

Should we drink in old age and if so, how much? Interpreting the evidence base

by Dr Erik Skovenborg

There is solid evidence that excessive use of alcohol is associated with an increased risk of early death and various negative consequences for individuals' physical and psychological well-being. For many outcomes, like accidents and some cancer types, there are linear associations between increasing alcohol consumption and harms to health. For other health outcomes, like coronary heart disease and type 2 diabetes, there are curvilinear (J-shaped) associations, with modest alcohol consumption appearing to offer health benefits, for post-menopausal women and men over 40, when the risk of these diseases increases.

Sensible drinking

Despite these different patterns of association, it is apparent that if people are to drink alcohol, then it would be sensible for them to do so in moderation, however, the creation of evidence-based low-risk drinking guidelines is a difficult task. An analysis of official definitions of standard drinks and consumption guidelines from all 27 European Union Member States and countries from all global geographic regions showed a remarkable lack of agreement about what constitutes harmful alcohol consumption on a daily / weekly basis with no consensus about the ratios of consumption guidelines for men and women. (Furtwängler NAFF, de Visser RO) Lack of international consensus in low-risk drinking guidelines. *Drug Alcohol Rev* 2013;32:11-18).

A recent review of governmental low-risk alcohol consumption guidelines in 37 countries found significant variability for low-risk drinking advice, ranging from 10–42 g per day for women and 10–56 g per day for men to 98–140 g per week for women and 150–280 g per week for men. (Kalinowski A, Humphreys K. Governmental standard drink definitions and low-risk alcohol consumption guidelines in 37 countries. *Addiction* 2016;111:1293-98)

Part of the reason for the lack of agreement in low-risk drinking guidelines may be that the epidemiological data do not identify clear or consistent thresholds at which alcohol increases the likelihood of different benefits or harms. Different levels of alcohol consumption have differential effects on different health risks, and

research has shown that the same epidemiological data may be used to justify different intake guidelines depending on which outcome one is most concerned about. (Rehm J, Patra J. Different guidelines for different countries? On the scientific basis of low-risk drinking guidelines and their implications. *Drug and Alcohol Review* 2012;31:156-61). In their review of the scientific basis of low-risk drinking guidelines Rehm and Patra recommend that at least two dimensions are incorporated: average volume of alcohol consumption and patterns of drinking. According to the results of a meta-analysis of the association of binge-drinking with ischemic heart disease risk the cardio protective effect of moderate alcohol consumption disappears when, on average, light to moderate drinking is mixed with irregular heavy drinking occasions with consumption of ≥ 60 g of pure alcohol or ≥ 5 drinks per occasion at least monthly. (Roerecke M, Rehm J. Irregular heavy drinking occasions and risk of ischemic heart disease: a systematic review and meta-analysis. *Am J Epidemiol* 2010;171:633-44).

Very little, very often

Over increasingly older age groups of current drinking, a cross-sectional study of 40,556 Americans age 60 years and older found that the proportions of men and women consuming higher quantities of alcohol (≥ 2 drinks) decreased, while the proportions consuming lower quantities (one drink) increased and the proportions drinking most frequently (260-365 days per year) also increased. (Breslow RA, Smothers B. Drinking patterns of older Americans: National Health Interview Surveys, 1997-2001. *J Stud Alcohol*. 2004;65:232-40).

The results of general population-based household surveys of randomly selected adults over 60 years of age in 14 European countries showed marked differences in alcohol consumption across countries. However most people in all countries present moderate consumption regarding the amount of alcohol and pattern of use. Age was negatively and significantly associated with alcohol consumption and the number of heavy drinkers was in general low. (Nuevo R, Chatterji S, Verdes E, Naidoo N et al. Prevalence of alcohol consumption and pattern of use among the elderly in the WHO



European Region. *Eur Addict Res* 2015;21:88-96). A common factor in the drinking habits of older adults is the everyday nature of drinking.

It seems therefore that for the great majority of older adults, advanced years have produced skills in controlling alcohol use and avoiding intoxication. They overwhelmingly consume alcohol in moderation, a pattern that has evolved with age and the course of life. (Haarni I, Hautamäki L. Life experience and alcohol: 60–75-year olds' relationship to alcohol in theme interviews. *Nordic Studies on alcohol and drugs* 2010;27:241-58).

In view of older people's general healthy drinking habits of very little, very often - it is perhaps not surprising that only four countries (Canada, Italy, Slovenia and the United States) have adopted especially prudent low-risk drinking guidelines for the elderly (65+ year olds). www.aim-digest.com/gateway/international_guidelines.pdf

Alcohol tolerance in old age

In terms of current thinking in public health, the biological, psychological and social changes associated with ageing has led to older people being described by some as 'uniquely' vulnerable to alcohol. (Nicholson D, McCormack F, Seaman P, Bell K et al. Alcohol and healthy ageing: a challenge for alcohol policy. *Public Health* 2017;148:13-18). "Research suggests that alcohol consumption generally declines with age and the proportion of non-drinkers increases," a factsheet from Alcohol Concern concludes. "Despite drinking comparatively little, older drinkers consume alcohol far more often than any other age group. The cumulative effect of regular drinking takes its toll on the body of an older person, which is less able to handle the same levels of alcohol as in previous years." (IAS Factsheet: Older people and alcohol. Institute of Alcohol Studies. www.ias.org.uk). According to the IAS Factsheet "Tolerance to alcohol is significantly lowered in the aged person, so it is possible that the same amount of alcohol can have a more detrimental effect than it would on a younger person. Older people are less tolerant to alcohol because of physical changes such as:

- A fall in ratio of body water to fat, meaning there is less water for the alcohol to be diluted in.
- Decreased hepatic blood flow, leading to weakening of the liver.
- Liver enzyme inefficiency, so alcohol will not be broken down as well as in younger people

- Poor kidney and liver function.
- An altered responsiveness of the brain; alcohol affects older brains more quickly than younger ones.

The IAS Factsheet does not substantiate these "facts" with scientific evidence regarding lower tolerance to alcohol in the aged person. A common statement among specialists in geriatric medicine is "To know one elderly patient is to know one elderly patient." As the adage implies, the population of adults aged 65 years or older is very varied, ranging from the most robust healthy individuals with excellent marathon performances to the frailest residents of assisted living facilities and nursing homes. No single formula can predict the alcohol tolerance and the consequences of drinking for this heterogeneous group, however, some facts from the recent scientific literature paint a less pessimistic picture:

- Total Body Water (TBW): In men TBW declines very modestly from 45.6 liters (20-29 years age group) to 42.5 liters (80-89 years age group) = a loss of 3.1 liters (6.9%) of TBW during 60 years. In women TBW declines from 32.0 liters (20-29 years age group) to 30.2 liters (80-89 years age group) = a loss of 1.8 liters (5.6%.) of TBW during 60 years. (Chumlea WC, Guo SS, Zeller CM, Reo NV et al. Total body water reference values and prediction equations for adults. *Kidney Int* 2001;59:2250-58.)
- Hepatic ethanol elimination: A study of the effect of aging on the elimination of ethanol in a group of 50 healthy subjects ranging in age from 21 to 81 years found no influence by age on the rates of ethanol elimination. (Vestal RE, McGuire EA, Tobin JD, Andres R et al. Aging and ethanol metabolism. *Clin Pharmacol Therapeutics* 1977;21:343-54). Their findings on well-preserved hepatic ethanol elimination in old age has subsequently been confirmed in eight other clinical studies.
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4. Wayne Jones A, Andersson L. Influence of age, gender, and blood-alcohol concentration on the disappearance rate of alcohol from blood in drinking drivers. *J Forensic Sci* 1996;41:922-26.
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Altered responsiveness of the brain (risk of falls)

In a US cross-sectional study consumption of ≥ 14 US drinks of 14g per week was associated with an increased risk of subsequent falls in older adults, so more than a glass of wine a day. (Mukamal KJ, Mittleman MA, Longstreth WT Jr, Newman AB et al. Self-reported alcohol consumption and falls in older adults: cross-sectional and longitudinal analyses of the cardiovascular health study. *J Am Geriatr Soc* 2004;52:1174-79). However, in a cohort of older Spanish adults both moderate drinking and the Mediterranean drinking pattern were associated with a lower risk of falls and injurious falls. (Ortolá R, García-Esquinas E, Galán I, Guallar-Castillón P et al. Patterns of alcohol consumption and risk of falls in older adults: a prospective cohort study. *Osteoporos Int* 2017;28:3143-52).

Moderate drinking and healthy aging – the evidence is clear

A study of alcohol use and mortality in older Australian men and women found that in people over the age of 65 years, alcohol intake of four drinks (40 g of alcohol) per day for men and two drinks (20 g of alcohol) per day for women was associated with lower mortality risk. "The argument for lower limits of regular alcohol use for older people has been based largely on theoretical concerns that specific amounts of alcohol result in higher blood alcohol concentrations in older people, and also that regular medication use, which may interact with alcohol, is common in older people. In our study these concerns do not seem to have been translated into all-cause mortality or accidental

death." (McCaul KA, Almeida OP, Hankey GJ, Jamrozik K et al. Alcohol use and mortality in older men and women. *Addiction* 2010;105:1391-400).

A prospective US study of late-life alcohol consumption and all-cause mortality over 20 years among 1,824 older adults found that compared to moderate drinkers, abstainers had a more than 2 times increased mortality risk while heavy drinkers had an increased risk of 70%. A model controlling for former problem drinking status, existing health problems, and key sociodemographic and social-behavioral factors, as well as for age and gender, substantially reduced the mortality effect for abstainers compared to moderate drinkers. However, even after adjusting for all covariates, abstainers and heavy drinkers continued to show increased mortality risks of 51 and 45%, respectively, compared to moderate drinkers. (Holahan CJ, Schutte KK, Brennan PL, Holahan CK et al. Late-life alcohol consumption and 20-year mortality. *Alcohol Clin Exp Res* 2010;34:1961-71).

Furthermore a meta-analysis of longitudinal studies of the associations of smoking and alcohol consumption with healthy aging found increased odds ratios of healthy aging for drinkers compared with non-drinkers (1.28, 95% CI 1.08 to 1.52), light drinkers compared with non-drinkers (1.12, 95% CI 1.03 to 1.22), moderate drinkers compared with non-drinkers (1.35, 95% CI 0.93 to 1.97) and high drinkers compared with non-drinkers (1.25, 95% CI 1.09 to 1.44). (Daskalopoulou C, Stubbs B, Kralj C, Koukounari A et al. Associations of smoking and alcohol consumption with healthy ageing: a systematic review and meta-analysis of longitudinal studies. *BMJ Open* 2018;8:e019540).

Alcohol as a social lubricant

A recent systematic overview found consistent evidence linking social isolation and loneliness to worse cardiovascular and mental health outcomes. (Leigh-Hunt N, Bagguley D, Bash K, Turner V et al. An overview of systematic reviews on the public health consequences of social isolation and loneliness. *Public Health* 2017;152:157-71). The potential benefit that moderate drinking may have upon psychosocial functioning is an underappreciated inquiry; specifically in relation to improved appetite and dietary consumption in older adults. In many societies, drinking provides a means for friends and family to gather, relax, eat, and enjoy each other's company. (Heath DB. Why we don't know more about the social benefits of



moderate drinking. *Ann Epidemiol* 2007;17:S71-4). While research reflecting a biomedical focus has been vital in understanding the risks associated with hazardous levels of alcohol use, it has rarely examined the role that low to moderate (defined as 10 to 20 grams of ethyl alcohol per day) levels of drinking may play in social engagement as a social lubricant. In this context, alcohol may be instrumental in facilitating social engagement for some older people and, by extension, positive outcomes in health and wellbeing. Perspectives such as these, which highlight the conviviality and pleasure associated with social drinking, are difficult to capture in purely quantitative research, and yet are critical to understanding the benefits older people gain through alcohol use, and hence help to explain why they drink. An important caveat is that older people's alcohol use needs to be viewed not solely through a biomedical lens, but rather from a holistic perspective which acknowledges the complex role alcohol plays in many older people's lives. (Wilkinson C, Dare J. *Shades of Grey: The Need for a Multi-disciplinary Approach to Research Investigating Alcohol and Ageing*. *J Public Health Res* 2014;3:180).

Health scare or sensible advice

The positive and valuable roles of alcohol in older people's lives - found in a systematic review of qualitative studies exploring older people's perceptions and experiences - contrast with the majority of studies of older people's drinking, which focus on risks to health and alcohol use as a coping mechanism for the challenges of ageing. (Bareham BK, Kaner E, Spencer LP, Hanratty B. *Drinking in later life: a systematic review and thematic synthesis of qualitative studies exploring older people's perceptions and experiences*. *Age and Ageing* 2018; 0: 1-13.) Drinking in older people is strongly linked to social engagement and there is skepticism about the health risks of alcohol, however drinking is also linked to difficulties such as social isolation, illness or bereavement. Older people often regulate their own drinking and strategies that emphasise the life experience of older people to drink wisely could be helpful. The evidence supports a strong social role for drinking alcohol, which should be taken into account in any policy development with the potential benefits of social participation for cognitive health. Approaches to reducing

alcohol use in older people need to avoid paradoxical harm, with a need for approaches that reduce harm from drinking alcohol but retain the benefit of socialising. (Kelly S, Olanrewaju O, Cowan A, Brayne C et al. *Alcohol and older people: A systematic review of barriers, facilitators and context of drinking in older people and implications for intervention design*. *PLoS One* 2018;13(1):e0191189).