TRIM: D15-9765

What are antibiograms?

Antibiograms are tables showing how susceptible a series of organisms are to different antimicrobials.

Antibiograms summarise the cumulative proportions of pathogenic organisms that are susceptible to particular antimicrobials. This provides a profile of the susceptibilities of specific pathogenic bacteria to antimicrobial agents as tested in routine clinical microbiology practice.

Producing annual cumulative antibiograms is a key strategy for antimicrobial stewardship as it provides a health service with information about which antimicrobials are more or less effective for different organisms, which informs antimicrobial choices for formularies and antimicrobial prescribing policies for health care services.

Producing a series of antibiograms can be used to track changes in resistance patterns over time, .and can inform the development of therapeutic guidelines at the national, regional and local level.

Table 1: Example of an extract of an antibiogram

Organism	Amikacin		Amoxycillin		Cefotaxime		Ceftazidime		Cephalothin		Ciprofloxacin	
	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n
Acinobacter baumannii	90.2	41	3.1	32	42.9	42	50	38	0	32	70.5	44
Escherichia coli	100	484	54.7	525	99.8	492	100	428	69.4	520	99	514

%S = percentage of isolates susceptible to the antimicrobial; n = number of isolates tested for susceptibility

How are antibiograms created?

Antibiograms are constructed from susceptibility testing data accumulated routinely in microbiology laboratories. For each pathogenic organism that undergoes susceptibility testing, the pattern of susceptibility and resistance is recorded in the laboratory information system as an antibiogram, with some or all of this information reported to the treating clinician to guide therapy. By analysing large amounts of such data over time, a cumulative antibiogram can be generated for each organism of interest.

In general, antibiograms summarise susceptibilities of first isolates from individual patients for urine, non-urine (all other body sites) and blood isolates where there are sufficient numbers of isolates to provide statistically reliable data.

Standards for analysis and presentation of antibiograms are provided in reference documents such as the Clinical and Laboratory Standards Institute guideline M39-A2 and the Specification for a Hospital Cumulative Antibiogram. Tabulated cumulative antibiograms should be produced for hospitals and other institutions annually.

Caveats for interpretation

Individual antibiograms do not detect trends because they are a summary of data accumulated over a fixed interval (usually one year).

The method used for susceptibility testing will influence the susceptibility rates reported in cumulative antibiograms. Users should be aware of the susceptibility testing methods employed by the laboratory to generate the antibiograms, because interpretive criteria (breakpoints that define susceptibility and resistance) differ between methods, and are also subject to review and change.

Cumulative hospital-wide antibiograms that aggregate data from diverse patient populations and locations can obscure differences in patient populations, whilst antibiograms stratified by population, age or hospital unit may have more potential to influence antibiotic selection.

Further information

Specification for a hospital-level cumulative antibiogram:
http://www.safetyandquality.gov.au/our-work/safety-in-e-health/national-safety-and-quality-health-service-standard-3-14-3/

Analysis and presentation of cumulative antimicrobial susceptibility test data; approved guideline:
http://shop.clsi.org/c.1253739/site/Sample_pdf/M39A4_sample.pdf

National surveillance and reporting of antimicrobial resistance and antibiotic usage for human health in Australia:
http://www.safetyandquality.gov.au/publications/national-surveillance-and-reporting-of-antimicrobial-resistance-and-antibiotic-usage-for-human-health-in-australia/

November 2015