

ANTIBIOTIC-RESISTANT BACTERIA

A threat to patient safety in hospitals



[Placeholder for national ministry logo]

Antibiotic-resistant bacteria have become an everyday concern in hospitals across Europe. Infections with antibiotic-resistant bacteria render appropriate antibiotic therapy difficult and may cause complications in patients leading to prolonged hospital stays, more severe illness and sometimes death.

Antibiotics – handle with care

Misuse of antibiotics is one of the main factors driving the development of antibiotic resistance in hospitals. Unfortunately, misuse of antibiotics is not uncommon. For example, patients are highly likely to receive antibiotics during their hospital stay and studies show that 50% of all antibiotic use in hospitals can be inappropriate.

Misuse of antibiotics can include any of the following:

- When antibiotics are prescribed unnecessarily
- When antibiotic administration is delayed in critically ill patients
- When broad-spectrum antibiotics are used too generously, or when narrow-spectrum antibiotics are used incorrectly
- When the dose of antibiotics is lower or higher than appropriate for the specific patient
- When the duration of antibiotic treatment is too short or too long
- When antibiotic treatment is not streamlined according to microbiological culture data results

Prudent use of antibiotics can prevent the emergence and selection of antibiotic-resistant bacteria. All hospital prescribers can play an active role in reversing the increasing rates of antibiotic-resistant bacteria.

Measures that guide antibiotic prescribing are likely to decrease antibiotic resistance in hospitals. Such measures include:

1. Obtaining cultures

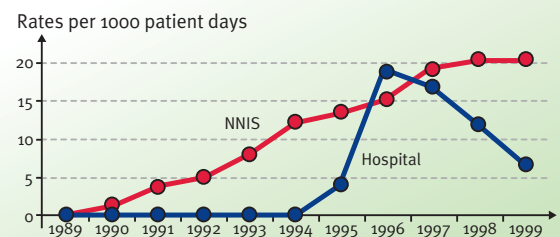
Take appropriate and early cultures before initiating empiric antibiotic therapy, and streamline antibiotic treatment based on the culture results.

2. Monitoring local antibiotic resistance patterns

Being aware of local antibiotic resistance patterns (antibiograms) enables appropriate selection of initial empiric antibiotic therapy.

3. Consulting specialists

Involve infectious disease physicians, microbiologists and pharmacists in your decisions about antibiotic therapy during your patient's stay.



Source: Carling P, Fung T, Killion A, Terrin N, Barza M. Favorable impact of a multidisciplinary antibiotic management program conducted during 7 years. *Infect Control Hosp Epidemiol.* 2003 Sep;24(9):699-706

Studies show that antibiotic management programmes help decrease rates of resistant bacteria:

Rates of Vancomycin-resistant *Enterococci* in hospital before and after implementation of the antibiotic management program compared with rates in National Nosocomial Infections Surveillance (NNIS) System* hospitals of similar size.

Antibiotic Awareness Day is a European health initiative.

For more information please visit:

[Placeholder for national web address]

[Placeholder for updated ECDC AMR web address]

*NNIS is now the National Healthcare Safety Network (NHSN).

Sources: European Antimicrobial Resistance Surveillance System [database on the Internet]. RIVM. 2009 [cited March 30, 2010]. Available from: <http://www.rivm.nl/earss/database/>. Davey P, Brown E, Fenelon L, Finch R, Gould I, Hartman G, et al. Interventions to improve antibiotic prescribing practices for hospital inpatients. *Cochrane Database Syst Rev.* 2005(4):CD003543. Cosgrove SE, Carmeli Y. The impact of antimicrobial resistance on health and economic outcomes. *Clin Infect Dis.* 2003 Jun 1;36(11):1433-7. Roberts RR, Hota B, Ahmad I, Scott RD, 2nd, Foster SD, Abbasi F, et al. Hospital and societal costs of antimicrobial-resistant infections in a Chicago teaching hospital: implications for antibiotic stewardship. *Clin Infect Dis.* 2009 Oct 15;49(8):1175-84. Kollef MH, Sherman G, Ward S, Fraser VJ. Inadequate antimicrobial treatment of infections: a risk factor for hospital mortality among critically ill patients. *Chest.* 1999 Feb;115(2):462-74. Ibrahim EH, Sherman G, Ward S, Fraser VJ, Kollef MH. The influence of inadequate antimicrobial treatment of bloodstream infections on patient outcomes in the ICU setting. *Chest.* 2000 Jul;118(1):146-55. Lodise TP, McKinnon PS, Swiderski L, Rybak MJ. Outcomes analysis of delayed antibiotic treatment for hospital-acquired *Staphylococcus aureus* bacteremia. *Clin Infect Dis.* 2003 Jun 1;36(11):1418-23. Alvarez-Lerma F. Modification of empiric antibiotic treatment in patients with pneumonia acquired in the intensive care unit. *ICU-Acquired Pneumonia Study Group. Intensive Care Med.* 1996 May;22(5):387-94. ECDC, EMEA. ECDC/EMA Joint Technical Report: The bacterial challenge: time to react 2009. Willemsen I, Groenhuijzen A, Bogaers D, Stuurman A, van Keulen P, Kluytmans J. Appropriateness of antimicrobial therapy measured by repeated prevalence surveys. *Antimicrob Agents Chemother.* 2007 Mar;51(3):864-7. Singh N, Yu VL. Rational empiric antibiotic prescription in the ICU. *Chest.* 2000 May;117(5):1496-9. Lepper PM, Grusa E, Reichl H, Hogel J, Trautmann M. Consumption of imipenem correlates with beta-lactam resistance in *Pseudomonas aeruginosa*. *Antimicrob Agents Chemother.* 2002 Sep;46(9):2920-5. Gyssens IC, van den Broek PJ, Kullberg BJ, Hekster Y, van der Meer JW. Optimizing antimicrobial therapy. A method for antimicrobial drug use evaluation. *J Antimicrob Chemother.* 1992 Nov;30(5):724-7. Carling P, Fung T, Killion A, Terrin N, Barza M. Favorable impact of a multidisciplinary antibiotic management program conducted during 7 years. *Infect Control Hosp Epidemiol.* 2003 Sep;24(9):699-706. Byl B, Clevenbergh P, Jacobs F, Struelens MJ, Zech F, Kentos A, et al. Impact of infectious diseases specialists and microbiological data on the appropriateness of antimicrobial therapy for bacteremia. *Clin Infect Dis.* 1999 Jul;29(1):60-6; discussion 7-8. Beardstey JR, Williamson JC, Johnson JW, Ohl CA, Karchmer TB, Bowton DL. Using local microbiologic data to develop institution-specific guidelines for the treatment of hospital-acquired pneumonia. *Chest.* 2006 Sep;130(3):787-93. Rello J, Gallego M, Mariscal D, Sonora R, Valles J. The value of routine microbial investigation in ventilator-associated pneumonia. *Am J Respir Crit Care Med.* 1997 Jul;156(1):196-200.