MPOG Cardiac Anesthesia Subcommittee Meeting
December 16th, 2024

Agenda

- Introduction & announcements
- Unblinded Review of measures:
  - ABX-02-C
  - ABX-03-C
  - ABX-04-C
  - ABX-05-C
  - AKI-02-C
- Summary and next steps

Introductions

- **ASPIRE Quality Team**
  - **Allison Janda, MD** – MPOG Cardiac Anesthesia Subcommittee Lead
  - **Michael Mathis, MD** – MPOG Director of Research
  - **Kate Buehler, MS, RN** – Clinical Program Manager

- Cardiac Anesthesiology Representatives joining us from around the US!

Upcoming Cardiac-Focused Measure Reviews

Measure	Review Date	Reviewers
TEMP-06-C: Hypothermia Avoidance	February 2025	Mariya Geube, Cleveland Clinic
TEMP-07-C: Hyperthermia Avoidance	February 2025	Ashan Grewal, UMaryland
GLU-06-C: Hyperglycemia Management	June 2026	Josh Billings, Vanderbilt
GLU-07-C: Hypoglycemia Management	June 2026	Rob Schonberger, Yale
GLU-08-C: Hyperglycemia Treatment	June 2026	Josh Billings, Vanderbilt

Thank you in advance for ensuring MPOG Cardiac-specific measures remain relevant & consistent with published recommendations!

Contact Allison with any questions: ajanda@med.umich.edu

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Unblinded Data Review:
Antibiotic Compliance Measures

Reminders:

Per the terms and conditions outlined during the registration process:

- A culture of openness and trust are critical to the development of such a collaborative effort to improve quality; and **a commitment for confidentiality is required to further the goals of ASPIRE.**

- The following examples are to be considered privileged and confidential information and should be discussed only within the confines of the Cardiac Subcommittee Meeting.
  - Any and all patient information.
  - Any and all patient identifiers/information which are considered privileged and protected health information as defined by current HIPAA laws.
  - Any specific MPOG QI registry case information.
  - Any information discussed regarding a specific site outcome.
  - Any reference to a specific MPOG site result or analysis.
  - All anesthesiology data presented including but not limited to outcome reports.
  - **Taking screenshots, pictures or videos of data slides is prohibited.**

Site Participation

- All sites that perform >75 open cardiac procedures annually are presented on the slides to follow
- This is a closed meeting: registration required to receive the Zoom link.
- Only those sites who have a participant on the cardiac subcommittee are unblinded
- Cardiac Anesthesia Champions were notified that unblinded data would be shared and were given the opportunity to opt out
- No sites emailed us to express a desire to be excluded from this review

ABX-02 Antibiotic Timing, Open Cardiac

- **Description:**
  - Percentage of adult patients undergoing open cardiac surgery with antibiotic administration initiated within the appropriate time frame before incision (see specification for timing expectations per agent)
- **Timing:**
  - 120 minutes prior to Surgery Start through Surgery Start.
- **Success Criteria:**
  - Documentation of antibiotics administered before surgery start time

ABX-02 Antibiotic Timing Considerations

- **Inclusions:**
  - Adult patients undergoing open cardiac surgical procedures (determined by Procedure Type Cardiac: value code 1)
- **Exclusions:**
  - Age < 18 years
  - ASA 6 including Organ Procurement
  - Patients already on scheduled antibiotics or had a documented infection prior to surgery, as determined by ABX Notes Phenotype (value code 2)
  - Non-cardiac, Transcatheter/Endovascular, EP/Cath groups and Other Cardiac cases as determined by the Procedure Type: Cardiac phenotype
  - Procedure Type: Lung Transplant

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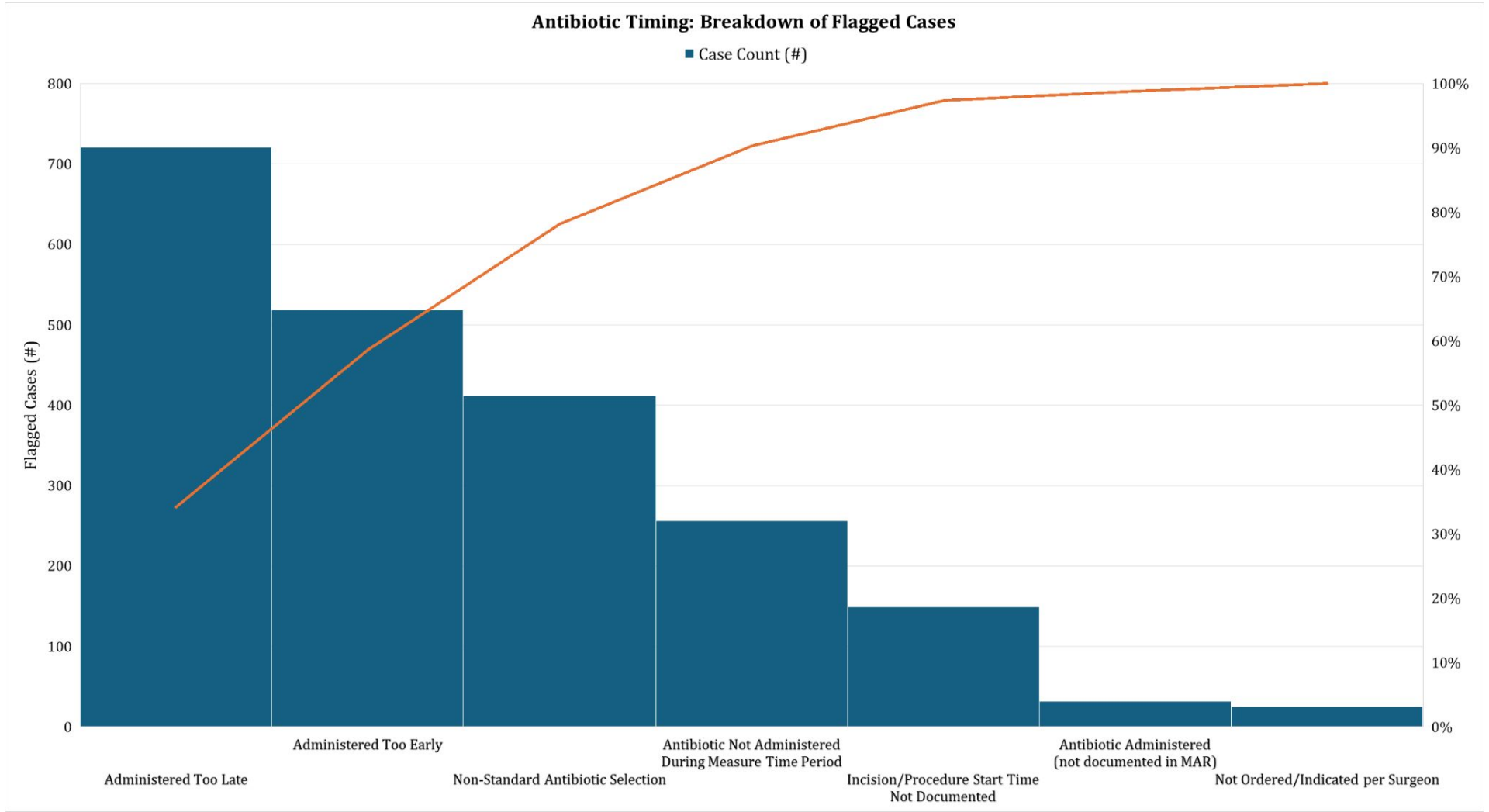
Antibiotic Timing: Breakdown of Flagged Cases
Case Count (#)
Flagged Cases (#)
800
700
600
500
400
300
200
100
0
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Administered Too Late
Administered Too Early
Non-Standard Antibiotic Selection
Antibiotic Not Administered During Measure Time Period
Incision/Procedure Start Time Not Documented
Antibiotic Administered (not documented in MAR)
Not Ordered/Indicated per Surgeon

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ABX-03 Antibiotic Re-dosing, Open Cardiac

- **Description:**
  - Percentage of adult patients undergoing open cardiac procedure with an antibiotic re-dose initiated within 3-4 hours after initial antibiotic administration (cephalosporins only).
- **Timing:**
  - 120 minutes prior to Anesthesia Start through Surgery End. If Surgery End is not available, then Anesthesia End.
- **Success:**
  - Documentation of cephalosporin re-dose within 165-255 minutes after each cephalosporin administration (max: 3 doses)

ABX-03 Antibiotic Re-dosing Considerations

- **Inclusions:**
  - Adult patients undergoing open cardiac surgical procedures (determined by Procedure Type Cardiac: value code 1) **and** receiving antibiotic prophylaxis with a cephalosporin
- **Exclusions:**
  - Age < 18 years
  - ASA 6 including Organ Procurement
  - Cases where Surgery End time is before re-dose (less than 4 hours and 15 minutes after cephalosporin dose)
  - Cases without administration of a cephalosporin for antibiotic prophylaxis
  - Patients already on scheduled antibiotics or had a documented infection prior to surgery, as determined by ABX Notes Phenotype (value code 2)
  - Non-cardiac, Transcatheter/Endovascular, EP/Cath groups and Other Cardiac cases as determined by the Procedure Type: Cardiac phenotype
  - Procedure Type: Lung Transplant

ABX-03-C: Antibiotic Redosing, Open Cardiac Procedures

- **Attribution:**
  - All anesthesia providers signed in at the time of each re-dose (if not given: 255 minutes after initial cephalosporin dose, and/or if not given: 255 minutes after the first re-dose)
- **Notes:**
  - Ceftriaxone & cefotetan are excluded due to extended half-lives as compared to more commonly used cephalosporins. Redosing not recommended.
  - Cefoxitin excluded: non-standard antibiotic for cardiac cases with short half-life.
- **Recent Updates:**
  - **Infusions now considered (start time determines re-dose window). If still running at time of re-dose = pass.**
  - **If re-dosed within 255 minutes before surgery end = pass, if not = exclude.**

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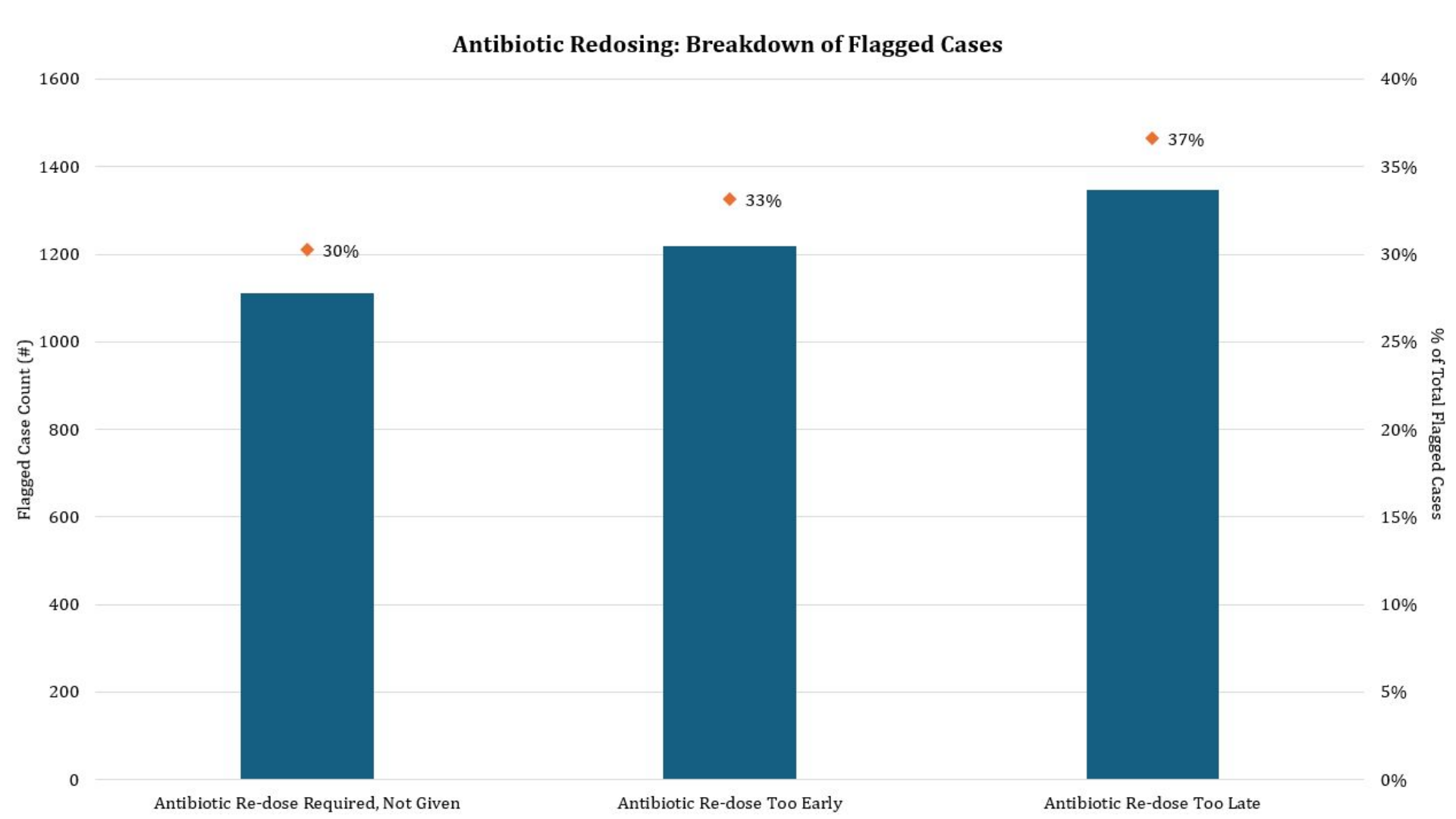
Antibiotic Redosing: Breakdown of Flagged Cases
Flagged Case Count (#)
% of Total Flagged Cases
1600
1400
1200
1000
800
600
400
200
0
40%
35%
30%
25%
20%
15%
10%
5%
0%
30%
33%
37%
Antibiotic Re-dose Required, Not Given
Antibiotic Re-dose Too Early
Antibiotic Re-dose Too Late

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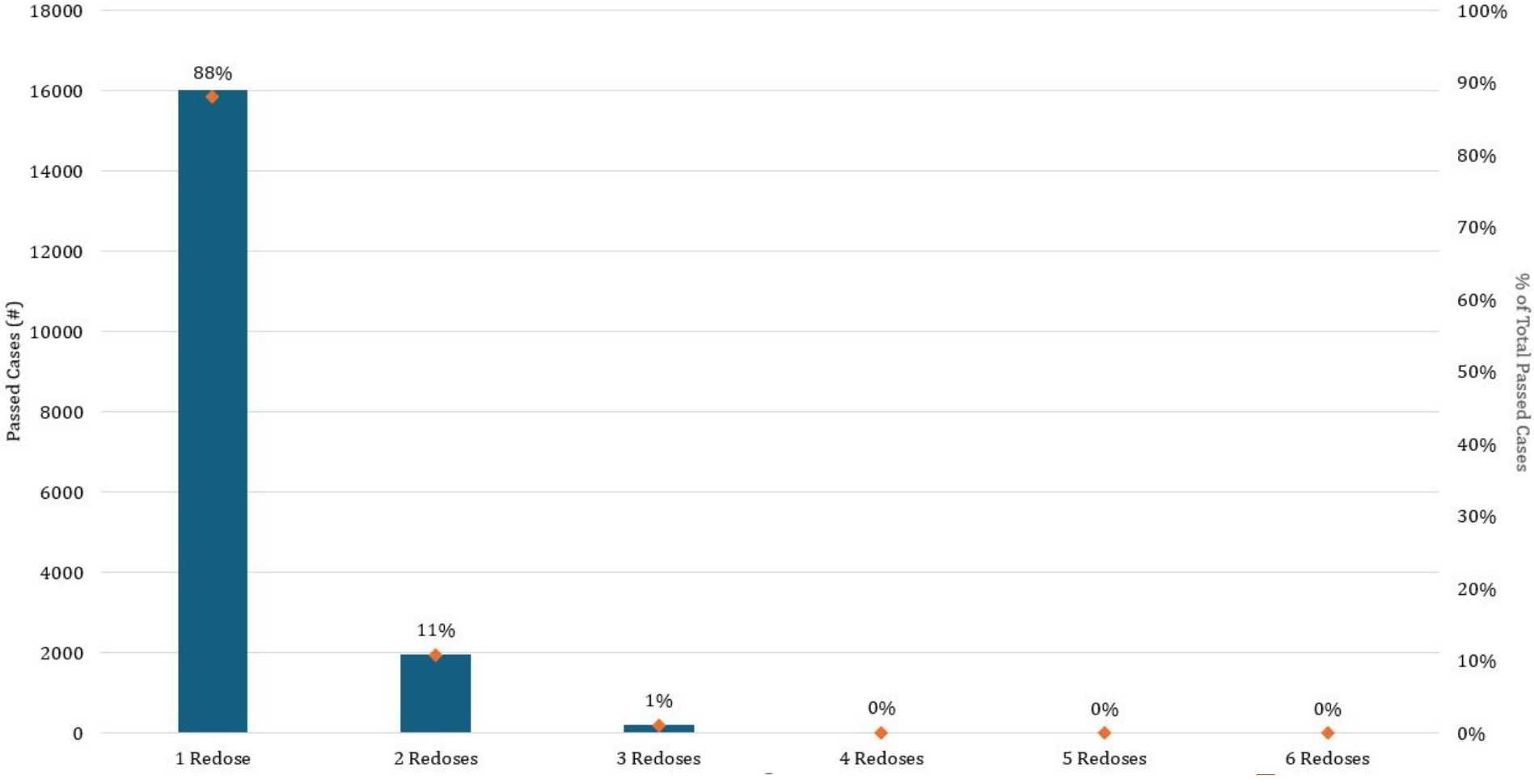
Number of Redoses per Case
ABX-03-C Passed Cases Only



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ABX-03-C Discussion

- Some cases are re-dosed just prior to surgical incision in an effort to achieve optimal blood concentration levels at time of incision. These cases flag as ‘Re-dosed too early’ currently. Is this appropriate?

  2:49:00 PM CEFUROXIME 1.5 GM

  3:10:00 PM Anesthesia Start

  3:50:00 PM CEFUROXIME 1.5 GM Flagged: Re-dose too early

  4:50:00 PM Procedure Start

  7:51:00 PM CEFUROXIME 1.5 GM

  8:48:00 PM Procedure End

  9:02:00 PM Anesthesia End

- If there are multiple doses prior to incision (procedure start), should we only consider the most recent dose and ignore earlier doses?

ABX-04 Antibiotic Selection, Open Cardiac Procedures

- **Description:**
  - Percentage of adult patients undergoing open cardiac surgery with the recommended antibiotic agents administered for surgical site infection prophylaxis.
- **Timing:**
  - 120 minutes prior to Anesthesia Start through Anesthesia End
- **Attribution:**
  - All anesthesia providers signed in at the time of Anesthesia Start Time

ABX-04 Antibiotic Selection Considerations

- **Inclusions:**
  - Adult patients undergoing open cardiac surgical procedures
- **Exclusions:**
  - Age < 18 years
  - ASA 6 including Organ Procurement
  - Patients already on scheduled antibiotics or had a documented infection prior to surgery, as determined by “Patient on Scheduled Antibiotics/Documented Infection” (value: 2) of the ABX Notes Phenotype
  - Non-cardiac, Transcatheter/Endovascular, EP/Cath groups and Other Cardiac cases as determined by the Procedure Type: Cardiac phenotype
  - Lung Transplant cases as determined by the Procedure Type: Lung Transplant phenotype

ABX-04 Antibiotic Selection Considerations

- **Acceptable antibiotic combinations for Open Cardiac Procedures:**
  - Vancomycin + Cephalosporin
  - Vancomycin + Aminoglycoside
  - Cephalosporin Only

ABX-04 Antibiotic Selection Considerations

Cases will be assigned one of the following result reasons:

- Passed - Vancomycin + Cephalosporin
- Passed - Vancomycin + Aminoglycoside
- Passed - Cephalosporin Only
- Flagged - Non-standard antibiotic selection
- Flagged - Prophylactic antibiotic not administered (Not documented in MAR)
- Flagged - Antibiotic not ordered/indicated per surgeon
- Flagged - Not administered for medical reasons
- Excluded - Scheduled antibiotics/documented infection

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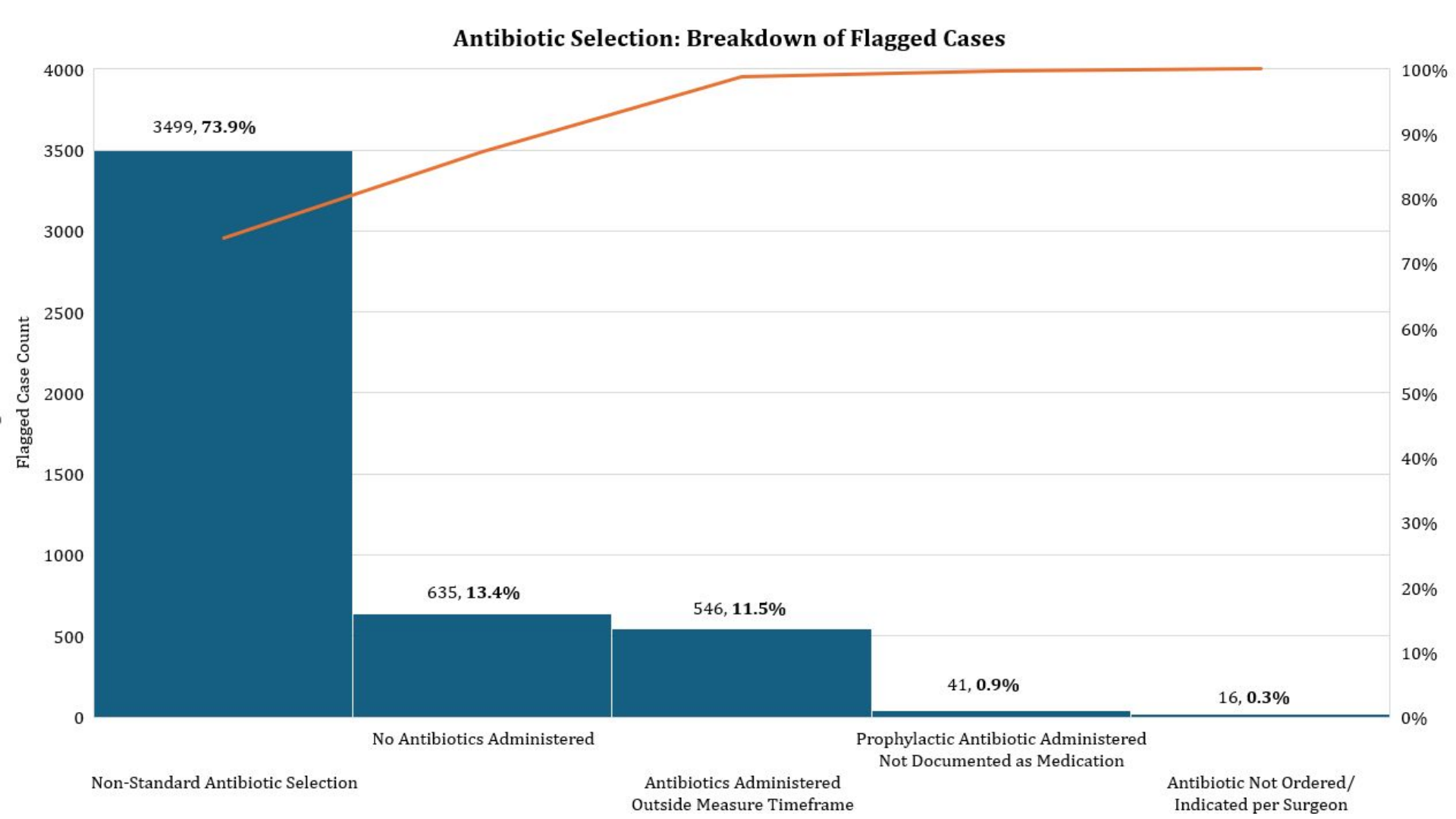
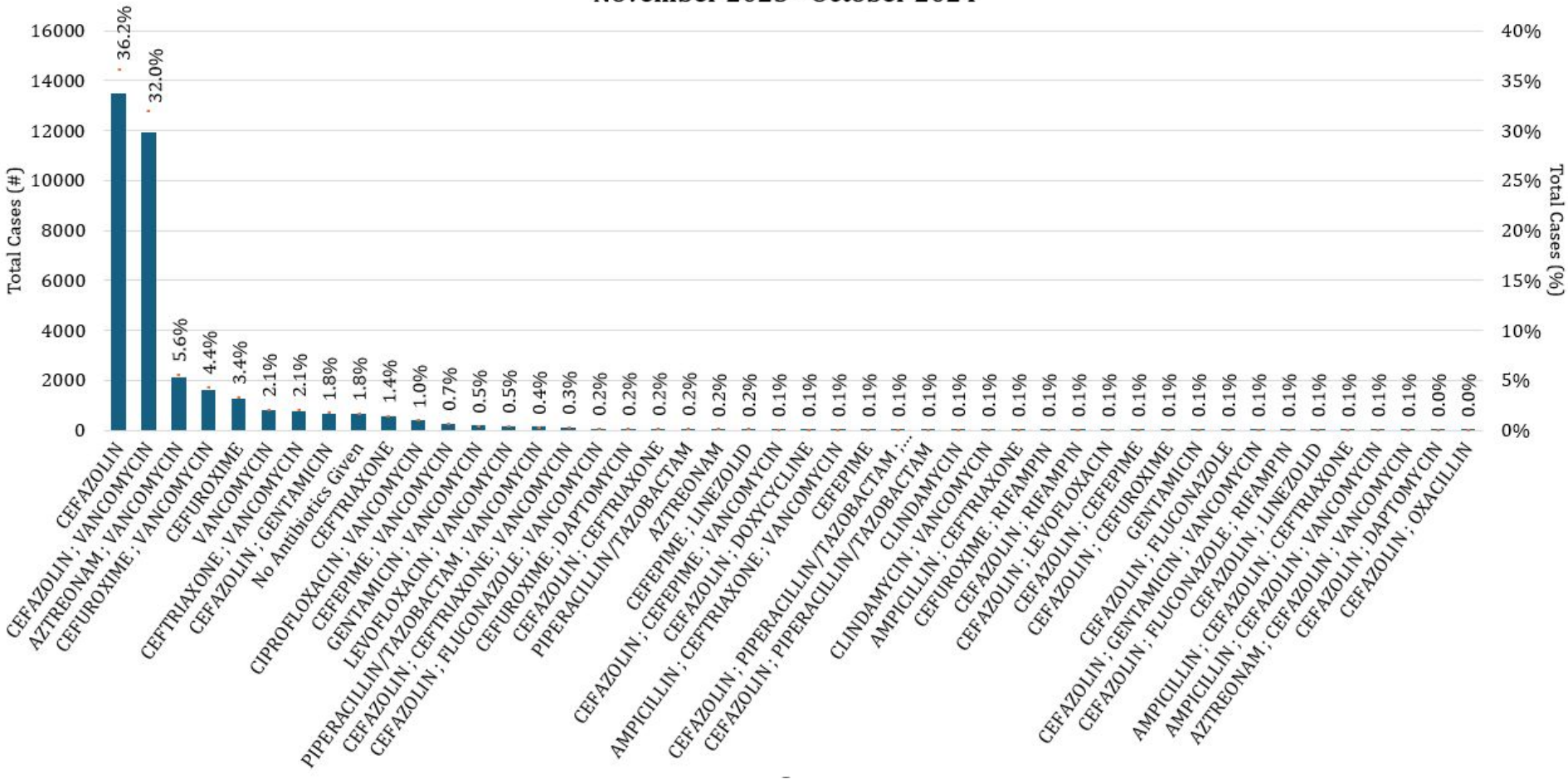
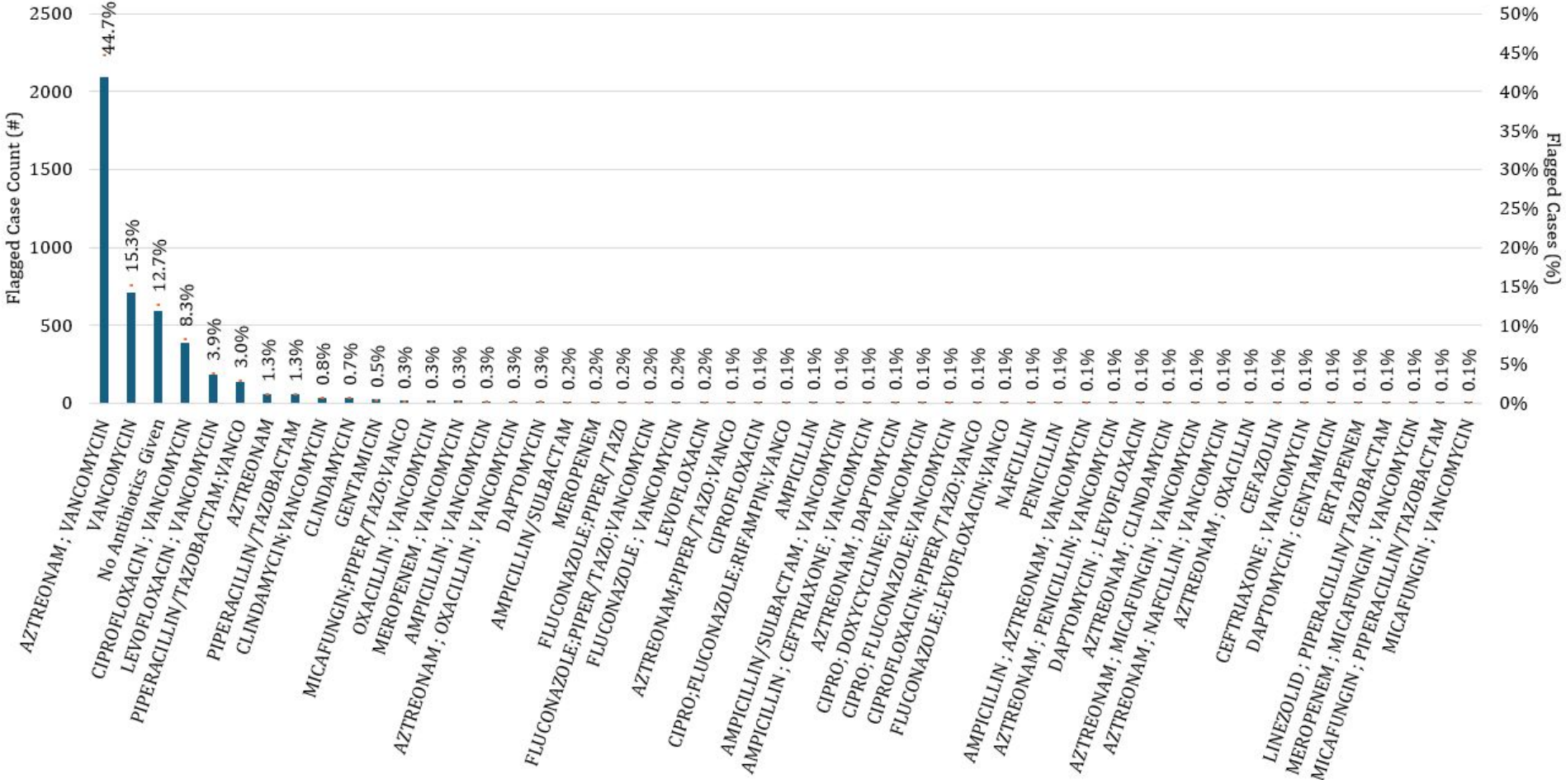
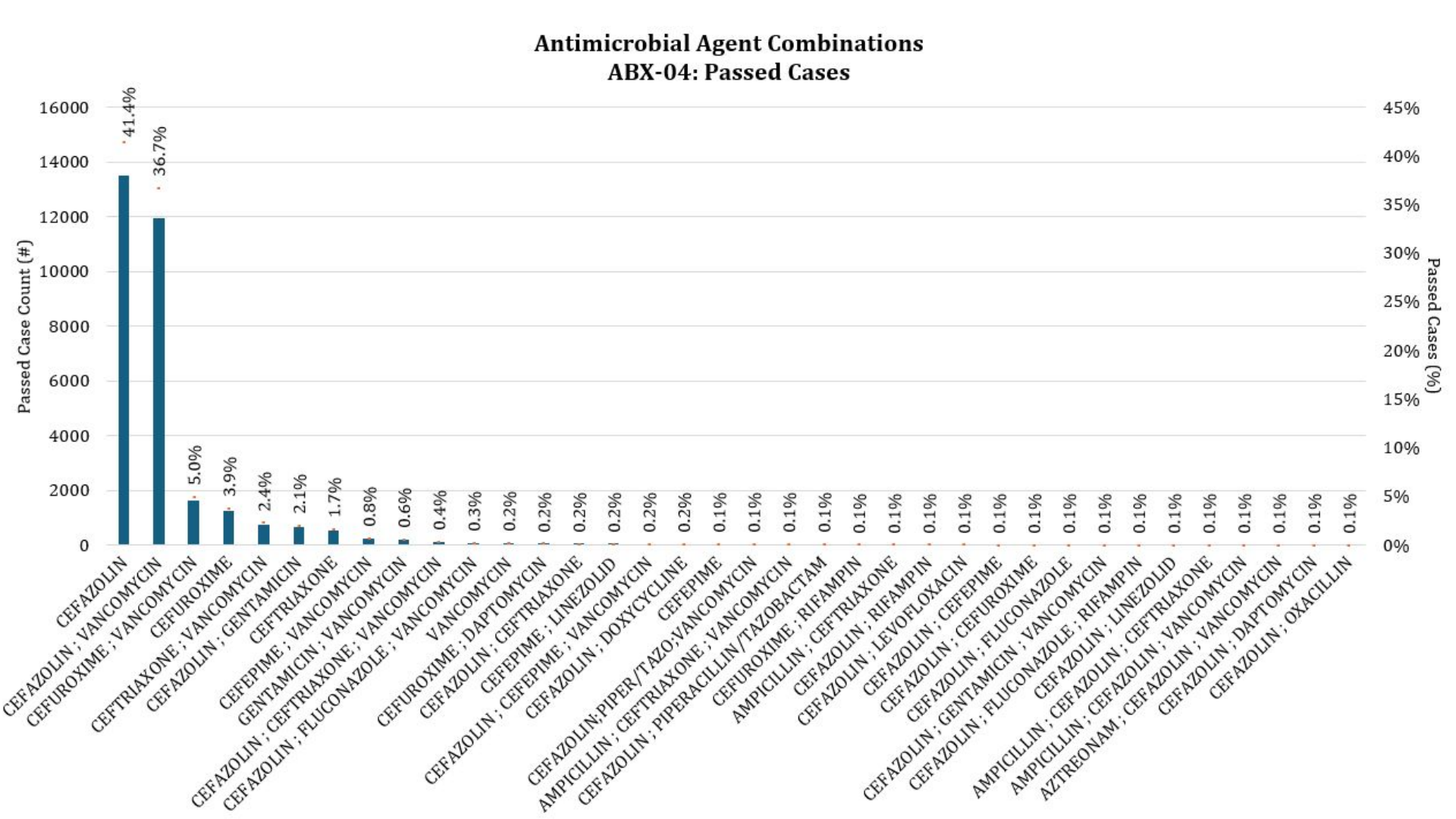

Antibiotic Selection: Breakdown of Flagged Cases
Flagged Case Count
4000
3500
3000
2500
2000
1500
1000
500
0
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
3499, 73.9%
635, 13.4%
546, 11.5%
41, 0.9%
16, 0.3%
Non-Standard Antibiotic Selection
No Antibiotics Administered
Antibiotics Administered Outside Measure Timeframe
Prophylactic Antibiotic Administered Not Documented as Medication
Antibiotic Not Ordered/ Indicated per Surgeon

Top 50 Most Common Antimicrobial Agents Administered for Open Cardiac Surgery
ABX-04: All Cases
November 2023 - October 2024



Antimicrobial Agent Combinations
ABX-04: Flagged Cases




Antimicrobial Agent Combinations
ABX-04: Passed Cases
Passed Case Count (#)
Passed Cases (%)
16000
14000
12000
10000
8000
6000
4000
2000
0
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
41.4%
36.7%
5.0%
3.9%
2.4%
2.1%
1.7%
0.8%
0.6%
0.4%
0.3%
0.2%
0.2%
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0.2%
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0.1%
0.1%
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0.1%
0.1%
0.1%
0.1%
0.1%
0.1%
0.1%
0.1%
CEFAZOLIN
CEFAZOLIN ; VANCOMYCIN
CEFUROXIME ; VANCOMYCIN
CEFUROXIME
CEFTRIAXONE ; VANCOMYCIN
CEFAZOLIN ; GENTAMICIN
CEFTRIAXONE
CEFEPIME ; VANCOMYCIN
GENTAMICIN ; VANCOMYCIN
CEFAZOLIN ; CEFTRIAXONE ; VANCOMYCIN
CEFAZOLIN ; FLUCONAZOLE ; VANCOMYCIN
VANCOMYCIN
CEFUROXIME ; DAPTOMYCIN
CEFAZOLIN ; CEFTRIAXONE
CEFEPIME ; LINEZOLID
CEFEPIME ; VANCOMYCIN
CEFAZOLIN ; DOXYCYCLINE
CEFEPIME
CEFAZOLIN;PIPER/TAZO;VANCOMYCIN
AMPICILLIN ; CEFTRIAXONE ; VANCOMYCIN
CEFAZOLIN ; PIPERACILLIN/TAZOBACTAM
CEFUROXIME ; RIFAMPIN
AMPICILLIN ; CEFTRIAXONE
CEFAZOLIN ; RIFAMPIN
CEFAZOLIN ; LEVOFLOXACIN
CEFAZOLIN ; CEFEPIME
CEFAZOLIN ; CEFUROXIME
CEFAZOLIN ; FLUCONAZOLE
CEFAZOLIN ; GENTAMICIN ; VANCOMYCIN
CEFAZOLIN ; FLUCONAZOLE ; RIFAMPIN
CEFAZOLIN ; LINEZOLID
AMPICILLIN ; CEFAZOLIN ; CEFTRIAXONE
AMPICILLIN ; CEFAZOLIN ; VANCOMYCIN
AZTREONAM ; CEFAZOLIN ; VANCOMYCIN
CEFAZOLIN ; DAPTOMYCIN
CEFAZOLIN ; OXACILLIN

ABX-04-C Discussion

- Should vancomycin + ‘any antibiotic with gram negative’ coverage = pass?
  - Ex. Currently, vanco + Zosyn or vanco + aztreonam are flagged

ABX-05 Composite Antibiotic Compliance for Open Cardiac

- **Description:**
  - Percentage of adult patients undergoing open cardiac surgery with appropriate antibiotic selection, timing, and re-dosing administered for surgical site infection prophylaxis.
- **Timing:**
  - 120 minutes prior to Anesthesia Start Time through Anesthesia End Time
- **Attribution:** Departmental Only
  - Case level attribution, viewable on the dashboard at the case level, not provided to individual clinicians
- **Success:**
  - Case must pass all antibiotic prophylaxis measures for which the case is not excluded for open cardiac procedure measures (must be included in at least one ABX measure to be a candidate for the composite measure)
    - ABX-02-C / ABX-03-C / ABX-04-C

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ABX-05 Composite Antibiotic Compliance Considerations

- **Inclusions:**
  - Adult patients undergoing open cardiac surgical procedures
- **Exclusions:**
  - Age < 18 years
  - ASA 6 including Organ Procurement
  - Patients already on scheduled antibiotics or had a documented infection prior to surgery, as determined by “Patient on Scheduled Antibiotics/Documented Infection” (value: 2) of the ABX Notes Phenotype
  - Non-cardiac, Transcatheter/Endovascular, EP/Cath groups and Other Cardiac cases as determined by the Procedure Type: Cardiac phenotype
  - Lung Transplant cases as determined by the Procedure Type: Lung Transplant Phenotype

ABX-05-C - Other Measure Build Details

Cases will be assigned one of the following result reasons:

- Passed - Antibiotic Prophylaxis Standards Met
- Flagged - Timing, Re-dosing, & Selection Not Met (ABX-02-C, ABX-03-C, & ABX-04-C flagged)
- Flagged - Timing & Selection Not Met (ABX-02-C & ABX-04-C flagged)
- Flagged - Re-dosing & Selection Not Met (ABX-03-C & ABX-04-C flagged)
- Flagged - Timing & Re-dosing Not Met (ABX-02-C & ABX-03-C flagged)
- Flagged - Antibiotic not administered on time (ABX-02-C flagged)
- Flagged - Antibiotic not appropriately re-dosed (ABX-03-C flagged)
- Flagged - Non-standard antibiotics selection (ABX-04-C flagged)
- Excluded - Scheduled antibiotics/documented infection

*Case must be included and passed for at least one of the antibiotic measures to be included for ABX-05. If any measure is flagged, ABX-05 will also be flagged.

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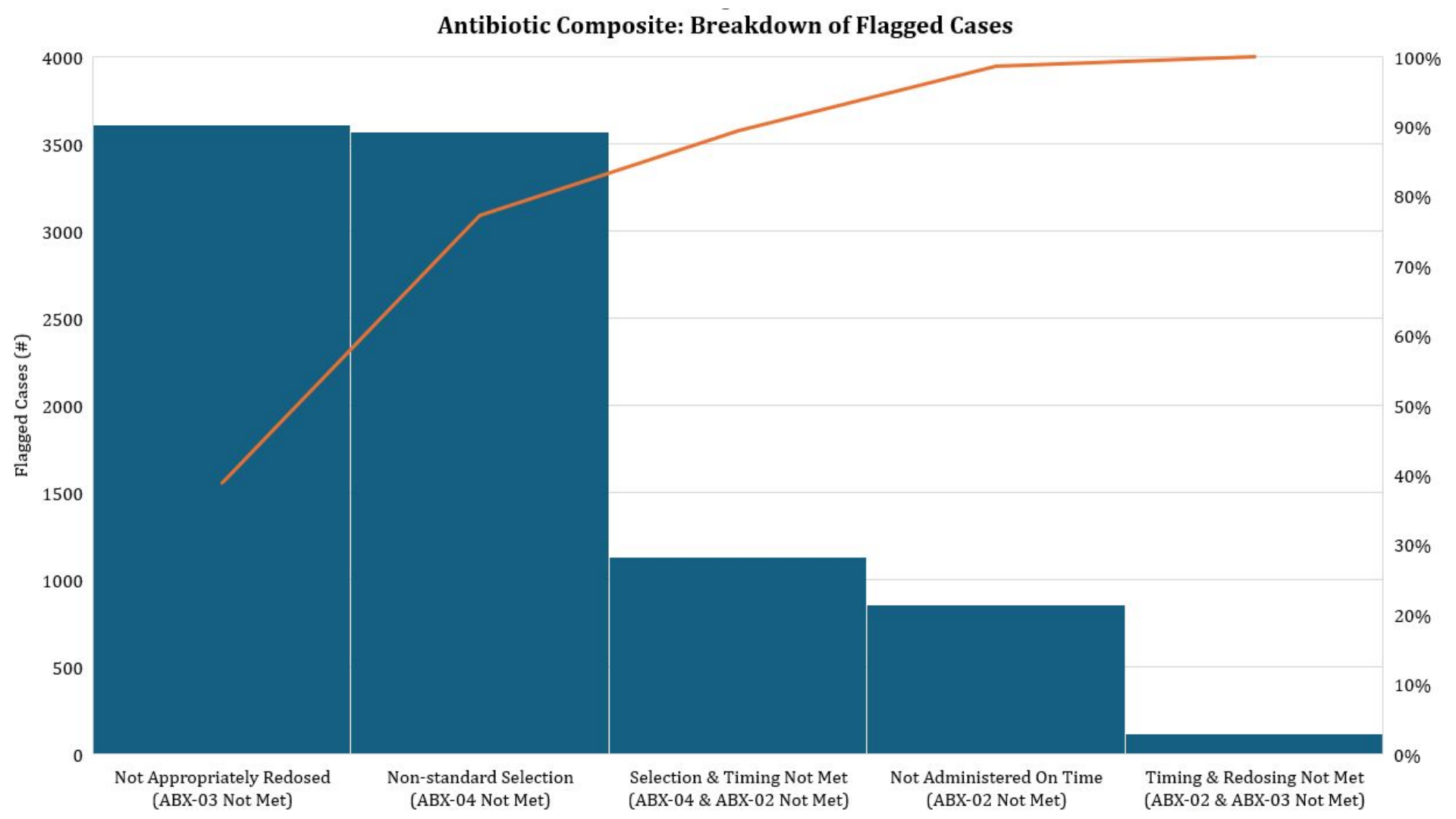
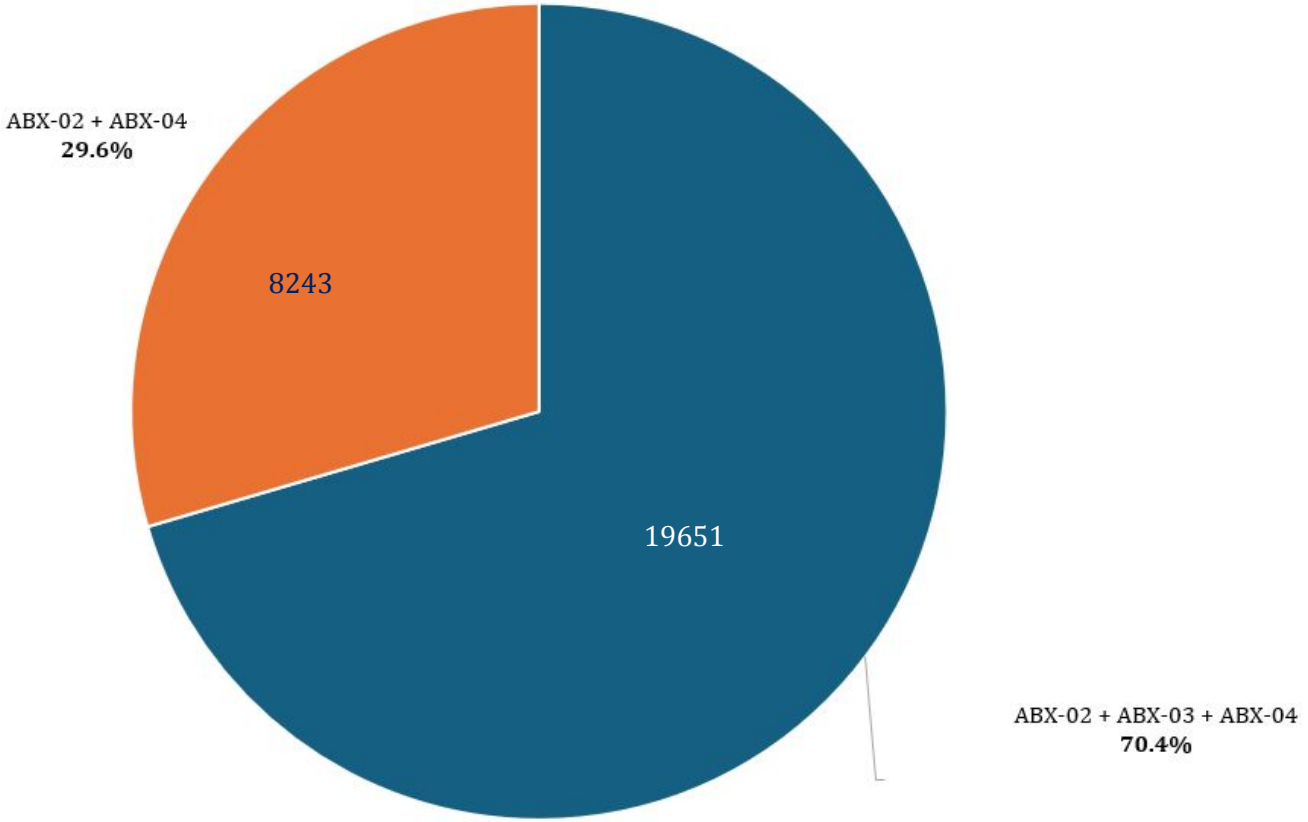

Antibiotic Composite: Breakdown of Flagged Cases
Flagged Cases (#)
4000
3500
3000
2500
2000
1500
1000
500
0
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Not Appropriately Redosed (ABX-03 Not Met)
Non-standard Selection (ABX-04 Not Met)
Selection & Timing Not Met (ABX-04 & ABX-02 Not Met)
Not Administered On Time (ABX-02 Not Met)
Timing & Redosing Not Met (ABX-02 & ABX-03 Not Met)

Antibiotic Composite: Breakdown of Passed Cases



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Acute Kidney Injury - Open Cardiac Surgery

AKI-02-C: Acute Kidney Injury in patients undergoing Open Cardiac Surgery

Description: Percentage of patients undergoing an open cardiac procedure with a baseline creatinine increase of more than 1.5 times within 7 postoperative days or the baseline creatinine level increases by ≥ 0.3 mg/dL within 48 hours postoperatively.

Inclusion: Adult patients undergoing open cardiac surgical procedures (determined by Procedure Type: Cardiac value code: 1)

Success:

1. The creatinine level does not go above 1.5x the baseline creatinine within 7 days post-op
2. The creatinine level does not increase by ≥ 0.3 mg/dL obtained within 48 hours after anesthesia end.

Reported as an inverse measure.

AKI-02-C: Acute Kidney Injury in patients undergoing Open Cardiac Surgery

Exclusions:

- ASA 6 (including CPT:01990)
- Cases where a baseline creatinine is not available within 60 days preoperatively
- Cases where a creatinine lab is not available within 7 postoperative days.
- Patients with more than one case in a 7-day period. The first case will be excluded if a postop creatinine is not documented for that first case. For example, a patient that has surgery twice in a 7-day period, the first surgery is excluded if a creatinine is not drawn in between cases
- Patients with pre-existing renal (stage 4 or 5) failure based upon BSA-Indexed EGFR < 30 mL/min/1.73m^2 determined by Preop EGFR (most recent) or MPOG Complication - Acute Kidney Injury (value code -2.
- Open cardiac procedures performed in conjunction with procedures affecting the kidney, bladder, or ureter (see spec for specific anesthesia and surgical CPT codes).
- Liver Transplants

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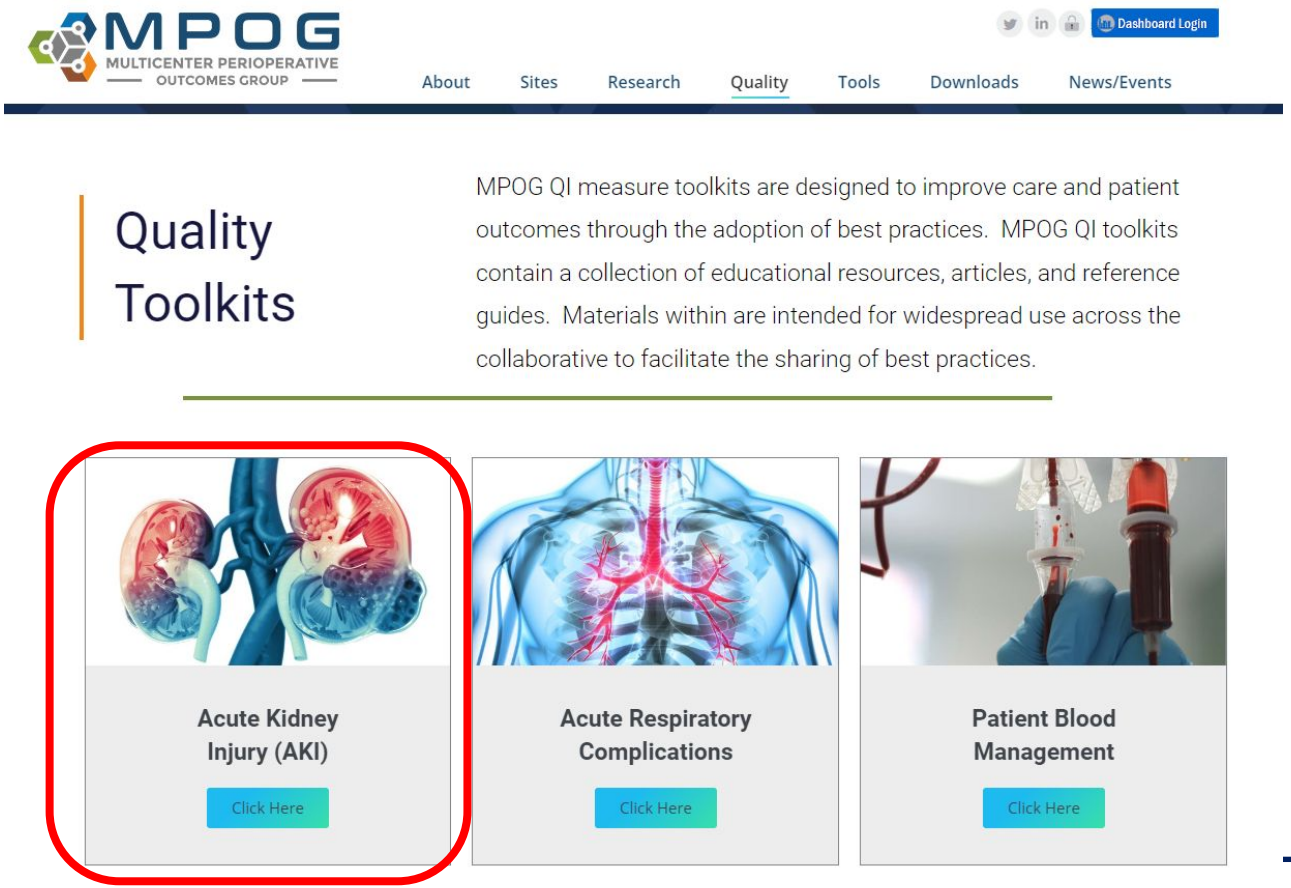
Acute Kidney Injury in Cardiac Surgery Toolkit



Acute Kidney Injury Prevention Toolkit for Cardiac Surgery has been updated!

2023 STS/SCA/AmSECT Clinical Practice Guidelines for the Prevention of Adult Cardiac Surgery-Associated AKI now included:

MPOG CS-AKI Toolkit

Summary/Next Steps

- New measure development - plan to share prelim data at next meeting:
  - Transfusion ratios (1:1:1)
  - Hypotension (anesthesia start - procedure start)

- **Next Meeting:**
  - February 2025
  - June 2025
  - November 2025

- Thank you for using the forum for discussion between meetings

Thank you!

Allison Janda, MD
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Subcommittee Chair
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