Table V: Recommended antimicrobial prophylaxis for urologic procedures

The recommendations listed herein are based on general consensus. Antibiotic choices should be based on “local” resistance patterns, antibiograms, and institutional polices, which may supersede the guidance listed in the Table below.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Likely Organisms</th>
<th>Prophylaxis Indicated</th>
<th>Antimicrobial(s) of Choice</th>
<th>Alternative Antimicrobial(s), if required</th>
<th>Duration of Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Tract Instrumentation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cystourethroscopy with minor manipulation, break in mucosal barriers, biopsy, fulguration, etc.; clean-contaminated</td>
<td>GNR, rarely enterococci</td>
<td>Uncertain; consider host-related risk factors. Increasing invasiveness increases risk of SSI</td>
<td>TMP-SMX or Amoxicillin/Clavulanate</td>
<td>1st/2nd generation Cephalosporin or Aminoglycoside (Aztreonam) +/- Ampicillin</td>
<td>Single dose</td>
</tr>
<tr>
<td>Transurethral Cases: e.g. TURP, TURBT, laser enucleative and ablative procedures, etc.; clean-contaminated</td>
<td>GNR, rarely enterococci</td>
<td>All cases</td>
<td>Cefazolin or TMP-SMX</td>
<td>Amoxicillin/Clavulanate or Aminoglycoside (Aztreonam) +/- Ampicillin</td>
<td>Single dose</td>
</tr>
<tr>
<td>Prostate brachytherapy or cryotherapy; clean-contaminated</td>
<td>S. aureus, skin; GNR</td>
<td>All cases</td>
<td>Cefazolin</td>
<td>Clindamycin</td>
<td>Single dose</td>
</tr>
<tr>
<td>Transrectal prostate biopsy; contaminated</td>
<td>GNR, anaerobes; consider MDR coverage, if risks of systemic antibiotics within six months, international travel, healthcare worker</td>
<td>All cases</td>
<td>Fluoroquinolone or 1st/2nd/3rd gen. Cephalosporin and Aminoglycoside</td>
<td>Aztreonam May need to consider infectious disease consultation</td>
<td>Single dose</td>
</tr>
<tr>
<td>Upper Tract Instrumentation</td>
<td>GNR, rarely enterococci, and skin‡‡, <em>S. aureus</em></td>
<td>All cases</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;/2&lt;sup&gt;nd&lt;/sup&gt; gen. Cephalosporin or Aminoglycoside (Aztreonam&lt;sup&gt;®&lt;/sup&gt;) and Metronidazole or Aminoglycoside (Aztreonam&lt;sup&gt;®&lt;/sup&gt;) and Clindamycin</td>
<td>Ampicillin/Sulbactam</td>
<td>≤24 hours</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------------------------------------------</td>
<td>----------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>-----------------</td>
<td>----------</td>
</tr>
<tr>
<td>Percutaneous renal surgery; e.g. PCNL; clean-contaminated</td>
<td>GNR, rarely enterococci, and skin‡‡, <em>S. aureus</em></td>
<td>All cases</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;/2&lt;sup&gt;nd&lt;/sup&gt; gen. Cephalosporin or Aminoglycoside (Aztreonam&lt;sup&gt;®&lt;/sup&gt;) and Metronidazole or Aminoglycoside (Aztreonam&lt;sup&gt;®&lt;/sup&gt;) and Clindamycin</td>
<td>Ampicillin/Sulbactam</td>
<td>≤24 hours</td>
</tr>
<tr>
<td>Ureteroscopy, all indications; clean-contaminated</td>
<td>GNR, rarely enterococci, and skin‡‡, <em>S. aureus</em></td>
<td>All cases; of undetermined benefit for uncomplicated diagnostic only procedures.</td>
<td>TMP-SMX or 1&lt;sup&gt;st&lt;/sup&gt;/2&lt;sup&gt;nd&lt;/sup&gt; gen. Cephalosporin or 1&lt;sup&gt;st&lt;/sup&gt;/2&lt;sup&gt;nd&lt;/sup&gt; gen. Cephalosporin or Amoxicillin/Clavulanate</td>
<td>Aminoglycoside (Aztreonam&lt;sup&gt;®&lt;/sup&gt;) +/- Ampicillin or 1&lt;sup&gt;st&lt;/sup&gt;/2&lt;sup&gt;nd&lt;/sup&gt; gen. Cephalosporin or Amoxicillin/Clavulanate</td>
<td>Single dose</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Open, Laparoscopic or Robotic Surgery</strong></th>
<th><em>S. aureus</em>, skin</th>
<th>Consider in all cases; may not be required</th>
<th>Cefazolin</th>
<th>Clindamycin</th>
<th>Single dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without entering urinary tract, e.g. adrenalectomy, lymphadenectomy, retroperitoneal or pelvic; clean</td>
<td><em>S. aureus</em>, skin</td>
<td>Likely not required</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category</td>
<td>Microorganisms</td>
<td>Antimicrobial Options</td>
<td>Dosage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>----------------</td>
<td>---------------------------------------------------------------------------------------</td>
<td>----------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urethroplasty; reconstruction anterior urethra, stricture repair,</td>
<td>GNR, rarely</td>
<td>Cefazolin</td>
<td>Single dose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>including urethrectomy; clean; contaminated; controlled entry into the</td>
<td>enterococci, S.</td>
<td>Cefoxitin or Cefotetan or Ampicillin/Sulbactam</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>urinary tract</td>
<td><em>aureus</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involving controlled entry into urinary tract e.g. renal surgery,</td>
<td>GNR (<em>E. coli</em>),</td>
<td>Cefazolin or Ampicillin/Sulbactam</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>nephrectomy, partial or otherwise, ureterectomy pyeloplasty, radical</td>
<td>rarely</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>prostatectomy; partial cystectomy, etc.; clean-contaminated</td>
<td>enterococci</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involving small bowel (i.e. urinary diversions), cystectomy with small</td>
<td>Skin, <em>S. aureus</em>, GNR, rarely</td>
<td>Clindamycin and aminoglycoside or Cefuroxime (2nd generation cephalosporin) or Aminopenicillin combined with a β- lactamase inhibitor and Metronidazole (optional)</td>
<td>Single dose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bowel conduit, other GU procedures; ureteropelvic junction repair,</td>
<td>rarely</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>partial cystectomy, etc.; clean-contaminated</td>
<td>enterococci</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involving large bowel§§, colon conduits; clean-contaminated</td>
<td>GNR, anaerobes</td>
<td>All cases</td>
<td>Cefazolin and Metronidazole or Cefoxitin and Metronidazole or Cefotetan and Metronidazole or Ceftriaxone and Metronidazole or Ertapenem</td>
<td>Ampicillin/Sulbactam or Ticarcillin/Clavulanate or Pipercillin/Tazobactam</td>
<td>Single parenteral dose</td>
</tr>
<tr>
<td>Implanted prosthetic devices: AUS, IPP, sacral neuromodulators; clean</td>
<td>GNR, S. aureus, with increasing reports of anaerobic, and fungal organisms</td>
<td>All cases</td>
<td>Aminoglycoside (Aztreonam®) and 1st/2nd gen. Cephalosporin or Aminoglycoside (Aztreonam®) and Vancomycin</td>
<td>Aminopenicillin or β-lactamase inhibitor (including Ampicillin/Sulbactam Ticarcillin, Tazobactam)</td>
<td>≤24 hours</td>
</tr>
<tr>
<td>Open, Laparoscopic or Robotic Surgery</td>
<td>GNR, <em>S. aureus</em></td>
<td>Of increased risk; all cases</td>
<td>Cefazolin</td>
<td>Ampicillin/Sulbactam</td>
<td>Single dose</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>-----------------</td>
<td>-----------------------------</td>
<td>----------</td>
<td>---------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Inguinal and scrotal cases; e.g. radical orchiectomy, vasectomy, reversals, varicocelectomy, hydrocelectomy, etc.; clean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaginal surgery, female incontinence, e.g. urethral sling procedures, fistulae repair, urethral diverticulectomy, etc.; clean-contaminated</td>
<td><em>S. aureus</em>, streptococci, enterococci, vaginal anaerobes; skin</td>
<td>All</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; gen. Cephalosporin (e.g., Cefoxitin, Cefotetan) provides better anaerobic coverage than 1&lt;sup&gt;st&lt;/sup&gt; gen. cephaloporins; however, Cefazolin is equivalent coverage for the vaginal anaerobes in sling procedures</td>
<td>Ampicillin/Sulbactam and Aminoglycoside or Aztreonam&lt;sup&gt;®&lt;/sup&gt; and Metronidazole or Aztreonam&lt;sup&gt;®&lt;/sup&gt; and Clindamycin or Clindamycin</td>
<td>Single dose</td>
</tr>
<tr>
<td>Other:</td>
<td>GNR, rarely enterococci; GU pathogens</td>
<td>Only if risk factors</td>
<td>If risks, consider TMP-SMX or 1&lt;sup&gt;st&lt;/sup&gt; gen. Cephalosporin (Cefazolin) or 2&lt;sup&gt;nd&lt;/sup&gt; gen. Cephalosporin (Cefuroxime) or Aminopenicillin combined with a β- lactamase inhibitor and Metronidazole</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;/2&lt;sup&gt;nd&lt;/sup&gt; gen. Cephalosporin or Amoxicillin/Clavulanate or Ampicillin and Aminoglycoside (Aztreonam&lt;sup&gt;®&lt;/sup&gt;) or Clindamycin</td>
<td>Single dose</td>
</tr>
</tbody>
</table>
† GU GNR: Common urinary tract organisms are *E. coli*, *Proteus* spp, *Klebsiella* spp, and GPC *Enterococcus*.
‡ See Table “Patient-related factors affecting host response to surgical infections.”
§ If urine culture shows no growth prior to the procedure, antimicrobial prophylaxis is not necessary.
¶ Or full course of culture-directed antimicrobials for documented infection (which is treatment, not prophylaxis).
¥ Aztreonam can be substituted for aminoglycosides in patients with renal insufficiency.
†† Includes transurethral resection of bladder tumor and prostate, and any biopsy, resection, fulguration, foreign body removal, urethral dilation or urethrotomy, or ureteral instrumentation including catheterization or stent placement/removal.
**Clindamycin, or aminoglycoside + metronidazole or clindamycin, are general alternatives to penicillins and cephalosporins in patients with penicillin allergy, even when not specifically listed.
§§ Skin: Common skin organisms are *S. aureus*, coagulase negative *Staphylococcus* spp, Group A *Streptococcus* spp
χ Routine administration of vancomycin for AP is not recommended. The antimicrobial spectrum of Vancomycin is less effective against methicillin-sensitive strains of *S. aureus*. 