Infectious Diseases Updates

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Objectives

- Evaluate evidence supporting shorter-duration antibiotic therapy and antibiotic overuse
- Discuss advantages of antibiotic prophylaxis in certain conditions
- Examine the risk of emerging/re-emerging infectious diseases

ID Updates

- Duration of therapy for bacteremia
- More safety data for ASB
- Doxy-PEP
- Misdiagnosis of cellulitis and pneumonia
- Skin microbiome contribution to surgical infections
- (Re)emerging infectious diseases

Duration of Therapy for Bacteremia

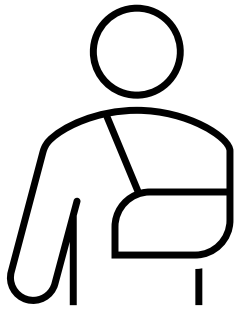
7 vs. 14 days for Gram Negative Bacteremia

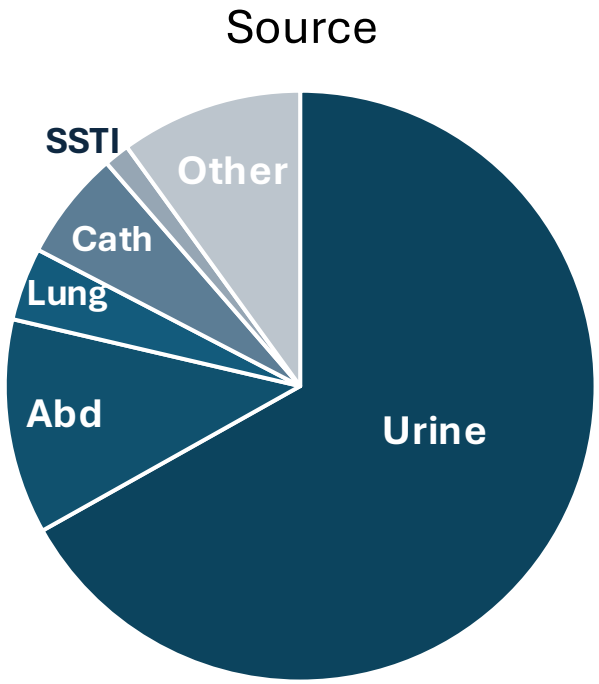
- 2 center, open-label, RCT
- Intervention 7 vs. 14 days of adequate antibiotics for bacteremia
- Patients were hemodynamically stable and afebrile by day 5
- Primary outcome – composite of 90-day mortality, failure, readmission or extended hospitalization

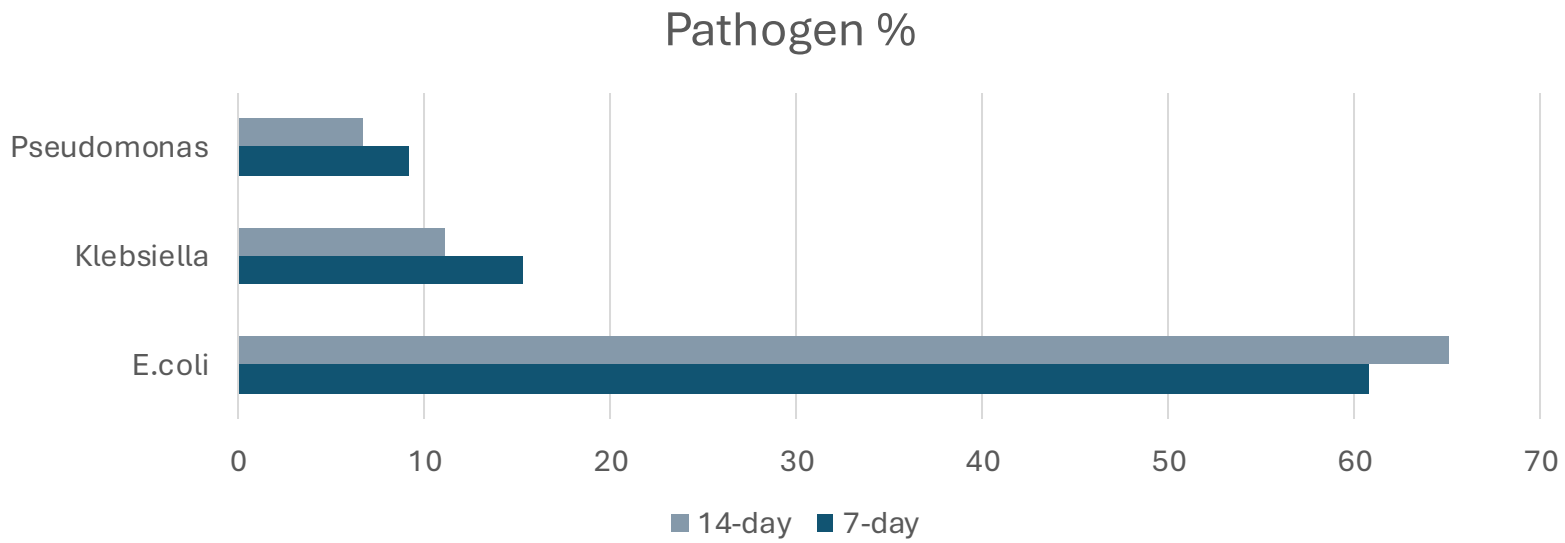
Yahav D. Clinical Infectious Diseases 2019. DOI: 10.1093/cid/ciy1054

Patient Population

- 604 Patients
- 52% female
- Median age 71
- Charlson comorbidity 2







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7 vs. 14 days for Gram Negative Bacteremia

Outcome	Short Arm (7 d) (n = 306)	Long Arm (14 d) (n = 298)	Risk Difference (95% CI)	*P* Value
Primary outcome	140 (45.8)	144 (48.3)	–2.6 (–10.5 to 5.3)	.527
90-d all-cause mortality	36 (11.8)	32 (10.7)	1.0 (–4.0 to 6.1)	.702
Readmissions	119 (38.9)	127 (42.6)	–3.7 (–11.5 to 4.1)	.363
Functional capacity: needs assistance/dependent in ADL or bedridden at 30 d	150 (51.4) (n = 292)	163 (57.2) (n = 285)	–5.8 (–13.9 to 2.3)	.031
Resistance development	33 (10.8)	29 (9.7)	1.0 (–3.7 to 5.9)	.690
Time to return to baseline activity, wk (90 d)	2 (0–8.3) (n = 218)	3 (1–12) (n = 222)	…	**.010**

7 days was non-inferior to 14 for GN bacteremia (if stable/afebrile for 48 hours) and patients had more rapid regain of functional status

Yahav D. Clinical Infectious Diseases 2019. DOI: 10.1093/cid/ciy1054

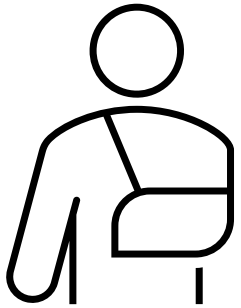
More Data for 7 days for Bacteremia

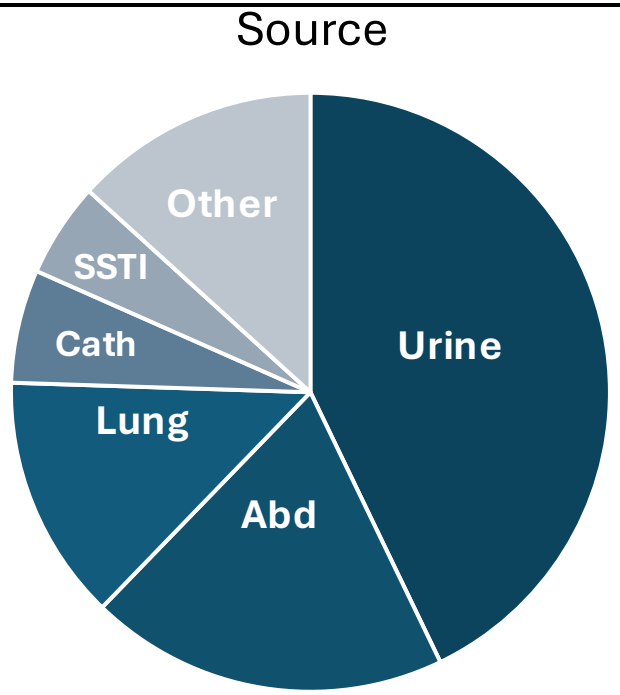
- BALANCE – multi-center (country), open-label, RCT
- Intervention 7 vs. 14 days of adequate antibiotics for bacteremia
- Primary outcome – 90-day mortality
- Notable exclusions – SAB, candidemia, transplant, neutropenia

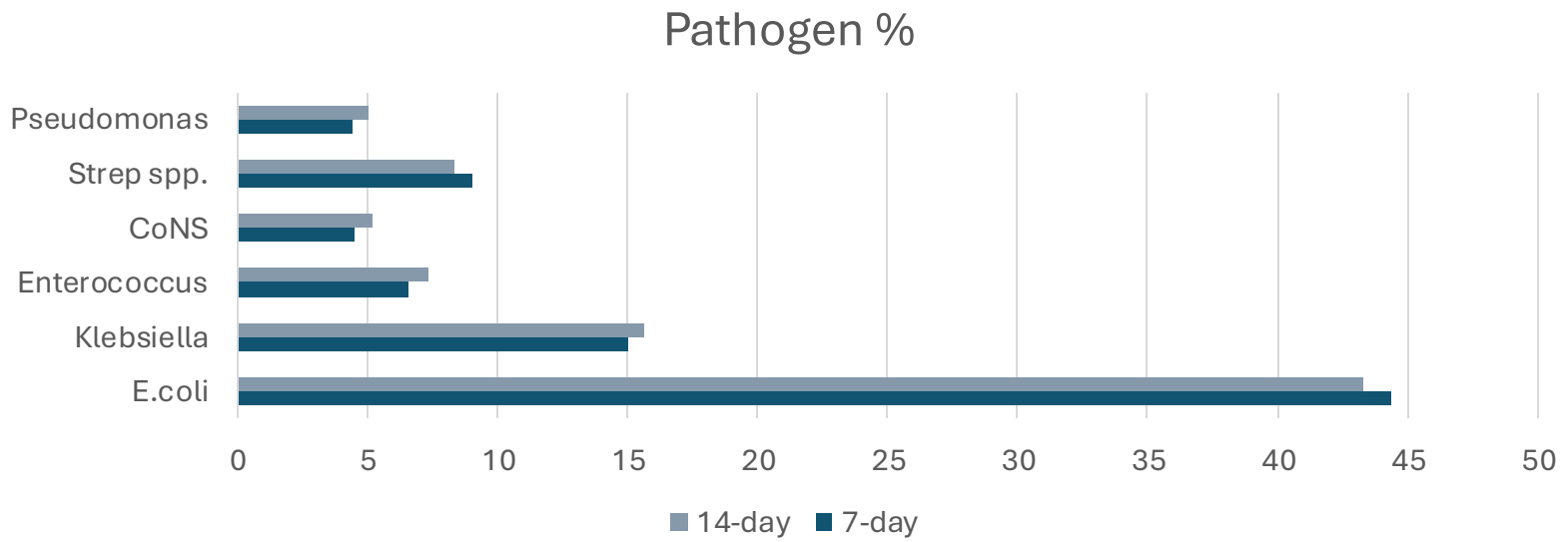
Daneman N, Fowler R. Abstract 376. Presented at: IDWeek; Oct. 16-19, 2024; Los Angeles.

Patient Population

- 3608 Patients
- 53% male
- Median age 70
- 55% Critically Ill







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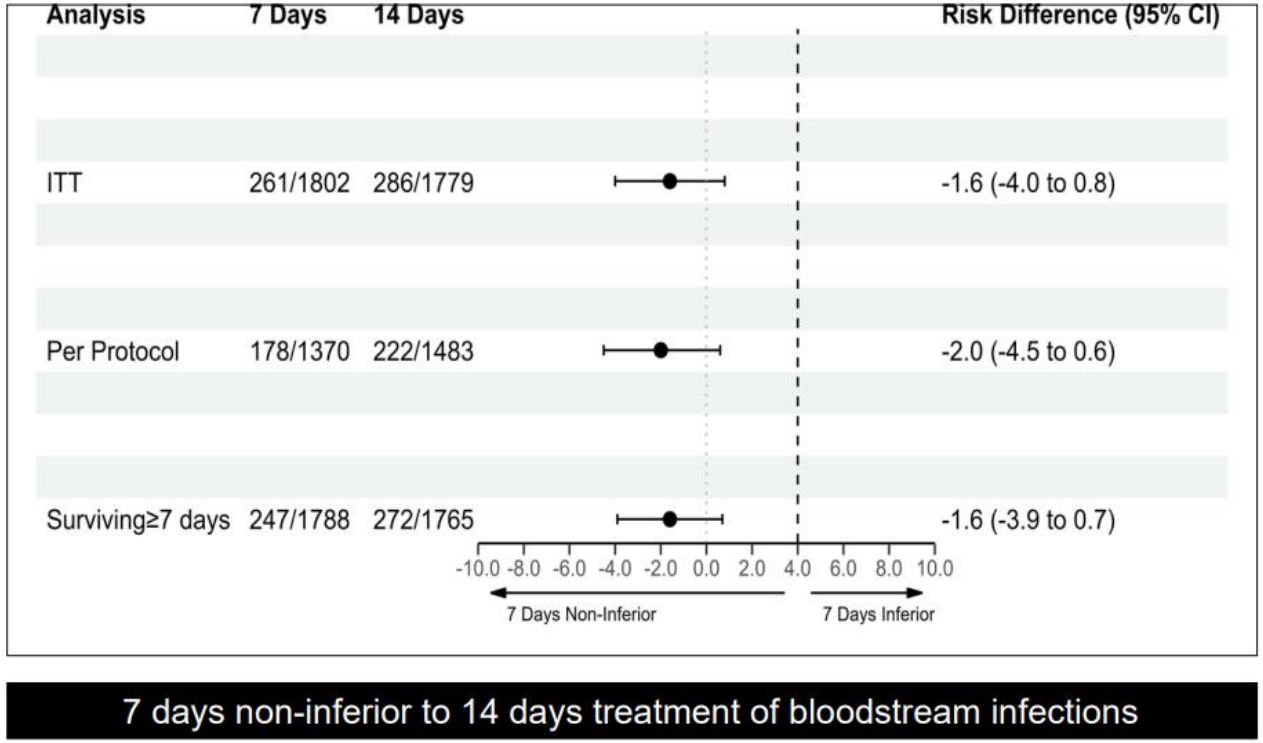
More Data for 7 days for Bacteremia

Primary Outcome: 90-day Mortality



7 days non-inferior to 14 days treatment of bloodstream infections

7-days should be the general antibiotic duration for bacteremia

Daneman N, Fowler R. Abstract 376. Presented at: IDWeek; Oct. 16-19, 2024; Los Angeles.

Bacteremia Take-Aways

- Staph aureus bacteremia & Candidemia are different (data forthcoming)
- “Why not 7” for everything else
- Need more data in severely immunocompromised patients

More Safety Data in Asymptomatic Bacteriuria

Urinary Source Bacteremia in Adults with Asymptomatic Bacteriuria (ASB)

- Retrospective, multi-center, cohort of adult hospitalized patients with ASB
- Primary outcome – prevalence of bacteremia from presumed urinary source
- Notable exclusions – pregnant, abn urinary tract, ICU, transplant, neutropenia, HIV CD4 <200

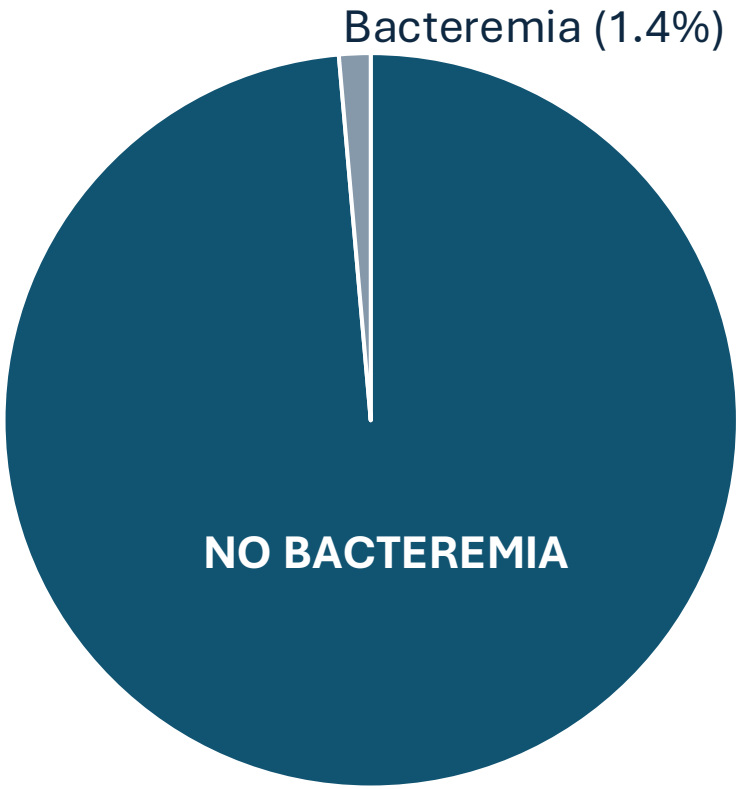
- ASB – bacteriuria + NO specific UTI symptoms (fever, rigors, urgency, frequency, dysuria, CVA pain/tender, suprapubic pain/tender, acute hematuria)

Vaughn V, JAMA Open, 2024. doi:10.1001/jamanetworkopen.2024.2283

Urinary Source Bacteremia in Adults with

Asymptomatic Bacteriuria (ASB)

- 11590 patients
- median age 78
- 74% female
- 72% received antibiotics for UTI

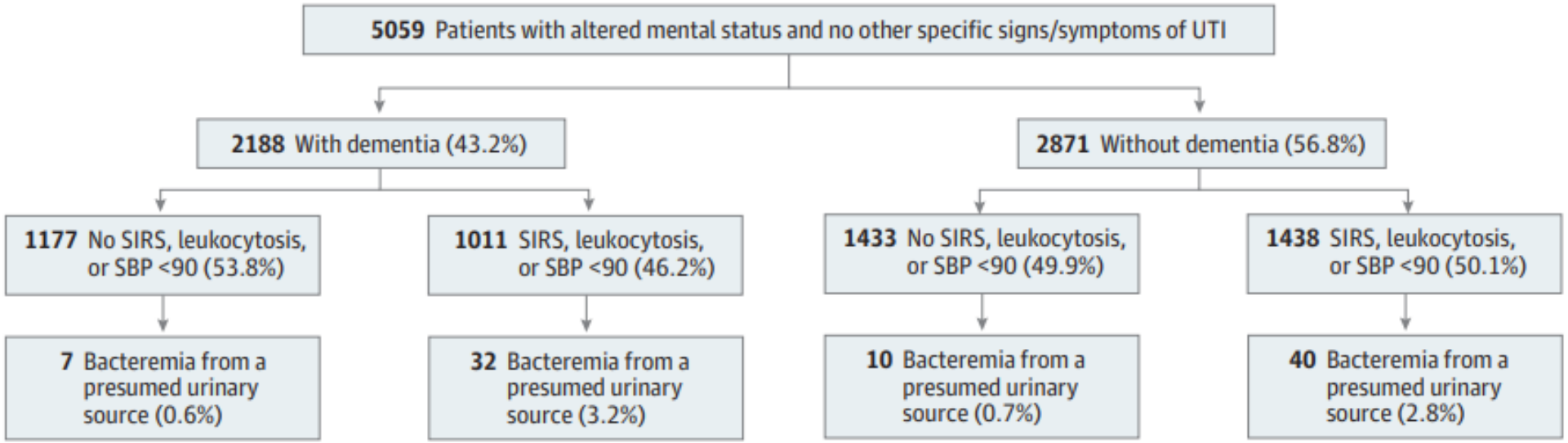


- 161 (1.4%) developed bacteremia from presumed urinary source

Vaughn V, JAMA Open, 2024. doi:10.1001/jamanetworkopen.2024.2283

Urinary Source Bacteremia in Adults with Asymptomatic Bacteriuria (ASB)

Figure. Bacteremia From a Presumed Urinary Source Among Hospitalized Patients With Bacteriuria and Altered Mental Status With or Without Dementia



SBP indicates systolic blood pressure; SIRS, systemic inflammatory response syndrome; UTI, urinary tract infection.

Vaughn V, JAMA Open, 2024. doi:10.1001/jamanetworkopen.2024.2283

Asymptomatic Bacteriuria Take-Aways

- Bacteremia from a urinary source in patients with ASB is RARE
- Altered mental status alone is not a symptom of UTI
- AMS, even in the setting of dementia, should not make you worry more about a severe missed UTI

Doxy-PEP

Doxycycline Post-Exposure Prophylaxis

- Doxycycline
  - 200mg asap and within 72 hours of condomless sex
  - For prevention of bacterial STI
- 2024: CDC recs for MSM and TGW with bacterial STI in the last 12 months to receive counseling and shared decision-making
- Pros:
  - 3 RCTs showing reduction in syphilis (70%), chlamydia, gonorrhea among MSM and TGW
- Cons:
  - Unknown microbiome impact
  - Resistance
  - Limited data in cisgender women

Bachmann L, MMWR. 2024. http://dx.doi.org/10.15585/mmwr.rr7302a1

Can Doxy-PEP Change STI Incidence?

- In 2022, SF Public Health rec'ed doxy-PEP for MSM and TGW with h/o STI or multiple sex partners
- Interrupted time-series analysis of chlamydia, syphilis and gonorrhea cases among MSW & TGW from 3 sexual health clinics

- Results: no change in gonorrhea incidence; increase in chlamydia among cis women

Sankaran M. Abstract 127. Presented at: CROI; Mar. 3-6, 2024; Denver.

Can Doxy PEP Change STI Incidence?

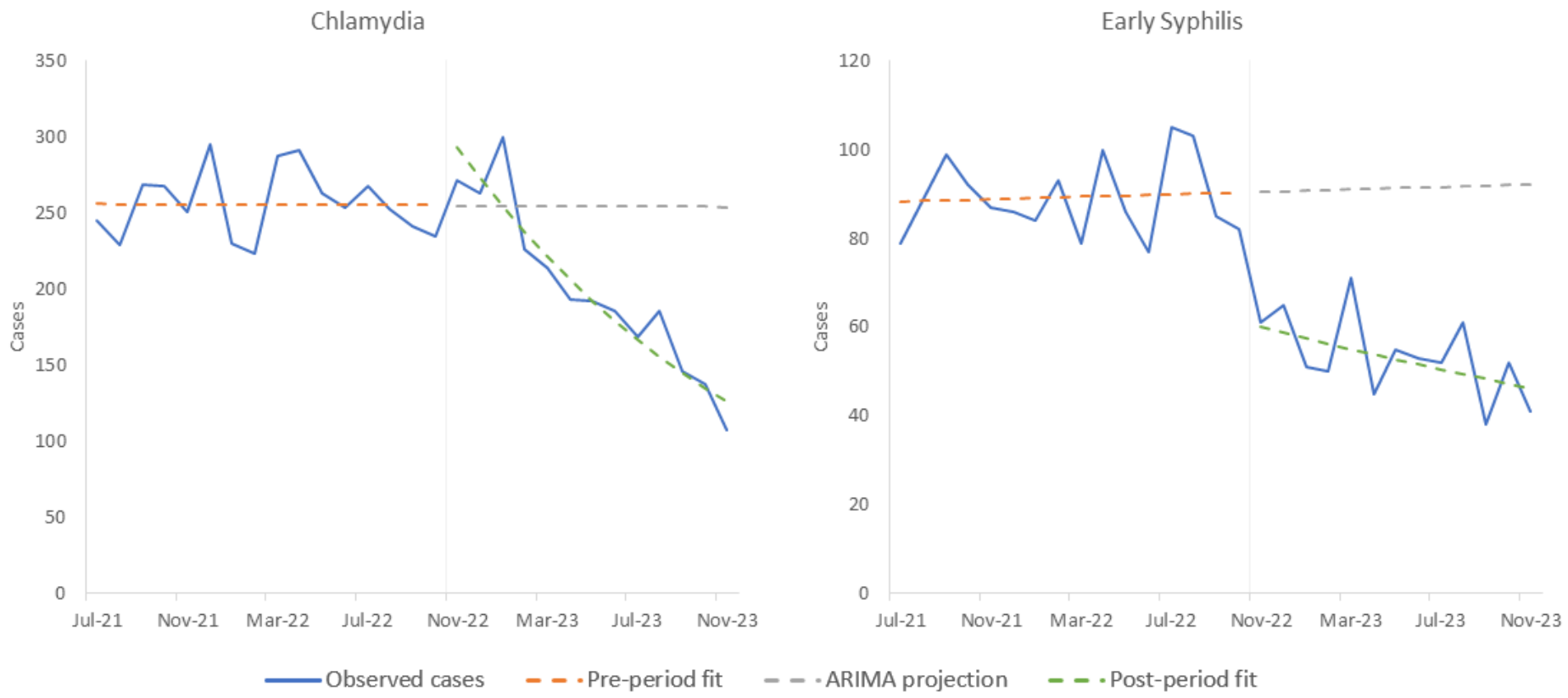


Figure. Observed and modelled chlamydia and early syphilis cases among MSM and TGW in San Francisco pre and post doxy-PEP implementation

Sankaran M. Abstract 127. Presented at: CROI; Mar. 3-6, 2024; Denver.

Doxy PEP

- Per the CDC (and Public Health Seattle & King County)
  - For MSM and TGW patients with a bacterial STI in the last 12 months, counsel + shared decision making
- Early data suggests potential to impact chlamydia and syphilis incidence
- Need successful implementation and so much more data

Misdiagnosis of Cellulitis and Pneumonia

Diagnostic Challenges Abound

Cellulitis

- Systemic review + meta-analysis of 8 studies, 858 pts
- Included pts seen by Derm or ID after Admit Dx = cellulitis
- 39% received alternative dx, 60% in 2 most recent studies
- Alt dx:
  - 68% non-infectious (common: stasis)
  - 10% abscess

CAP

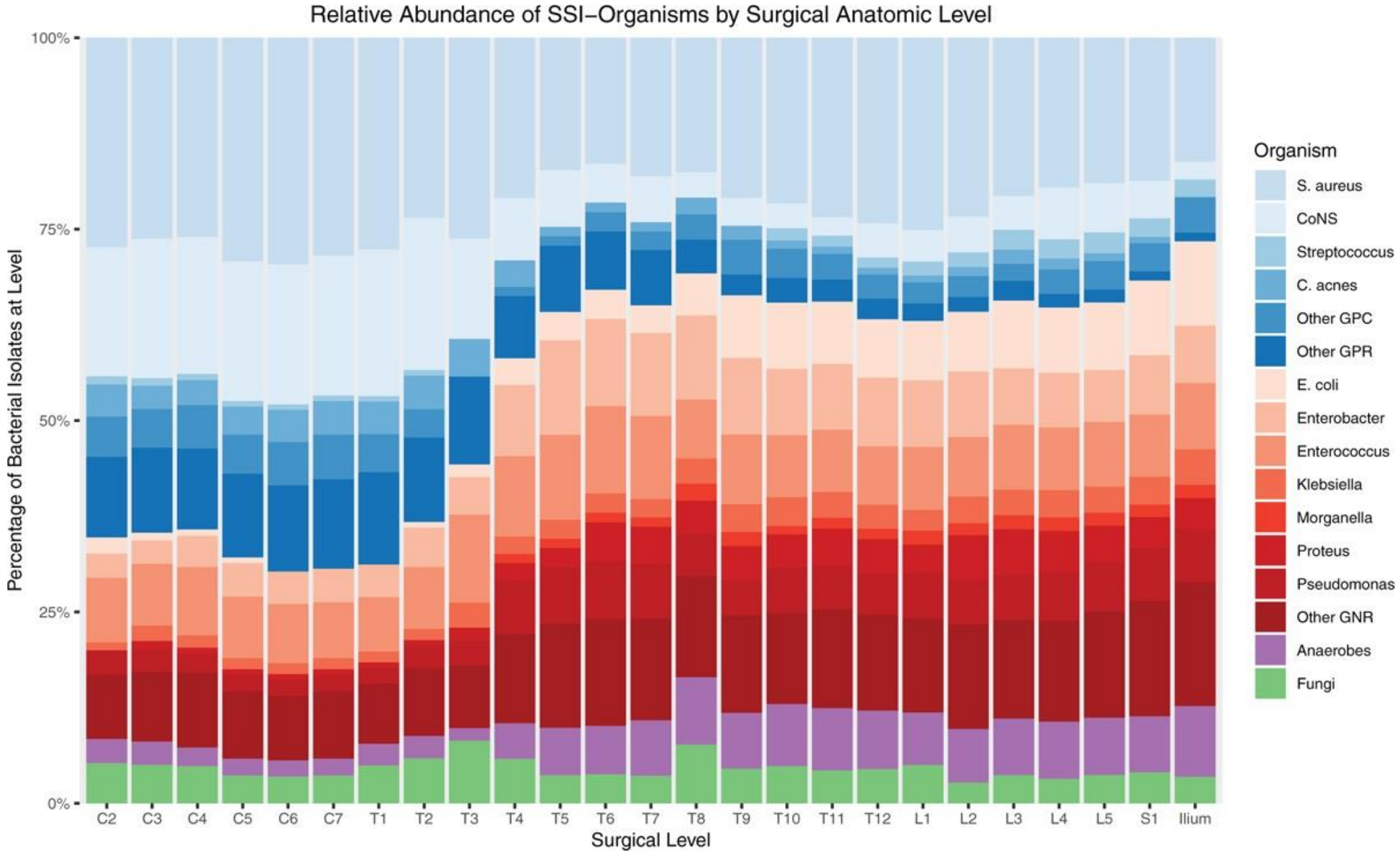
- Retrospective VA cohort
- 2.4 million hospitalizations
- 57% discordance between CAP admit and D/c Dx
- D/c Dx = CAP and +CXR
  - 33% did not have admit dx CAP
- Admit Dx = CAP
  - 36% did not have D/c Dx
  - 21% had no +CXR

Cutler TS. J Hosp Med. 2023. doi: 10.1002/jhm.12977.
Jones BE. Ann Intern Med. 2024. DOI: 10.7326/M23-2505

When Diagnosing Cellulitis or Pneumonia

- About half of patients treated for pneumonia and cellulitis had discordant diagnoses
- Contributes to significant antibiotic overuse
- But missed diagnosis of pneumonia is also common

Contribution of the Skin Microbiome to Surgical Site Infections

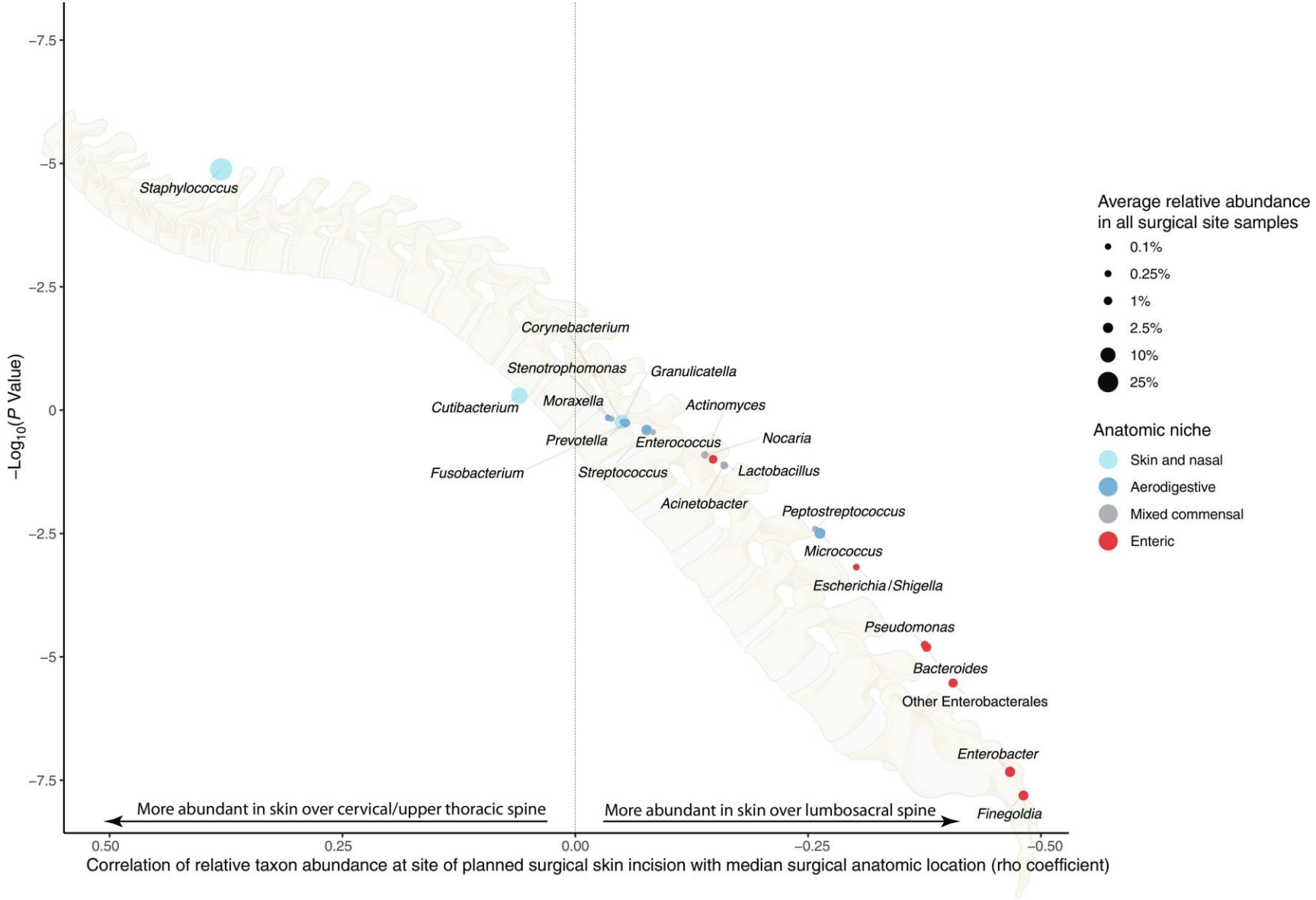


Long D. Spine 2021. DOI: 10.1097/BRS.0000000000003603

BYOB (Bring your own Bacteria)

- Over a one-year period, patients undergoing spinal fusion at Harborview had nares, rectal and surgical site skin swabs collected pre-op
- Patients were followed for 90 days for surgical site infection
  - If present, bacteria causing the infection were then compared to the bacteria in pre-op swabs

Long D. Science Translational Medicine 2024. DOI: 10.1126/scitranslmed.adk822



Long D. Science Translational Medicine 2024. DOI: 10.1126/scitranslmed.adk822

BYOB (Bring your own Bacteria)

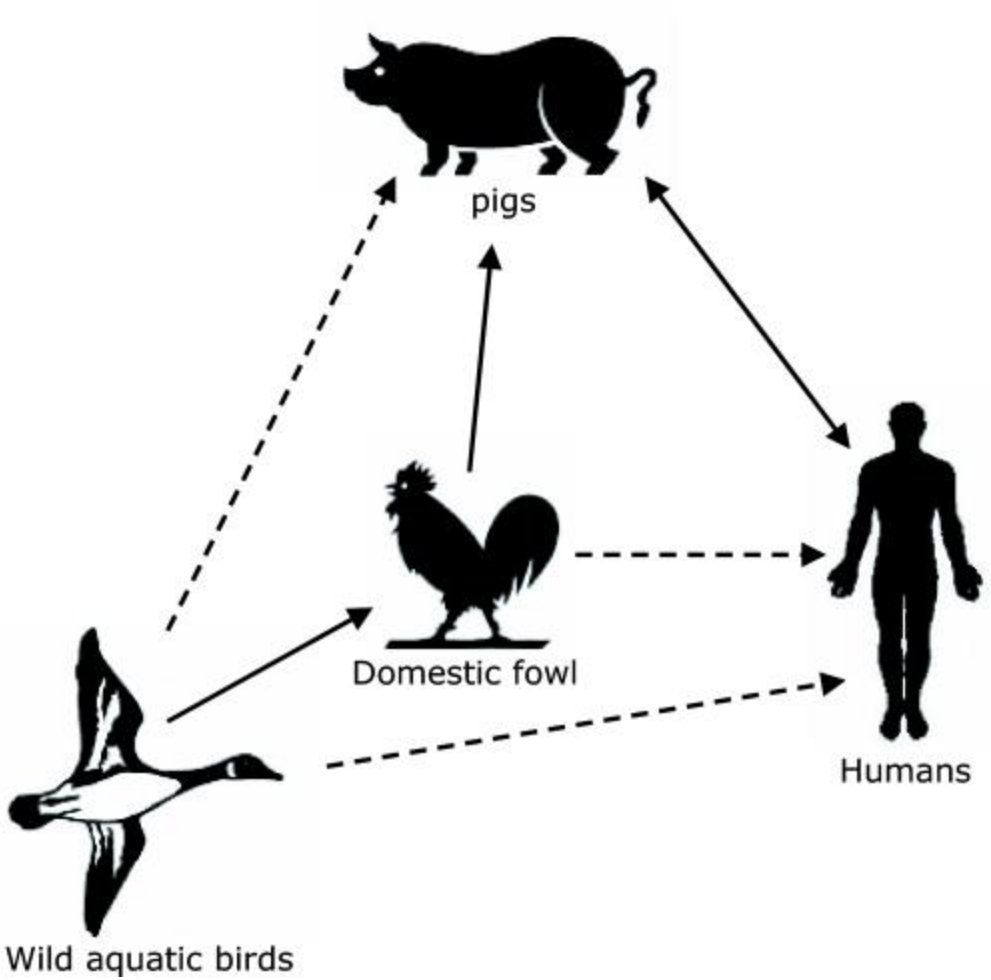
- 22 patients developed a deep surgical site infection
- 19 (86%) of these isolates matched a strain present in one of the pre-op swabs
  - The 3 isolates that didn't match pre-op differed from each other
- 60% of these isolates were resistant to the pre-op antibiotic

Long D. Science Translational Medicine 2024. DOI: 10.1126/scitranslmed.adk822

Contribution of the Skin Microbiome to Surgical Site Infections

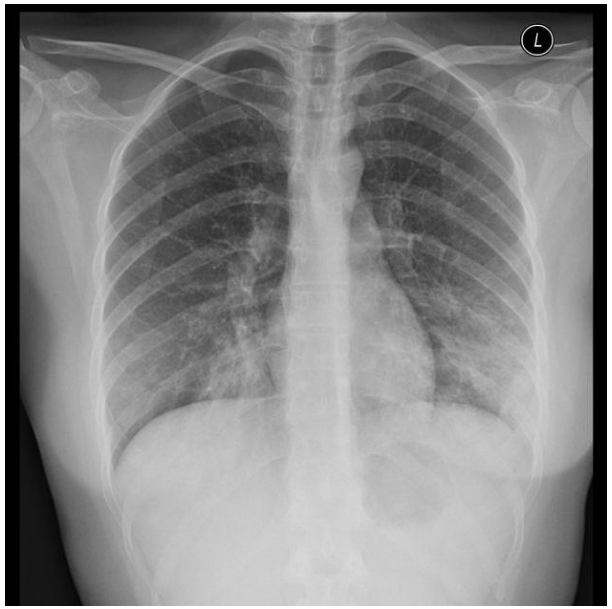
- In spine surgical site infections, the implicated bacteria is frequently from the patient, not the hospital
- Individualized approaches to surgical site infection prevention are needed

Fast Facts and (Re)Emerging Infectious Diseases



Ma W. J Mol Genet Med. 2008.

Rise in Mycoplasma pneumoniae cases



- Sx: fever, HA, slowly worsening cough. Younger kids – diarrhea, wheezing, vomiting

- D/c Dx March – October 2024
  - 2 – 4yo: 1 to 7.2%
  - 5 – 17yo: 3.6 to 7.4%

- Recs:
  - increases suspicion in CAP that isn't improving on beta-lactams
  - Consider testing (nose & NP)

Mycoplasma Pneumoniae Infections Have Been Increasing | NCIRD | CDC

Jahangiri A. Radiopedia, accessed Nov 2024. https://doi.org/10.53347/rID-45781

Conclusions

- Bacteremia = treat for 7 days for most
- ASB is RARELY associated with urinary bacteremia
- DoxyPEP – might curb the syphilis (and chlamydia) epidemic
- Diagnosing common infections remains so hard
- The future of SSI prevention is in your own bacteria
- Infections will continue to surprise