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Tom Nolan's research reviews—3 February 2022

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Ventilators on display

We've probably reached the stage of the pandemic where someone, somewhere, must be dreaming up plans for a national covid-19 museum. I, for one, can't wait to take the kids to the taped-off children's play area, have a coffee at the Downing Street Garden Cafe (available for private parties with a fully licensed bar), and buy a tiny bottle of alcohol gel for £10 from the gift shop. Among the exhibits will hopefully be a prototype of the Dyson ventilator: the UK government ordered 10 000 of them in March 2020 and then cancelled the order in April.

In the meantime, the RECOVERY-RS trial was quickly set up to assess whether non-invasive ventilation (NIV) or conventional oxygen therapy would lead to fewer patients with hypoxaemia due to covid-19 going on to need tracheal intubation or dying within 30 days. The researchers started recruiting on 6 April 2020, and the peer reviewed findings have now been reported. Fewer patients given NIV reached the composite end point (36.3% (137/377) versus 44.4% (158/356)). But when the endpoints are separated out, NIV reduced tracheal intubation but had no effect on mortality at 30 days.

JAMA doi:10.1001/jama.2022.0028

Death rates and urates

Two recent randomised controlled trials assessing whether allopurinol may be renoprotective in patients who do not have gout found no benefit to renal function and a non-statistically significant increase in mortality. This prompted researchers to look at mortality in patients over 40 years old with gout and chronic kidney disease, examining records in UK primary care. They found no association between initiating allopurinol, or achieving target serum urate levels with allopurinol, and increased mortality.

The study also provides some interesting real-world data on what happens after that first prescription of allopurinol. When putting guidelines into practice, such as titrating allopurinol to a target serum urate level, there are so many patient, clinician, and system factors that need to align. In this example, two thirds of those who initiated treatment didn't reach the target serum urate levels within a year, and a third of those stopped treatment after the first prescription.

Ann Intern Med doi:10.7326/M21-2347

Smoking games

Gamification is a big thing in healthcare, with app developers adding gaming elements to interventions. The theory is that replicating the endorphin rush of, say, guessing the word "knoll" on the third attempt in my daily dose of Wordle, will help me to make positive behaviour changes. That many of these health gaming tools are promoted as effective

interventions without any attempt to study them in a clinical trial can be frustrating, so credit to the team of researchers who have just published a randomised clinical trial of *Take A Break*. This is "a novel game experience with mobile tools" to engage and motivate people who are not yet ready to quit smoking, and not to be confused with the other *Take A Break*—the weekly magazine packed full of real life stories and puzzles to keep your brain active.

They found that 18% of the intervention group had quit smoking at six months compared with 10% of the control group, who were offered only nicotine replacement therapy. Note that this was a small, unblinded study of a complex intervention featuring five behavioural components including text message quizzes, a goal-setting phone call, mHealth apps, and gift card incentives.

JAMA Intern Med doi:10.1001/jamainternmed.2021.7866

Asymptomatic atrial fibrillation screening gets the thumbs down

A few years ago our clinical commissioning group bought each general practice in the area a mobile electrocardiogram (ECG) recording device. At the training session there were a lot of impressed smiles each time someone put their thumbs on the metal sensors and an ECG rhythm strip appeared on their phone. Our device rarely got used, but some practices used them for opportunistic screening or incorporated them into healthcheck appointments on the reasonable premise that atrial fibrillation (AF) is a treatable cause of stroke. Later, we started getting paid according to the percentage of patients aged over 50 years we had performed a pulse check on. But do people with asymptomatic screen-detected AF benefit from oral anticoagulants?

The US Preventive Services Task Force (USPSTF) has just updated its recommendations on screening for AF and kept its recommendation that the current evidence is insufficient to assess the balances of benefits and harms of screening for AF in asymptomatic adults aged 50 years and older. An editorial to accompany the recommendations is well worth a read. It summarises two recent studies of screening in older people with either twice daily single-lead ECGs for two weeks or an implantable loop recorder, and concludes that "recent data support the finding that AF screening among asymptomatic individuals has no net benefit on outcomes. Non-beneficial interventions that add cost are not helpful for patients and create a net harm to society."

JAMA doi:10.1001/jama.2021.23732; *JAMA Intern Med* doi:10.1001/jamainternmed.2021.7283

The scale of antimicrobial resistance

The *Lancet* features a study of the global burden of bacterial antimicrobial resistance (AMR) in 2019. The analysis covered a whopping 471 million individual records or isolates and 7585 study-location-years. It estimated that 4.95 million deaths were associated with AMR in 2019, with the highest rates of death attributable to AMR occurring in western sub-Saharan Africa. For anyone studying for exams (or just wanting to impress on your next ward round), the six pathogens that were each responsible for more than 250 000 deaths from AMR in 2019 are: *Eschericia coli*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Streptococcus pneumoniae*, *Acinetobacter baumannii*, and *Pseudomonas aeruginosa*.

Lancet doi:10.1016/S0140-6736(21)02724-0