

# Stick or carrot? How can hospital doctors be encouraged to prescribe antibiotics more appropriately?

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*In this blog for non-medical readers, retired GP Dr Lynda Ware, Senior Fellow in General Practice with Cochrane UK, looks at new Cochrane evidence on reducing unnecessary antibiotic prescribing by hospital doctors.*

Antibiotics are widely used to treat infections caused by bacteria and there is a year on year increase in the number of prescriptions issued. In 2015 NHS England reported a 12% increase in hospital inpatient antibiotic use. Studies have shown that patients who are hospitalised are highly likely to be given antibiotic therapy and up to 50% of all antibiotic use in hospitals may be inappropriate.

The overuse of antibiotics has led to an increase in antibiotic resistance, where antibiotics are no longer able to kill bacteria. This is a major public health problem and can lead to prolonged hospital stays and a higher risk of death. Inappropriate use of antibiotics is also linked to the emergence of healthcare-associated infections such as *Clostridium difficile* and MRSA, which pose a serious risk to patients, staff and visitors.

The cost of unnecessary antibiotic prescribing and of treating resistant infections is significant.

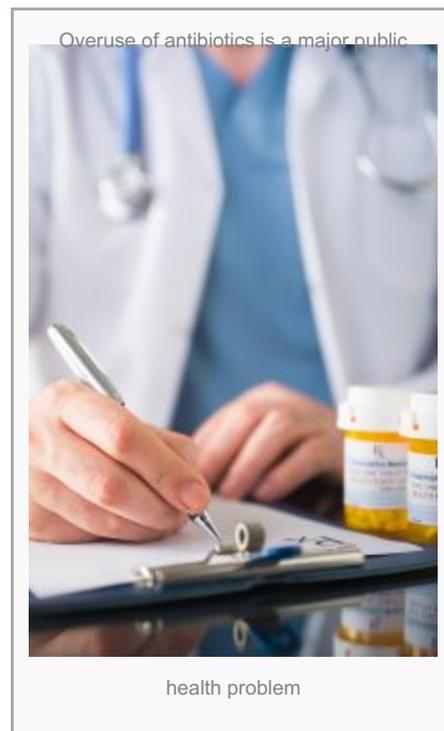
More than thirty years ago programmes (called Antimicrobial Stewardship) were introduced in hospitals to address inappropriate antibiotic prescribing and the increase in antibiotic resistance rates.

A [Cochrane Review](#) published this week looks at interventions to change doctors' behaviour and improve antibiotic prescribing for hospital inpatients.

## What did the Cochrane review look at?

The aim of the review was to assess different ways in which antibiotic prescribing to hospital inpatients might be improved. Two particular interventions were studied: **restrictive interventions**, where prescribing was carefully controlled and **enabling interventions**, where clinicians were helped to prescribe more appropriately by advice and feedback.

The reviewers found 221 studies, the majority of which came from Europe and North America. There were 58 randomized controlled trials (RCTs) and 163 non-randomized studies (NRS). The studies looked at the effectiveness and safety of the interventions and, in the main, compared prescribing patterns and clinical outcomes with and without an intervention added to usual hospital prescribing policy. The interventions were delivered in different ways e.g. 51% of the studies included interventions designed and delivered by a multidisciplinary team, 24% by specialist physicians (infectious diseases or microbiology) and 9% by pharmacists.



## What did the review find?

Data from 29 RCTs with 23,394 participants showed that when an intervention was in place more hospital patients were treated according to antibiotic prescribing policy. There was a 15% increase in compliance from 43% to 58%. This evidence was assessed as being of high certainty, which means that further research is unlikely to change the conclusions.

There was high certainty evidence from 14 RCTs with 3318 participants that the duration of antibiotic treatment decreased by two days (from 11 days to 9 per patient).

The interventions probably reduced the length of hospital stay from 13 days to 12 (15 RCTs with 3834 participants and moderate certainty evidence – this means that further research might change the conclusions). The risk of death was 11% for both the intervention and the no intervention control groups (28 RCTs, 15,827 participants and moderate certainty evidence), suggesting that reducing antibiotic prescribing did not lead to an increase in harm.

Looking more closely at the kinds of interventions used, the review showed that both restrictive and enabling interventions increased compliance to antibiotic prescribing policies (high-certainty evidence). Enabling interventions were better accepted by staff (perhaps not surprisingly) and, when combined with restrictive measures, improved adherence to prescribing rules. The most effective enabling technique appeared to be feedback to the prescribing physicians.

There was only very low certainty evidence about the effect that the interventions had on reducing hospital infections.



## What more do we need to know?

Peter Davey, lead author of the Cochrane Review summed this up :

*“We do not need more studies to answer the question of whether these interventions reduce antibiotic use, but we do need more research to understand why the most effective behavioural techniques are not more widely adopted within hospital settings.”*

The interventions included in this review are effective and safe but, as can be seen from the data, compliance to prescribing guidelines increased from 43% to 58%, indicating that there is still room for improvement.

The studies were mostly from Europe and North America. Antibiotic resistance is a global problem and ways to implement antibiotic stewardship must be sought worldwide.

The data in this review do not provide an answer to the question as to whether improving antibiotic prescribing reverses antibiotic resistance rates. This will require longer-term studies to assess the impact of stewardship measures.



## Final words....

From Diamantis Plachouras (European Centre for Disease Prevention and Control, Stockholm) and Susan Hopkins (Public Health England, London) :

*“Antimicrobial stewardship is effective and safe. We need to ensure that it is implemented, and this Cochrane Review highlights two key delivery methods. Political commitment and adequate funding will be essential if antimicrobial stewardship is to be implemented in every healthcare setting.”*

## Link:

Full citation: Davey P, Marwick CA, Scott CL, Charani E, McNeil K, Brown E, Gould IM, Ramsay CR, Michie S. [Interventions to improve antibiotic prescribing practices for hospital inpatients](#). Cochrane Database of Systematic Reviews 2013, Issue 4 . Art. No.: CD003543. DOI: 10.1002/14651858.CD003543.pub4.

Lynda Ware has nothing to disclose.