



AGENDA

British Geriatrics Society
Improving healthcare for older people

Issue 96 | February/March 2025
ISSN 2754-4532

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Multipurpose medicines

Polypharmacy is a particular problem among older people - but what if we knew more about the potential of medicines to do more than one job, asks Helen Cowan.

"Most older people in care homes are taking several medications and errors may arise at the point of prescribing, dispensing, administering or monitoring that medication. Recent research has highlighted the unacceptably high levels of medication error," writes the Centre for Policy on Ageing.¹ For the administering nurse, chance of error can be reduced by avoiding interruptions (perhaps by wearing a labelled jacket asking that they are not disturbed), and by requesting printed, rather than hand-written drug charts, with a photograph of the resident attached.

The report also suggests that staff training in medication is vital. Knowledge of individual drugs, their indication and side effects can reduce administration error, but it can be difficult for nurses to keep up to date with drug developments and discoveries. Even common drugs can confuse when prescribed for new conditions, with some medicines being truly multipurpose. Viagra, for example, started out as an anti-angina pill, but is perhaps a "little blue pill to treat all ills", prescribed for erectile dysfunction and pulmonary arterial hypertension, and showing promise in the treatment of cancer, heart disease² and Alzheimer's. When old drugs are taught new tricks, staff need training too.

Old wine in new bottles...

...is the title of a scientific paper written in Poland for the *European Journal of Pharmacology*, and refers to so-called 'drug repurposing' (rather than rebottling), where everything from aspirin to thalidomide, antibiotics to anti-diabetic drugs, are being tested for their potential to treat cancer. Just because a drug is designed for one condition, doesn't mean it can't treat another - thalidomide was identified originally as an anti-sickness drug (and did a lot of damage to unborn babies) but is now prescribed to treat a type of blood cancer, and has been tested against breast, lung and prostate cancer.

It works the other way too: clabridine and haematopoietic stem cell transplantation (HSCT) were originally treatments for cancer, and are now licensed as a treatment for relapsing multiple sclerosis. The MS Society³ are investigating, in the "Octopus" trial, whether other drugs might also be more multipurpose than first imagined. Sometimes it's the side effects of a drug which hint at how it might be helpful for a completely different condition.

The painkillers

Amitriptyline is taken to treat nerve pain and prevent migraine. It started out as an antidepressant yet has gained more popularity as a painkiller. Around ten million prescriptions were given to patients in England at the dose recommended for pain in 2022-2023, with five million issued at the higher dose for depression. With its widespread use, doctors are calling for clinical trials⁴ to evaluate its effectiveness as a painkiller, and to study safety when taken long-term.

Amitriptyline can also reduce bed-wetting at night in some children, when other treatments haven't worked. It's also prescribed to treat insomnia, though not licensed for this purpose, and the 'ATLANTIS' trial suggests it can relieve symptoms of irritable bowel syndrome in adults (mean age 48). Acting on the brain, bladder and bowel, amitriptyline could have untapped potential. A word of caution though - in older adults, amitriptyline is a drug which it is recommended to target in deprescribing discussions. We know there is limited evidence of its benefit in managing chronic pain in this patient group,⁵ and there is some evidence that it causes harm in older patients.⁶

Other pleiotropic painkillers (meaning they have many effects) include morphine and codeine. Both are prescribed for pain - and can suppress cough. Morphine can also relieve breathlessness in cancer, whilst codeine constipates, relieving diarrhoea. Pregabalin, meanwhile, is a painkiller and an anti-epileptic and anti-anxiety drug.

The anaesthetic and antiviral drugs

For 50 years, ketamine⁷ has been used as an important anaesthetic in human and animal medicine. "More recently, ketamine has been studied and used for several new indications, ranging from chronic pain to drug addiction and post-traumatic stress disorder," writes Dr Samuel Kohtala from the University of Helsinki. It also has potential in the treatment of depression, though it's early days. "The ability of ketamine to provide a rapid relief of depressive symptoms, often within hours, has brought it to the forefront of treating severe treatment-resistant depression," he writes.

Could anaesthetics help the heart as well as the head? It's long been pondered whether some inhaled anaesthetics protect the heart⁸ from injury during a heart attack or heart surgery, perhaps by triggering release of antioxidants within. I studied this for my PhD back in 2000, but it's proving difficult to translate from the laboratory bench to the bedside.

The antiviral drug amantadine made a surprise announcement as a treatment for Parkinson's in the 1960's when a patient with the movement disorder noticed relief of her symptoms whilst taking amantadine to treat a bout of flu; side effects here signalling a surprising new use for an existing medicine. Today amantadine can be used for involuntary movements in Parkinson's,⁹ for complications of shingles and, sometimes, for relieving fatigue in multiple sclerosis.¹⁰

The healthy heart medicines

Type 2 diabetes and raised cholesterol both increase your risk of heart disease and stroke: metformin and statin drugs lower sugar and cholesterol levels respectively and perhaps treat a whole host of other conditions in the body too. Metformin might actually turn out to be something of a wonder drug.¹¹ Dr Robert H. Shmerling, writing for Harvard Health Publishing, notes that, beyond diabetes, metformin is prescribed for polycystic ovary syndrome, to help with fertility and menstrual regulation; it might also minimise the weight gain sometimes seen with antipsychotic drugs used in schizophrenia. "Researchers are also investigating the potential of metformin to lower the risk of cancer in people with type 2 diabetes, lower risks for dementia and stroke...and slow ageing and increase lifespan," he writes. "If that's true, 'wonder drug' might be an understatement."

It may be too soon to celebrate, however, particularly for older people with frailty - the MET-PREVENT trial found that metformin did not improve physical performance and was poorly tolerated in older people with sarcopenia, with high rates of adverse events.¹²

Statins meanwhile are one of the most prescribed drugs in the UK, with an estimated 7-8 million adults taking them for heart health. They work to lower cholesterol and protect the inside of artery walls. They are also attracting attention as possible anti-cancer agents,¹³ and as drugs which might slow or stop disability progression for people with secondary progressive multiple sclerosis.¹⁴

Teaching old drugs new tricks

Is a phrase commonly used in scientific circles as clinicians consider new uses for existing drugs. NHS England established a 'Medicines Repurposing Programme' in 2021 to do just this, and gives an example of tocilizumab, an arthritis drug, repurposed to support recovery from COVID-19 pneumonia. Writing for the American Association for Cancer Research, Dr Srivani Ravoori wonders whether "good old aspirin might be a saviour for cancer patients".¹⁵

That, globally, we have not yet exhausted the uses of existing medicines gives hope that much needed cures for some of our most difficult to treat diseases could be closer than we think. For clinical staff, the challenge will be to keep up to date with the rapid rate of drug discovery, especially in an age of artificial intelligence, where complex biological and chemical languages are decoded at speed and cures may be conceived more quickly. Medication training really matters.

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