 18;350(9085):1119-23.
Krumholz HM, Seeman TE, Merrill SS, Mendes de Leon CF, Vaccarino V, Silverman DI, Tsukahara R, Ostfeld AM, Berkman LF. Lack of association between cholesterol and coronary heart disease mortality and morbidity and all-cause mortality in persons older than 70 years. JAMA. 1994 Nov 2;272(17):1335-40.
Afilalo J, Duque G, Steele R, et al. Statins for Secondary Prevention in Elderly Patients. J Am Coll Cardiol. 2008 Jan, 51 (1) 37–45.
Kim Johnson et al. The PRagmatic EValuation of evENTs And Benefits of Lipid-lowering in oldEr adults (PREVENTABLE) trial. Ongoing study in 2022.

6

CMS Manual System Appendix PP - Guidance to Surveyors for Long Term Care Facilities. Centers for Medicare and Medicaid Services, U.S. Department of Health and Human Services; 2017 Nov 22 [cited 2022 June 24]. Available from: https://www.cms.gov/medicare/provider-enrollment-and-certification/guidanceforlawsandregulations/downloads/appendix-pp-state-operations-manual.pdf.
Gould CV, Umscheid CA, Agarwal RK, Kuntz G, Pegues DA; Healthcare Infection Control Practices Advisory Committee. Guideline for prevention of catheter-associated urinary tract infections 2009. Infect Control Hosp Epidemiol. 2010 Apr;31(4):319-26.
Hooton TM, Bradley SF, Cardenas DD, Colgan R, Geerlings SE, Rice JC, Saint S, Schaeffer AJ, Tambayh PA, Tenke P, Nicolle LE; Infectious Diseases Society of America. Diagnosis, prevention, and treatment of catheter-associated urinary tract infection in adults: 2009 International Clinical Practice Guidelines from the Infectious Diseases Society of America. Clin Infect Dis. 2010 Mar;50(5):625-63.

7

Schoenborn NL, Huang J, Sheehan OC, Wolff JL, Roth DL, Boyd CM. Influence of Age, Health, and Function on Cancer Screening in Older Adults with Limited Life Expectancy. J Gen Intern Med. 2019 Jan;34(1):110-117.
Clarfield AM. Screening in frail older people: an ounce of prevention or a pound of trouble? J Am Geriatr Soc. 2010 Oct;58:2016-21.
Gill TM. The central role of prognosis in clinical decision making. JAMA. 2012 Jan 11;307(2):199-200.
Gross CP. Cancer screening in older persons: a new age of wonder. JAMA Intern Med. 2014 Oct;174(10):1565-7.
Lee SJ, Leipzig RM, Walter LC. Incorporating lag time to benefit into prevention decision for older adults. JAMA. 2013 Dec (25);310(24):2609-10. 7 8 9 10 11 12 13
Lonsdorp-Vogelaar I, Gulati R, Mariotto AB, Schechter CB, de Carvalho TM, Knudsen AB, van Ravesteyn NT, Heijnsdijk EA, Pabiniak C, van Ballegooijen M, Rutter CM, Kuntz KM, Feuer EJ, Etzioni R, de Koning HJ, Zauber AG, Mandelblatt JS. Personalizing age of cancer screening cessation based on comorbid conditions: model estimates of harms and benefits. Ann Intern Med. 2014 Jul 15;161(2):104-12.
Moyer VA. Screening for prostate cancer: U.S. Preventive Services Task Force Recommendation Statement. Ann Intern Med. 2012 Jul 17;157(2):120-34.
Royce TJ, Hendrix LH, Stokes WA, Allen IM, Chen RC. Cancer screening rates in individuals with different life expectancies. JAMA Intern Med. 2014 Oct;174(10):1558-65.
Spivack B, Cefalu C, Kamel H, et al. Health Maintenance in the Long Term Care Setting Clinical Practice Guideline. 2012. Columbia, MD: American Medical Directors Association.
van Hees F, Habbema JD, Meester RG, Lansdorp-Vogelaar I, van Ballegooijen M, Zauber AG. Should colorectal cancer screening be considered in elderly persons without previous screening? A cost-effectiveness analysis. Ann Intern Med. 2014 Jun 3;160(11):750-9.
Walter LC, Covinsky KE. Cancer screening in elderly patients: a framework for individualized decision making. JAMA. 2001 Jun 6;285(21):2750-6.

8

Dubberke, E., Carling, P., Carrico, R., Donskey, C., Loo, V., McDonald, L., Gerding, D. (2014). Strategies to Prevent Clostridium difficile Infections in Acute Care Hospitals: 2014 Update. Infection Control & Hospital Epidemiology, 35(S2), S48-S65. doi:10.1017/S0899823X00193857
Sethi AK, Al-Nassir WN, Nerandzic MM, Bobulsky GS, Donskey CJ. Persistence of skin contamination and environmental shedding of Clostridium difficile during and after treatment of C. difficile infection. Infect Control Hosp Epidemiol. 2010 Jan;31(1):21-7. doi: 10.1086/649016. PMID: 19929371.
"FAQs for Clinicians about C. diff." Centers for Disease Control and Prevention, 20 July 2021, https://www.cdc.gov/cdiff/clinicians/faq.html.

9

Chinnappa-Quinn L, Bennett M, Makkar SR, Kochan NA, Crawford JD, Sachdev PS. Is hospitalisation a risk factor for cognitive decline in the elderly? Curr Opin Psychiatry. 2020 Mar;33(2):170-177.

Ouslander JG, Bonner A, Herndon L, Shutes J. The Interventions to Reduce Acute Care Transfers (INTERACT) quality improvement program: an overview for medical directors and primary care clinicians in long term care. J Am Med Dir Assoc. 2014;15(3):162-170. doi:10.1016/j.jamda.2013.12.005

Creditor MC. Hazards of hospitalization of the elderly. Ann Intern Med. 1993 Feb 1;118(3):219.

Inouye SK, Westendorp RG, Saczynski JS. Delirium in elderly people. Lancet. 2014 Mar 8;383(9920):911-22.

Murray LM, Laditka SB. Care transitions in older adults from nursing homes to hospitals: implications for long-term care practice, geriatrics education, and research. J Am Med Dir Assoc. 2010 May;11(4):231-8.

Tulsky JA. Beyond advance directives: importance of communication skills at the end of life. JAMA. 2005 Jul 20;294(3):359-65.

10

Williamson JD, Supiano MA, Applegate WB, Berlowitz DR, Campbell RC, Chertow GM, Fine LJ, Haley WE, Hawfield AT, Ix JH, Kitzman DW, Kostis JB, Krousel-Wood MA, Launer LJ, Oparil S, Rodriguez CJ, Roumie CL, Shorr RI, Sink KM, Wadley VG, Whelton PK, Whittle J, Woolard NF, Wright JT Jr, Pajewski NM, SPRINT Research Group. Intensive vs Standard Blood Pressure Control and Cardiovascular Disease Outcomes in Adults Aged≥75 Years: A Randomized Clinical Trial. JAMA. 2016;315(24):2673.

The SPRINT Research Group. A randomized trial of intensive versus standard blood-pressure control. N Engl J Med 2015;373:2103-16. DOI:10.1056/NEJMoa1511939.

Beckett NS, Peters R, Fletcher AE, Staessen JA, Liu L, Dumitrascu D, Stoyanovsky V, Antikainen RL, Nikitin Y, Anderson C, Belhani A, Forette F, Rajkumar C, Thijs L, Banya W, Bulpitt CJ; HYVET Study Group. Treatment of hypertension in patients 80 years of age or older. N Engl J Med. 2008 May 1; 358(18):1887-98.

James PA, Oparil S, Carter BL, Cushman WC, Dennison-Himmelfarb C, Handler J, Lackland DT, LeFevre ML, MacKenzie TD, Ogedegbe O, Smith SC Jr, Svetkey LP, Taler SJ, Townsend RR, Wright JT Jr, Narva AS, Ortiz E. 2014 evidence-based guideline for the management of high blood pressure in adults. JAMA. 2014 Feb 5;311(5):507-20.

Muntner P, Bowling CB, Shimbo D. Systolic blood pressure goals to reduce cardiovascular disease among older adults. Am J Med Sci. 2014 Aug;348(2):129-34.

Tinetti ME, Han L, Lee DSH, McAvay GJ, Peduzzi P, Gross CP, Zhou B, Lin H. Antihypertensive medications and serious fall injuries in a nationally representative sample of older adults. JAMA Intern Med. 2014 Apr;174(4):588-95

Angelousi A, Girerd N, Benetos A, Frimat L, Gautier S, Weryha G, Boivin J-M. Association between orthostatic hypotension and cardiovascular risk, cerebrovascular risk, cognitive decline and falls as well as overall mortality: a systematic review and meta-analysis. Journal of Hypertension 2014, 32:1562–1571

Whelton PK, Carey RM, Aronow WS, et al. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/ APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. J Am Coll Cardiol 2018;71:2199-2269.

Anker D, et al. J of Human Hypertension, Blood pressure control and complex health conditions in older adults: impact of recent hypertension management guidelines. 2021;35:280-9.

11

Cook D, Guyatt G. Prophylaxis against Upper Gastrointestinal Bleeding in Hospitalized Patients. N Engl J Med 2018; 378:2506-2516. DOI: 10.1056/NEJMra1605507

Mafi JN, May FP, Kahn KL et al. Low-Value Proton Pump Inhibitor Prescriptions Among Older Adults at a Large Academic Health System. J Am Geriatr Soc 67:2600–2604, 2019. doi.org/10.1111/jgs.16117.

Vaezi MF, Yang Y, Howden CW. Complications of Proton Pump Inhibitor Therapy. Gastroenterology 2017;153(1):35-48.

12

Metlay JP, Waterer GW, Long AC, et al. Diagnosis and Treatment of Adults with Community-acquired Pneumonia. An Official Clinical Practice Guideline of the American Thoracic Society and Infectious Diseases Society of America. Am J Respir Crit Care Med 2019; 200:e45.

Bruns AH, Oosterheert JJ, Prokop M, et al. Patterns of resolution of chest radiograph abnormalities in adults hospitalized with severe community-acquired pneumonia. Clin Infect Dis 2007; 45:983.

Mittl RL Jr, Schwab RJ, Duchin JS, et al. Radiographic resolution of community-acquired pneumonia. Am J Respir Crit Care Med 1994; 149:630.

13

Jacobs GD, Pace-Schott EF, Stickgold R, Otto MW. Cognitive behavior therapy and pharmacotherapy for insomnia: A randomized controlled trial and direct comparison. Arch Intern Med 2004;164:1888-1896.

McMillan JM, Aitken E, Holroyd-Leduc JM. Management of insomnia and long-term use of sedative-hypnotic drugs in older patients. CMAJ. 2013;185(17):1499–1505. doi:10.1503/cmaj.130025 Mysliwiec, V, Martin, J, Ulmer, C, Chowdhuri, S, Brock, M, Spevak, C, Sall, J. The management of chronic insomnia disorder and obstructive sleep apnea. Annals of Internal Medicine. 2020;172(5). doi.org/10.7326/M19-3575

Randall T. Espinoza, Clarifying the Relationship Between Benzodiazepines and Dementia, Journal of the American Medical Directors Association, 10.1016/j.jamda.2019.12.006, 21, 2, (143-145), (2020).

Khusbu Patel, High-Risk Prescriptions for Aging Patients, Geriatric Practice, 10.1007/978-3-030-19625-7_14, (177-184), (2019).

Claire K. Ankuda and Olusegun Apoeso, Diagnosis and Management of Delirium, Geriatric Practice, 10.1007/978-3-030-19625-7_19, (237-246), (2019).

Kelly Cummings and Helen Fernandez, Driving, Geriatric Practice, 10.1007/978-3-030-19625-7_27, (335-344), (2019).

"American Geriatrics Society Updated Beers Criteria®." https://geriatricscareonline.org/, American Geriatrics Society. January 31, 2019. https://geriatricscareonline.org/toc/american-geriatricssocietyupdated-beers-criteria/CL001

Dore, D. D., Zullo, A. R., Mor, V., Lee, Y., & Berry, S. D. (2018). Age, Sex, and Dose Effects of Nonbenzodiazepine Hypnotics on Hip Fracture in Nursing Home Residents. Journal of the American Medical Directors Association, 19(4), 328–332.e2. https://doi.org/10.1016/j.jamda.2017.09.015

14

Tjia, J et al. Daily Medication Use in Nursing Home Residents with Advanced Dementia (2010) JAGS 58 (5) 880-888.
Pelosi, A, McNulty, S. Role of cholinesterase inhibitors in dementia care needs rethinking. BMJ 2006; 333 doi: https://doi.org/10.1136/bmj.38945.478160.94 (Published 31 August 2006)
Deardorff, W.J., Feen, E. & Grossberg, G.T. The Use of Cholinesterase Inhibitors Across All Stages of Alzheimer's Disease. Drugs Aging 32, 537–547 (2015). https://doi.org/10.1007/s40266-015-0273-x
Palmer, J.B., Albrecht, J.S., Park, Y. et al. Use of Drugs with Anticholinergic Properties Among Nursing Home Residents with Dementia: A National Analysis of Medicare Beneficiaries from 2007 to 2008. Drugs Aging 32, 79–86 (2015). https://doi.org/10.1007/s40266-014-0227-8
Colloca, G., Tosato, M., Vetrano, D. L., Topinkova, E., Fialova, D., Gindin, J., van der Roest, H. G., Landi, F., Liperoti, R., Bernabei, R., Onder, G., & SHELTER project (2012). Inappropriate drugs in elderly patients with severe cognitive impairment: results from the shelter study. PloS one, 7(10), e46669. https://doi.org/10.1371/journal.pone.0046669
"Deprescribing guidelines." The University of Sydney, https://cdpc.sydney.edu.au/research/medication-management/deprescribing-guidelines/. Accessed 6 July 2022.

15

Opioids in Nursing Homes. AMDA Resolution & Position Statement 12/2018.
Chou R, Turner JA, Devine EB, Hansen RN, Sullivan SD, Blazina I, Dana T, Bougatsos C, Deyo RA. The effectiveness and risks of long-term opioid therapy for chronic pain: a systematic review for a National Institutes of Health Pathways to Prevention Workshop. Ann Intern Med. 2015;1-62(4):276
AMDA — The Society for Post-Acute and Long-Term Care Medicine. Pain in the Post-Acute and Long-Term Care Setting Clinical Practice Guideline. Columbia, MD: AMDA 2021
Dowell D, Haegerich TM, Chou R. CDC Guideline for Prescribing Opioids for Chronic Pain – United States, 2016. MMWR Recomm Rep 2016;65(No. RR-1):1-49. https://www.cdc.gov/mmwr/ volumes/65/rr/rr6501e1.htm
Hunnicutt, J. N., Chrysanthopoulou, S. A., Ulbricht, C. M., Hume, A. L., Tjia, J., & Lapane, K. L. (2018). Prevalence of Long-Term Opioid Use in Long-Stay Nursing Home Residents. Journal of the American Geriatrics Society, 66(1), 48–55. https://doi.org/10.1111/jgs.15080
Fain, KM, Alexander, GC, Dore, DD, Segal, JB, Zullo, AR, Castillo-Salgado, C. Frequency and Predictors of Analgesic Prescribing in U.S. Nursing Home Residents with Persistent Pain. J Am Geriatr Soc. 2017 Feb;65(2):286-293. doi: 10.1111/jgs.14512. Epub 2016 Nov 7.
PALTC Practitioners Step Up to Address Opioid Crisis: Joanne Kaldy Caring for the Ages, Volume 20, ISSUE 4, P19, May 01, 2019 DOI:https://doi.org/10.1016/j.carage.2019.03.014
Gazelka HM, Leal JC, Lapid MI et al. Opioids in Older Adults: Indications, Prescribing, Complications, and Alternative Therapies for Primary Care. Mayo Clin Proc. 2020;95(4):793-800. doi.org/10.1016/j.mayocp.2020.02.002.

16

2023 American Geriatrics Society Beers Criteria® Update Expert Panel. American Geriatrics Society 2023 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. J Am Geriatr Soc. 2023;1-30. doi:10.1111/jgs.18372
Hwang YJ, Chang AR, Brotman DJ et al. Baclofen and the risk of fall and fracture in older adults: A real world cohort study. J Am Geriatr Soc 2024: 72:91-101.
Trueman, C., Castillo, S., O'Brien, K, & Hoie, E. Inappropriate use of skeletal muscle relaxants in geriatric patients. US Pharm. 2020;45(1):25-29.
Verdiner R, Khurmi N, Choukalas C, Erickson C, Poterack K. Does adding muscle relaxant make post-operative pain better? A narrative review of the literature from US and European studies. Anesth Pain Med (Seoul). 2023 Oct;18(4):340-348. doi: 10.17085/apm.23055. Epub 2023 Oct 30. PMID: 37919918; PMCID: PMC10635846.
Viana SS, Souza NP, Aliberti MJ, Jacob-Filho W. Use of potentially inappropriate medications and adverse events in older outpatients with acute conditions. Einstein (São Paulo). 2022;20:eAO8024.

17

Camaschella C, et al. (2021). Iron-deficiency anemia. N Engl J Med 385: 1401-1411. doi:10.1056/NEJMra2035711.
Deloughery TG, Jackson CS, Ko CW, et al. AGA Clinical Practice Update on Management of Iron Deficiency Anemia: Expert Review. Clin Gastroenterol Hepatol 2024;22:1575-83.
Kaynar LA, Gökçen S, Can F, Yeğin ZA, Özkurt ZN, Yağcı M. Comparison of daily oral iron replacement therapy with every other day treatment in female reproductive age patients with iron-deficiency anemia. Ann Hematol. 2022 Jul;101(7):1459-1464. doi: 10.1007/s00277-022-04835-6. Epub 2022 Apr 23. PMID: 35460388
Stoffel NU, Zeder C, Brittenham GM, Moretti D, Zimmermann MB. Iron absorption from supplements is greater with alternate day than with consecutive day dosing in iron-deficient anemic women. Haematologica. 2020 May;105(5):1232-1239. doi: 10.3324/haematol.2019.220830. Epub 2019 Aug 14. PMID: 31413088; PMCID: PMC7193469.

18

American Geriatrics Society 2023 updated AGS Beers Criteria for potentially inappropriate medication use in older adults. By the 2023 American Geriatrics Society Beers Criteria Update Expert Panel. 2023 Jul; J Am Geriatr Soc. 71(7):2033-2357

Bishara D, Perera G, Harwood D, Funnell N, Stewart R, Mueller C. Centrally acting anticholinergic drugs used for urinary conditions associated with worse outcomes in dementia. JAMDA. 2021 Dec;22(12):2547-52

Griebling TL. Re: Anticholinergic drug use, serum anticholinergic activity, and adverse drug events among older people: a population-based study. J Urol. 2014 Aug;192(2):490

Landi F, Dell'Aquila G, Collamati A, Martone AM, Zuliani G, Gasperini B, Eusebi P, Lattanzio F, Cherubini A. Anticholinergic drug use and negative outcomes among the frail elderly population living in a nursing home. JAMDA. 2014 Nov;15(11):825-9

Lattanzio F, Onder G, La Fauci MM, Volpato S, Cherubini A, Fabbietti P, Ruggiero C, Garasto S, Cozza A, Crescibene L, Tarsitano A, Corsonello A. Anticholinergic burden is associated with increased mortality in older patients with dependency discharged from hospital. JAMDA. 2018 Nov; 19(11): 942-7

Oudenwortel L, van der Roest HG, Onder G, Wijnen VJM, Liperoti R, Denkinger M, Finne-Soveri H, Topinkova E, Henrard JC, van Gool WA. The association of Anticholinergic drugs and delirium in nursing home patients with dementia: results from the SHELTER study. JAMDA. 2021 Oct;22(10):2087-92

Roe CM, Anderson MJ, Spivack B. Use of anticholinergic medications by older adults with dementia. J Am Geriatr Soc. 2002 May;50(5):836-42.

Stewart C, Yrjana K, Kishor M, Soiza RL, Taylor-Rowan M, Quinn TJ, Loke YK, Myint PK. Anticholinergic burden measures predict older people's physical function and quality of life: a systematic review. JAMDA. 2021 Jan;22(1):56-64

19

Arnett, D, Blumenthal, R, Albert, M. et al. 2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular Disease: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. JACC. 2019 Sep, 74 (10) e177–e232. https://doi.org/10.1016/j.jacc.2019.03.010

Gaziano JM, Brotons C, Coppolecchia R, et al. Use of aspirin to reduce risk of initial vascular events in patients at moderate risk of cardiovascular disease (ARRIVE): a randomised, double-blind, placebo-controlled trial. Lancet. 2018;392(10152):1036-1046. doi:10.1016/S0140-6736(18)31924-X

Gelbenegger G, Postula M, Pecen L,et al. Aspirin for primary prevention of cardiovascular disease: a meta-analysis with a particular focus on subgroups. BMC Med. 2019 Nov 4;17(1):198. doi: 10.1186/s12916-019-1428-0. PMID: 31679516; PMCID: PMC6827248.

McNeil, JJ., Wolfe, R, Woods, RL, et al. (2018). Effect of Aspirin on Cardiovascular Events and Bleeding in the Healthy Elderly. N Engl J Med 2018;379:1519-28. DOI: 10.1056/NEJMoa1803955.

Rothwell PM, Cook NR, Gaziano JM, et al. Effects of aspirin on risks of vascular events and cancer according to bodyweight and dose: analysis of individual patient data from randomised trials. Lancet. 2018 Aug 4;392(10145):387-399. doi: 10.1016/S0140-6736(18)31133-4. Epub 2018 Jul 17. PMID: 30017552; PMCID: PMC6083400.

US Preventive Services Task Force; Davidson KW, Barry MJ, Mangione CM, et al. Aspirin Use to Prevent Cardiovascular Disease: US Preventive Services Task Force Recommendation Statement. JAMA. 2022 Apr 26;327(16):1577-1584. doi: 10.1001/jama.2022.4983. PMID: 35471505.

Wang M, Yu H, Li Z,et al. Benefits and Risks Associated with Low-Dose Aspirin Use for the Primary Prevention of Cardiovascular Disease: A Systematic Review and Meta-Analysis of Randomized Control Trials and Trial Sequential Analysis. Am J Cardiovasc Drugs. 2022;22(6):657-675. doi:10.1007/s40256-022-00537-6

Zheng SL, Roddick AJ. Association of Aspirin Use for Primary Prevention With Cardiovascular Events and Bleeding Events: A Systematic Review and Meta-analysis [published correction appears in JAMA. 2019 Jun 11;321(22):2245. doi: 10.1001/jama.2019.3941]. JAMA. 2019;321(3):277-287. doi:10.1001/jama.2018.20578.

20

Janssen KJ, Hoebe CJ, Dukers-Muijrers NH, et al. Viability-PCR Shows That NAAT Detects a High Proportion of DNA from Non-Viable Chlamydia trachomatis. PLoS One. 2016 Nov 3;11(11):e0165920. doi: 10.1371/journal.pone.0165920.

Loeb, M, Bentley, DW, Bradley, S, et al. Development of minimum criteria for the initiation of antibiotics in residents of long-term–care facilities: results of a consensus conference. Infect Control Hosp Epidemiol 2001;22:120–124. doi: 10.1086/501875.

Palat ST, Biehle L, Adler L. Rapid Molecular Testing for UTIs: A Diagnostic Stewardship Perspective. J Am Med Dir Assoc. 2024 Sep;25(9):105031. doi: 10.1016/j.jamda.2024.105031.

Singhal U, Horrow JD, Kesselheim AS, et al. Modernizing Federal Oversight of Laboratory-Developed Test-Toward Safety, Validity, and Utility. N Engl J Med 2023; 389:1735-1737.

Szlachta-McGinn A, Douglass KM, Chung UYR, et al. Molecular Diagnostic Methods Versus Conventional Urine Culture for Diagnosis and Treatment of Urinary Tract Infection: A Systematic Review and Meta-analysis. European Urology Open Science. 2022;44:113-124. doi: doi: 10.1016/j.euros.2022.08.009.

Wojno KJ, Baunoch D, Luke N, et al. Multiplex PCR Based Urinary Tract Infection (UTI) Analysis Compared to Traditional Urine Culture in Identifying Significant Pathogens in Symptomatic Patients. Urology. 2020;136:119-126. doi.org/10.1016/j.urology.2019.10.018

Xu R, Deebel N, Casals R, et al. A New Gold Rush: A Review of Current and Developing Diagnostic Tools for Urinary Tract Infections. Diagnostics. 2021;11(3). doi: https://doi.org/10.3390/diagnostics11030479

Zering J, Stohs EJ. Urine polymerase chain reaction tests: stewardship helper or hinderance? Antimicrob Steward Healthc Epidemiol. 2024 Mar 6;4(1):e77. doi: 10.1017/ash.2024.71.