Open Source Antimicrobial Stewardship Project www.opensourceams.com

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ABOUT THE PROJECT

Approval systems for restricted antimicrobials are listed as an essential strategy in the Australian Commission on Safety and Quality in Healthcare (ACSQHC, 2020) AMS Clinical Care Standard.

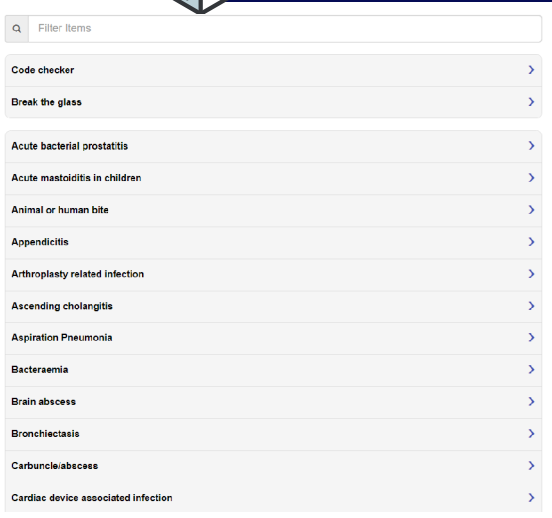
The Open Source Antimicrobial Stewardship Project (OSAMS) is a collaborative project to develop a free and open-source system to provide restricted antimicrobial approval and prescription advice.

This system differs from most traditional/commercial antimicrobial approval systems. Rather than assuming prescribers have prior knowledge of which antimicrobial is best for their patient, instead it provides a clinical decision support pathway for each approval code, helping to guide prescribing to achieve best outcomes.

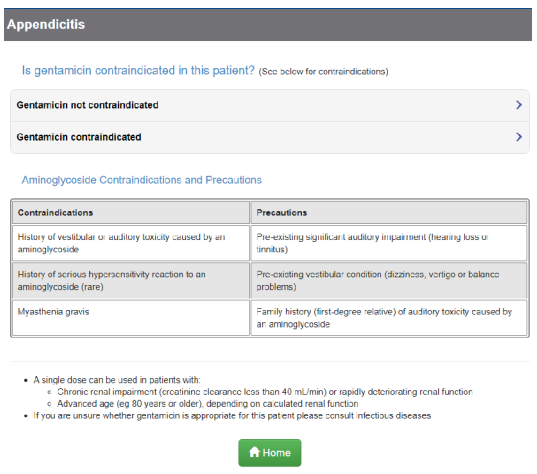
The project's aim is to reduce antimicrobial resistance and improve patient health outcomes within Australian healthcare, by providing a 'no-cost' option for evidence based electronic restricted antimicrobial approval. This system is now in use within 15 Australian hospitals, across eight Australian health services, and has been developed in line with current best practice recommendations for the design of clinical decision support systems (Kawamoto et al. 2005, Sutton et al. 2020).

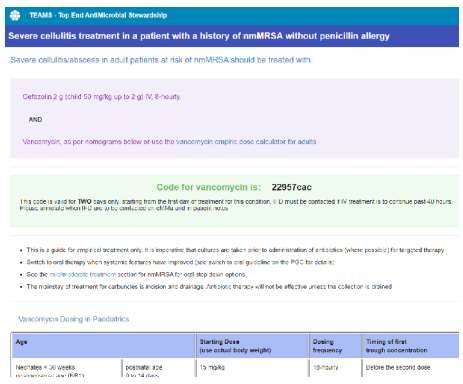
Further information about the project, the application's open-source license and the requirements to host the freeware application at your site are available at: https://opensourceams.com/

APPLICATION DESIGN



The OSAMS application consists of a set of decision support pathways ending in recommended treatments which may include a restricted antimicrobial approval code.

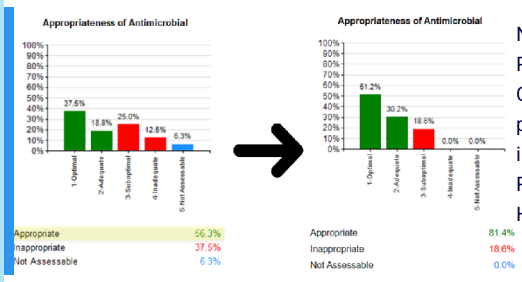




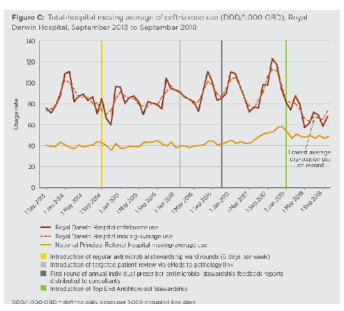
A typical treatment endpoint and approval. An overview of which decisions were taken to reach each endpoint are provided to the AMS team to help with review of the patient.

OUTCOMES AND NEXT STEPS

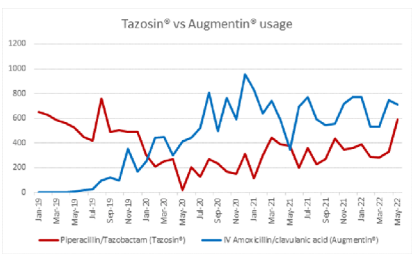
The OSAMS project has been positively received by most health services that have adopted the system. It was a winner at the 2018 Northern Territory Top End Health Service Innovation and Excellence Awards, and received nomination for exemplary clinical practice following accreditation assessment by the Australian Commission for Safety and Quality in Health Care in 2021.
Results from application implementation have demonstrated improvements in IV to oral antimicrobial conversion times, and reductions in broad-spectrum antimicrobial usage.
Staff surveys have repeatedly scored the application positively, with one hospital's emergency department scoring the application highest out of all its electronic clinical support tools (reviewing usability, staff knowledge, usage time and clinical relevance).
One site has opted to discontinue use of OSAMS due to lack of resources to maintain the application internally, and a lack of funding to contract external technical support.
At a recent review by a Country Health Service piloting the application, a 25% increase in antimicrobial appropriateness was observed following implementation of the application.
Another site have successfully incorporated treatment recommendations for COVID-19 infections during an outbreak.
On average, due to the flexibility in application design, minimal change management issues have been encountered. The open-source design caters for the needs of any specialty areas, ultimately improving user acceptance at health services adopting the application.



National Antimicrobial Prescribing Survey Comparison pre and post OSAMS pilot implementation at a Regional Australian Hospital.



Review of antimicrobial usage for ceftriaxone post implementation of the OSAMS (locally named Top End Antimicrobial Stewardship) application at Royal Darwin Hospital (AURA 2019).



Increase in IV amoxicillin/clavulanic acid usage vs piperacillin/tazobactam at Western Australia East Metro Health Service following pilot of OSAMS from September 2019.

As with any open-source project, OSAMS relies on a strong body of supporters, especially active clinicians and those with an interest in information technology (ICT).
The OSAMS application framework is made from simple 'vanilla' HTML and JavaScript, and can be updated using only a simple text editor.
It requires no specialised software or supporting frameworks to implement, and requires only a basic web server to host the application at your institution.
The application source code can easily be updated by a clinician who has completed some basic training via a free online course in basic JavaScript and HTML.
Alternately the application code can be provided to your local government ICT department, or you can contract external ICT support to update the application under a creative commons share-alike license with attribution.
If you have an interest in antimicrobial stewardship or in developing new skills in basic web development and would like to be involved in the ongoing improvement of OSAMS, or if you would just like a copy of the application to trial yourself then please email: info@opensourceams.com

References

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AURA 2019: Third Australian report on antimicrobial use and resistance in human health. Available at https://www.safetyandquality.gov.au/our-work/antimicrobial-resistance/antimicrobial-use-and-resistance-australiasurveillance-system/aura-2019 (accessed June 14, 2022). Google Scholar
Kawamoto, Kensaku, Caitlin A. Houlihan, E. Andrew Balas, and David F. Lobach. "Improving clinical practice using clinical decision support systems: a systematic review of trials to identify features critical to success." Bmj 330, no. 7494 (2005): 765.
Sutton, Reed T., David Pincock, Daniel C. Baumgart, Daniel C. Sadowski, Richard N. Fedorak, and Karen I. Kroeker. "An overview of clinical decision support systems: benefits, risks, and strategies for success." NPJ digital medicine 3, no. 1 (2020): 1-10.