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Our Mission: Helping to prepare Iowa's health practitioners to care for our growing population of elders. *E-NEWS* is one of our methods of teaching through technology.

Each month, *E-NEWS* delivers abstracts from current multidisciplinary healthcare journal articles related to a specific geriatric topic. This month's *E-NEWS* focuses on REDUCING RISK OF NEGATIVE HEALTH OUTCOMES; IMMUNIZATIONS AND BEERS CRITERIA UPDATE.

REDUCING RISK OF NEGATIVE HEALTH OUTCOMES; IMMUNIZATIONS AND BEERS CRITERIA UPDATE

In this issue of the *E-NEWS*, you will find abstracts for:

- An article that provides an update on the American Geriatrics Society Beers Criteria® for potentially inappropriate medication use in older adults.
- A study that investigates the association between potentially inappropriate medication use and frailty phenotype among community-dwelling older adults.
- An article that presents considerations for applying herpes zoster vaccine recommendations.
- An article that discusses vaccinations in older adults.
- An article that analyzes the effectiveness of the 23-valent pneumococcal polysaccharide vaccine (PPV23) against pneumococcal disease in older adults.
- An article that examines vaccination for quality of life with herpes zoster vaccines.
- A study that explores a cost-effectiveness analysis of vaccination for prevention of herpes zoster and related complications.
- An article that addresses the impact and cost-effectiveness of different vaccination strategies to reduce the burden of pneumococcal disease among older adults.
- A review that evaluates the efficacy, effectiveness, and safety of herpes zoster vaccines in older adults.
- A study that seeks to determine the prevalence of Beers Criteria medication use and subsequent fall risk in geriatric trauma patients.

- By the 2019 American Geriatrics Society Beers Criteria® Update Expert Panel. American Geriatrics Society 2019 Updated AGS Beers Criteria® for Potentially Inappropriate Medication Use in Older Adults. *J Am Geriatr Soc.* 2019 Apr;67(4):674-694.

The American Geriatrics Society (AGS) Beers Criteria® (AGS Beers Criteria®) for Potentially Inappropriate Medication (PIM) Use in Older Adults are widely used by clinicians, educators, researchers, healthcare administrators, and regulators. Since 2011, the AGS has been the steward of the criteria and has produced updates on a 3-year cycle. The AGS Beers Criteria® is an explicit list of PIMs that are typically best avoided by older adults in most circumstances or under specific situations, such as in certain diseases or conditions. For the 2019 update, an interdisciplinary expert panel reviewed the evidence published since the last update (2015) to determine if new criteria should be added or if existing criteria should be removed or undergo changes to their recommendation, rationale, level of evidence, or strength of recommendation. © The American Geriatrics Society.



- Bolina AF, Gomes NC, Marchiori GF, Pegorari MS, Tavares DMDS. Potentially inappropriate medication use and frailty phenotype among community-dwelling older adults: A population-based study. *J Clin Nurs.* 2019 Nov;28(21-22):3914-3922.

AIMS AND OBJECTIVES: To investigate the association between potentially inappropriate medication use and frailty phenotype among community-dwelling older adults and to identify factors associated with the use of these drugs according to frailty condition. BACKGROUND: There is insufficient evidence about the association between inappropriate medication use and the condition of frailty, particularly among community-dwelling older adults. Therefore, data obtained from population surveys should be made available in order to support the development of clinical guidelines about the prevention of frailty. DESIGN: This was a cross-sectional study conducted according to the STROBE Checklist. METHODS: This population-based study was conducted on 1,607 older adults. Potentially inappropriate medication use was assessed according to Beers criteria and frailty syndrome was determined according to the phenotype proposed by Fried and colleagues. Data were analyzed statistically using multinomial or binary logistic regression models. RESULTS: About 13.6% of the subjects were frail, and 36.8% used at least one inappropriate medication. The adjusted model indicated that, the more potentially inappropriate medication use, the higher the prevalence of frailty, prefrailty and the walking slowness component. Female gender, one or more years of schooling, five or more reported morbidities, and instrumental dependence regarding daily life activities were factors associated with potentially inappropriate medication use in the nonfrail group. CONCLUSION: Inappropriate medication use was prevalent among community-living older adults, and its presence was associated with the occurrence of frailty. RELEVANCE TO CLINICAL PRACTICE: Primary care nurses are the professionals with the greatest contact with the older adults in the community. Thus, the results support the inclusion of the assessment of potentially inappropriate medication use in the routine of nursing consultation. In case of a positive screening, the older person should be referred to geriatric evaluation in order to optimize drug treatment for the prevention of frailty. © John Wiley & Sons Ltd.



- Brogie JD, Rumph JH, Chaplin MD, Drake N, Hodge BK, Owens RE. Practical points for applying herpes zoster vaccine recommendations. *Nurse Pract.* 2019 Sep;44(9):43-47.

The recombinant zoster vaccine (Shingrix) was approved to help combat the incidence of shingles in patients age 50 years and older and the CDC now recommends it over the zoster vaccine live (Zostavax). This article highlights practical considerations to help clinicians appropriately apply the most recent vaccine recommendations to their patients.



- [Burke M, Rowe T. Vaccinations in Older Adults. *Clin Geriatr Med.* 2018 Feb;34\(1\):131-143.](#)

Vaccines are important for preventing infections in adults aged ≥ 65 years. Older adults are at increased risk for complications from vaccine-preventable illnesses due to age-associated changes in immune function and chronic medical comorbidities. Vaccination rates for older adults remain low despite widely accepted practice guidelines. Recommended vaccinations for older adults include (1) influenza; (2) pneumococcal; (3) herpes zoster; (4) tetanus, diphtheria, pertussis; and (5) hepatitis B. Cost influences vaccination rates in older adults. © Elsevier Inc.

- [Falkenhorst G, Remschmidt C, Harder T, Hummers-Pradier E, Wichmann O, Bogdan C. Effectiveness of the 23-Valent Pneumococcal Polysaccharide Vaccine \(PPV23\) against Pneumococcal Disease in the Elderly: Systematic Review and Meta-Analysis. *PLoS One.* 2017 Jan 6;12\(1\):e0169368.](#)

BACKGROUND: Routine vaccination of elderly people against pneumococcal diseases is recommended in many countries. National guidelines differ, recommending either the 23-valent polysaccharide vaccine (PPV23), the 13-valent conjugate vaccine (PCV13) or both. Considering the ongoing debate on the effectiveness of PPV23, we performed a systematic literature review and meta-analysis of the vaccine efficacy/effectiveness (VE) of PPV23 against invasive pneumococcal disease (IPD) and pneumococcal pneumonia in adults aged ≥ 60 years living in industrialized countries. METHODS: We searched for pertinent clinical trials and observational studies in databases MEDLINE, EMBASE, Cochrane Central Register of Controlled Trials, and Cochrane Database of Systematic Reviews. We assessed the risk of bias of individual studies using the Cochrane Risk of Bias tool for randomized controlled trials and the Newcastle-Ottawa Scale for observational studies. We rated the overall quality of the evidence by GRADE criteria. We performed meta-analyses of studies grouped by outcome and study design using random-effects models. We applied a sensitivity analysis excluding studies with high risk of bias. RESULTS: We identified 17 eligible studies. Pooled VE against IPD (by any serotype) was 73% (95%CI: 10-92%) in four clinical trials, 45% (95%CI: 15-65%) in three cohort studies, and 59% (95%CI: 35-74%) in three case-control studies. After excluding studies with high risk of bias, pooled VE against pneumococcal pneumonia (by any serotype) was 64% (95%CI: 35-80%) in two clinical trials and 48% (95%CI: 25-63%) in two cohort studies. Higher VE estimates in trials (follow-up ~ 2.5 years) than in observational studies (follow-up ~ 5 years) may indicate waning protection. Unlike previous meta-analyses, we excluded two trials with high risk of bias regarding the outcome pneumococcal pneumonia, because diagnosis was based on serologic methods with insufficient specificity. CONCLUSIONS: Our meta-analysis revealed significant VE of PPV23 against both IPD and pneumococcal pneumonia by any serotype in the elderly, comparable to the efficacy of PCV13 against vaccine-serotype disease in a recent clinical trial in elderly people. Due to its broader serotype coverage and the decrease of PCV13 serotypes among adults resulting from routine infant immunization with PCV13, PPV23 continues to play an important role for protecting adults against IPD and pneumococcal pneumonia.

- [Lang PO, Aspinall R. Vaccination for quality of life: herpes-zoster vaccines. *Aging Clin Exp Res.* 2019 Oct 23. doi: 10.1007/s40520-019-01374-5. \[Epub ahead of print\]](#)

Current vaccination policy in most high-income countries aims to counteract the decline in cell-mediated immunity to varicella zoster virus that occurs with advancing age or immunosuppression. The aim of this review was to describe the burden of illness associated with herpes zoster (HZ) and post-herpetic neuralgia (PHN) risks and their impact on the social and common life in infected people. The effectiveness/efficacy and cost effectiveness of the immunization strategy will be presented through the review of the literature relevant to the live attenuated HZ vaccine (ZLV) licensed in 2006 and the recombinant HZ vaccine (RZV). The latter has very recently been approved to protect aged people aged ≥ 50 years against HZ morbidity including its complications, and associated health-care costs. Finally, this review also provides data with respect of precautions of using and safety of ZVL and RVZ.

- Prosser LA, Harpaz R, Rose AM, Gebremariam A, Guo A, Ortega-Sanchez IR, Zhou F, Dooling K. A Cost-Effectiveness Analysis of Vaccination for Prevention of Herpes Zoster and Related Complications: Input for National Recommendations. *Ann Intern Med.* 2019 Mar 19;170(6):380-388.

Background: The U.S. Advisory Committee on Immunization Practices recently developed recommendations for use of a new recombinant zoster vaccine (RZV). Objective: To evaluate the cost-effectiveness of vaccination with RZV compared with zoster vaccine live (ZVL) and no vaccination, the cost-effectiveness of vaccination with RZV for persons who have previously received ZVL, and the cost-effectiveness of preferential vaccination with RZV over ZVL. Design: Simulation (state-transition) model using U.S. epidemiologic, clinical, and cost data. Data Sources: Published data. Target Population: Hypothetical cohort of immunocompetent U.S. adults aged 50 years or older. Time Horizon: Lifetime. Perspective: Societal and health care sector. Intervention: Vaccination with RZV (recommended 2-dose regimen), vaccination with ZVL, and no vaccination. Outcome Measures: The primary outcome measure was the incremental cost-effectiveness ratio (ICER). Results of Base-Case Analysis: For vaccination with RZV compared with no vaccination, ICERs ranged by age from \$10 000 to \$47 000 per quality-adjusted life-year (QALY), using a societal perspective and assuming 100% completion of the 2-dose RZV regimen. For persons aged 60 years or older, ICERs were less than \$60 000 per QALY. Vaccination with ZVL was dominated by vaccination with RZV for all age groups 60 years or older. Results of Sensitivity Analysis: Results were most sensitive to changes in vaccine effectiveness, duration of protection, herpes zoster incidence, and probability of postherpetic neuralgia. Vaccination with RZV after previous administration of ZVL yielded an ICER of less than \$60 000 per QALY for persons aged 60 years or older. In probabilistic sensitivity analyses, RZV remained the preferred strategy in at least 95% of simulations, including those with 50% completion of the second dose. Limitation: Few data were available on risk for serious adverse events, adherence to the recommended 2-dose regimen, and probability of recurrent zoster. Conclusion: Vaccination with RZV yields cost-effectiveness ratios lower than those for many recommended adult vaccines, including ZVL. Results are robust over a wide range of plausible values. Primary Funding Source: Centers for Disease Control and Prevention.



- Thorrington D, van Rossum L, Knol M, de Melker H, Rümke H, Hak E, van Hoek AJ. Impact and cost-effectiveness of different vaccination strategies to reduce the burden of pneumococcal disease among elderly in the Netherlands. *PLoS One.* 2018 Feb 9;13(2):e0192640.

BACKGROUND: Streptococcus pneumoniae causes morbidity and mortality among all ages in The Netherlands. To reduce this burden, infants in The Netherlands receive the 10-valent pneumococcal conjugated vaccine (PCV10), but older persons are not targeted. We assessed the impact and cost-effectiveness of vaccination with 23-valent pneumococcal polysaccharide vaccine (PPV23) or 13-valent PCV (PCV13) among all those aged 60, 65 or 70 and/or in combination with replacing PCV10 with PCV13 in the infant vaccination program. METHODS: A static cost-effectiveness model was parameterized including projected trends for invasive pneumococcal disease (IPD) and hospitalized community acquired pneumonia (CAP). The different strategies were evaluated using vaccine list prices and a 10-year time horizon. Incremental cost-effectiveness ratios (ICER) were calculated with the current strategy (infant vaccination program with PCV10) as reference. RESULTS: Compared to the reference, the largest impact on pneumococcal disease burden was projected with a combined use of PCV13 among infants and PPV23 at 60, 65 and 70 years, preventing 1,635 cases of IPD and 914 cases of CAP. The most cost-effective strategy was vaccinating with PPV23 at 70 years only with similar low ICERs at age 60 and 65. The impact of the use of PCV13 among infants depends strongly on the projected herd-immunity effect on serotype 19A. Vaccinating elderly with either PCV13 or PPV23 was dominated by PPV23 in all investigated scenarios, mainly due to the lower price of PPV23. CONCLUSION: Under the current assumptions, the best value for money is the use of PPV23 for elderly, with a single dose or at five year increment between age 60 to age 70.



- [Tricco AC, Zarin W, Cardoso R, Veroniki AA, Khan PA, Nincic V, Ghassemi M, Warren R, Sharpe JP, Page AV, Straus SE. Efficacy, effectiveness, and safety of herpes zoster vaccines in adults aged 50 and older: systematic review and network meta-analysis. *BMJ*. 2018 Oct 25;363:k4029.](#)

OBJECTIVE: To compare the efficacy, effectiveness, and safety of the herpes zoster live attenuated vaccine with the herpes zoster adjuvant recombinant subunit vaccine or placebo for adults aged 50 and older. DESIGN: Systematic review with bayesian meta-analysis and network meta-analysis. DATA SOURCES: Medline, Embase, and Cochrane Library (inception to January 2017), grey literature, and reference lists of included studies. ELIGIBILITY CRITERIA FOR STUDY SELECTION: Experimental, quasi-experimental, and observational studies that compared the live attenuated vaccine with the adjuvant recombinant subunit vaccine, placebo, or no vaccine in adults aged 50 and older. Relevant outcomes were incidence of herpes zoster (primary outcome), herpes zoster ophthalmicus, post-herpetic neuralgia, quality of life, adverse events, and death. RESULTS: 27 studies (22 randomized controlled trials) including 2 044 504 patients, along with 18 companion reports, were included after screening 2037 titles and abstracts, followed by 175 full text articles. Network meta-analysis of five randomized controlled trials found no statistically significant differences between the live attenuated vaccine and placebo for incidence of laboratory confirmed herpes zoster. The adjuvant recombinant subunit vaccine, however, was statistically superior to both the live attenuated vaccine (vaccine efficacy 85%, 95% credible interval 31% to 98%) and placebo (94%, 79% to 98%). Network meta-analysis of 11 randomized controlled trials showed the adjuvant recombinant subunit vaccine to be associated with statistically more adverse events at injection sites than the live attenuated vaccine (relative risk 1.79, 95% credible interval 1.05 to 2.34; risk difference 30%, 95% credible interval 2% to 51%) and placebo (5.63, 3.57 to 7.29 and 53%, 30% to 73%, respectively). Network meta-analysis of nine randomized controlled trials showed the adjuvant recombinant subunit vaccine to be associated with statistically more systemic adverse events than placebo (2.28, 1.45 to 3.65 and 20%, 6% to 40%, respectively). CONCLUSIONS: Using the adjuvant recombinant subunit vaccine might prevent more cases of herpes zoster than using the live attenuated vaccine, but the adjuvant recombinant subunit vaccine also carries a greater risk of adverse events at injection sites.



- [Walker BS, Collier BR, Bower KL, Lollar DI, Faulks ER, Matos M, Nussbaum MS, Hamill ME. The Prevalence of Beers Criteria Medication Use and Associations with Falls in Geriatric Patients at a Level 1 Trauma Center. *Am Surg*. 2019 Aug 1;85\(8\):877-882.](#)

The Beers Criteria for Potentially Inappropriate Medication (PIM) use is a list of medications with multiple risks in older patients. Approximately 24 per cent use rate is reported in prior studies. Our objective was to determine the local PIM use and subsequent fall risk in geriatric trauma patients. We conducted a retrospective analysis of PIM use in all geriatric patients evaluated at our Level 1 trauma center between 2014 and 2017. Patients were identified from our trauma database. Pre-admission medication use was determined through medication reconciliation from our electronic medical record (EMR). Patients not undergoing medication reconciliation were excluded. After initial analysis, patients were stratified by age into three groups: 65 to 74, 75 to 84, and ≥85 years. Multivariate logistic regression analyses were used to calculate odds ratios of falls for specific PIMs. In all, 2181 patients met the inclusion criteria. Overall, 71.2 per cent of geriatric trauma patients were prescribed at least one PIM-73.1 per cent of falls compared with 68.6 per cent for other mechanisms. Specific PIM use varied by age group. PIMs associated with fall risk in all patients included antipsychotics, benzodiazepines, and diclofenac. For those aged 65 to 74 years, antihistamines, diclofenac, proton pump inhibitors, and promethazine were associated. In those aged 75 to 84 years, alprazolam, antipsychotics, benzodiazepines, cyclobenzaprine, diclofenac, and muscle relaxants were implicated. No significant associations were found for patients aged ≥85 years. PIM use at our trauma center seems to be rampant and well above the national average. Geriatric falls were associated with using ≥1 PIM and multiple specific PIMs implicated. We are designing a targeted educational program for local primary care physicians (PCPs) that will attempt to decrease geriatric PIM use.



Next Month's Issue:

Deprescribing Antipsychotics in Older Adults

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