

SURGICAL CRITICAL CARE ANTIBIOTIC CONTROL PROGRAM

Empiric Antibiotic Therapy: Appropriate empiric antibiotic selection for infectious processes in critically ill patients has been demonstrated to dramatically reduce mortality (~50% reduction). The likely pathogens causing nosocomial infections in an individual are determined by the unit of origin, length of hospitalization and by antibiotic exposure. Both the pathogens and their sensitivity to antibiotics vary unit to unit. Thus, empiric coverage for nosocomial infections should be determined by historical data regarding the likely pathogens and pathogen sensitivities for each unit.

Limiting Antibiotic Resistance: Infections caused by antibiotic resistant pathogens increase hospital length of stay, costs, and mortality. The single strongest risk factor for development of nosocomial infection with a resistant pathogen is prior recent exposure to antibiotics. Some strategies to limit antibiotic resistance include:

- 1) de-escalation therapy – broad empiric coverage is narrowed to cover only proven pathogens obtained by appropriate and specific culture techniques (quantitative or sterile site cultures)
- 2) antibiotic stewardship – prophylactic antibiotic use limited to proven settings with shortest course and narrowest spectrum, empiric coverage provided only when adequate data suggests likely site of infection and with the appropriate institution of non-antibiotic therapy to obtain source control, implementation of shortest therapeutic antibiotic courses and with the narrowest spectrum with proven efficacy
- 3) maintenance of geographic antibiotic heterogeneity – cycling strategies in which different agents are utilized for the various clinical infections (pneumonia vs other) and are rotated over time

Antibiotic program for surgical critical care units:

On a quarterly basis, the most common pathogens for blood stream infections, hospital acquired pneumonia, and surgical site infections for the surgical ICUs will be reviewed using the Infection Control Database (data obtained from continuous infection control surveillance) for the previous one year period. Unit specific sensitivities of the isolates from the past year will be utilized to determine the most appropriate empiric antibiotic selections. Rotation of the empiric antibiotic selections will occur on a quarterly basis (unit data used to verify appropriate empiric coverage of majority of likely pathogens) Computerized order sets for empiric coverage of appropriate infections will be created and updated on a quarterly basis.

Infection control data:

VUMC maintains continuous infection control surveillance within the intensive care units. This data is prospectively collected by experienced, well trained, and highly skilled Infection Control Practitioners who review data concurrent to collection and ensure quality of information and appropriate standards and definitions. Historically, data has been reported to the CDC-NNIS system but until recently was not easily queried to allow in-depth analysis. Translation of this data into database that allows analysis more easily has recently occurred enabling “real-time” analysis of unit specific shifts in pathogens and resistance.

Operational structure and procedures:

Program Director – Addison K. May, MD, FACS, FCCM

Responsible for overall program, communication with unit medical directors, SCC platform, CCI and Clinical PharmD's .

Infection Control –

Tom Talbot, MD, Chair of the Infection Control Committee, and the Infection Control Practitioners for the ICUs collect and provide information on nosocomial infections via the Infection Control/Nosocomial Infections Database

ICU Clinical PharmDs –

Sloan Flemming – TICU, Marcus Dortch – SICU, Mark Sullivan – NICU.

Assist in data analysis for each unit, antibiotic selection and dosing considerations and liaison to pharmacy and P&T committee

ICU Medical Directors –

Each will maintain authority over implementation of program within their unit and in maintaining compliance

Center for Clinical Improvement –

To maintain Infection Control Database and appropriate access to designated personnel