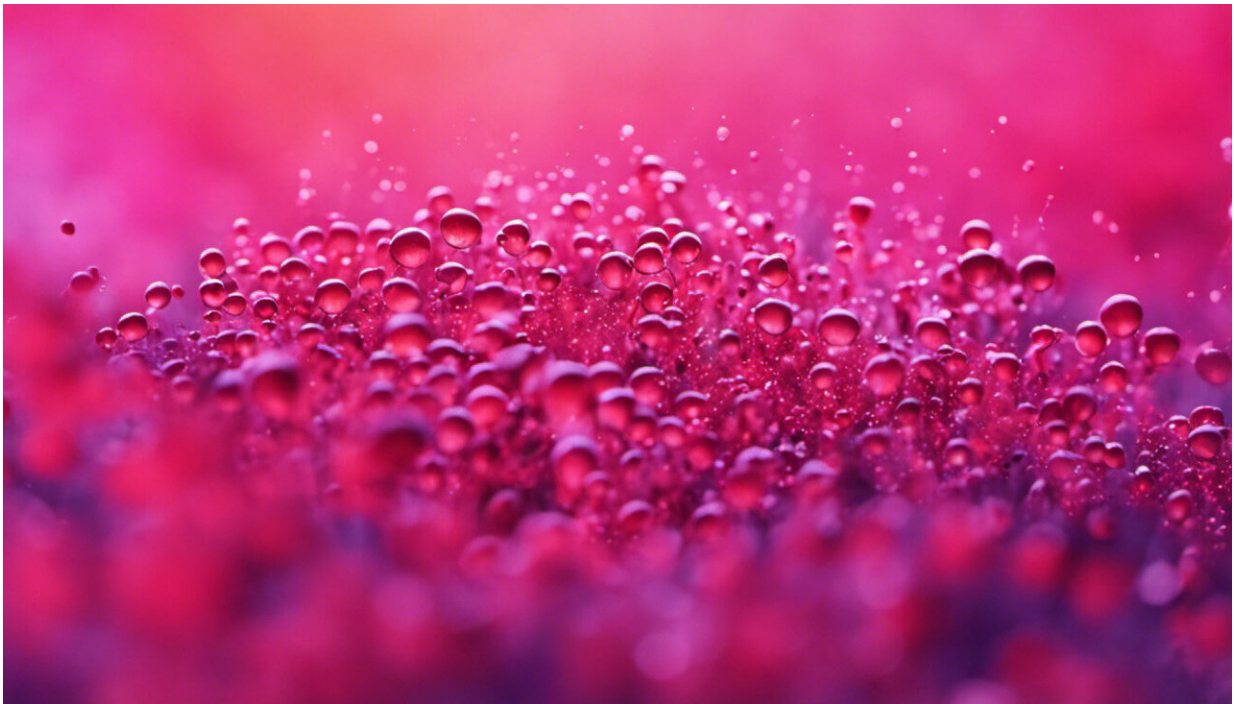


Why we're losing the fight against antibiotic resistance

January 21 2016, by Allen Cheng



Credit: AI-generated image ([disclaimer](#))

Doctors often tell patients to take a "course" of antibiotics, because a partially treated infection may result in relapse with antibiotic-resistant bacteria. But where does this advice come from?

As Lyn Gilbert has pointed out on The Conversation, there isn't good

evidence behind many of these recommendations. For GPs, the main determinant of the duration of antibiotics is the size of the pack they come in.

In hospitals, we also have some [odd rules](#) about antibiotics:

Prime numbers for durations of up to a week (three, five or seven days) Even numbers for more serious infections that take weeks to eradicate (two, four or six weeks) Multiples of three for really tenacious infections such as bone infections (three months) or TB (six months).

Of course, there is nothing magical about these numbers. I doubt anyone was harmed by stopping their treatment on day 89 instead of day 90.

Although this seems rather silly, it highlights the serious point that we often don't know exactly how long is necessary to treat many infections.

The evidence base for these recommended durations comes from the duration used in previous studies. But shorter courses often haven't been tested. [Clinical trials](#) that [test shorter durations](#) of treatment aren't as sexy as those testing a new antibiotic, but are also important.

If we could safely treat infections with shorter courses of antibiotics, this might help reduce the risk of [antibiotic resistance](#) developing in bacteria. On the other hand, inadequate treatment of infections can increase the risk of resistance, so the optimal treatment length is "just enough".

Grey areas in clinical diagnosis

One of the most difficult areas for new doctors is dealing with uncertainty. It is easy to catastrophise: every headache could possibly be meningitis, every cough could be pneumonia, every fever could be the harbinger of an overwhelming infection. The problem is, sometimes they

are. The junior (and senior) doctor's worst nightmare is to miss a serious diagnosis, be responsible for a patient's death and end up in court.

Given this uncertainty, it isn't surprising that doctors sometimes over-prescribe antibiotics. Despite clinical guidelines not to prescribe antibiotics for viral infections – and knowledge that antibiotics don't benefit [patients](#) who have bronchitis – it is easy to rationalise why "my" patient might be different.

Patients don't present to their doctors with a diagnosis; when doctors make the decision to prescribe antibiotics they rarely have the results of a test for viral flu, or a chest x-ray to diagnose pneumonia. Even in hospitals, where access to diagnostic tests isn't really a problem, the results of the test may not be available until well after the decision to prescribe antibiotics is made.

Another example is in [sinusitis](#). The [clinical trials](#) that looked at the role of antibiotics in sinusitis largely focused on those presenting to GPs in the community. They show little or no benefit for patients given antibiotics compared to those who did not receive antibiotics.

But what about patients who need to be hospitalised with sinusitis? What about a patient with sinusitis who responded well to antibiotics last time? What about a patient with sinusitis who had a heart transplant and is on medication to heavily suppress her immune system? Or the frail elderly patient with multiple chronic illnesses who probably wouldn't survive a serious infection?

[One way](#) we have been combating this problem in hospitals is to have "post-prescription" reviews. A team of pharmacists and infectious diseases specialists checks the notes and tests of patients who are prescribed broad spectrum antibiotics two to three days after they are started, with the sole aim to see if something better could be used.

This recognises that simple rules for prescribing don't account for how complicated patients can be, and that not all the information may be available when the initial decision is made.

Benefits for the individual, harm to others

Antibiotic resistance is, in many ways, a lot like global warming. We want to be warm and well fed, live comfortably in large houses and take holidays in exotic locations, but don't want to think about the consequences for the environment.

As Alex Broom wrote on The Conversation, doctors want the best for their patient, and giving antibiotics to treat or prevent [infection](#) provides a potential benefit for the patient. It is hard enough deciding on the balance of benefits and harms for the patient in front of you, let alone the potential "harms" to the wider community.

[Cultural factors](#) may be particularly important in clinical decision-making. When I worked in the United States, there was a strong feeling among many doctors that the individual being treated was the patient, and the impact on other patients was very much a secondary consideration. I once heard a doctor saying he used new, [broad spectrum antibiotics](#) because he wanted his patient to benefit from them before the bacteria became resistant to it.

On the other hand, the northern Europeans are well known for their low rates of [antibiotic use](#) and resistance.

I once worked in a hospital in Denmark and had a patient who was rather unwell with sinusitis, which had caused fever for more than two weeks. I explained to him that while the evidence generally didn't support the use of antibiotics for sinusitis, prolonged illness was a situation where we might consider using antibiotics. He said to me that he would prefer to

wait a few more days, just to see if he might avoid the need to take antibiotics.

In addition to the obvious cultural differences between Americans and Europeans, this suggests that education is required for both doctors and patients. Australia's National Prescribing Service is running a [Resistance Fighter](#) campaign to raise awareness of the dangers of unnecessary antibiotic use.

[Research findings](#) that antibiotic use actually increases the risk of resistance in the patient, and isn't just a hypothetical problem in a far-off future, is also an important message.

It is easy to make excuses for poor prescribing and no doubt a significant proportion of [antibiotics](#) are not required. We could do more by researching the optimal durations of treatment for different infections, setting up systems to deal with clinical uncertainty and educating both [doctors](#) and patients about the trade-off between antibiotic use and resistance.

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