S.aureus bacteraemia and OPAT – review of experience in NHS GGC

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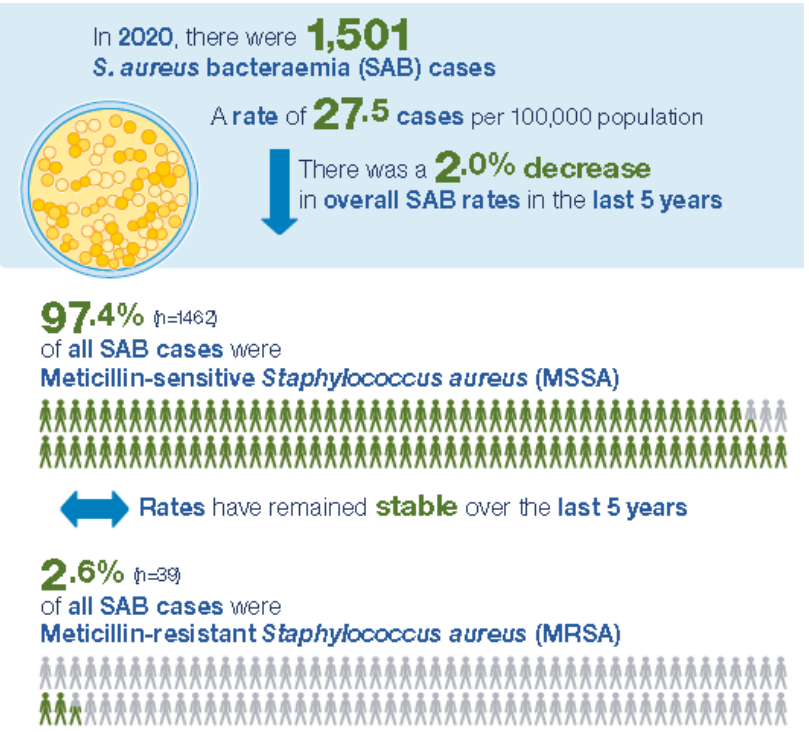
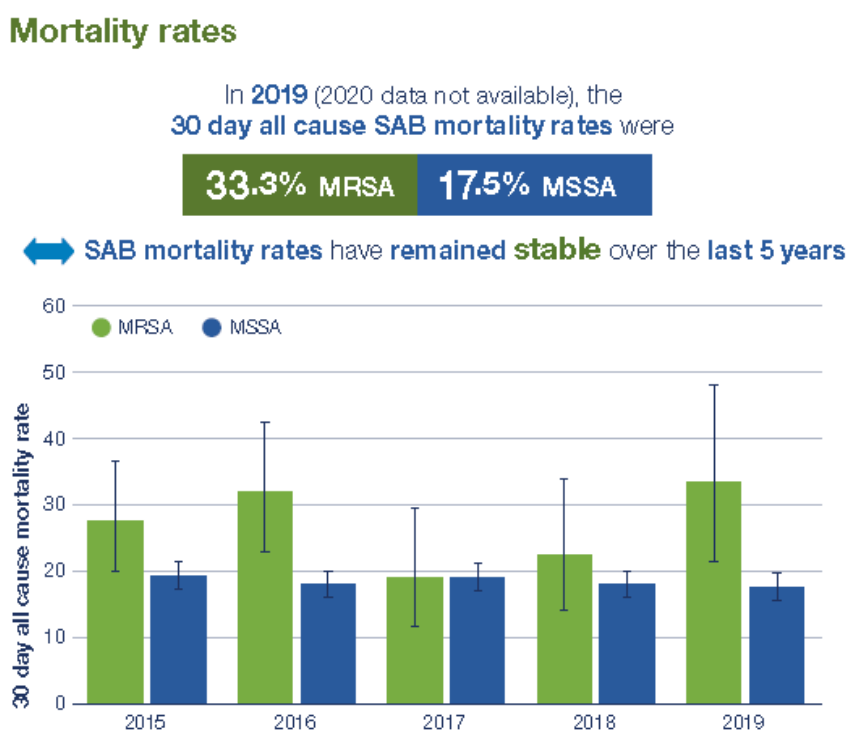
Background

- Staphylococcus aureus is the 2nd most common bacteraemia reported in Scotland
- Associated with a significant mortality rate





Year	Cases
2017	448
2018	413
2019	414
2020	372
2021	387
2022 Q1	89

Healthcare Improvement Scotland | SAPG

Guidance on management of proven or suspected *Staphylococcus aureus* bacteraemia (SAB) in adults

NHS SCOTLAND

Staphylococcus aureus bacteraemia suspected or identified in the laboratory

CLINICAL TEAM INITIAL MANAGEMENT

- Ensure prompt prescription and administration of empirical IV antibiotic therapy
- If NEWS ≥ 5, complete Sepsis 6 bundle
- Consider further microbiology samples (e.g. urine, pus, sputum, prosthetic material)
- Consider risk factors: recent hospitalisation, surgery, vascular device, person who injects drugs (PWID), haemodialysis, or previous SAB
- Discuss with patient's consultant and consider early infection specialist review
- Ensure clinical management plan is documented in notes
- Discuss all patients with complex/ deep seated/ device-related or persistent SABs, Endocarditis and all PWIDs with an infection specialist
- If SAB is healthcare associated discuss with Infection Prevention Control team regarding need for a root cause analysis and consider duty of candour

FURTHER CLINICAL MANAGEMENT

EXAMINE AND INVESTIGATE TO IDENTIFY SOURCE OF SAB
Vascular device, Skin/Soft tissue/Wound, Septic arthritis, Osteomyelitis, Discitis, Endocarditis, Prosthesis, Infected DVT/septic thrombophlebitis, Pneumonia

↓

SOURCE CONTROL
Remove infected IV device, involve appropriate surgical specialist to remove drain collections, wash out joints etc.

↓

TRANS THORACIC ECHO (TTE) IN ALL PATIENTS
Consider trans-oesophageal echocardiogram (TOE) if TTE negative and prosthetic valve or higher suspicion of endocarditis

↓

REPEAT BLOOD CULTURES 48-96 hours after starting IV antibiotics

ANTIBIOTIC TREATMENT

MINIMUM 2 WEEKS IV FLUCLOXACILLIN
(or IV Vancomycin if true allergy or MRSA)

IV FLUCLOXACILLIN is more effective than IV VANCOMYCIN in flucloxacillin-sensitive SAB

- MRSA accounts for <10% of all SABs in Scotland
- IV FLUCLOXACILLIN 2g 6 hourly (consider dose reduction only if Cr Cl < 10 mls/min) or 4-6 hourly if treating Endocarditis as per local policy
- If known MRSA carrier or previous MRSA infection use IV VANCOMYCIN but consider adding IV FLUCLOXACILLIN pending sensitivity results.
- Use IV VANCOMYCIN first line if assessed as true Penicillin allergy
- IV VANCOMYCIN dosing
  - Intermittent (pulsed) infusions: trough of 15-20 mg/L
  - Continuous infusion: steady state concentration of 20-25 mg/L

INFECTION SPECIALIST ROLE (ID physician or clinical microbiologist)

- Advice on further investigation (imaging/need for TOE) and source control
- Advice on therapy duration and need for/selection of ongoing oral therapy or OPAT
- Any antibiotic-related adverse events or failure to respond to treatment

July 2019 Review date: July 2022

Original version of guidance developed by the Scottish Antimicrobial Prescribing Group in collaboration with the Scottish Microbiology and Virology Network

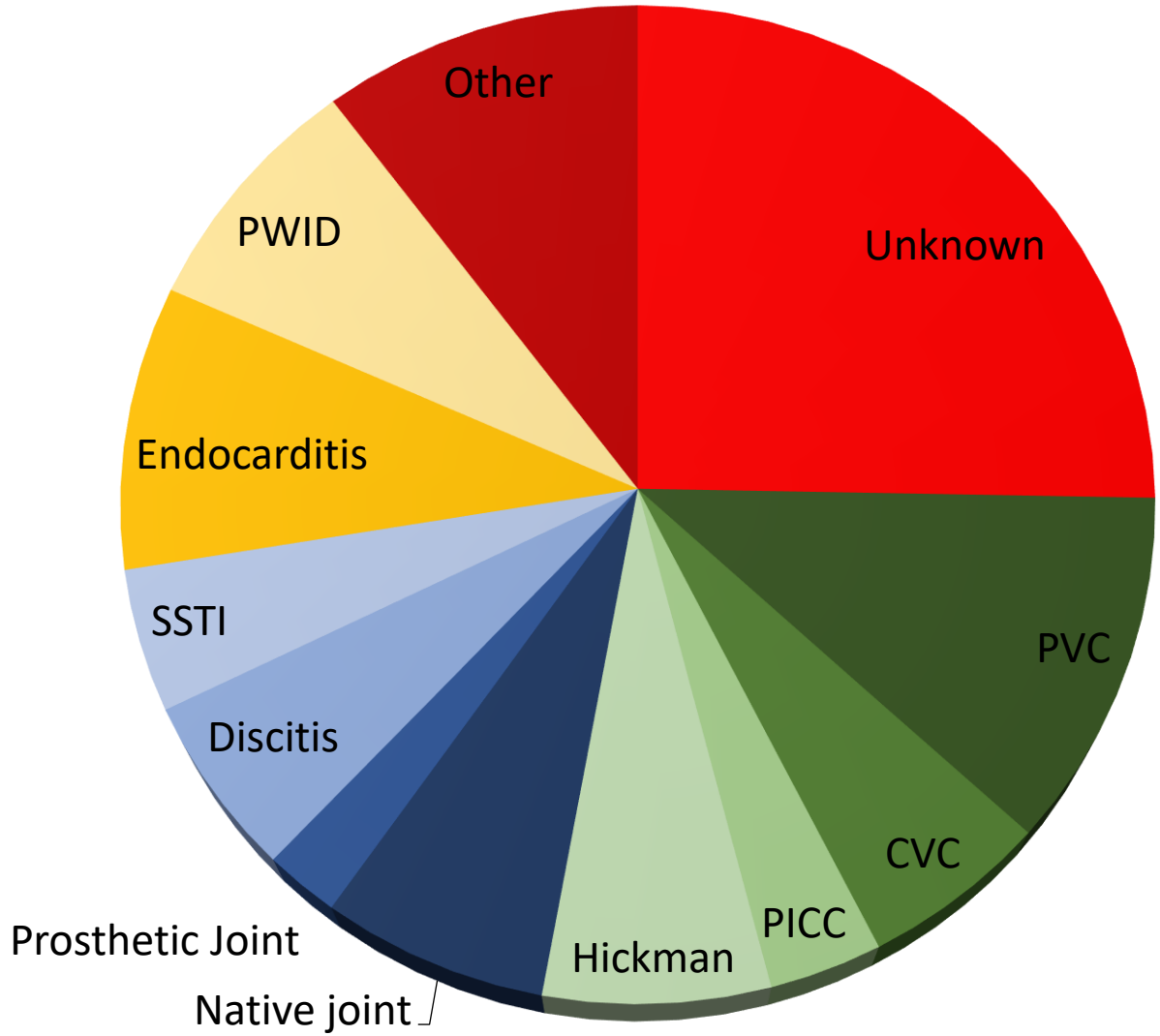
OPAT experience in NHS GGC

- Retrospective review of cases managed by NHS GGC OPAT
- CHI retrieved from clinical database
- EPR and Lab system reviewed – demographics, microbiology, diagnosis and antibiotic treatment
- OPAT choice, duration, side effects / ADEs
- Ongoing work so preliminary data

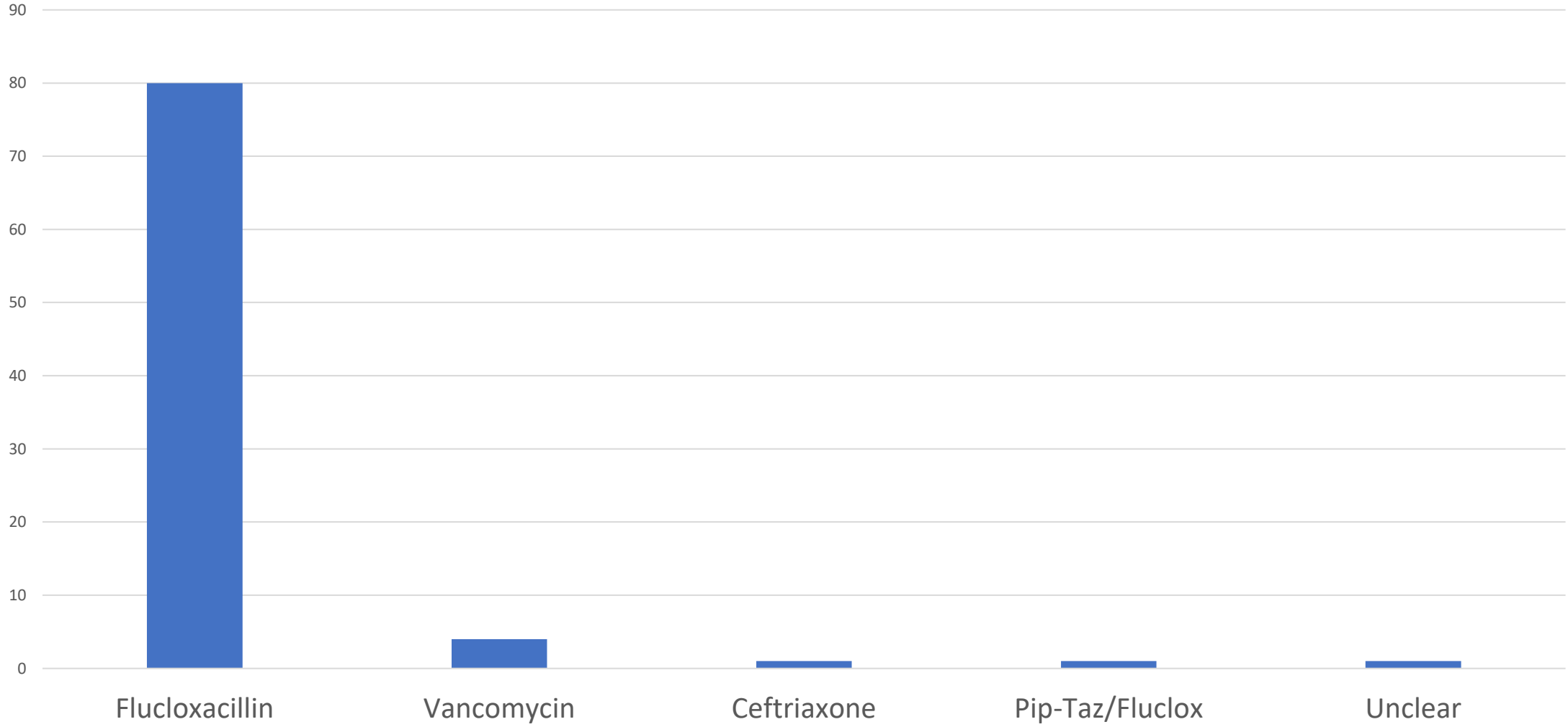
Overview

- 87 cases included
- 49 (56.3%) males, 38 (43.7%) females
- Median age 51 (14-87 years)
- August 2013 – September 2022 (median October 2020)
- 86 MSSA and 1 MRSA
- All had echo carried out
- 84/87 had negative follow up blood cultures

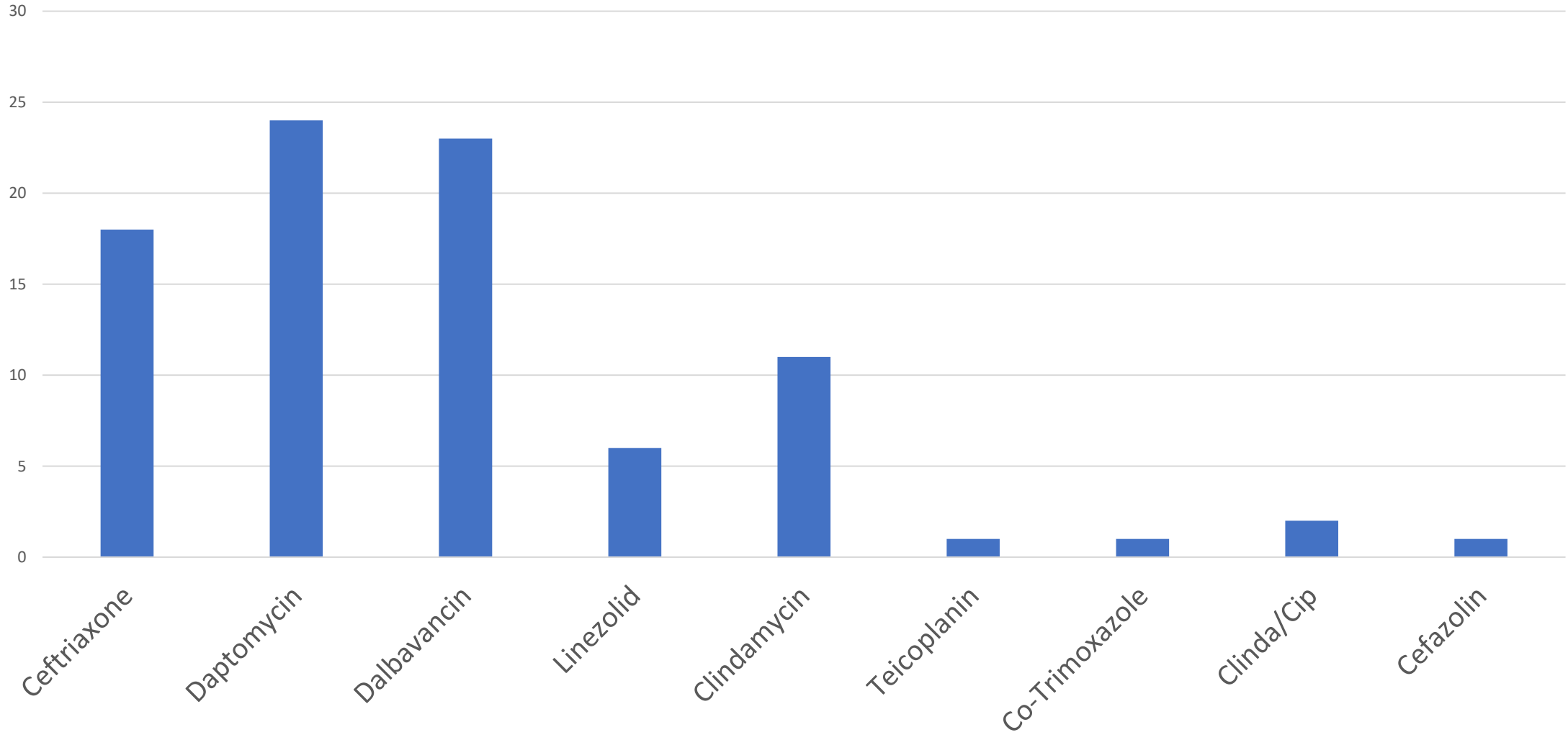
Infection Source



Inpatient treatment



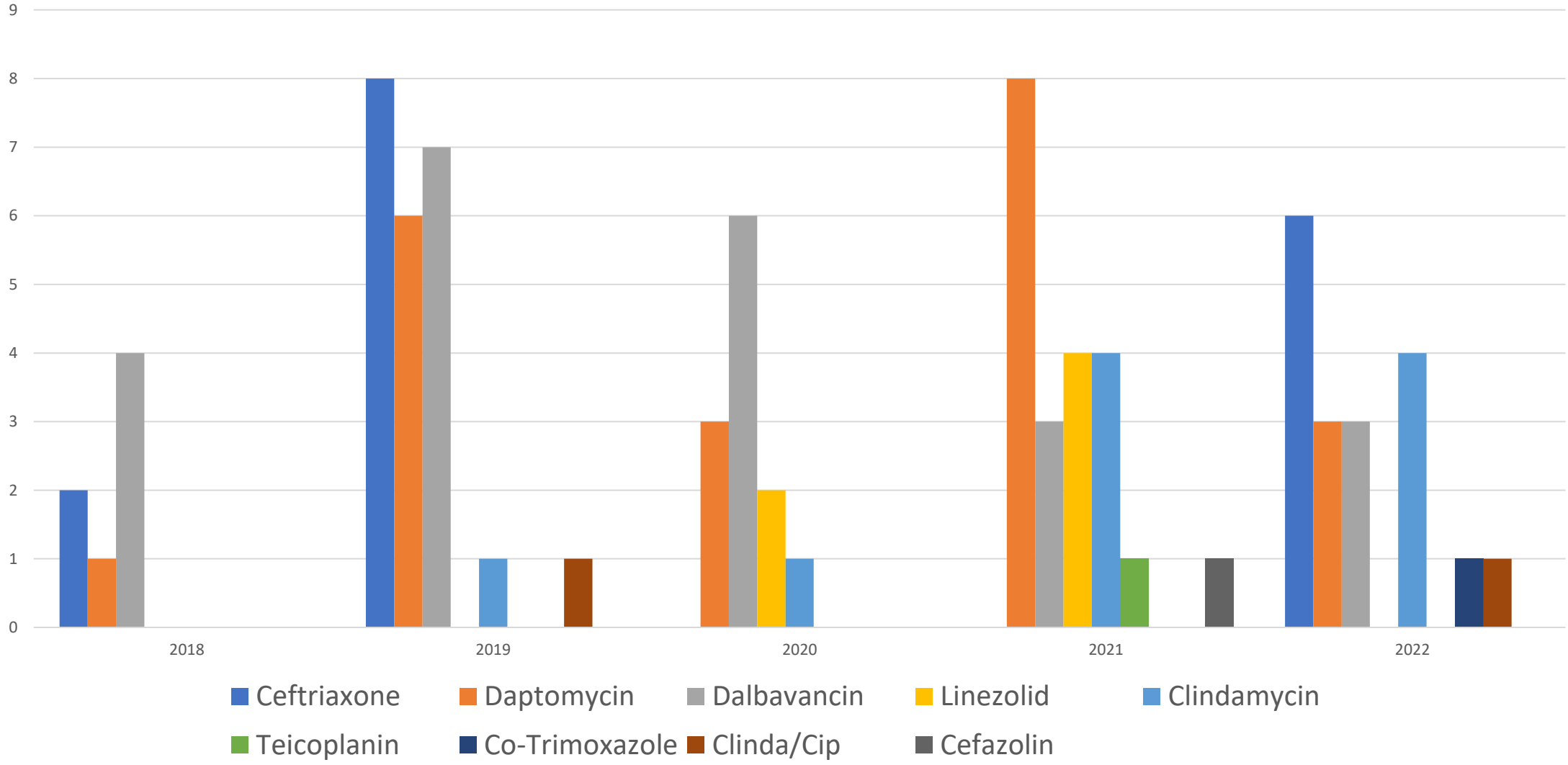
Planned OPAT treatment



Treatment Aims:
Good practice recommendations

- **Cure:** To complete an agreed OPAT duration of therapy on either intravenous and/or complicated oral antimicrobials[a] with **no** requirement for long-term antimicrobial therapy.
- **Improvement:** To complete an agreed OPAT duration of therapy on either intravenous and/or complicated oral antimicrobials (a) as part of an agreed surgical infection management plan with further surgery planned or (b) where there is a requirement for subsequent long-term or an extended course of oral suppressive antimicrobial therapy, or (c) where potentially infective prosthetic material is still *in situ*.
- **Palliation:** To undertake a course of OPAT on either intravenous and/or complicated oral antimicrobials where there are agreed ceilings of care due to comorbidities, with death being the likely outcome.

Planned outpatient treatment



Outcomes

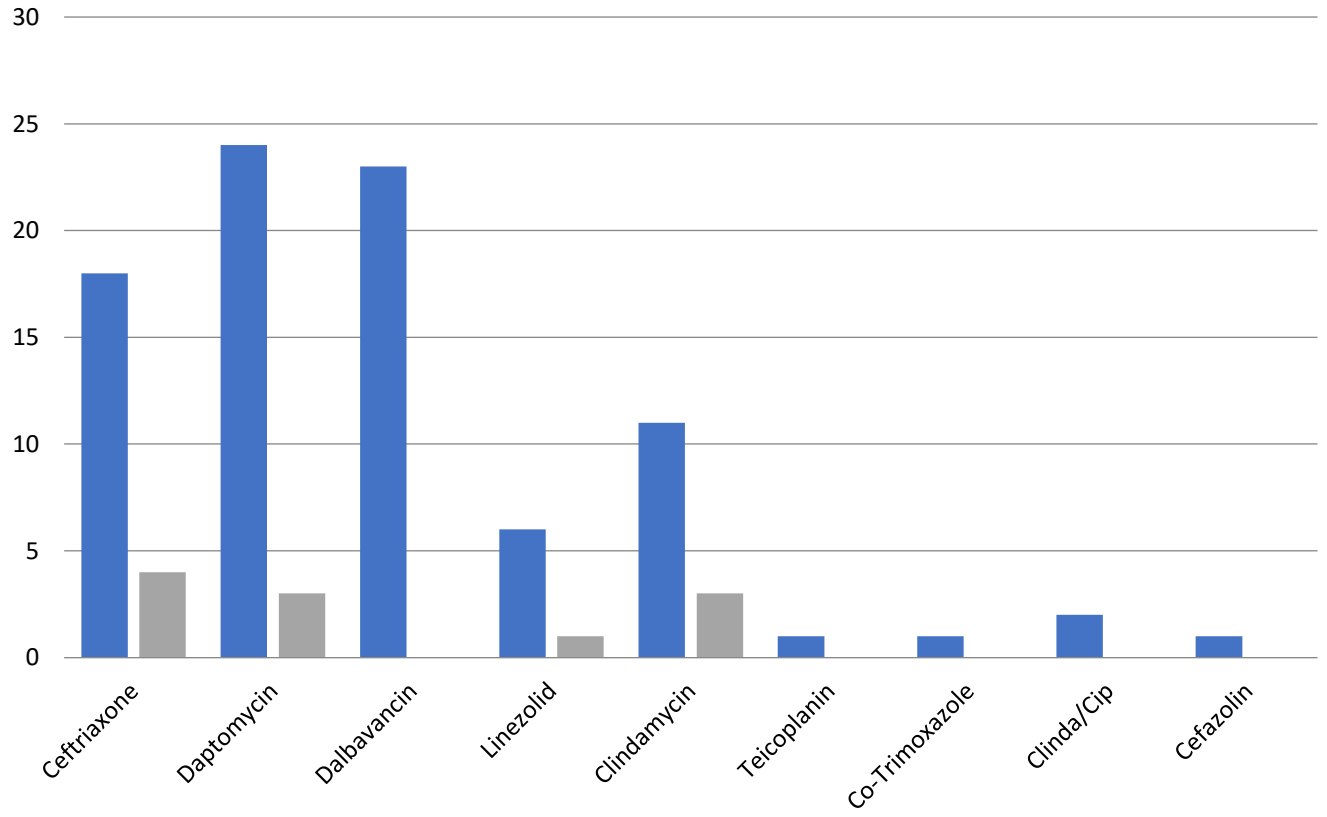
- Referral to discharge – 2 days (-2 – 28)
- Positive culture to discharge – 12 days (4 – 55)
- 9 IVOST < 14 days
  - 1/9 Readmission
  - No ADEs
  - *Some very recent episodes

Outcomes:
Good practice recommendations

- **Treatment aim attained** – uncomplicated Completed OPAT therapy as per treatment aim with:
  - **no** unplanned changes in antimicrobial agent.
  - **no** adverse events.
  - **no** planned or unplanned readmission related to the current OPAT episode.
  - **no** readmission of ≥24 h for unrelated event (i.e. day case/overnight stay for another medical problem allowed).
- **Treatment aim attained** – complicated Completed OPAT therapy as per treatment aim but **with** one or more of the following:
  - unplanned changes in antimicrobial agent.
  - any adverse event including readmission for <24 h related to the current OPAT episode.
- **Treatment aim not attained** – failure to complete planned OPAT therapy for any reason other than readmission due to unrelated event.
  - worsening of infection requiring readmission.
  - readmission for ≥24 h for any cause related to OPAT, including adverse events.
- **Indeterminate** – Readmission for ≥24 h due to unrelated event.
- **Death** - Death due to any cause, except palliation.

Complications - outpatient

- 10/87 (11.5%) documented side effects resulting in drug switch
  - Facial swelling
  - Blood dyscrasia
  - Eosinophilia
  - Rash x 4
  - Nausea
  - Poor compliance
  - Unable to monitor



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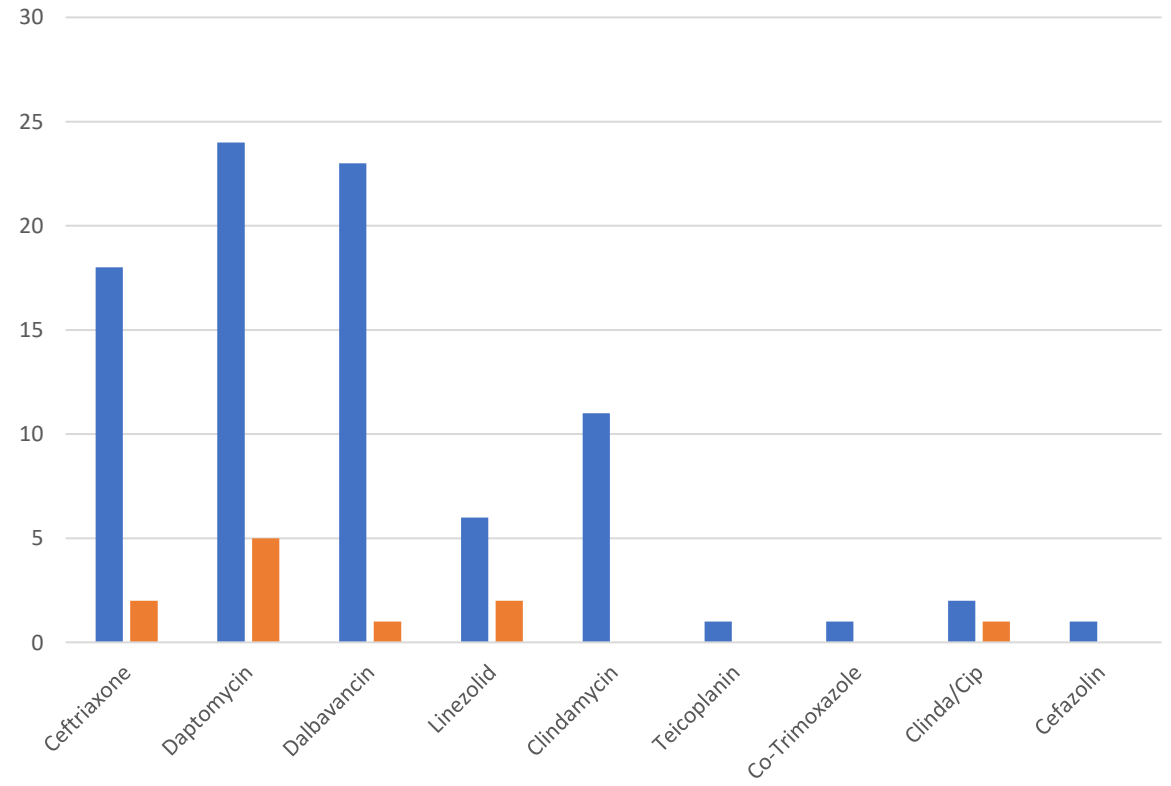
Complications - admissions

- 18/87 (21%) unplanned admission < 28 days from discharge
  - Indeterminate (8%)
    - 7 unrelated
  - Treatment not attained (13%)
    - 2 acute kidney injury
    - 2 line infection
    - 2 relapse
    - 1 worsening pain
    - 1 facial swelling
    - 1 Rash
    - 1 GI side effects
    - 1 linezolid toxicity



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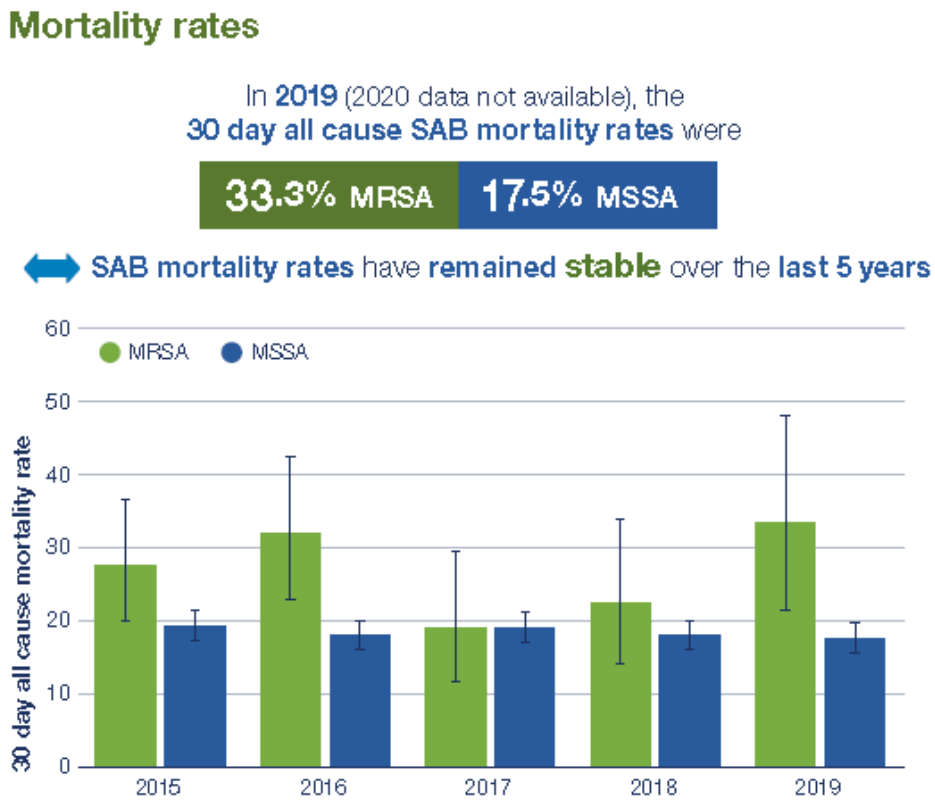
Outcomes

- 2 (2%) deaths within 30 days of discharge
- 4 (5%) deaths within 90 days of discharge
  - Each patient had a malignancy
- 14 (16%) deaths within 1 year of discharge



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Comparison with inpatient management

- 88 inpatient SAB cases in 2022
- 6 deaths within 90 days of discharge
- Additional 15 deaths during admission
- Median LOS 20 days
  - Does site / source differ?
  - Are there demographic differences?
  - What are the barriers to OPAT?

Conclusions

- OPAT management of SAB has good outcomes
- Once daily IV or oral administration with close observation
- Mortality rate much lower than expected
- Likely relates to highly selected population (and infection specialist input?)

Further work and discussion

Further work

- Community vs hospital acquired SAB
- Comparison with inpatient outcomes
- More data points

Discussion

- Barriers to OPAT
- Change in practice

> Clin Infect Dis. 2021 Sep 7;73(5):866-872. doi: 10.1093/cid/ciab201.

Comparable Outcomes of Short-Course and Prolonged-Course Therapy in Selected Cases of Methicillin-Susceptible Staphylococcus aureus Bacteremia: A Pooled Cohort Study

Louise Thorlacius-Ussing [1], Håkon Sandholdt [1], Jette Nissen [2], Jon Rasmussen [3], Robert Skov [4], Niels Frimodt-Møller [5], Jenny Dahl Knudsen [5], Christian Østergaard [6], Thomas Benfield [1]

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ClinicalTrials.gov Identifier: NCT05137119

Recruitment Status : Recruiting
First Posted : November 30, 2021
Last Update Posted : March 10, 2022

See Contacts and Locations

Sponsor:
University of Melbourne

Thanks

OPAT team

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