American Thoracic Society (ATS) and Infectious Diseases Society of America (IDSA) guidelines recommend the following:

- Early, appropriate, broad spectrum, antibiotic therapy at adequate doses to optimize efficacy
- Empiric regimens to include agents from a different antibiotic class than the patient has recently received (use local microbiological data to adapt treatment recommendations to a specific clinical setting)
- Combination therapy for specific pathogen (e.g., Amino glycoside for 5 days along with β-lactam for P. aeruginosa pneumonia)
- Consider de-escalation of antibiotics based on results of lower respiratory tract cultures and patients' clinical improvement.
- Empiric MRSA coverage with Vancomycin or Linezolid
- Use short course antibiotics (8 days) for patients with uncomplicated HAP, VAP, or HCAP.

It is important to recognize that hospital acquired pneumonia occurring in the first 5 days (early onset HAP), are due to relatively sensitive and innocuous bacteria which originated from the community (Strep Pneumoniae, H. influenza, Methicillin Sensitive Staph Aureus), and hence can be treated with simpler antibiotics (like 3rd gen cephalosporins, quinolones, amoxy clav, ertapenem etc).

However the initial empiric antibiotic for late onset VAP should target the MDR pathogens (Pseudomonas aeruginosa, Klebsiella Pneumoniae, Acinetobacter species. Use of Antipseudomonal carbapenem (imipenem, meropenem, piperapenicillin-tazobactum, +/- fluroquinolones or amino glycosides are recommended.

WHO warns: Antimicrobials, more than 150 of them, are losing their fight over the microbes as more and more people are being prescribed anti microbial where none is required. As per the fact sheet No.194 of WHO revised in January 2002, 'total consumption of anti microbials is the critical factor in selecting resistance'. WHO states further ‘...for these reasons, improving use is a priority if the emergence and spread of resistance are to be controlled'. Probability increases with recent use of an antibiotic.

Overcoming Bacterial Resistance: One of the major areas where antibiotics are used and misused is in the patients admitted into the hospitals, especially the intensive care units. Nosocomial pneumonias (including Hospital Acquired Pneumonia, Ventilator Associated Pneumonia, and the newly introduced category called Health Care Associated Pneumonia) are a clinical challenge to treat. Pneumonia accounts for a staggering 27% of all nosocomial infections in the adult Intensive Care Units.

Ideally, the criteria for diagnosing Pneumonia, is fever, purulent sputum, CXR infiltrate, leukocytosis or leucopenia (CDC definition). But many a time antibiotics may be initiated on insufficient grounds. On the other hand knowledge of the guidelines will help the clinician to choose the right antibiotic.

R Vijai Kumar, Hyderabad

“...The soil is everything, the seed is nothing”.

Louis Pasteur

A 12 year old boy in Brooklyn (USA) had a wound he sustained while playing basket ball. Eventually it got infected with MRSA, and young Omar Rivera died on 26th October 2007.

The reason for Omar's infection was overuse or abuse of Antibiotics for patients who did not need Antibiotics in the first place. The moment the bacteria are exposed to an Antibiotic, its useful lifetime begins a count down. Over a period of time the bacteria learns to resist the Antibiotic with it's ingenious methods like drug destruction, drug excretion, and target replacement and can even undergo mutation.

The possibility of healthy people contracting a severe and resistant infection like MRSA was unthinkable a decade ago. In the USA, MRSA is a cause for death in 19000 people, while HIV/AIDS kills even less. In fact one out of 5 infected with MRSA is destined to die. The cost of treating MRSA with drugs like Vancomycin for 10 days in a tertiary care hospital can cost the patient anywhere between Rs.2 lacs to Rs.5 lacs.

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Inappropriate therapy drives resistance

Resistance among gram negative bacteria is a major problem, worldwide.

**Anti Pseudomonal Antibiotics:** The worldwide resistance to Carbapenems for Enterobacteriaceae, Pseudomonas, and Acinetobacter is a cause for concern. Anti Pseudomonal Antibiotics are a finite and limited resource. Their use in community acquired infections should be avoided, simply because Pseudomonas is an unlikely organism outside the hospital. Thus use of antibiotics like Cephaperazone, imipenem, meropenem, piperacillin, amino glycosides, should avoided in the community acquired infections.

**REFERENCES**

5. www.rivm.nl/earss/result/monitoring_reports/annual_reports