

# **INFECTION CONTROL ISSUES**

## **IN LONG TERM CARE NURSING FACILITIES**

**PREPARED BY:**

**AUDRIUS V. PLIOPLYS MD, FRCPC, FAAP, CMD**

**MEDICAL DIRECTOR OF ALDEN VILLAGE, LITTLE ANGELS,  
MARKLUND, PHILIP ROCK CENTER AND SCHOOL**

**ASSISTANT PROFESSOR  
DEPARTMENT OF NEUROLOGY  
UNIVERSITY OF ILLINOIS**

**DDNA-NORTHERN ILLINOIS CHAPTER MEETING**

**MAY 1, 1996, HILLSIDE, IL**

**HAND WASHING**

**HAND WASHING**

**HAND WASHING**

**HAND WASHING**

**HAND WASHING**

**HAND WASHING**

**HAND WASHING**

**HAND WASHING**

**HAND WASHING**

**HAND WASHING**

**HAND WASHING**

**HAND WASHING**

**HAND WASHING**

**HAND WASHING**

**HAND WASHING**

**HAND WASHING**

**HAND WASHING**

**HAND WASHING**

**HAND WASHING**

**HAND WASHING**

# PENICILLINS

**DISCOVERED 1941 -- STILL #1 FAMILY OF ANTIBIOTICS**

**AS A GROUP STILL #1 ANTIBIOTIC: BACTERIOCIDAL**

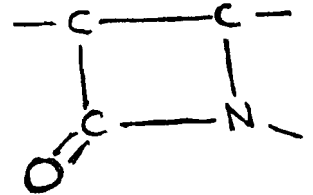
**INHIBIT CELL WALL PRODUCTION AND ACTIVATE AUTOLYSIS**

**ENTIRE BODY, LOW TOXICITY, HIGH EFFICACY**

**10% ALLERGIC TO PENICILLIN**

**QUICKLY DEVELOPED RESISTANCE: BETA LACTAMASE**

- METHICILLIN
- OXACILLIN
- DICLOXACILLIN      STAPH + STREP



**STAPH DEVELOPED NEW PROTEINS THAT DO NOT BIND  
PENICILLIN INTRACELLULARLY -- GENETIC CHANGE -- 1980'S: MRSA**

**GRAM - BACILLI COVERAGE: H FLU, PSEUDOMONAS,  
ENTEROCOCCI**

- AMPICILLIN
- AMOXICILLIN
- CARBENICILLIN, ETC.

**PENICILLIN + BETA LACTAMASE INHIBITOR**

- CLAVULONIC ACID + AMOX. (AUGMENTIN)
- SULBACTAM (IV USE)

# CEPHALOSPORINS

**ACTION IDENTICAL TO PENICILLINS**

**BETA LACTAM RING WITH SIDE ADDITIONS**

**ORIGIN FROM ANOTHER FUNGUS**

**SIDE EFFECTS SAME AS PCN; ALSO DRUG-INDUCED FEVER**

**BROAD SPECTRUM: GRAM - AND +**

**1ST GENERATION: STREP + STAPH**

- DURICEF (CEFADROXIL)
- KEFLEX (CEPHALEXIN)

**2ND GENERATION: STREP + STAPH**

- CECLOR (CEFACLOR)
- CEFTIN (CEFUROXIME)

**3RD GENERATION: MANY GRAM -:  
H FLU, NEISERIA, SERRATIA, ENTEROBACTER**

- SUPRAX (CEFIXIME)
- ROCEPHIN (CEFTRIAZONE)  
(PARENTERAL: GOOD CNS AND RENAL FAILURE)

## **TETRACYCLINES**

- TETRACYCLINE**
- DOXYCYCLINE**
- MINOCYCLINE**

**BIND BACTERIAL RIBOSOMES: INHIBIT PROTEIN SYNTHESIS:  
BACTERIOSTATIC**

**GOOD FOR RICKETSIA, RMSF, MYCOPLASMA**

## **MACROLIDES**

- ERYTHROMYCIN**
- BIAXIN (CLARITHROMYCIN)**
- AZITHROMYCIN**

**BIND TO RIBOSOMAL SUBUNITS:  
INHIBIT PROTEIN SYNTHESIS:  
BACTERIOSTATIC**

**GOOD FOR MYCOPLASMA, LEGIONELLA, CHLAMYDIA,**

## **SULFONAMIDES**

**BLOCK FOLIC ACID SYNTHESIS  
NOT IN PREGNANCY**

**HIGH URINE LEVELS: GOOD FOR UTI**

**POSSIBLE SJ SYNDROME**

**TRIM. + SULFA (BACTRIM): SALMONELLA, PNEUMOCYSTIS**

# QUINOLONES

**CIPROFLOXACIN (CIPRO)**

**OFLOXACIN (FLOXIN)**

**NORFLOXACIN (NOROXIN)**

**BLOCK DNA-GYRASE: ENZYME TO SUPERCOIL DNA:  
DNA UNWINDS AND DEGRADES**

**BACTERIOCIDAL: RESISTANCE RAPID  
MRSA RAPIDLY RESISTANT**

**WIDE SPECTRUM: PSEUDOMONAS  
E COLI  
SHIGELLA**

**HIGH URINE AND STOOL LEVELS**

**INTO BONE AND PROSTATE**

**GI DIFFICULTIES**

**HEADACHES, DIZZY, SLEEP DISTURBANCE**

**INCREASED CNS TOXICITY FROM THEOPHYLLINE AND CAFFEINE**

## **ANTI-VIRALS**

### **AMANTADINE**

**FOR INFLUENZA A**

**PROPHYLACTIC: CAN USE WITH IMMUNIZATION**

**MUST START WITHIN 48 HOURS OF EXPOSURE**

**TREAT FOR 5 TO 7 DAYS**

### **ACYCLOVIR**

**INHIBITS DNA POLYMERASE**

**HERPES FAMILY (DNA) OF VIRUSES**

## **ANTI-FUNGALS**

### **AMPHOTERICIN-B (PARENTERAL)**

#### **NAFTIN**

**BINDS TO STEROIDS IN WALL OF FUNGUS**

**CAN HAVE ESTROGEN EFFECTS**

### **GRISEOFULVIN**

**DISRUPTS MICROTUBULES:**

**INHIBITS CELL DIVISION AND MOVEMENT**

**HIGH CONCENTRATION IN KERATIN PRECURSORS  
(NAIL AND HAIR)**

# **INFECTION CONTROL PRACTICUM**

**MARCH 7, 1996, NEW ORLEANS**

**AMERICAN MEDICAL DIRECTORS ASSOCIATION**

**HIGHLIGHTS: GERIATRIC NURSING HOMES**

**1/4 N H RESIDENTS PER YEAR ARE ON ANTIBIOTICS**

**IN 100 BED FACILITY -- 200 INFECTIONS PER YEAR**

**IN ELDERLY: VERY HIGH RATES OF BACTEREMIA:  
MANY CHRONIC AND IMMUNE-SUPPRESSING ILLNESSES**

**OKLAHOMA N H STUDY IN 1994:**

**MOST COMMON BACTERIA ISOLATED IN CULTURES:**

**E COLI**

**KLEBSIELLA**

**PROTEUS**

**PSEUDOMONAS**

**(SAME SPECTRUM AS IN HOSPITALS)**

**15+% E COLI IN UTI RESISTANT TO BACTRIM  
(SAME % AS IN HOSPITALS)**

**IN GENERAL, SITES OF INFECTION:**

**43% UTI**

**32% SKIN**

**16% LOWER RESP (HIGH DEATH RATE)**



**20+% MRSA COLONIZATION IN NH (NASAL)**

**30% HOSPITAL SA CULTURES ARE MRSA**

**THEORY THAT ORIGIN OF MRSA WAS IV DRUG ABUSERS  
DEVELOPED HEART INFECTION WITH STAPH  
REQUIRED LONG-TERM IV ANTIBIOTIC RX  
RESISTANCE DEVELOPED**

**MRSA INFECTIONS: ALMOST ALL ARE WOUND--DECUBITUS**

**MOST MRSA COLONIZED ARE ALSO VRE COLONIZED**

**THEORY THAT ORIGIN OF VRE WAS AGRICULTURAL**

**RECENT STUDIES: 20% VRE COLONIZATION  
PRIMARILY UTI**

**UNPUBLISHED STUDY:**

**MONTHLY URINE CULTURES FOR 1 YEAR**

**100/400 BECAME + FOR VRE**

**ONLY 20 WERE + FOR MORE THAN 4 MON.**

**ALL OTHER CASES CLEARED SPONT. WITH NO TREATMENT**

**MRSA AND VRE ARE WEAK PATHOGENS**

# **INFECTION CONTROL:**

## **MONITORING OF RATES OF INFECTION**

**FACILITY A: 101 RESIDENTS**

**4.5 YEARS OF DATA**

**FACILITY B: 49 RESIDENTS**

**6 YEARS OF DATA**

### **MEAN # OF CASES/MONTH/100 RESIDENTS**

	<b>FACILITY A</b>	<b>FACILITY B</b>
<b>UPPER RESP</b>	<b>2.07</b>	<b>2.24</b>
<b>LOWER RESP</b>	<b>4.43</b>	<b>4.93</b>
<b>EYE</b>	<b>5.75</b>	<b>2.52</b>
<b>EAR</b>	<b>2.47</b>	<b>4.39</b>

# MEAN # OF CASES/MONTH/100 RESIDENTS

± 1 STANDARD DEVIATION

	FACILITY A	FACILITY B
UPPER RESP	2.07 <u>±</u> <u>2.50</u>	2.24 <u>±</u> <u>3.22</u>
LOWER RESP	4.43 <u>±</u> <u>3.33</u>	4.93 <u>±</u> <u>5.78</u>
EYE	5.75 <u>±</u> <u>3.47</u>	2.52 <u>±</u> <u>3.13</u>
EAR	2.47 <u>±</u> <u>1.77</u>	4.39 <u>±</u> <u>4.48</u>

# **MAXIMUM ALLOWABLE # OF CASES/MONTH/100 RESIDENTS**

**(MEAN + 2 STANDARD DEVIATIONS OF THE MEAN)**

**FACILITY A**

**FACILITY B**

**UPPER RESP**

**7.1**

**8.7**

**LOWER RESP**

**11.1**

**16.5**

**EYE**

**12.7**

**8.8**

**EAR**

**6.0**

**13.3**

# **LOG BOOK**

**TYPES OF INFECTIONS**

**POSITIVE CULTURES**

**SECTION FOR EACH RESIDENT**

**NURSE REVIEWS BEFORE CALLING MD**

# **CLINICAL PRACTICE GUIDELINES**

# **CLINICAL JUDGMENT MUST ALWAYS**

## **SUPERCEDE PROTOCOL DETAILS**

### **PROTOCOL: INFECTION CONTROL**

**If a resident's temperature is 101 or above or if any symptoms are present (example: nasal discharge, productive cough, etc.), keep resident in bed or in wheelchair in room until temperature gone and no symptoms present for 24 hours.**

**When there is reason to believe that a resident has an infectious or communicable disease, the Attending Physician will be notified for appropriate isolation precautions. Isolation precautions shall remain in effect until discontinued by the Attending Physician.**

**If diagnosed as urinary tract infection, otitis media or eye infection, no additional precautions necessary.**

**Use gloves and full universal precautions for any contact with:**

- blood**
- body fluids visibly contaminated with blood**
- purulent nasal discharge or tracheal secretions**
- wound drainage or secretions**
- diarrhea**
- discharge from eyes or ears**

**Strict hand washing ENFORCED when resident has elevated temperature or any symptoms.**

**Medical Director's Signature: \_\_\_\_\_**

# **PROTOCOL: TEMPERATURE**

**When a resident spikes a temperature:**

**Obtain full set of vital signs and oxygen saturation**

**Note presence or absence of:**

- vomiting**
- abdominal distension**
- diarrhea**
- cough**
- purulent (yellow/green) nasal drainage**
- purulent (yellow/green) pulmonary discharge**
- conjunctivitis**
- arousability**
- irritability**
- increased seizures**

**Check for:**

- rash or sores**
- eardrums for redness or discharge (use otoscope)**
- throat**
- nuchal rigidity (stiff neck)**
- chest (auscultate)**
- abdomen (for bowel sounds, tenderness, distension and impaction - -if impacted, remove stool; see Protocol: Emesis)**
- swollen anterior cervical nodes**

**If any abnormalities noted, notify Attending Physician for further orders.**



**Give acetaminophen or ibuprofen according to order sheet for that resident, PRN.**

**If resident is vomiting, may substitute acetaminophen suppositories mg/mg and administer rectally.**

**Give additional fluids (10cc/kg per day) of Pedialyte or clear liquids for fever  $\geq 101.5$  (see Protocol: Fluid Calculations for routine fluid requirements).**

**Monitor temperature every 1 hour until  $\leq 101.5$  and then every 4 hours until normal for 24 hours.**

**For a temperature  $\geq 104^{\circ}\text{F}$ , may use a tepid bath for 30 minutes.**

**Notify Attending Physician if resident's temperature is above  $101.5^{\circ}$  (R) for 24 hours, if there are no other symptoms.**

**Notify Attending Physician if there is no response to antibiotic treatment after 72 hours.**

**Medical Director's Signature:\_\_\_\_\_**

## **PROTOCOL: FLUID CALCULATION**

**The following is a fluid requirement formula that is followed if a resident has an emesis and/or diarrhea:**

**Note: weight in pounds divided by 2.2 = weight in kilograms**

**Fluid requirements/24 hours:**

**0 - 10kg = 100cc/kg/24hrs**

**+ 10 - 20kg = 50cc/kg/24hrs**

**+ over 20kg = 20cc/kg/24hrs**

**Example: 25 kg resident**

<b>first 10 kg (10 x 100) =</b>	<b>1000cc</b>
<b>second 10 kg (10 x 50) =</b>	<b>500cc</b>
<b>over 20 kg (5 x 20) =</b>	<b><u>100 cc</u></b>
	<b>1600cc/24hrs.</b>

**Medical Director's Signature: \_\_\_\_\_**