Australasian Society for Infectious Diseases: low value interventions

The challenge will be changing clinicians' behaviour and practice so that the use of low value interventions decreases

In March 2015, the Australasian Society for Infectious Diseases (ASID) was one of 41 medical societies of the Royal Australasian College of Physicians to participate in the EVOLVE initiative, aimed at identifying five practices or interventions that were of low value or of limited usefulness.[1] ASID members, including paediatricians, were surveyed and asked to short-list (and rank) suggested low value interventions (LVIs). From this survey emerged an overall short list that was circulated to respondents for further comment, and the final five LVIs were submitted to the ASID Council for endorsement.[1]

We present these five interventions below, with rationales as to why they are considered to be of low value. There are, of course, some uncommon situations where these interventions may demonstrate utility and we give some examples of these exceptions.

It is notable that four of the five interventions relate to the inappropriate use of antibiotics. Antibiotic use, both appropriate and inappropriate, is the major driver of antimicrobial resistance, which a recent World Health Organization report has highlighted as "an increasingly serious threat to global public health".[2] Inappropriate antibiotic use is also associated with a risk of *Clostridium difficile* infection,[3] an unnecessary risk of developing antibiotic allergy and unjustified health care costs.

The five low value interventions

1. Prescribing antibiotics for asymptomatic bacteriuria

Asymptomatic bacteriuria (with or without pyuria) is common, particularly in older patients, and does not require treatment. Antibiotic treatment for asymptomatic bacteriuria does not decrease the incidence of symptomatic urinary tract infection or systemic sepsis. This also applies to patients with indwelling catheters: bacteriuria is almost universal in patients with urinary catheters in situ for more than a few days, and antimicrobial therapy does not decrease their risk of clinical symptoms or sepsis.

Thus, it is generally recommended that clinicians request urine samples for microscopy and culture only when patients have symptoms. Because a positive urine culture from an asymptomatic patient may trigger a decision to prescribe unnecessary antibiotic therapy, not ordering the test is the best way to avoid this situation. There are a few situations where antibiotics are indicated for asymptomatic bacteriuria. The most common are during pregnancy,[4] when screening should be performed at the first antenatal visit,[3] and preoperatively for patients undergoing a urological procedure in which mucosal bleeding is anticipated.[4]

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2. Taking a swab of a leg ulcer without signs of clinical infection and treating the patient with antibiotics against the identified bacteria

Leg ulcers, such as venous ulcers, should not be investigated or treated for bacterial infection in the absence of clinical evidence of infection, such as purulent discharge or spreading erythema. There is no evidence that antibiotic therapy promotes wound healing in this setting[5] Swabbing an ulcer and performing microscopy and culture in the absence of clinical signs of infection may identify commensal flora of no clinical relevance. Even if a potential pathogen such as *Staphylococcus aureus* or a β-haemolytic streptococcus is present, antimicrobial therapy in the absence of significant inflammation is not recommended. These recommendations for leg ulcers (not to take a swab or treat with antibiotics unless there are clinical symptoms of infection) apply to many other skin conditions that may present with leg erythema, such as lower leg venous stasis, contact dermatitis, arterial ischaemia and dependent oedema.

3. Treating upper respiratory tract infections with antibiotics

Most uncomplicated upper respiratory tract infections (URTIs) are viral in aetiology and antibiotic therapy is not indicated. This is particularly relevant in young children, who frequently receive unnecessary antibiotic therapy for URTIs. The antibiotic volume of the Australian Therapeutic Guidelines recommends avoiding "routine use" of antibiotic therapy for acute rhinosinusitis.[3] Antibiotics are frequently prescribed for a purulent nasal discharge or to prevent secondary bacterial pneumonia,[6] but there is no evidence to support such use.

Symptomatic management and education about the lack of benefit and potential adverse effects of antibiotics are key in this setting. Education can change doctors' behaviour with regard to inappropriate prescribing of antibiotics,[7] and education for patients and their parents or caregivers should help them to understand that improvement in the patient's condition came with time and not as a result of inappropriately prescribed antibiotics.

There are specific URTIs where antibiotics are indicated, and these include *Streptococcus pyogenes* pharyngitis and *Bordetella pertussis* infection.

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doi: 10.5694/mja16.01427

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4. Investigation for faecal pathogens in the absence of diarrhoea or other gastrointestinal symptoms

Microscopy and culture or, more recently (and particularly), multiplex polymerase chain reaction (PCR) testing of faeces, should not be performed in the absence of diarrhoea or other gastrointestinal symptoms. Microbiology laboratories should not process a formed faecal specimen. Moreover, antimicrobial treatment for a potential gastrointestinal pathogen is not indicated in the absence of symptoms. For example, a patient whose diarrhoea has resolved by the time a microbiological diagnosis of *C. difficile* infection is made does not require treatment.

The recent introduction of faecal multiplex DNA-based diagnostic (PCR) methods has resulted in increased detection and reporting of several rarely pathogenic protozoa, especially *Blastocystis hominis* and *Dientamoeba fragilis*, as molecular methods are considerably more sensitive than microscopy. These organisms are often found in patients who are asymptomatic or whose symptoms are incompatible with enteric infection. Antimicrobial treatment is generally unnecessary and not recommended. The Australian and New Zealand Paediatric Infectious Diseases Group has highlighted this issue[8] and, following consultation, the Royal College of Pathologists of Australasia now recommends that diagnostic laboratories use multiplex PCR tests without targets for these two protozoans.[9]

There are times where testing of non-diarrhoea stool may be indicated. These include:

- screening of refugees for chronic parasitic infection that may be asymptomatic (eg, schistosomiasis and strongyloidosis);[10]
- neurological syndromes (eg, acute flaccid paralysis) where enteroviruses may be implicated on epidemiological grounds;[11] and
- to confirm faecal clearance of *Salmonella typhi* or *Salmonella paratyphi* after treatment of enteric fever in food handlers, under the direction of public health authorities.

5. Ordering multiple serological investigations for patients with fatigue without a clinical indication or relevant epidemiology

It is very unusual for serological testing (eg, for brucellosis, Q fever, rickettsial disease, syphilis) to identify an underlying cause of fatigue if there is no clinical indication of an infectious cause on history or examination and in the absence of relevant epidemiology (ie, known risk factors).[12] This is especially true if the patient has been fatigued for a prolonged period. Acute (IgM) serological testing is notoriously non-specific and often leads to further unnecessary investigations and treatments, with potential adverse effects, inconvenience, erroneous diagnoses (eg, in the case of false positive results) and cost.

Use of low value interventions

Although there are no national data on how often the LVIs described above are used in current clinical practice, some studies suggest they are likely to be widespread. In one report from New Zealand, more than three-quarters of patients with an URTI received antibiotics.[13]

The underlying reasons for the popularity of these interventions are multiple and include: lack of an evidence base for treating some conditions; the expectations of patients and caregivers;[14] suboptimal training and work pressure for clinicians;[15] the anxiety of missing the diagnosis of a significant condition;[16] and fear of litigation.[15] Broad spectrum testing and therapy may be perceived (almost always erroneously) to compensate in some way for the lack of an evidence base.[14]

The EVOLVE initiative continues to be a useful vehicle to question common but non-evidence-based and potentially wasteful and harmful clinical practices, and to identify and discuss interventions that are of low value. However, the lack of usefulness of many of these LVIs is already well known, so it is important to question why they are still being used.

The challenge for ASID, and for all the societies involved in the EVOLVE initiative, is influencing behaviour to change practice so that the use of identified LVIs by medical practitioners decreases. Widespread and ongoing education, directed both at practitioners and the community, should be enhanced. ASID's participation in the expert working groups that develop the antibiotic volume of the Australian Therapeutic Guidelines[3] is likely to influence inappropriate antimicrobial prescribing because these guidelines are evidence-based and widely used.

Antimicrobial stewardship activities in hospitals do decrease inappropriate antibiotic use,[17] and this may provide lessons for changing practice in the broader medical community. Finally, change may also be driven by incentives linked to best practice and by alterations to the regulatory environment, such as may come from the Medical Benefits Scheme Review.[18]

Competing interests: No relevant disclosures.

Provenance: Commissioned; externally peer reviewed. ■

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