Supplement 1. Inclusion and Exclusion of Patients and Cultures

- 635 inpatients with first admission identified January 2019 - December 2019
  - N cultures = 1,188

Exclude cultures from patients with Cystic Fibrosis, cultures from patients with cancer, cultures from patients admitted <3 days
- N patients = 75
- N cultures = 98

Exclude no growth, test not performed, missing data, duplicate cultures
- N patients = 112
- N cultures = 207

Exclude cultures with same organism(s) and antibiotic regimen as previous culture collected within same 4-day period
- N cultures = 57

N patients = 448
- N cultures = 826
- N isolates = 1,079

*EAC = Endotracheal aspirate culture
Supplement 2. Antibiotics Prescribed and Associated Days of Therapy
Supplement 3. Organism Classification Flowcharts

Always report the following, regardless of quantity or predominance:

1. Group A strep
2. Group B Strep (pediatrics)
3. Francisella tularensis
4. Bordetella species
5. Yersinia pestis
6. GC
7. Bacillus anthracis
8. Cryptococcus neoformans
9. Mold

The following are ALWAYS mixed upper respiratory flora (MURF) and should never be reported individually. If any of these are reported in culture, that is considered overreporting:

1. Viridans Strep
2. Non pathogenic Neisseria
3. Diphtheroids
4. Coag neg staph
5. Rothia
6. Group F strep (Strep anginosus)
7. Anaerobes
8. Haemophilus species not influenzae
9. Eikenella
10. Acintobacillus
11. Capnocytophaga
12. Moraxella species not catarrhalis
13. Enterococci
14. Yeast
15. Abiotrophia
16. Bacillus cereus group
17. *Lactobacillus*
18. *Pasteurella*

**Supplement 3. Organism Classification Flowcharts**

### *S. pneumoniae and H. influenzae*

Is the organism reported in a quantity of few or more?

- **YES**
  - Not overreported
- **NO**
  - Review Gram Stain: Was the org seen in the GS in any quantity? Acceptable GS for SPN = GPC, GPCP, GPCPC for HFLU= GNR, GNCB, GNPR

- **YES**
  - Not overreported
- **NO**
  - Overreported
Supplement 3. Organism Classification Flowcharts

*M. catarrhalis, N. meningitidis*

Is the organism reported in a quantity of few or more?

- YES
- NO

- Not overreported
- Is the organism in pure culture?

- YES
- NO

- Not overreported
- Review the Gram stain: was the organism seen in any quantity? (Acceptable GS = GNDC)

- YES
- NO

- Review the PMNS: are there few or more?
- Overreported

- YES
- NO

- Not overreported
- Overreported
Supplement 3. Organism Classification Flowcharts

Staphylococcus aureus

Is the organism pure or predominant?

- **YES**
- **NO**

If **YES**
- Is the organism reported in a quantity of few or more?
  - **YES**
  - **NO**

If **NO**
- Overreported

If **YES**
- Not overreported

Review the Gram stain: was the organism seen in any quantity? (Acceptable BS = GPC, GCP, GPCPS)

- **YES**
- **NO**

If **NO**
- Overreported

If **YES**
- Review the PMNS: are there few or more?
  - **YES**
  - **NO**

If **NO**
- Not overreported

If **YES**
- Overreported
Supplement 3. Organism Classification Flowcharts

**Enteric Gram Negative Rods and Other Nonfermenting GNRs**

- Is the GNR predominant or growing in pure culture or predominant and is only ONE morphology type?
  - **YES**
  - **NO**
    - Is the organism reported in a quantity of few or more?
      - **YES**
      - No, more than 1 more morphology of GNR or reported with MURF and not predominant
      - **NO**
    - **NO**
      - Is the organism reported as a genus and species (for example Enterobacter cloacae)?
        - **YES**
        - Overreported
        - **NO**
          - Not overreported
          - Review the Gram stain: was the organism seen in any quantity? (Acceptable GS = GNR, GNCB)
            - **YES**
            - Review the PMNS: are there few or more?
              - **YES**
              - Not overreported
              - **NO**
            - **NO**
          - Not overreported
          - Not overreported
Supplement 3. Organism Classification Flowcharts

**Enterococcus and Coagulase negative Staph**

Is the organism fully reported? (meaning a genus and species ID is reported)

- YES
  - Overreported
  - Is the organism growing in pure culture?
    - YES
      - Not overreported if there are PMNS
    - NO
      - Overreported if NO PMNs
- NO
### Supplement 4. Single Predictor Nested Logistic Regression Models Predicting Report Category and Days of Therapy (DOT)

| Variable                                                                 | N (%) | OR (95% CI) Bivariate: Report category (Overreported vs MURF) | OR (95% CI) Bivariate: Report Category (Overreported vs MURF & Concordant) | IRR (95% CI) Bivariate: Post-reporting Days of Therapy | IRR (95% CI) Bivariate: Total Days of Therapy |
|--------------------------------------------------------------------------|-------|-----------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------|
| **Age Group**                                                            |       |                                                                |                                                                          |                                                        |                                                 |
| 0-27 days                                                                | 100 (22) | p≤0.01                                                        | 10.36 (2.99, 35.81) *                                                    | 1.36 (0.82, 2.26)                                      | 1.40 (0.89, 2.50)                                  |
| 28 days – 12 months                                                      | 130 (28) | [Reference]                                                   | [Reference]                                                             | [Reference]                                            | [Reference]                                      |
| 13 months-2 years                                                        | 60 (13) | 0.09 (0.02, 0.39) *                                          | 0.20 (0.05, 0.72) *                                                     | 0.72 (0.37, 1.39)                                      | 0.71 (0.36, 1.40)                                  |
| 3-5 years                                                                | 45 (10) | 0.52 (0.13, 2.12)                                           | 1.30 (0.33, 4.89)                                                      | 0.84 (0.39, 1.82)                                      | 0.91 (0.42, 2.00)                                  |
| 6-11 years                                                               | 58 (12) | 0.32 (0.08, 1.30)                                           | 0.50 (0.13, 1.80)                                                      | 0.51 (0.25, 1.04)                                      | 0.23 (0.25, 1.08)                                  |
| 12-18+ years                                                             | 71 (15) | 0.52 (0.15, 1.73)                                           | 1.18 (0.38, 3.72)                                                      | 0.69 (0.35, 1.35)                                      | 0.59 (0.29, 1.19)                                  |
| **Gender**                                                               |       |                                                                |                                                                          |                                                        |                                                 |
| Female                                                                   | 207 (45) | p=0.75                                                        | 1.14 (0.51, 2.55)                                                      | 0.86 (0.56, 1.34)                                      | 0.94 (0.60, 1.46)                                  |
| Male                                                                     | 257 (55) | [Reference]                                                   | [Reference]                                                             | [Reference]                                            | [Reference]                                      |
| **Race**                                                                |       |                                                                |                                                                          |                                                        |                                                 |
| Black, not Hispanic or Latino                                           | 35 (7) | 0.24 (0.05, 1.08)                                           | 0.45 (0.10, 1.96)                                                      | 1.56 (0.68, 3.61)                                      | 1.32 (0.57, 3.10)                                  |
| Hispanic or Latino                                                       | 135 (29) | 1.10 (0.44, 2.72)                                           | 0.80 (0.35, 1.83)                                                      | 0.94 (0.57, 1.56)                                      | 0.92 (0.55, 1.52)                                  |
| Other                                                                    | 92 (20) | 0.20 (0.07, 0.61) *                                          | 0.22 (0.08, 0.62)                                                      | 1.02 (0.68, 3.61)                                      | 1.07 (0.58, 2.00)                                  |
| White, not Hispanic or Latino                                           | 202 (44) | [Reference]                                                   | [Reference]                                                             | [Reference]                                            | [Reference]                                      |
| **Medical History**                                                      |       |                                                                |                                                                          |                                                        |                                                 |
| One or more complex conditions at Admission                              | 272 (59) | p≤0.01                                                        | [Reference]                                                            | [Reference]                                            | [Reference]                                      |
| No complex conditions at admission                                      | 192 (41) | 4.26 (1.82, 9.92) *                                          | 2.42 (1.13, 5.23)                                                      | 1.21 (0.80, 1.81)                                      | 1.25 (0.76, 2.07)                                  |
| **Length of stay at time of culture (days)**                            |       |                                                                |                                                                          |                                                        |                                                 |
| Less than 1 day                                                          | 69 (17) | p≤0.01                                                        | 0.39 (0.13, 1.13)                                                      | 1.35 (0.70, 2.61)                                      | 1.35 (0.70, 2.61)                                  |
| 1-3 days                                                                 | 144 (36) | [Reference]                                                   | [Reference]                                                            | [Reference]                                            | [Reference]                                      |
| 4-10 days                                                                | 76 (19) | 1.69 (0.67, 4.24)                                           | 1.85 (0.76, 4.49)                                                      | 1.09 (0.59, 2.02)                                      | 1.04 (0.55, 1.98)                                  |
| 11-30 days                                                               | 51 (13) | 4.47 (1.45, 13.80) *                                         | 1.48 (0.57, 3.82)                                                      | 1.95 (1.03, 3.71)                                      | 1.81 (0.93, 3.53)                                  |
| >30 days                                                                 | 59 (15) | 3.78 (1.22, 11.70) *                                         | 1.63 (0.60, 4.43)                                                      | 1.25 (0.70, 3.71)                                      | 1.36 (0.75, 2.47)                                  |
| **Ventilator days at time of culture**                                   |       |                                                                |                                                                          |                                                        |                                                 |
| 1-7 days                                                                 | 221 (81) | [Reference]                                                   | [Reference]                                                            | [Reference]                                            | [Reference]                                      |
| 8-30 days                                                                | 35 (13) | 3.84 (1.25, 11.80) *                                         | 1.90 (0.74, 4.89)                                                      | 0.21 (0.11, 0.41)                                      | 0.22 (0.11, 0.43)                                  |
|                  |   |                |                |                |                |
|------------------|---|----------------|----------------|----------------|----------------|
| >30 days         | 18 (7) | 2.74 (0.60, 13.02) | 0.75 (0.23, 2.40) | 1.05 (0.52, 2.12) | 1.04 (0.51, 2.14) |
| Polymorphonuclear cells (PMNs) in Gram Stain | | | | | |
| Less than few    | 158 (38) | 1.40 (0.73, 2.66) | 1.87 (1.06, 3.28) * | 0.62 (0.36, 1.10) | 0.53 (0.32, 1.10) * |
| Few or more      | 249 (62) | [Reference] | [Reference] | [Reference] | [Reference] |
| Organisms in Gram Stain | | | | | |
| No organisms seen | 269 (58) | 0.59 (0.31, 1.12) | 1.73 (1.01, 2.95) * | 0.57 (0.36, 0.90) * | 0.51 (0.32, 0.81) * |
| One or more organisms seen | 195 (42) | [Reference] | [Reference] | [Reference] | [Reference] |

*Significant at a p value of ≤0.05

Abbreviations: OR = odds ratio, IRR = Incident rate ratio