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Antimicrobial Duration Stewardship Project: A QI approach

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Antimicrobial Duration Stewardship Project: A QI approach

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Project Problem and Background

Respiratory	Community-acquired pneumonia (CAP)	<p><i>S pneumoniae</i></p> <p><i>Mycoplasma pneumoniae</i></p> <p><i>S pyogenes</i></p> <p><i>S aureus</i></p> <p><i>H influenzae</i></p> <p><i>M catarrhalis</i></p>	<p>Amoxicillin OR Ampicillin OR Penicillin for fully immunized patients in regions without high prevalence of PCN-resistant pneumococcus</p> <p>(Allergy: Clindamycin OR Levofloxacin)</p> <p>Ceftriaxone for hospitalized patients in regions with high levels PCN-resistant pneumococcus</p> <p>Add macrolide if atypical pathogen (eg, <i>Mycoplasma</i> or <i>Chlamydia</i> species) suspected</p> <p>Add Vancomycin OR Clindamycin OR Linezolid if MRSA suspected</p>	<p>5 days from uncomplicated CAP improving during that time</p> <p>May extend duration when complicated by empyema, necrotizing pneumonia, or pulmonary abscess</p>	<p>Respiratory viruses cause the majority of CAP, especially in young children; thus, antibiotic therapy may not be indicated for all patients</p> <p>Early switch to oral route encouraged when tolerated</p> <p>Transient <i>S pneumoniae</i> bacteremia in otherwise uncomplicated pneumonia does not warrant prolonged or IV antibiotic therapy</p> <p>Consider <i>S aureus</i> superinfection in patients with influenza</p>	Bradley et al ⁶
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Project Problem and Background

Ear, Nose, and Throat/ Ophthalmologic	Acute sinusitis	<i>S pneumoniae</i> <i>H influenzae</i> <i>Moraxella catarrhalis</i>	Amoxicillin OR Amoxicillin-clavulanate (Allergy: Clindamycin OR Levofloxacin)	5–7 days	Diagnosis of acute bacterial sinusitis requires the presence of one of the following criteria: (1) persistent nasal discharge or daytime cough <u>without evidence of clinical improvement</u> for ≥ 10 days; consider watchful waiting in this scenario (2) worsening or new onset of nasal discharge, daytime cough, or fever after initial improvement (3) temperature $\geq 39^{\circ}\text{C}$ with either purulent nasal discharge and/or facial pain for at least 3 consecutive days	<i>Haemophilus influenzae</i> Infections, p 345 <i>Moraxella catarrhalis</i> Infections, p 537 <i>Streptococcus pneumoniae</i> (Pneumococcal) Infections, p 717 Chow et al ² Wald et al ³
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Children's Mercy Hospital Clinical Pathway

Uncomplicated CAP - Ambulatory	3 – 5 days	<p>Amoxicillin</p> <ul style="list-style-type: none"> • 40 – 50 mg/kg/dose PO q12hrs (max 2000 mg/dose) • 30 mg/kg/dose PO q8hrs (max 1000 mg/dose) <p>Note: Every 8-hour dosing optimizes amoxicillin exposure and should be considered for hospitalized children transitioning to oral therapy OR patients > 25 kg.</p>	<p>One of the following oral cephalosporins¹</p> <ul style="list-style-type: none"> - Cefuroxime 250 – 500 mg PO q12hrs (tablet form only) - Cefpodoxime 5 mg/kg/dose PO q12hrs (max 200 mg/dose) - Cefprozil 15 mg/kg/dose PO q12hrs (max 500 mg/dose) <p>OR</p> <p>Clindamycin 10 – 13 mg/kg/dose PO q8hrs (max 600 mg/dose)</p>	Clindamycin 10 – 13 mg/kg/dose PO q8hrs (max 600 mg/dose) ³
Uncomplicated CAP - Inpatient	5 – 7 days	Ampicillin 50 mg/kg/dose IV q6hrs (max 2000 mg/dose)	Ceftriaxone 50 mg/kg/dose IV q24hrs (max 2000 mg/dose) ²	Clindamycin 13.3 mg/kg/dose IV q8hrs (max 600 mg/dose) ³
Complicated CAP	<i>Duration guided by Infectious Diseases</i>	<p>Ampicillin/sulbactam 50 mg of ampicillin component/kg/dose IV q6hrs (max 2000 mg of ampicillin component/dose)</p> <p>For concern of MRSA or severe disease, addition of vancomycin 15 mg/kg/dose IV q6-8hrs (max 1000 mg/dose) is recommended.</p>	<p>Clindamycin 13.3 mg/kg IV q8hrs (max 600 mg/dose)</p> <p>PLUS</p> <p>Ceftriaxone 50 mg/kg/dose IV q24hrs (max 2000 mg/dose)²</p>	<p>Clindamycin 13.3 mg/kg IV q8hrs (max 600 mg/dose)</p> <p>PLUS</p> <p>Ceftriaxone 50 mg/kg/dose IV q24hrs (max 2000 mg/dose)²</p>
Atypical CAP (see note below)	5 days	<p>Azithromycin</p> <ul style="list-style-type: none"> - Day 1: 10 mg/kg IV/PO q24h (max 500 mg/dose) - Day 2- 5: 5 mg/kg IV/PO q24h (max 250 mg/dose) <p>Note: Azithromycin should not be given as monotherapy for CAP. Give with additional preferred pneumococcal agent.</p>	<p>Doxycycline 2.2 mg/kg IV/PO q12h (max 100 mg/dose)</p> <p>OR</p> <p>Levofloxacin</p> <ul style="list-style-type: none"> - < 5 years old: 8 – 10 mg/kg IV/PO q12h (max 500 mg/dose) - ≥ 5 years old: 8 - 10 mg/kg IV/PO q12h (max 750 mg/dose) 	



Purpose

- AIM Statement: Increase percentage of children discharged home from the emergency department with a diagnosis of community acquired pneumonia (CAP) or acute bacterial rhinosinusitis (ABRS) treated with an optimal antibiotic duration (5 days or less for CAP, 7 days or less for ABRS) from 22% to 70% by July 2025.
- Secondary aim: Assess for differences in care based on demographic and socioeconomic factors such as the Area deprivation index

Metrics

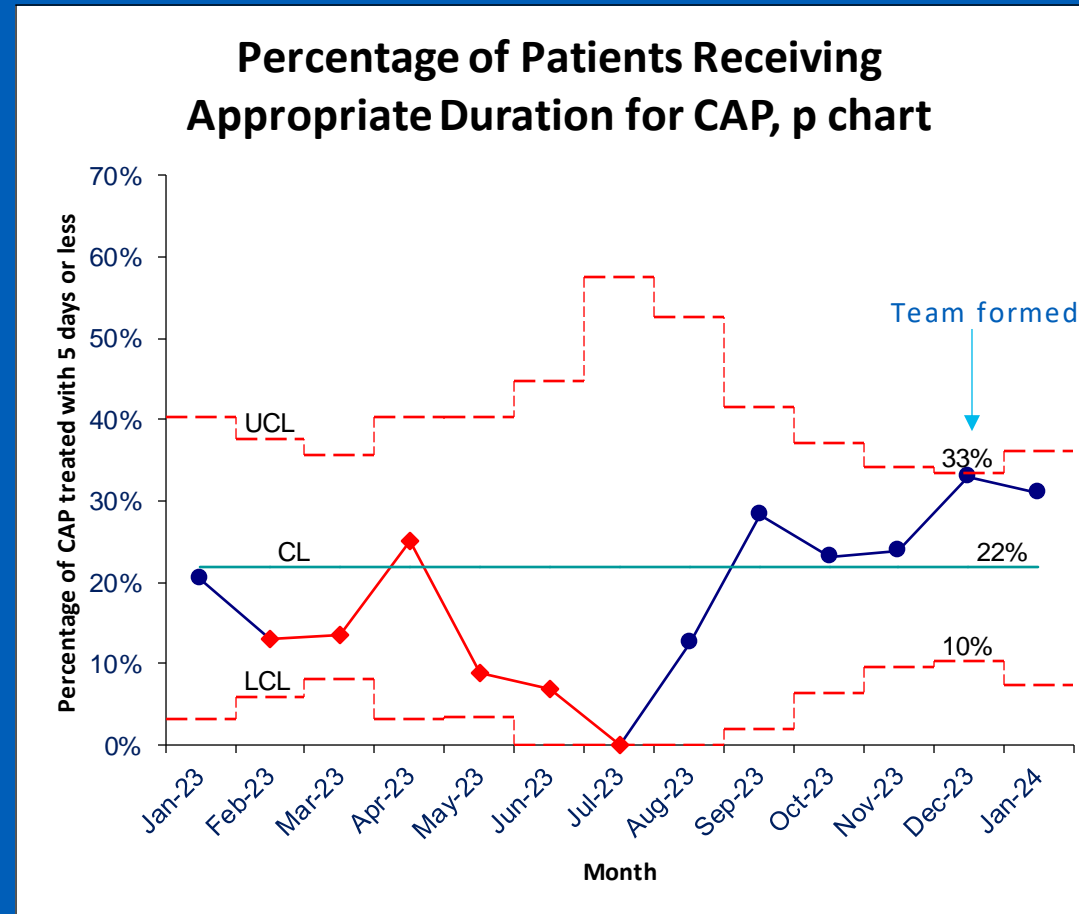
- Outcome: Percentage of patients receiving appropriate duration antibiotics for the diagnoses of interest (CAP, ABRS)
- Process: Measure order set and quick discharge usage
- Balancing: ED visits; Return visits with same discharge diagnosis within 14 days (treatment failure)



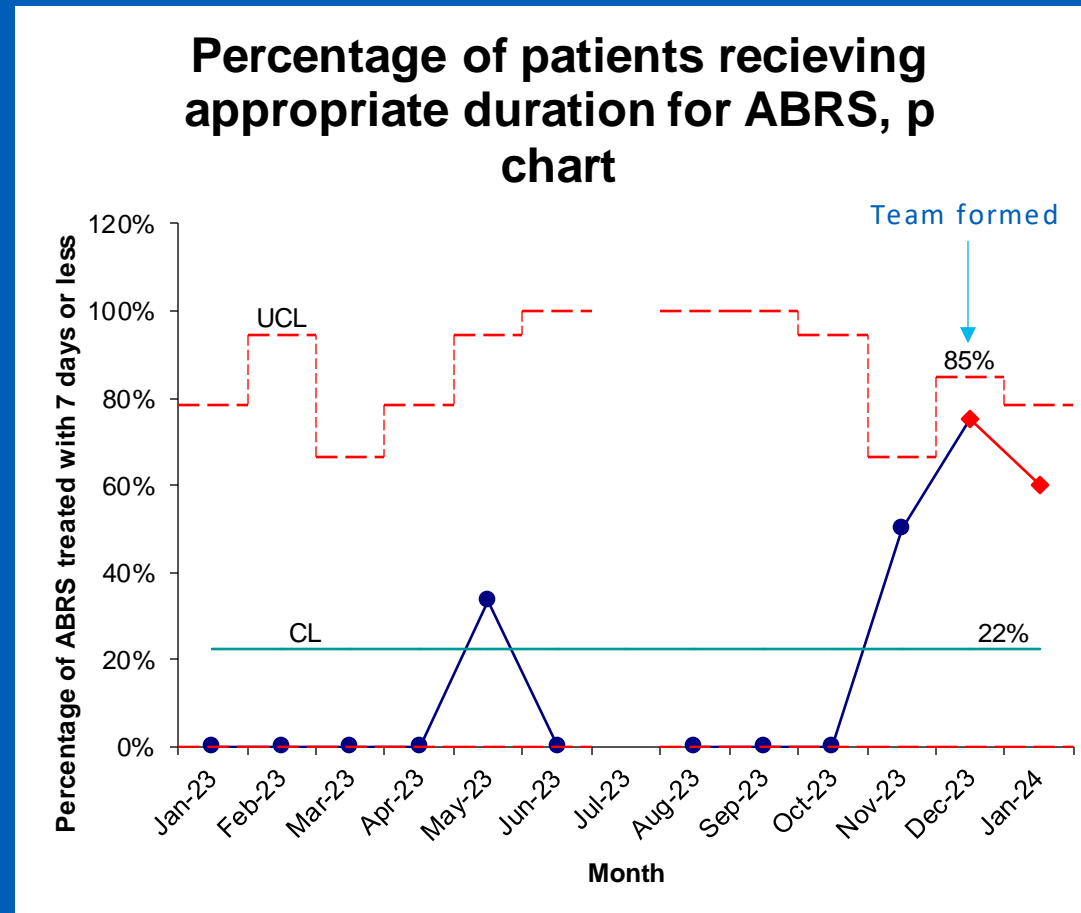
Data Collection

- Successfully obtained baseline data from 1/23 through 1/24
- Monthly data has been separated by diagnosis and stratified by prescribed duration ranges
 - Exclusion criteria: no prescribed antibiotics for the encounter, coinfection with diagnoses requiring prolonged antibiotic course, infants younger than 6 months

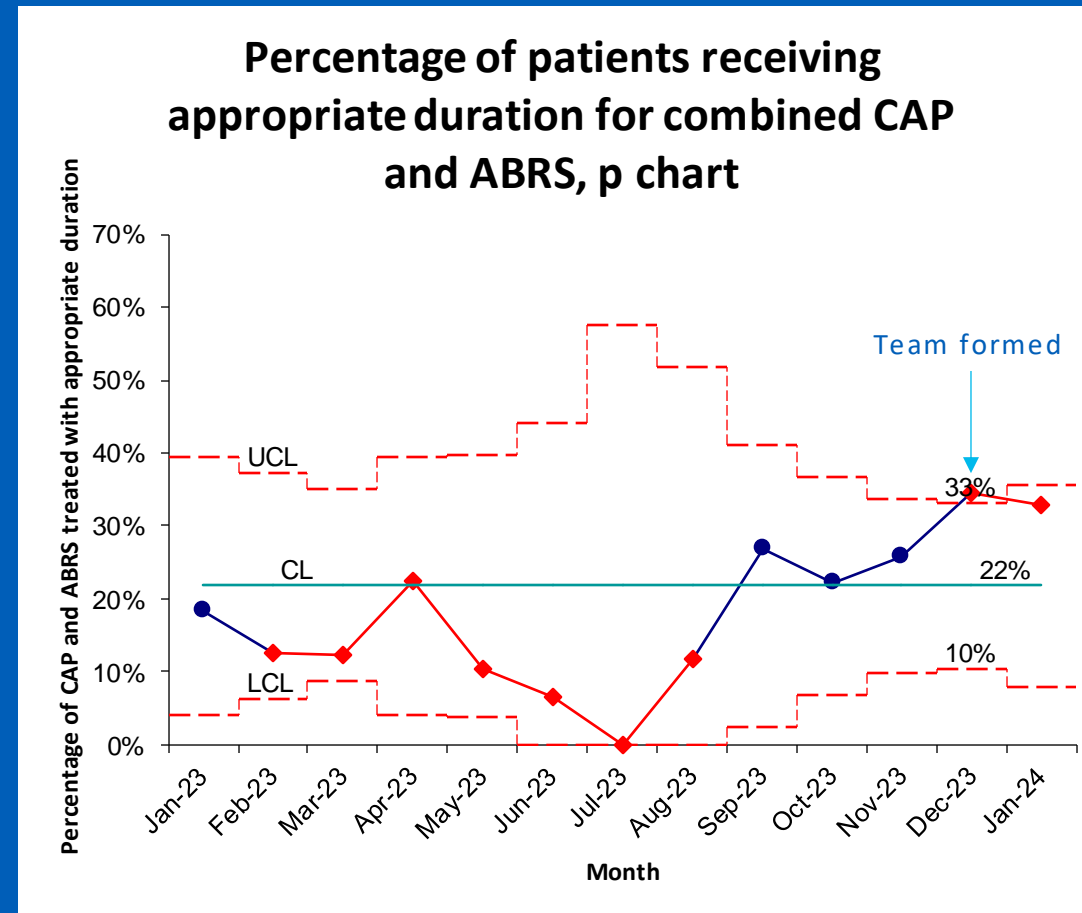
Community Acquired Pneumonia (CAP)



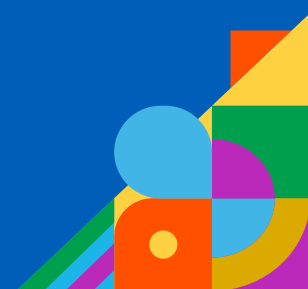
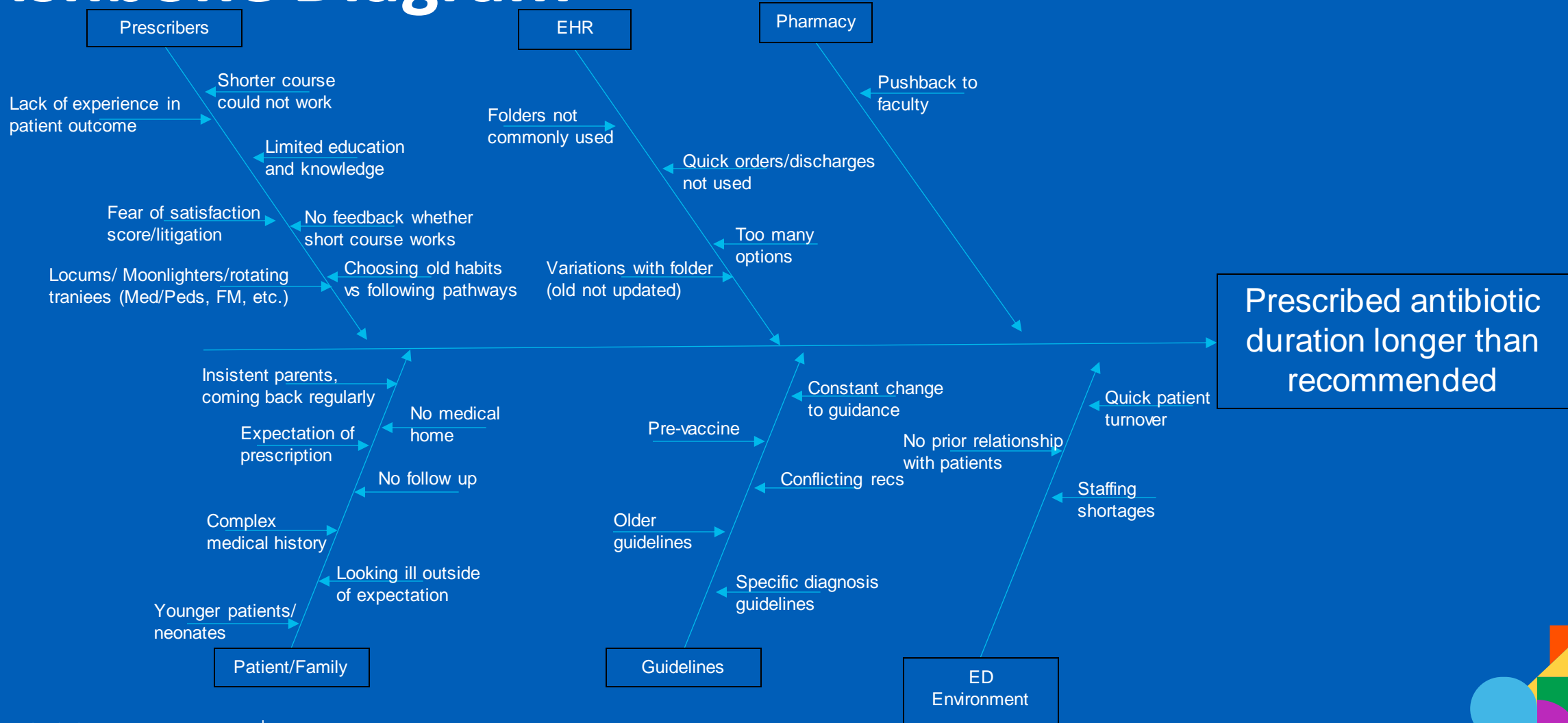
Acute Bacterial Rhinosinusitis (ABRS)



Combined CAP and ABRS

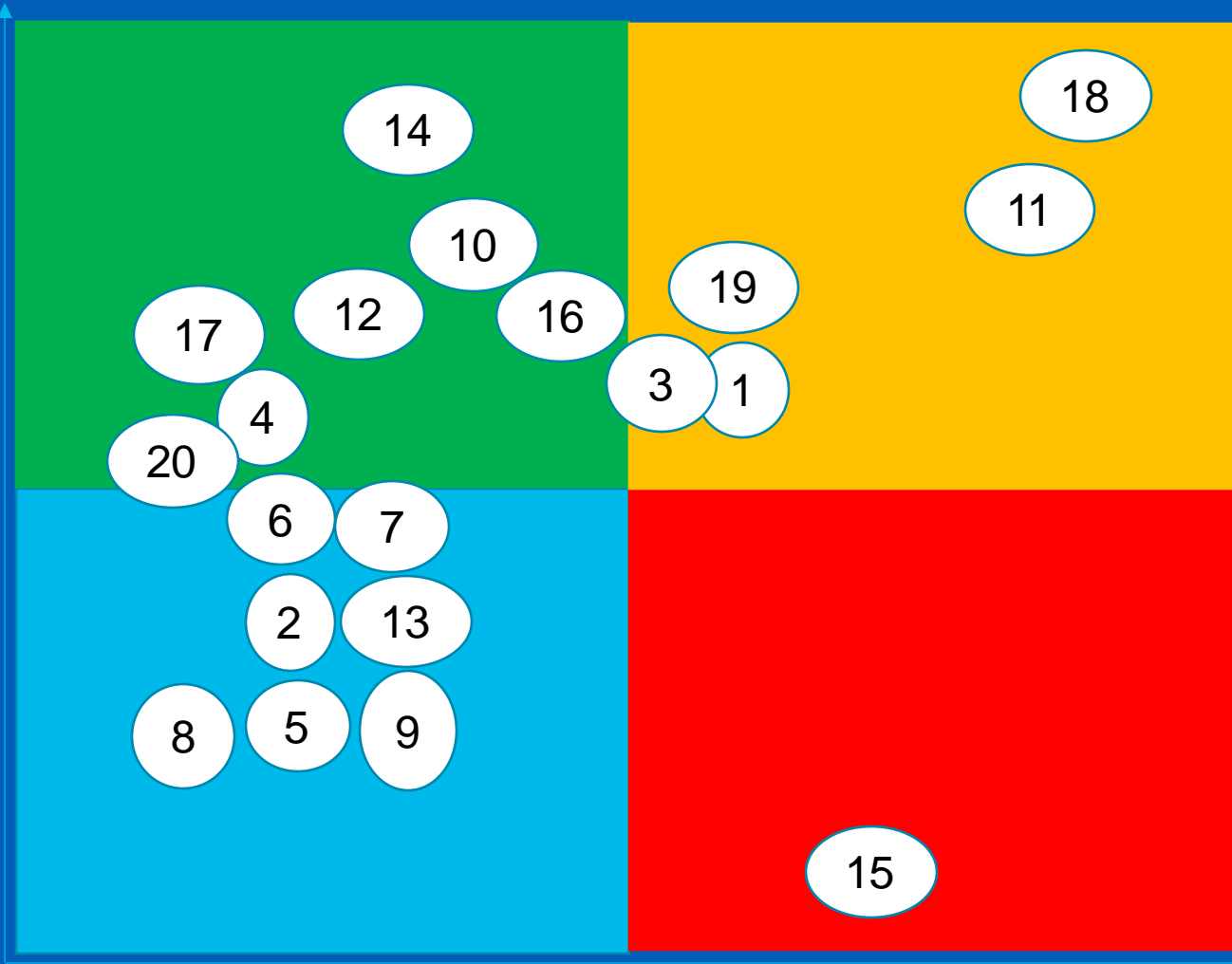


Fishbone Diagram

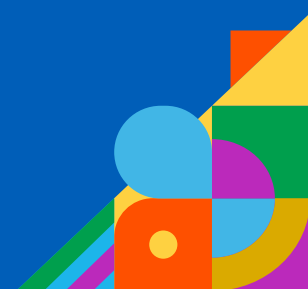


PICK Chart

I
M
P
A
C
T



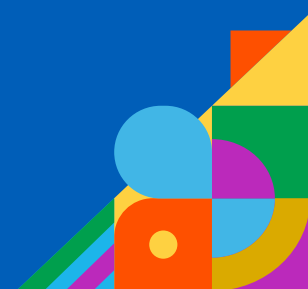
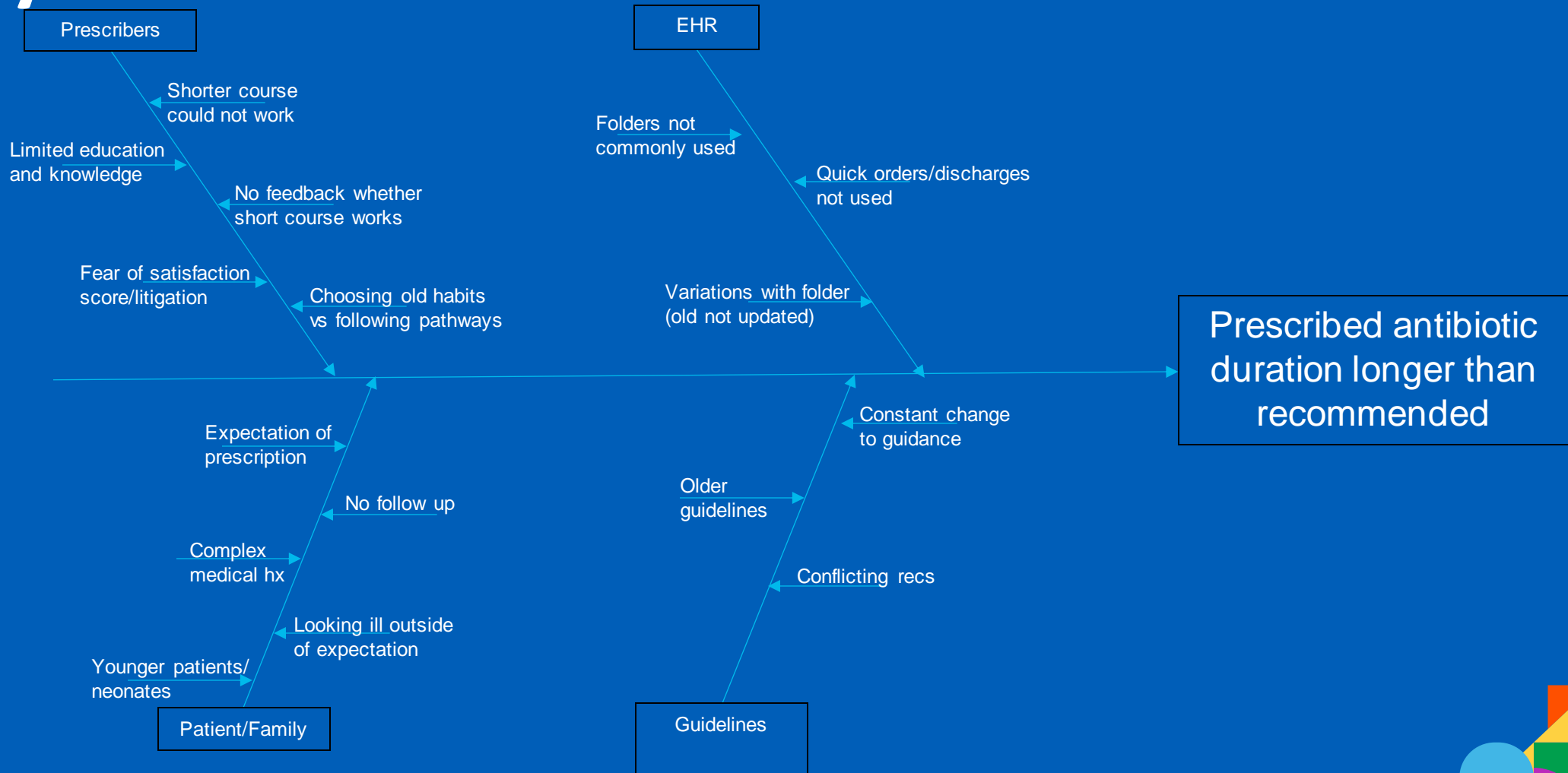
1. Aligning order sets to duration guidelines
2. Create/modify quick discharge orders sets to align with guidelines
3. Make prescription folders for each diagnosis
4. Share new pneumonia clinical pathway
5. Laminated QR codes to clinical pathway in work rooms
6. Quick education or dot phrases modifications to align with guidelines
7. Smart phrase for those outside the guidelines
8. Updating outpatient handbook with new clinical pathway
9. Prescriber survey
10. Prescriber education – in person and module
11. Prescriber directed feedback, quarterly
12. MOC part 4 credit
13. Performance improvement CME
14. Submission for DOP
15. Education for pharmacy
16. Add to metric board, weekly data
17. Prescriber acknowledgement
18. Utilizing AI/decision support to stratify patient in real time to optimize treatment
19. Changing prescriber favorite orders to align with guidelines
20. Educate Urgent care prescribers/moonlighters/residents



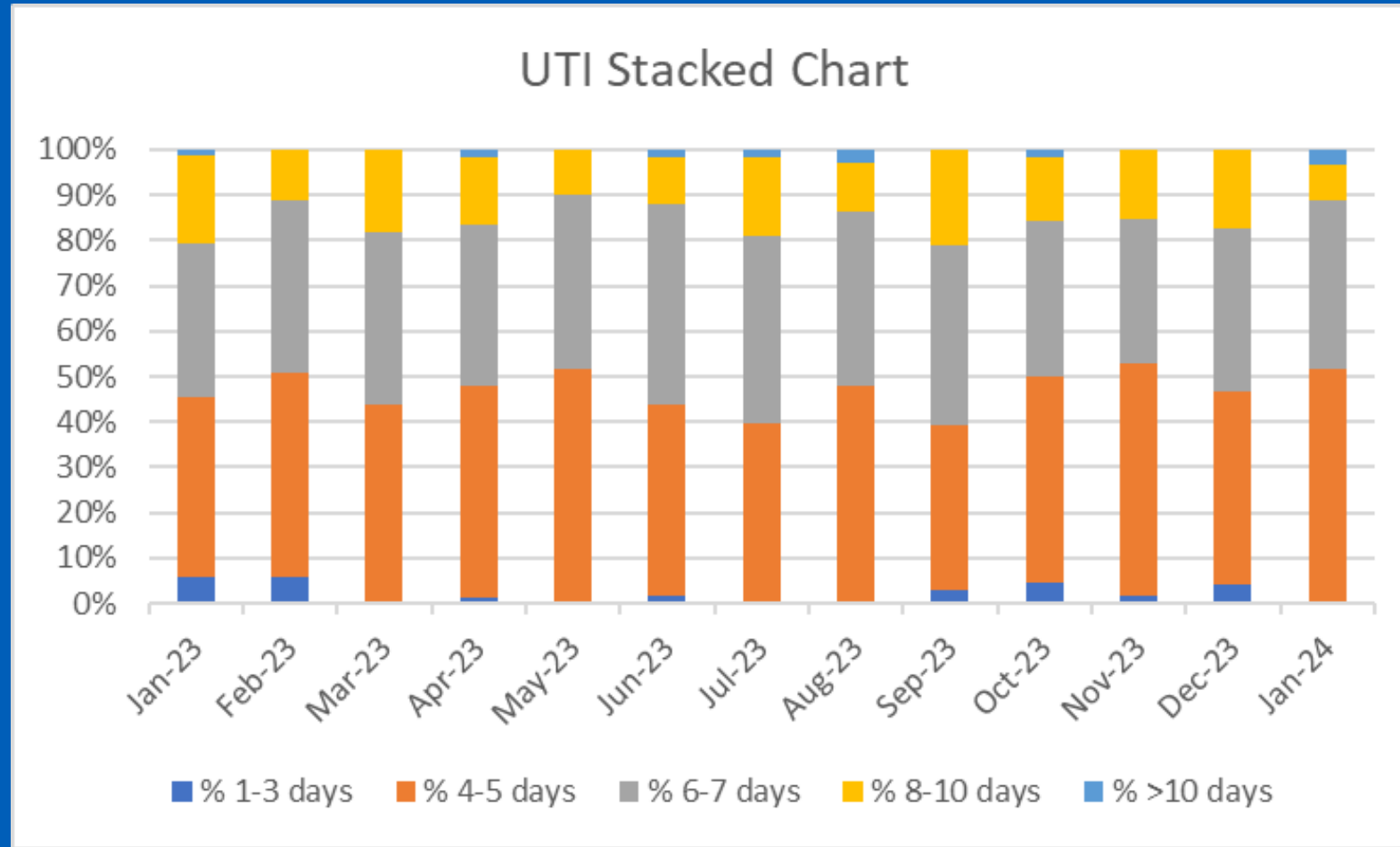
Next Steps

- Using our fishbone diagram and recent guidelines, plan to develop a survey for ED provider
 - Create Pareto chart
- Update quick discharge order set for pneumonia

Survey Focus



Future Directions



Questions?

