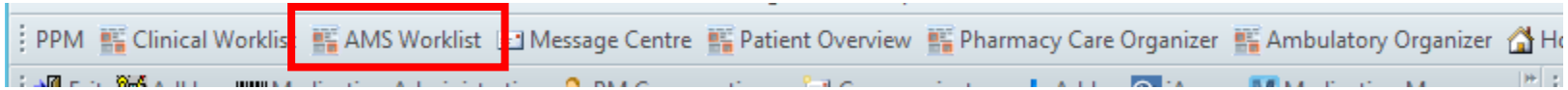
COASTAL ASPIRES PROSPECTIVE AUDIT AND FEEDBACK OVERVIEW — UPDATED: 26FEB2021

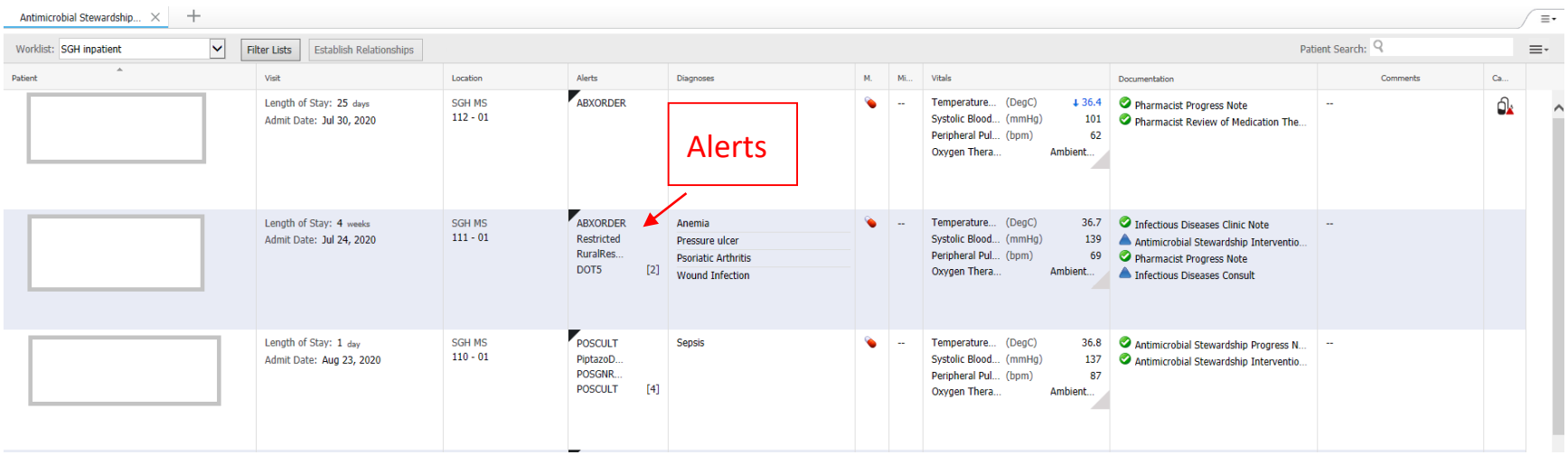
IMPORTANT NOTE

- The role of antimicrobial stewardship staff is to provide periodic chart auditing and then provide feedback to primary clinical team to provide case-based education and optimize therapy as needed. (CID 2016;62(10):e51–e77)
- The responsibility of identifying and resolving therapy issues remains with the primary clinical team (i.e. attending physician, ward pharmacist, nurse practitioner, etc)

CERNER AMS WORKLIST

- Accessed via Cerner Powerchart tool bar
- Populated with alerts based on pre-specified rules





Duration

- **IV vancomycin which has been administered for more than 72 hours**
    - Potential opportunity: preserve vancomycin IV
        - Non-local guidelines recommend adding vancomycin IV to ceftriaxone IV to cover ceftriaxone-resistant Strep pneumonia. S. pneumoniae susceptibility to ceftriaxone is 100% in VCH. Vancomycin IV not indicated as part of empiric meningitis therapy for local patients
        - Patients colonized with MRSA can still have cellulitis due to streptococci. MRSA cellulitis more likely to present with purulence. Do not initiate empiric anti-MRSA coverage based on MRSA colonization status. When anti-MRSA coverage indicated, consider PO options such as doxycycline PO (susceptibility 97%) or TMP-SMX PO (susceptibility 93%)
        - See ***May 2019 Coastal ASPIRES Flyer*** for details
- **IV azithromycin which has been administered for more than 72 hours**
    - Potential opportunity: PO stepdown, limit exposure to 1.5g total
        - See ***Dec 2018 Coastal ASPIRES Flyer*** for details
- **IV broad spectrum antibiotic which has been administered for more than 72 hours**
    - Potential opportunity: PO stepdown, narrowing, shorter duration
        - Empiric broad-spectrum antibiotics should be reassess at 24-48 hours based on patient status, diagnostics, and microbiology data.
        - Piperacillin-tazobactam is usually only warranted in those with risk factor/history of Pseudomonas or critically ill. Ceftriaxone or ceftriaxone plus metronidazole usually provide adequate empiric coverage. Please refer to disease state specific guidelines (such as Bugs and Drugs) for details.
- **Any IV antibiotic, antifungal and antiviral which has been administered for more than 5 days**
    - Potential opportunity: PO stepdown, narrowing, shorter duration

New Culture Results

- **There is a new positive *Clostridium difficile* result**
  - Ensure patient on appropriate treatment if symptomatic. Reassess concurrent antibiotics for stopping/narrowing as appropriate.
- **Any new positive blood culture (preliminary or final)**
  - Note: automatic ID consult is approved for patients with Staph aureus, Enterococcus or Candida in blood

Other

- **Patient has an active order of IV or PO clindamycin**
  - Clindamycin carries significant risk for C. difficile infection
  - Increase in resistance of Staph and Strep to clindamycin (~30%) resulting in more clinical failure
  - See ***Aug 2020 Coastal ASPIRES Flyer*** for details
- **Patient does not have penicillin allergy (drug class allergy) and has an active order for moxifloxacin, levofloxacin or ciprofloxacin**
  - Fluroquinolone (FQ) stewardship
    - preserve FQ for patients with beta-lactam allergy, failure of first line therapy, or antibiotic use from other classes within 3 months.
    - FQ use associated with MRSA infection and gram negative bacilli (ie. Pseudomonas) resistance
    - Reduce risk of FQ ADRs (QT prolongation, tendonitis, tendon rupture, CNS effects, peripheral neuropathy, worsening of myasthenia gravis)
    - Reduce C diff risk associated with FQ

Restricted Antimicrobials

- Per policy, at LGH, ID consult required beyond 72 hours for ceftazidime, daptomycin, linezolid, meropenem, tigecycline and IV cotrimoxazole.
- Refer to Coastal Formulary Restriction for drug-specific criteria

amphotericin B
amphotericin B lipid complex
amphotericin B liposomal
cefTAZidime
ceftobiprole
ceftolozane-tazobactam
DAPTOmycin
ertapenem
fidaxomicin
imipenem-cilastatin
linezolid
meropenem
micafungin
posaconazole
sulfamethoxazole-trimethoprim (IV only)
tigecycline
valGANciclovir
voriconazole

OTHER AMS INTERVENTIONS LED BY CLINICAL PHARMACISTS (NOT ROUTINELY AUDITED, WILL AUDIT IF TIME PERMITS)

Multiple Therapies

- Two or more antibiotics with anaerobic activity are active at one time:
    - Amoxicillin-clavulanate
    - Cefoxitin
    - Clindamycin
    - Ertapenem
    - Meropenem
    - Metronidazole
    - Moxifloxacin
    - Piperacillin-tazobactam

De-escalation

- Examples:
    - Carbapenem, piperacillin-tazobactam, 3rd/4th/5th generation cephalosporins de-escalation based on culture results
    - IV vancomycin is ordered for when there is an existing blood culture which isolated Enterococcus sp. susceptible to ampicillin
    - IV vancomycin is ordered when the patient has a sterile culture which isolated Staphylococcus aureus that is susceptible to cloxacillin, oxacillin, or cefazolin
    - IV vancomycin is ordered when the patient has any culture which isolated Staphylococcus aureus that is susceptible to cloxacillin, oxacillin, or cefazolin

Culture-Antimicrobial Mismatch

- Examples
    - IV vancomycin is ordered for a patient who has a diagnosis of pneumonia or a sputum culture ordered in the past 48 hours, and has no, or a negative MRSA culture (see ***May 2019 Coastal ASPIRES Flyer*** for details)
    - If new microbiology results reveal that the patient's current antibiotic, antiviral or antifungal has intermediate activity, or no activity (resistant)

Dosing optimization

- Meropenem
    - Standard dosing: 500mg IV Q6H
        - 1g IV Q8H dosing phased out of practice (currently looking into removing from Cerner Order and PDTM)
        - 500mg IV Q6H is the national practice which optimizes time above MIC with lower drug cost
    - CNS infection/cystic fibrosis patient: 2g IV Q8H
        - To allow for better penetration for CNS infection
        - To accommodate the higher drug metabolism in CF patients
- Metronidazole
    - 500mg Q8H dosing – for C difficile infection
    - 500mg Q12H dosing – for all other infections
- Ceftriaxone
    - 1g Q24H dosing – pyelonephritis, pneumonia
    - 2g Q12H dosing – CNS infections, Enterococcus endocarditis synergy
    - 2g Q24H dosing – all other infections

IV-PO Stepdown – Therapeutic

- Examples
    - IV antibiotic for uncomplicated urosepsis
        - May be able to step down to PO cotrimoxazole or PO amoxicillin-clavulanate
        - See ***May 2020 Coastal ASPIRES Flyer*** for details
    - IV ceftriaxone for community acquired pneumonia
        - Reassess CAP therapy at 48 hours for potential step down (such as to cefuroxime)
            - See ***Sept 2019 Coastal ASPIRES Flyer*** for details
    - IV ampicillin for E. facaelis UTI
        - Facilitate stepdown to amoxicillin as appropriate. E. faecalis isolates susceptible to ampicillin are predictably susceptible to amoxicillin, piperacillin tazobactam and imipenem.

IV-PO Stepdown – Bioequivalent

Per ASPIRES Guideline (list also posted with ***July 2018 Coastal ASPIRES Flyer***):

LIST OF IV ANTI-INVECTIVES ELIGIBLE FOR PO CONVERSION	CHECKLIST FOR IV TO PO CONVERSION
Group 1 (similar drug levels achieved with oral dosage form of same drug) • Ciprofloxacin → 250-500 mg BID (750 mg BID severe) • Clindamycin → 300-450 mg TID (600 mg TID severe) • Co-trimoxazole → 1-2 DS BID (2 DS TID-QID severe) • Fluconazole → 200 mg Daily (400-800 mg Daily severe) • Linezolid → 600 mg BID • Moxifloxacin → 400 mg Daily • Metronidazole → 500 mg BID-TID • Voriconazole → 3 mg/kg BID (4 mg/kg BID severe)	**IV is equivalent to PO** ❑ continual need for medication; ❑ clinically stable; ❑ capable of tolerating oral dosage form; (e.g. taking other oral medications & full liquid diet or solids) ❑ no factors affecting oral absorption (e.g. presence of gastrointestinal abnormalities or drug interactions).

Excerpt from NSMAC support letter (June 2020):

The purpose of this letter is to ask NSMAC to reaffirm its support for pharmacists to independently convert bioequivalent antimicrobials from the IV to PO route when clinically appropriate; and when the patient is clinically able to tolerate and absorb medication via the oral route. This is an established practice at other hospitals such as VGH and SPH and is becoming the standard of practice for hospitals supported by Lower Mainland Pharmacy Services (FH/VCH/PHC/PHSA).

IV to PO conversion interventions are in keeping with the College of Pharmacists of BC Professional Practice Policy #58. The policy outlines parameters for pharmacists' scope of practice for medication management activities such as dose/frequency/route adjustments.1,2 Please see attached document, "Pharmacist Scope of Practice" (Oct 2018) for details. The updated scope had previously been reviewed and approved by NSMAC in 2018.

The "change-route" activity is applicable to bioequivalent antimicrobials such as ciprofloxacin, clindamycin, co-trimoxazole, fluconazole, linezolid, metronidazole, moxifloxacin, and voriconazole. While **azithromycin** is not technically classified as bioequivalent, the PO route is considered clinically comparable to the IV route and is thus included in the "change-route" activity as well.

Antimicrobial therapy IV to PO conversion has been associated with many patient care and cost benefits including shorter length of stay, lower risk of line-associated infections, improved patient mobility, and reduced costs. With active pharmacist involvement, we anticipate fewer phone calls to prescribers and shorter time to PO stepdown for patients.

Patient with penicillins allergy with penicillin re-exposure in hospital

Pharmacist will be contacted to assess/monitor the re-exposure with the goal to hopefully delabel the patient. Should the patient tolerated the re-exposure, the expectation would be to update Cerner allergy record, PharmaNet (if applicable) and counsel the patient/family member.

Patient with penicillins allergy on alternative/second line antibiotic

It is expected that clinical pharmacist would clarify the penicillin allergy details to assess whether the use of alternative agent is appropriate.

General Review

Discrepancies between patient's therapy and the ASPIRES Treatment Guidelines for Common Infections will be brought to the pharmacist's attention for further review