**Supplementary Material**

**Appendix 1. Geographic Distribution of VAMCs by Quartile of ARI Dashboard use.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Facility (N=130)** | **Percentage of Facilities** | **Never accessed dashboard** | **Quartile 1** | **Quartile 2** | **Quartile 3** | **Quartile 4** |
| VHA Region | 100.0 | 11.5 | 21.5 | 22.3 | 21.5 | 22.3 |
| Region 1 (Northeast) | 27.7 | 16.7 | 25.0 | 33.3 | 16.7 | 5.6 |
| Region 2 (Central) | 22.3 | 20.7 | 17.2 | 24.1 | 13.8 | 24.1 |
| Region 3 (Southeast) | 20.8 | 0.0 | 25.9 | 14.8 | 33.3 | 25.9 |
| Region 4 (West) | 29.2 | 7.9 | 18.4 | 15.8 | 23.7 | 34.2 |

**Appendix 2. Diagnostic Codes and Description for the Cohort.**

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| **ARI Inclusion Diagnostic Codes** |
| ARI Diagnosis | ARI-ICDCode Version | ARIICD Code | ICD-Description |
| 1: Sinusitis | 9 | 461.0 | ACUTE MAXILLARY SINUSITIS |
| 1: Sinusitis | 9 | 461.2 | ACUTE ETHMOIDAL SINUSITIS |
| 1: Sinusitis | 9 | 461.1 | ACUTE FRONTAL SINUSITIS |
| 1: Sinusitis | 9 | 461.3 | ACUTE SPHENOIDAL SINUSITIS |
| 1: Sinusitis | 9 | 461.9 | ACUTE SINUSITIS, UNSPECIFIED |
| 1: Sinusitis | 9 | 461.8 | OTHER ACUTE SINUSITIS |
| 1: Sinusitis | 10 | J01.30 | Acute sphenoidal sinusitis, unspecified |
| 1: Sinusitis | 10 | J01.21 | Acute recurrent ethmoidal sinusitis |
| 1: Sinusitis | 10 | J01.31 | Acute recurrent sphenoidal sinusitis |
| 1: Sinusitis | 10 | J01.40 | Acute pansinusitis, unspecified |
| 1: Sinusitis | 10 | J01.80 | Other acute sinusitis |
| 1: Sinusitis | 10 | J01.91 | Acute recurrent sinusitis, unspecified |
| 1: Sinusitis | 10 | J01.11 | Acute recurrent frontal sinusitis |
| 1: Sinusitis | 10 | J01.41 | Acute recurrent pansinusitis |
| 1: Sinusitis | 10 | J01.81 | Other acute recurrent sinusitis |
| 1: Sinusitis | 10 | J01.90 | Acute sinusitis, unspecified |
| 1: Sinusitis | 10 | J01.00 | Acute maxillary sinusitis, unspecified |
| 1: Sinusitis | 10 | J01.01 | Acute recurrent maxillary sinusitis |
| 1: Sinusitis | 10 | J01.10 | Acute frontal sinusitis, unspecified |
| 1: Sinusitis | 10 | J01.20 | Acute ethmoidal sinusitis, unspecified |
| 2: Bronchitis | 9 | 466.0 | ACUTE BRONCHITIS |
| 2: Bronchitis | 9 | 490. | BRONCHITIS, NOT SPECIFIED AS ACUTE OR CHRONIC |
| 2: Bronchitis | 10 | J20.0 | Acute bronchitis due to Mycoplasma pneumoniae |
| 2: Bronchitis | 10 | J20.6 | Acute bronchitis due to rhinovirus |
| 2: Bronchitis | 10 | J20.9 | Acute bronchitis, unspecified |
| 2: Bronchitis | 10 | J20.1 | Acute bronchitis due to Hemophilus influenzae |
| 2: Bronchitis | 10 | J20.2 | Acute bronchitis due to streptococcus |
| 2: Bronchitis | 10 | J20.3 | Acute bronchitis due to coxsackievirus |
| 2: Bronchitis | 10 | J20.8 | Acute bronchitis due to other specified organisms |
| 2: Bronchitis | 10 | J20.4 | Acute bronchitis due to parainfluenza virus |
| 2: Bronchitis | 10 | J20.5 | Acute bronchitis due to respiratory syncytial virus |
| 2: Bronchitis | 10 | J20.7 | Acute bronchitis due to echovirus |
| 3: Pharyngitis | 9 | 463. | ACUTE TONSILLITIS |
| 3: Pharyngitis | 9 | 462. | ACUTE PHARYNGITIS |
| 3: Pharyngitis | 10 | J03.90 | Acute tonsillitis, unspecified |
| 3: Pharyngitis | 10 | J02.8 | Acute pharyngitis due to other specified organisms |
| 3: Pharyngitis | 10 | J02.9 | Acute pharyngitis, unspecified |
| 3: Pharyngitis | 10 | J03.80 | Acute tonsillitis due to other specified organisms |
| 3: Pharyngitis | 10 | J03.00 | Acute streptococcal tonsillitis, unspecified |
| 3: Pharyngitis | 10 | J03.01 | Acute recurrent streptococcal tonsillitis |
| 3: Pharyngitis | 10 | J02.0 | Streptococcal pharyngitis |
| 3: Pharyngitis | 10 | J03.81 | Acute recurrent tonsillitis due to other specified organisms |
| 3: Pharyngitis | 10 | J03.91 | Acute recurrent tonsillitis, unspecified |
| 4: URI | 9 | 460. | ACUTE NASOPHARYNGITIS (COMMON COLD) |
| 4: URI | 9 | 464.00 | ACUTE LARYNGITIS, WITHOUT MENTION OF OBSTRUCTION |
| 4: URI | 9 | 465.0 | ACUTE LARYNGOPHARYNGITIS |
| 4: URI | 9 | 465.8 | ACUTE UPPER RESPIRATORY INFECTIONS OF OTHER MULTIPLE SITES |
| 4: URI | 9 | 465.9 | ACUTE UPPER RESPIRATORY INFECTIONS OF UNSPECIFIED SITE |
| 4: URI | 10 | J05.10 | Acute epiglottitis without obstruction |
| 4: URI | 10 | J04.0 | Acute laryngitis |
| 4: URI | 10 | J04.10 | Acute tracheitis without obstruction |
| 4: URI | 10 | J04.11 | Acute tracheitis with obstruction |
| 4: URI | 10 | J05.11 | Acute epiglottitis with obstruction |
| 4: URI | 10 | J00. | Acute nasopharyngitis [common cold] |
| 4: URI | 10 | J04.30 | Supraglottitis, unspecified, without obstruction |
| 4: URI | 10 | J06.0 | Acute laryngopharyngitis |
| 4: URI | 10 | J06.9 | Acute upper respiratory infection, unspecified |
| 4: URI | 10 | J04.2 | Acute laryngotracheitis |
| 4: URI | 10 | J04.31 | Supraglottitis, unspecified, with obstruction |
| 4: URI | 10 | J05.0 | Acute obstructive laryngitis [croup] |
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| Note: ARIs return visits used the same codes  |

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| **Infection-Related Hospitalization Diagnostic Codes** |
| Hospital\_ICDCode | icd\_description |
| 491.21 | OBSTRUCTIVE CHRONIC BRONCHITIS W ACUTE EXACERBATION |
| J44.1 | Chronic obstructive pulmonary disease with (acute) exacerbation |
| 486. | PNEUMONIA, ORGANISM UNSPECIFIED |
| J18.9 | Pneumonia, unspecified organism |
| A41.9 | Sepsis, unspecified organism |
| J15.9 | Unspecified bacterial pneumonia |
| 038.9 | UNSPECIFIED SEPTICEMIA |
| 482.9 | BACTERIAL PNEUMONIA, UNSPECIFIED |
| 491.22 | OBSTRUCTIVE CHRONIC BRONCHITIS WITH ACUTE BRONCHITIS |
| 466.0 | ACUTE BRONCHITIS |
| J44.0 | Chronic obstructive pulmonary disease with (acute) lower respiratory infection |
| 465.9 | ACUTE UPPER RESPIRATORY INFECTIONS OF UNSPECIFIED SITE |
| J20.9 | Acute bronchitis, unspecified |
| J06.9 | Acute upper respiratory infection, unspecified |
| 490. | BRONCHITIS, NOT SPECIFIED AS ACUTE OR CHRONIC |
| 487.1 | INFLUENZA WITH OTHER RESPIRATORY MANIFESTATIONS |
| J10.1 | Influenza due to other identified influenza virus with other respiratory manifestations |
| J09.X2 | Influenza due to identified novel influenza A virus with other respiratory manifestations |
| J20.8 | Acute bronchitis due to other specified organisms |
| 790.7 | BACTEREMIA |
| R78.81 | Bacteremia |
| J44.9 | Chronic obstructive pulmonary disease, unspecified |
| 462. | ACUTE PHARYNGITIS |
| J40. | Bronchitis, not specified as acute or chronic |
| A41.89 | Other specified sepsis |
| J18.1 | Lobar pneumonia, unspecified organism |
| 786.2 | COUGH |
| R05. | Cough |
| J11.1 | Influenza due to unidentified influenza virus with other respiratory manifestations |
| 475. | PERITONSILLAR ABSCESS |
| J02.9 | Acute pharyngitis, unspecified |
| J36. | Peritonsillar abscess |
| 473.9 | UNSPECIFIED SINUSITIS (CHRONIC) |
| 488.02 | INFLUENZA DUE TO IDENTIFIED AVIAN INFLUENZA VIRUS WITH OTHER RESPIRATORY MANIFESTATIONS |
| A41.51 | Sepsis due to Escherichia coli [E. coli] |
| 481. | PNEUMOCOCCAL PNEUMONIA (STREPTOCOCCUS) |
| J01.90 | Acute sinusitis, unspecified |
| 482.1 | PNEUMONIA DUE TO PSEUDOMONAS |
| 463. | ACUTE TONSILLITIS |
| J15.8 | Pneumonia due to other specified bacteria |
| J03.90 | Acute tonsillitis, unspecified |
| J13. | Pneumonia due to Streptococcus pneumoniae |
| B34.9 | Viral infection, unspecified |
| 482.41 | PNEUMONIA DUE TO STAPHYLOCOCCUS AUREUS |
| 461.9 | ACUTE SINUSITIS, UNSPECIFIED |
| J12.9 | Viral pneumonia, unspecified |
| 034.0 | STREPTOCOCCAL SORE THROAT |
| 487.0 | INFLUENZA WITH PNEUMONIA |
| A41.02 | Sepsis due to Methicillin resistant Staphylococcus aureus |
| L03.211 | Cellulitis of face |
| 038.8 | OTHER SPECIFIED SEPTICEMIAS |
| J15.1 | Pneumonia due to Pseudomonas |
| J10.08 | Influenza due to other identified influenza virus with other specified pneumonia |
| 038.42 | SEPTICEMIA DUE TO ESCHERICHIA COLI (E. COLI) |
| J09.X1 | Influenza due to identified novel influenza A virus with pneumonia |
| J18.8 | Other pneumonia, unspecified organism |
| J15.212 | Pneumonia due to Methicillin resistant Staphylococcus aureus |
| 480.9 | VIRAL PNEUMONIA, UNSPECIFIED |
| J02.8 | Acute pharyngitis due to other specified organisms |
| A40.3 | Sepsis due to Streptococcus pneumoniae |
| 038.0 | STREPTOCOCCAL SEPTICEMIA |
| A41.59 | Other Gram-negative sepsis |
| J15.6 | Pneumonia due to other Gram-negative bacteria |
| A41.01 | Sepsis due to Methicillin susceptible Staphylococcus aureus |
| 075. | INFECTIOUS MONONUCLEOSIS |
| J14. | Pneumonia due to Hemophilus influenzae |
| J12.1 | Respiratory syncytial virus pneumonia |
| A41.52 | Sepsis due to Pseudomonas |
| K12.2 | Cellulitis and abscess of mouth |
| 485. | BRONCHOPNEUMONIA, ORGANISM UNSPECIFIED |
| J18.0 | Bronchopneumonia, unspecified organism |
| 038.12 | METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS SEPTICEMIA |
| J02.0 | Streptococcal pharyngitis |
| 482.89 | PNEUMONIA, DUE TO OTHER SPECIFIED BACTERIA, NEC |
| 047.9 | UNSPECIFIED VIRAL MENINGITIS |
| J39.0 | Retropharyngeal and parapharyngeal abscess |
| 461.0 | ACUTE MAXILLARY SINUSITIS |
| J01.00 | Acute maxillary sinusitis, unspecified |
| A41.50 | Gram-negative sepsis, unspecified |
| 038.2 | PNEUMOCOCCAL SEPTICEMIA |
| 482.83 | PNEUMONIA DUE TO OTHER GRAM-NEGATIVE BACTERIA |
| 513.0 | ABSCESS OF LUNG |
| 474.00 | CHRONIC TONSILLITIS |
| A40.0 | Sepsis due to streptococcus, group A |
| 038.11 | STAPHYLOCOCCUS AUREUS SEPTICEMIA |
| J01.40 | Acute pansinusitis, unspecified |
| 488.12 | INFLUENZA DUE TO IDENTIFIED NOVEL H1N1 INFLUENZA VIRUS WITH OTHER RESPIRATORY MANIFESTATIONS |
| 136.3 | PNEUMOCYSTOSIS |
| 482.0 | PNEUMONIA DUE TO KLEBSIELLA PNEUMONIAE |
| 482.30 | PNEUMONIA DUE TO STREPTOCOCCUS UNSPECIFIED |
| A41.81 | Sepsis due to Enterococcus |
| J85.1 | Abscess of lung with pneumonia |
| J21.9 | Acute bronchiolitis, unspecified |
| J05.10 | Acute epiglottitis without obstruction |
| J11.00 | Influenza due to unidentified influenza virus with unspecified type of pneumonia |
| 473.8 | OTHER CHRONIC SINUSITIS |
| 038.49 | OTHER SEPTICEMIA DUE TO GRAM-NEGATIVE ORGANISMS |
| J12.2 | Parainfluenza virus pneumonia |
| K04.7 | Periapical abscess without sinus |
| 786.4 | ABNORMAL SPUTUM |
| 527.3 | ABSCESS OF SALIVARY GLAND |
| K11.3 | Abscess of salivary gland |
| 522.4 | ACUTE APICAL PERIODONTITIS OF PULPAL ORIGIN |
| J21.1 | Acute bronchiolitis due to human metapneumovirus |
| 466.19 | ACUTE BRONCHIOLITIS DUE TO OTHER INFECTIOUS ORGANISMS |
| J21.0 | Acute bronchiolitis due to respiratory syncytial virus |
| J20.1 | Acute bronchitis due to Hemophilus influenzae |
| J20.0 | Acute bronchitis due to Mycoplasma pneumoniae |
| J20.4 | Acute bronchitis due to parainfluenza virus |
| J20.5 | Acute bronchitis due to respiratory syncytial virus |
| J20.6 | Acute bronchitis due to rhinovirus |
| J20.2 | Acute bronchitis due to streptococcus |
| J05.11 | Acute epiglottitis with obstruction |
| 464.30 | ACUTE EPIGLOTTITIS WITHOUT MENTION OF OBSTRUCTION |
| 461.2 | ACUTE ETHMOIDAL SINUSITIS |
| J01.20 | Acute ethmoidal sinusitis, unspecified |
| 461.1 | ACUTE FRONTAL SINUSITIS |
| J01.10 | Acute frontal sinusitis, unspecified |
| J04.0 | Acute laryngitis |
| 464.00 | ACUTE LARYNGITIS, WITHOUT MENTION OF OBSTRUCTION |
| 465.0 | ACUTE LARYNGOPHARYNGITIS |
| J04.2 | Acute laryngotracheitis |
| H70.092 | Acute mastoiditis with other complications, left ear |
| H70.091 | Acute mastoiditis with other complications, right ear |
| 383.00 | ACUTE MASTOIDITIS WITHOUT COMPLICATIONS |
| H70.002 | Acute mastoiditis without complications, left ear |
| H70.001 | Acute mastoiditis without complications, right ear |
| 460. | ACUTE NASOPHARYNGITIS (COMMON COLD) |
| J00. | Acute nasopharyngitis [common cold] |
| J01.21 | Acute recurrent ethmoidal sinusitis |
| J01.11 | Acute recurrent frontal sinusitis |
| J01.91 | Acute recurrent sinusitis, unspecified |
| J03.91 | Acute recurrent tonsillitis, unspecified |
| 381.03 | ACUTE SANGUINOUS OTITIS MEDIA |
| 381.01 | ACUTE SEROUS OTITIS MEDIA |
| 461.3 | ACUTE SPHENOIDAL SINUSITIS |
| J01.30 | Acute sphenoidal sinusitis, unspecified |
| J03.00 | Acute streptococcal tonsillitis, unspecified |
| J03.80 | Acute tonsillitis due to other specified organisms |
| 464.10 | ACUTE TRACHEITIS WITHOUT MENTION OF OBSTRUCTION |
| J04.10 | Acute tracheitis without obstruction |
| 465.8 | ACUTE UPPER RESPIRATORY INFECTIONS OF OTHER MULTIPLE SITES |
| J12.0 | Adenoviral pneumonia |
| B34.0 | Adenovirus infection, unspecified |
| 523.31 | AGGRESSIVE PERIODONTITIS, LOCALIZED |
| 523.30 | AGGRESSIVE PERIODONTITIS, UNSPECIFIED |
| 041.84 | BACTERIAL INFECTION DUE TO ANAEROBES |
| 041.05 | BACTERIAL INFECTION DUE TO GROUP G STREPTOCOCCUS |
| 041.10 | BACTERIAL INFECTION DUE TO UNSPECIFIED STAPHYLOCOCCUS |
| A49.9 | Bacterial infection, unspecified |
| G00.9 | Bacterial meningitis, unspecified |
| J47.1 | Bronchiectasis with (acute) exacerbation |
| 494.1 | BRONCHIECTASIS WITH ACUTE EXACERBATION |
| J47.0 | Bronchiectasis with acute lower respiratory infection |
| H05.012 | Cellulitis of left orbit |
| H05.011 | Cellulitis of right orbit |
| H05.019 | Cellulitis of unspecified orbit |
| 473.2 | CHRONIC ETHMOIDAL SINUSITIS |
| J32.2 | Chronic ethmoidal sinusitis |
| 473.1 | CHRONIC FRONTAL SINUSITIS |
| 383.1 | CHRONIC MASTOIDITIS |
| H70.13 | Chronic mastoiditis, bilateral |
| H70.12 | Chronic mastoiditis, left ear |
| H70.11 | Chronic mastoiditis, right ear |
| 473.0 | CHRONIC MAXILLARY SINUSITIS |
| J32.0 | Chronic maxillary sinusitis |
| 472.1 | CHRONIC PHARYNGITIS |
| J35.01 | Chronic tonsillitis |
| J35.03 | Chronic tonsillitis and adenoiditis |
| B34.2 | Coronavirus infection, unspecified |
| 464.4 | CROUP |
| L02.01 | Cutaneous abscess of face |
| 521.02 | DENTAL CARIES EXTENDING INTO DENTINE |
| 521.03 | DENTAL CARIES EXTENDING INTO PULP |
| K02.53 | Dental caries on pit and fissure surface penetrating into pulp |
| K02.9 | Dental caries, unspecified |
| 478.6 | EDEMA OF LARYNX |
| J38.4 | Edema of larynx |
| 478.25 | EDEMA OF PHARYNX OR NASOPHARYNX |
| 529.0 | GLOSSITIS |
| K14.0 | Glossitis |
| 098.6 | GONOCOCCAL INFECTION OF PHARYNX |
| 074.3 | HAND, FOOT, AND MOUTH DISEASE |
| 041.5 | HEMOPHILUS INFLUENZAE (H. INFLUENZAE) INFECTION IN CONDITIONS CLASSIFIED ELSEWHERE AND OF UNSPECIFIED SITE |
| J12.3 | Human metapneumovirus pneumonia |
| B27.99 | Infectious mononucleosis, unspecified with other complication |
| B27.90 | Infectious mononucleosis, unspecified without complication |
| 488.19 | INFLUENZA DUE TO IDENTIFIED 2009 H1N1 INFLUENZA VIRUS WITH OTHER MANIFESTATIONS |
| 488.11 | INFLUENZA DUE TO IDENTIFIED 2009 H1N1 INFLUENZA VIRUS WITH PNEUMONIA |
| 488.09 | INFLUENZA DUE TO IDENTIFIED AVIAN INFLUENZA VIRUS WITH OTHER MANIFESTATIONS |
| 488.01 | INFLUENZA DUE TO IDENTIFIED AVIAN INFLUENZA VIRUS WITH PNEUMONIA |
| J09.X3 | Influenza due to identified novel influenza A virus with gastrointestinal manifestations |
| J09.X9 | Influenza due to identified novel influenza A virus with other manifestations |
| 488.82 | INFLUENZA DUE TO IDENTIFIED NOVEL INFLUENZA A VIRUS WITH OTHER RESPIRATORY MANIFESTATIONS |
| 488.81 | INFLUENZA DUE TO IDENTIFIED NOVEL INFLUENZA A VIRUS WITH PNEUMONIA |
| J10.81 | Influenza due to other identified influenza virus with encephalopathy |
| J10.2 | Influenza due to other identified influenza virus with gastrointestinal manifestations |
| J10.89 | Influenza due to other identified influenza virus with other manifestations |
| J10.01 | Influenza due to other identified influenza virus with the same other identified influenza virus pneumonia |
| J10.00 | Influenza due to other identified influenza virus with unspecified type of pneumonia |
| J11.2 | Influenza due to unidentified influenza virus with gastrointestinal manifestations |
| J11.89 | Influenza due to unidentified influenza virus with other manifestations |
| J11.08 | Influenza due to unidentified influenza virus with specified pneumonia |
| 487.8 | INFLUENZA WITH OTHER MANIFESTATIONS |
| 324.0 | INTRACRANIAL ABSCESS |
| 482.84 | LEGIONNAIRES' DISEASE |
| A48.1 | Legionnaires' disease |
| 320.9 | MENINGITIS DUE TO UNSPECIFIED BACTERIUM |
| 322.9 | MENINGITIS, UNSPECIFIED |
| G03.9 | Meningitis, unspecified |
| 041.12 | METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS IN CONDITIONS CLASSIFIED ELSEWHERE AND OF UNSPECIFIED SITE |
| A49.02 | Methicillin resistant Staphylococcus aureus infection, unspecified site |
| 041.11 | METHICILLIN SUSCEPTIBLE STAPHYLOCOCCUS AUREUS IN CONDITIONS CLASSIFIED ELSEWHERE AND OF UNSPECIFIED SITE |
| A49.01 | Methicillin susceptible Staphylococcus aureus infection, unspecified site |
| 491.1 | MUCOPURULENT CHRONIC BRONCHITIS |
| J41.1 | Mucopurulent chronic bronchitis |
| R09.81 | Nasal congestion |
| 376.01 | ORBITAL CELLULITIS |
| J39.1 | Other abscess of pharynx |
| J01.81 | Other acute recurrent sinusitis |
| 461.8 | OTHER ACUTE SINUSITIS |
| J01.80 | Other acute sinusitis |
| 474.8 | OTHER CHRONIC DISEASE OF TONSILS AND ADENOIDS |
| J32.8 | Other chronic sinusitis |
| 478.79 | OTHER DISEASES OF LARYNX |
| J38.7 | Other diseases of larynx |
| J39.2 | Other diseases of pharynx |
| 478.29 | OTHER DISEASES OF PHARYNX OR NASOPHARYNX |
| H70.892 | Other mastoiditis and related conditions, left ear |
| 038.19 | OTHER STAPHYLOCOCCAL SEPTICEMIA |
| 482.49 | OTHER STAPHYLOCOCCUS PNEUMONIA |
| A40.8 | Other streptococcal sepsis |
| B34.8 | Other viral infections of unspecified site |
| J12.89 | Other viral pneumonia |
| R07.0 | Pain in throat |
| 478.22 | PARAPHARYNGEAL ABSCESS |
| 522.7 | PERIAPICAL ABSCESS WITH SINUS |
| K04.6 | Periapical abscess with sinus |
| 522.5 | PERIAPICAL ABSCESS WITHOUT SINUS |
| 523.5 | PERIODONTOSIS |
| L03.213 | Periorbital cellulitis |
| B59. | Pneumocystosis |
| 480.0 | PNEUMONIA DUE TO ADENOVIRUS |
| 482.81 | PNEUMONIA DUE TO ANAEROBES |
| 482.82 | PNEUMONIA DUE TO E.COLI |
| J15.5 | Pneumonia due to Escherichia coli |
| 482.2 | PNEUMONIA DUE TO HEMOPHILUS INFLUENZAE (H. INFLUENZAE) |
| J15.0 | Pneumonia due to Klebsiella pneumoniae |
| J15.211 | Pneumonia due to Methicillin susceptible Staphylococcus aureus |
| 483.0 | PNEUMONIA DUE TO MYCOPLASMA |
| J15.7 | Pneumonia due to Mycoplasma pneumoniae |
| J16.8 | Pneumonia due to other specified infectious organisms |
| 483.8 | PNEUMONIA DUE TO OTHER SPECIFIED ORGANISM |
| J15.29 | Pneumonia due to other staphylococcus |
| J15.4 | Pneumonia due to other streptococci |
| 482.39 | PNEUMONIA DUE TO OTHER STREPTOCOCCUS |
| 480.8 | PNEUMONIA DUE TO OTHER VIRUS NOT ELSEWHERE CLASSIFIED |
| 480.2 | PNEUMONIA DUE TO PARAINFLUENZA VIRUS |
| 480.1 | PNEUMONIA DUE TO RESPIRATORY SYNCYTIAL VIRUS |
| 480.3 | PNEUMONIA DUE TO SARS-ASSOCIATED CORONAVIRUS |
| J12.81 | Pneumonia due to SARS-associated coronavirus |
| 482.40 | PNEUMONIA DUE TO STAPHYLOCOCCUS, UNSPECIFIED |
| J15.20 | Pneumonia due to staphylococcus, unspecified |
| 482.31 | PNEUMONIA DUE TO STREPTOCOCCUS GROUP A |
| 079.6 | RESPIRATORY SYNCYTIAL VIRUS (RSV) |
| 478.24 | RETROPHARYNGEAL ABSCESS |
| 390. | RHEUMATIC FEVER WITHOUT MENTION OF HEART INVOLVEMENT |
| A41.4 | Sepsis due to anaerobes |
| A41.3 | Sepsis due to Hemophilus influenzae |
| A41.1 | Sepsis due to other specified staphylococcus |
| A41.53 | Sepsis due to Serratia |
| A40.1 | Sepsis due to streptococcus, group B |
| A41.2 | Sepsis due to unspecified staphylococcus |
| 785.52 | SEPTIC SHOCK |
| 038.3 | SEPTICEMIA DUE TO ANAEROBES |
| 038.40 | SEPTICEMIA DUE TO GRAM-NEGATIVE ORGANISM, UNSPECIFIED |
| 038.41 | SEPTICEMIA DUE TO HEMOPHILUS INFLUENZAE (H. INFLUENZAE) |
| 038.43 | SEPTICEMIA DUE TO PSEUDOMONAS |
| 038.44 | SEPTICEMIA DUE TO SERRATIA |
| R65.20 | Severe sepsis without septic shock |
| 320.3 | STAPHYLOCOCCAL MENINGITIS |
| 038.10 | STAPHYLOCOCCAL SEPTICEMIA, UNSPECIFIED |
| G00.2 | Streptococcal meningitis |
| A40.9 | Streptococcal sepsis, unspecified |
| J04.31 | Supraglottitis, unspecified, with obstruction |
| J04.30 | Supraglottitis, unspecified, without obstruction |
| J22. | Unspecified acute lower respiratory infection |
| 491.9 | UNSPECIFIED CHRONIC BRONCHITIS |
| J42. | Unspecified chronic bronchitis |
| 474.9 | UNSPECIFIED CHRONIC DISEASE OF TONSILS AND ADENOIDS |
| 521.00 | UNSPECIFIED DENTAL CARIES |
| 519.9 | UNSPECIFIED DISEASE OF RESPIRATORY SYSTEM |
| 383.9 | UNSPECIFIED MASTOIDITIS |
| H70.92 | Unspecified mastoiditis, left ear |
| H70.91 | Unspecified mastoiditis, right ear |
| 382.9 | UNSPECIFIED OTITIS MEDIA |
| 464.50 | UNSPECIFIED SUPRAGLOTTIS, WITHOUT MENTION OF OBSTRUCTION |
| 386.35 | VIRAL LABYRINTHITIS |
| A87.9 | Viral meningitis, unspecified |
| B33.22 | Viral myocarditis |
| B33.23 | Viral pericarditis |
| 033.9 | WHOOPING COUGH, UNSPECIFIED ORGANISM |
| A37.90 | Whooping cough, unspecified species without pneumonia |
| 008.45 | INTESTINAL INFECTION DUE TO CLOSTRIDIUM DIFFICILE |
| A04.7 | Enterocolitis due to Clostridium Difficile |
| A04.72 | Enterocolitis due to Clostridium difficile, not specified as recurrent |
| A04.71 | Enterocolitis due to Clostridium difficile, recurrent |

**Legend:** ARI = acute respiratory infection, ICD= International Classification of Diseases, NOS=Not otherwise specified.

**Appendix 3. Suggest Approach Implementation Protocol for VHA ARI Campaign.**

**Outpatient Antimicrobial Stewardship Campaign to Improve the Management**

**of Acute Respiratory Tract Infections (ARI) Through Academic Detailing: Tool Kit and Implementation Strategy**

**Antimicrobial Stewardship Taskforce/VA Academic Detailing Service**

Electronic Access to Appendices Content & Additional ARI Campaign Related Resources available at:

VA PBM Academic Detailing Service SharePoint Site

[https://vaww.portal2.va.gov/sites/ad](https://vaww.portal2.va.gov/sites/ad/)

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**PURPOSE AND BACKGROUND:**

Up to 80% of all antimicrobials are prescribed in outpatient settings. Acute upper respiratory infections (ARIs) including rhinosinusitis, pharyngitis, bronchitis, colds, and other upper respiratory tract infections account for 45% of all outpatient prescriptions. 1 The CDC estimates that up to half of antimicrobial treatment for ARIs is unnecessary. A recent VA Center for Medication Safety (MedSAFE) medication utilization evaluation conducted in 28 VA medical centers, identified high rates of unnecessary antibiotic prescribing for ARIs.2 Despite a significant reduction in antimicrobial use within inpatient VA settings, the overall rate of antimicrobial prescribing for ARIs did not change between 2012 and 2016. 2,3 Based on these analyses, practices to reduce unnecessary antimicrobial prescribing for ARIs in the outpatient setting are needed.

This document provides guidance on academic detailing related activities to improve the management of ARIs by addressing the core elements of outpatient antibiotic stewardship: commitment, action, tracking and reporting, education and expertise.4 Personnel performing outpatient antimicrobial stewardship may utilize this document as a guide to implement academic detailing for the ARI Management Campaign (e.g. ARI Campaign).

The VA Academic Detailing Service SharePoint site hosts materials for the ARI Campaign, including: the ARI Priority Panel Report, ARI Prescribing Dashboard, ARI Prescribing Trend Charts (e.g. summary metrics), SalesForce for documenting ARI Campaign activities, and instructions for ordering Academic Detailing ARI materials. Link: <https://vaww.portal2.va.gov/sites/ad/SitePages/Home.aspx>

Summary metrics for the ARI campaign are aligned with Academic Detailing Key Messages, which have been developed based on recommended best practices and professional society guidelines.

**Key Messages for the ARI Campaign include:**

* Use antibiotics only when indicated in the treatment of ARIs to prevent adverse effects
* Make a specific, clinical ARI diagnosis to drive appropriate care
* Prescribe antibiotics only for patients who meet clinical diagnostic criteria for pharyngitis or bacterial sinusitis
* Provide symptomatic therapies that help patients feel better
* Use penicillin or penicillin-like antibiotics as the cornerstone of therapy when prescribing antibiotics for pharyngitis and bacterial sinusitis
* SHARE treatment decisions for ARI management with patients to improve satisfaction

# **DEFINITIONS:**

**Academic Detailer:** A clinician who has received academic detailing training. The training should include basic skills training endorsed by the VA Academic Detailing Service.

**Academic Detailing (AD):** An educational service for clinicians, by clinicians, that provides individualized, face-to-face outreach, to encourage evidence-based decision making to improve Veteran health.

**Antimicrobial Stewardship:** A series of coordinated interventions designed to improve and measure the appropriate use of antimicrobial agents by promoting the selection of the optimal antimicrobial drug regimen including dosing, duration of therapy, and route of administration. Each VA Medical Center is required to have an antimicrobial stewardship program (ASP).

**Acute Respiratory Tract Infections (ARI):** Infections limited to the respiratory tract, excluding pneumonia and including rhinosinusitis, pharyngitis, bronchitis, the common cold, or other viral infection of the upper respiratory system.

**Campaign Coordinator:** The local facility individual healthcare professional who provides day-to-day facility coordination of the ARI Campaign.

**Facility Provider Antimicrobial Stewardship Champion:** Provider assigned by the facility as the designated Physician Antimicrobial Stewardship Champion who is a leader or co-leader of the facility ASP and subject matter expert in the design, implementation, and function of the antimicrobial stewardship program.

**Facility Pharmacy Antimicrobial Stewardship Champion:** The Clinical Pharmacist or Clinical Pharmacy Specialist assigned as the designated Pharmacy Antimicrobial Stewardship Champion who is a leader or co-leader and subject matter expert in the design, implementation, and function of the antimicrobial stewardship program

**Facility Clinic Provider Champions:** Respected provider members within the facility such as the Chief of Medicine, an ambulatory care provider, or an emergency department (ED) site provider who can speak to the importance of Stewardship within the department or clinic and who can serve as an internal facilitator and/or early adopter of the ARI Campaign.

**Uncomplicated Acute Respiratory Tract Infections:** ARI occurring in patients WITHOUT the following: chronic obstructive pulmonary disease, significant immunocompromised states (such as, but not limited to, HIV, neutropenia, hematologic malignancies, receipt of a solid organ or peripheral blood, stem cell transplant or concurrent chemotherapy or other immunosuppressive therapy, or hemodialysis).

**Shared Decision Making (SDM):** A provider-patient communication strategy that helps clarify patient expectations regarding antibiotic therapy by comparing benefits, harms and risks of therapy through meaningful dialogue about what matters most to the patient.

**Priority Panel Providers:** Providers with a large group of ARI encounters based on a summary metric defined in the academic detailing campaign.

# **PROCEDURES**

The ARI Campaign will be most effective if activities within a medical center are coordinated by the facility antimicrobial stewardship provider or pharmacy champion and have local, facility administrative support. If the provider or pharmacy antimicrobial stewardship champion choose to not coordinate the campaign, they should identify a suitable local healthcare professional to coordinate the campaign. The campaign coordinator may wish to delegate campaign-related tasks to other facility personnel and collaborate with VISN -level academic detailers to implement and maintain the campaign.

**The core components of the ARI campaign toolkit include:**

**Commitment:** Suggestions on how to obtain and optimize local administrative support; a critical element for successful implementation.

**Action:** Academic detailing and provider education specifically designed to improve ARI management. Resources necessary to conduct an academic detailing campaign to improve ARI management are provided through the ARI Campaign

**Tracking:** Access to an ARI dashboard to identify and track information such as provider, clinic, and facility antibiotic prescribing rates for uncomplicated ARI encounters, ARI campaign summary metrics, and ARI campaign-related workload.

**Reporting:** The ability to report provider, clinic, and facility-level performance and ARI campaign metrics and related workload on a quarterly basis.

**Education:** Instructions on how to obtain and utilize educational materials including ARI-specific academic detailing materials, an ARI campaign slide-set, a short webinar on provider-patient communication techniques; and patient-educational materials. Additional educational resources include instructions on the obtainment of AD service endorsed training to teach stewardship personnel how to engage in ARI related academic detailing.

## COMMITMENT AND PREPARATION

**Identifying and gaining commitment from leadership within the institution and targeted clinic locations:**

ARI campaign success will be enhanced if there is commitment from local facility leadership, as well as, key clinic and academic detailing personnel.

**Facility leadership:** Examples of facility leadership include the Director, Chief of Staff, the Chief of Ambulatory Care services, and the Chief of Pharmacy.

**Clinic leadership:** Examples include physician clinic heads, clinic nurse managers and clinic pharmacists within clinics targeted for intervention (i.e. emergency department, urgent care, etc.)

**Academic detailing personnel:** Antimicrobial Stewardship personnel or other local personnel who complete AD service endorsed academic detailing training (see COMMITMENT AND PREPARATION section, pg. 5) may choose to perform academic detailing visits, however; commitment and collaboration with local or VISN academic detailing personnel may enhance the extent of provider outreach and effectiveness.

Methods to gain commitment may include meeting with facility leadership to provide an overview of the ARI Campaign and then engaging clinic-level leadership to ensure that the ARI Campaign aligns with the goals and objectives of the system(s) affected. Soliciting input from facility and clinic leadership can identify implementation clinics and clinic leaders to serve as champions. Generally, these individuals are respected provider members of the targeted clinic who can serve as “early adopters” and “internal facilitators” of the ARI Campaign. Collaboration with leadership should be considered to identify other facility-level considerations such as approval from facility-governing committees (approval from the Medical Executive Committee if necessary). If appropriate, a request may be sent to facility or clinic leadership to review and sign a Letter of Commitment (See ARI Campaign on AD SharePoint).

Meeting with local and/ or VISN academic detailing personnel may help determine if facility-level implementation aligns with academic detailing campaign priorities and identify if the ARI campaign may benefit from utilizing existing academic detailing personnel versus local facility Antibiotic Stewardship Champions.

**Structure of the academic detailing support for the ARI campaign in the individual facility:**

Local implementation of the ARI campaign can utilize academic detailing depending on available resources and preferences of delivery. The choice of implementation strategy will require different actions by campaign coordinators and additional campaign personnel. One of the following academic detailing service endorsed approaches is recommended:

**Option 1:** Facility antimicrobial stewardship providers conduct academic detailing visits within the facility. Pharmacy champions or other local campaign personnel can complete the TMS training “Academic Detailing in Acute Respiratory Tract Infections: Best Evidence Better Practice” and carefully study the provider academic detailing materials. Practice of academic detailing skills are encouraged before engaging in academic detailing visits with providers. In addition, conducting initial outreach visits with providers who are supportive of the ARI Campaign will be useful in practicing academic detailing skills. The webinar may be accessed through the Talent Management System (TMS). (See EDUCATION Section, pg. 7)

**Option 2:** Local or VISN AD personnel conduct academic detailing visits with VISN AD program manager support. Academic detailing personnel should meet with stewards or local campaign coordinators during the preparation phase of the ARI campaign to coordinate activities. Academic detailing will be more effective if detailers understand the facility’s current approach to outpatient stewardship activities (i.e., CPRS menus, availability of rapid antigen detection tests for Group A Streptococcus, preferred antibiotic and symptom management medications etc.) as well as, discussing the ARI priority panel report before initiating contact with providers. The detailers will then initiate contact with the provider. If initial kick-off activities are planned, the detailer should be aware of the extent and timing of these activities. (See ACTION section, pg. 9-10)

**Option 3:** Facility provider or pharmacy antimicrobial stewardship champions or other local campaign personnel may conduct the academic detailing visits, after applying to the Academic Detailing Service to complete a two-day face to face intensive academic detailing course. In this option, stewards can receive additional ongoing National AD Service educational support as an academic detailer.

## ACTION

**Identification of Clinic/ED locations and personnel for campaign implementation:**

Optimal sites for the ARI Campaign will have a high volume of patients presenting with ARIs and an environment conducive to quality improvement. Typical clinic sites may include the Emergency Department (ED), Urgent Care or Primary Care Centers. Academic detailing for ARIs can also be conducted in other practice settings such as Community Based Outreach Clinics (CBOCs). However, it is important to recognize that accurate feedback on provider prescribing rates and summary metrics is a key component of the ARI Campaign. VA pharmacy prescription services data are used to calculate ARI prescribing rates in AD service generated reports. Select clinics including CBOCs may have inconsistent VA pharmacy services prescription data as medications in these setting may be obtained through fee basis vendors or emergency supply floor stock. AD service generated reports may not accurately reflect provider or clinic performance on summary metrics, and caution is advised when interpreting feedback reports.

 It may be preferential to coordinate the ARI Campaign kick-off at the beginning of the ARI season (October- April) as most ARI encounters occur during this time. Establishing a specific kick-off date for the ARI Campaign will aid in specific planning and coordination of Campaign activities.

***The facility stewards and/or the ARI campaign coordinator should determine which activities will be conducted within the facility including who will conduct the academic detailing visits.***

Planning meetings should be scheduled to include leadership, key clinic and academic detailing personnel and to provide an overview of the goals and ARI Campaign; the campaign tools; and to explain personnel roles in facilitating the ARI campaign. Potential barriers should be identified that may influence the timing and/ or need for modification of the campaign outlined in this document. If non-steward academic detailing personnel (facility or VISN academic detailers) will be contacting clinicians it may be beneficial to meet with them to provide facility-specific context before initiating academic detailing. In addition, of engagement clinic site champions should occur periodically throughout the ARI Campaign.

After the initial visit, follow-up meetings with stakeholders should be scheduled as needed to obtain commitment, to review the ARI Campaign components, to provide an update on progress, etc. The approach to academic detailing should be discussed including who will be responsible for each step of the campaign and timelines for completion of ARI Campaign-related tasks. The ARI campaign checklist can be used to identify roles and responsibilities associated with the ARI Campaign (see Appendix A).

**Implementation of ARI-specific CPRS menus (optional component):**

If the facility does not already have CPRS ARI disease-based order menus or symptomatic therapy menus, it may be helpful to develop these menus and make them available for clinician use to aid in the selection of appropriate recipients of antibiotic therapy and selection of appropriate medications. The value that decision support tools can provide should be promoted with providers and key personnel throughout the ARI Campaign. Examples of the following disease-based menus are provided: acute rhinosinusitis, acute pharyngitis, acute bronchitis, and symptomatic therapies (See ARI Campaign). Questions regarding menu implementation can be directed to Karl.Madaras-Kelly2@va.gov. Experience suggests that key components of the menus include clinical diagnostic criteria for antibiotic therapy, quick orders for guideline recommended antibiotic therapies, and a symptomatic therapies menu.

**Suggested steps for menu implementation:**

Existing facility menus (if available) should be compared with ARI Campaign menus for differences in diagnostic criteria and diagnostic or medication quick orders. Use of existing menus with or without adaptation may be appropriate to fit the needs of the ARI Campaign.

If menus do not exist, the optimal location for the menus within CPRS should be identified. Optimal locations are easy for providers to locate quickly without the need to search or click through multiple menus. Depending on local procedures, consider building test menus with key personnel (i.e. Pharmacy, Lab, and Medicine). Test menus may allow implementation personnel to review content and usability before implementation. Specific facility laboratory test availability and preferred medications should be considered when designing the menus.

Follow the appropriate local procedures for creation of CPRS menus. Sufficient time should be allocated to seek and gain any necessary approvals. In many facilities, resource availability is limited, and it may take time to implement menus changes. Prior to CPRS activation, ensure that the menus are functional in advance of the Campaign kick-off.

Education and familiarization with the ARI menus can be done during both the ARI Campaign kick-off and academic detailing visits to promote use.

### **EDUCATION**

**Obtain and gain familiarity with educational resources:**

A variety of educational materials are used to implement the ARI Campaign. These include: provider academic detailing materials, a provider directed SDM for ARIs slide-set, an adaptable ARI Campaign introductory slide-set, patient directed written materials, and TMS training for stewards and academic detailers on how to conduct academic detailing specifically for ARIs. Patient directed educational handouts may require the obtainment of facility-level education committee approval prior to use and sufficient time should be allowed for those procedures. Furthermore, personnel who will be performing academic detailing visits should gain familiarity with ARI Campaign materials prior to engaging providers in detailing activities. All ARI Campaign educational materials can be accessed and ordered through the VA Academic Detailing Service SharePoint site (See pg. 1).

**Provider Education Materials:** Hardcopy provider academic detailing materials should be available to detailers and shared with providers in the target clinics during academic detailing encounters. Materials include the ARI Clinician Guide and Quick Reference Guide, an ARI Campaign kick-off slide set and a slide presentation on SDM. The Clinician Guide and Quick Reference guide are used as discussion aids during the detailing session with a provider and should be left with the provider upon completion of the visit. Aspects of shared decision making from the slide set can be discussed with the provider if they report that their patients frequently demand antibiotics. Additional information about each of the educational materials is given below:

**Clinician Guide**:Acute Respiratory Tract Infections: A VA Clinician’s Guide to Identification and Management of Acute Respiratory Tract Infections (ARI) Without Overusing Antibiotics (2017) Product Number: IB 10-933, P96813. This document serves as a support tool for academic detailers to communicate evidence-based information to support Key Messages within academic detailing sessions. Information within this resource includes a background of the current issues related to antibiotic use, current trends in antibiotic prescribing, current recommendations for antibiotic prescribing, and solutions for overcoming common barriers for appropriate antibiotic prescribing within ARI consultations. (See ARI Campaign on AD SharePoint)

**Quick Reference Guide:** Acute Upper Respiratory Infections Identification and Management of Acute Respiratory Tract Infections (ARI) Without Overusing Antibiotics IB 10-1010, P96878. Information within this pocket-sized resource includes the latest recommendations for diagnosing and prescribing for acute rhinosinusitis, pharyngitis, bronchitis and the common cold based upon CDC and IDSA practice guidelines including specific recommendations for medication selection, dose, and duration of therapy. (See ARI Campaign on AD SharePoint )

**SDM and ARI Presentation:** Shared Decision Making (SDM) is a provider-patient communication strategy that helps clarify patient demands regarding antibiotic therapy by comparing benefits, harms and risks of therapy through meaningful dialogue about what matters most to the patient. The SDM narrated presentation is approximately 15 minutes long and includes video clips of example provider-patient interactions. The webinar may be shown to providers in target clinics or viewed during academic detailing sessions.

**ARI Campaign kick-off slide-set:** This slide-set can be used “as is” or modified to suit the needs of individual facilities engaging in the ARI Campaign. The slide-set provides: a summary of the current evidence regarding antibiotic prescribing and ARIs; an overview of appropriate diagnosis and treatment of ARIs, select MedSAFE ARI Medication Utilization Evaluation slides which highlight VA-specific ARI diagnosis and treatment data, an overview of the ARI Campaign, and provider tools to aid in performance improvement.

**Patient Education Materials:** Available patient education tools should be discussed with key clinic personnel and providers. If not already available, a process should be developed in each targeted clinic to order, disseminate, and restock patient education materials on the appropriate use of antibiotics for ARIs. If possible, dissemination of antibiotic-specific patient education materials to clinics should parallel the process for other disease-state specific patient education materials. Several patient education resources are available for download from the Academic Detailing Service SharePoint sites, however, printing and use of these materials will need local approval.

Patient brochures can be displayed in waiting rooms or given before or during ARI encounters. These handouts aim to educate patients concerning the appropriate use of antibiotics.

The Viral RX Pad is a support tool for providers to utilize during encounters where antibiotics are an inappropriate choice for treatment. This resource is a hardcopy document that mirrors a prescription to provide patients with directions for care to alleviate current symptoms.

**Steward and Academic Detailer Education Materials:** Academic detailing service endorsed training is strongly encouraged for any personnel providing academic detailing visits for ARIs. Although many facility and VISN level academic detailing personnel have completed training through the VA Academic Detailing Service, most provider and pharmacy antimicrobial stewardship champions may not have such training. A video has been developed to teach the core concepts and application of academic detailing for ARI consultations. The training may be completed for continuing education credit through the Talent Management System (TMS). Academic detailers who have completed prior trainings on opioids or other campaigns are encouraged to watch this webinar and meet with facility provider or pharmacy antimicrobial stewardship champions to gain a better understanding of knowledge specific to academic detailing for ARIs.

**Academic Detailing in ARI: Best Evidence, Better Practice:** This webinar is helpful in introducing academic detailing within the context of ARIs including: evidence supporting academic detailing, preparation steps necessary to implement the ARI Campaign, key features of an academic detailing visit, and Campaign Key Messages. The webinar includes video examples of provider-detailer interactions including the suggested approaches and pitfalls to avoid during an academic detailing visit. Stewards interested in obtaining more comprehensive training in academic detailing may apply for more intensive training offered through VA Academic Detailing Service (see COMMITMENT AND PROCEDURES section, pg. 5)

**Notification of clinic providers and personnel about upcoming ARI Campaign activities:**

Participating clinic providers and other personnel in clinics targeted for implementation should be notified in advance of the ARI Campaign and related kick-off. The approach to notify clinic providers and personnel may depend upon the scope of the ARI Campaigns targeted clinics. For, example if all the facility’s clinics are involved this might include asking facility leadership to announce the campaign by e-mail, staff meetings, or through a Grand Rounds presentation, whereas if the campaign will focus only on ED and urgent care providers, clinical leadership may deliver the message through team meetings or other relevant forums. (See ARI Campaign Link)

**IMPLEMENTATION**

**Campaign kick-off Coordination: Presentation and Additional Materials (Optional component**)

It may be preferential to initiate multiple components or the ARI campaign within a focused time-frame around the kick-off event (ARI Campaign kick-off).

Any CPRS ARI order menus and patient education materials that will be used by clinicians should be made available within target clinic sites.

If the ARI Campaign is to be implemented facility wide or in large clinics, it may be advantageous to provide ARI education and an introduction to the ARI Campaign through a kick-off presentation. The target audience for the venue may vary depending on the facility and number of clinics/EDs involved in the ARI Campaign. If practical, facility and/ or clinic leadership should be present at the kick-off meeting and engage the audience in some capacity (e.g., Introducing the speaker, verbally expressing support for the project, etc.).

After identifying suitable ARI providers from the provider priority panel (See TRACKING section, pg. 12) academic detailing sessions should be scheduled with priority providers in target clinics shortly after the “kick-off”. A suggested timeline is to conduct all baseline academic detailing visits with target providers within the subsequent month.

Tracking and reporting ARI Campaign metrics through the facilities antimicrobial stewardship program reporting structure and other relevant facility governing committees should be implemented along with the kick-off. (See TRACKING section, pgs. 11-12)

**Academic Detailing Outreach Visits**

The VA Academic Detailing Service SharePoint site hosts ARI campaign dashboards used to support the ARI Campaign. The Academic Detailing Report Dashboard can be used to identify priority providers (providers with high numbers of encounters and/or poor performance on ARI metrics) within the target clinics (See TRACKING section, pg. 11).

If the detailer is unfamiliar with the provider or academic detailing is a new activity within the facility, it may be advantageous to meet with clinic leadership or other clinic key personnel (i.e. pharmacist, clinic manager) prior to contacting the provider directly to facilitate the initial contact with the provider.

**Suggested steps for the academic detailing visits:**

An appointment should be requested with the priority providers. Detailers should use the provider’s preferred mode of communication (e.g. email, Lync/IM, phone call, or drop in); if this is unknown, key clinic personnel may help determine the provider’s preferred mode of communication. Alternatively, the detailer can try one mode and if that fails to get a response, try another mode.

The designated detailer should offer to meet at the practice or office location of the targeted provider. In addition, consideration should be given to schedule the appointment during the provider’s administrative time (if applicable) so that it is more convenient for the provider. Alternatively, if it is a provider in a location near the detailer, they can offer to meet with the provider when and if he or she has a no-show time slot.

If the clinician is unwilling to meet one-on-one, or is not responding to several requests for an appointment some possible strategies are outlined below:

The facility antimicrobial stewardship provider, pharmacy champion or other clinic leadership may be courtesy copied (cc’d) in the e-mail request for a meeting.

Small group appointments may be offered with his or her team.

Requesting priority providers who have participated in the ARI academic detailing at the facility to introduce the detailer to the non-responsive provider.

It may be necessary to re-contact the provider later. Academic detailing is not a mandatory service for providers; persistently resistant providers may eventually become more open as the ARI Campaign becomes accepted and influential within the clinic.

**Note:** It may take several appointment requests using different modes of communication to obtain an appointment with some providers

Academic detailers involved in the ARI Campaign should attempt to meet with each provider listed on the priority provider panel who is underperforming on ARI metrics at least once during the ARI season. It may be appropriate to meet with providers more frequently throughout the ARI season, or in subsequent ARI seasons based on individual provider need, numbers of ARI encounters, and performance on ARI metrics. It also may be appropriate to have the facility antimicrobial stewardship provider or pharmacist champion, clinic leadership, or other respected provider accompany the detailer on subsequent academic detailing visits with priority providers who do not improve on ARI metrics after several visits.

**General tips for providing AD services for ARI:**

After the kick-off, contact should be made and academic detailing visits scheduled. Provider(s) should be notified in advance about the purpose, meeting location, and time of the session. It may be helpful to have clinic leadership, key clinic personnel, or the antimicrobial steward facilitate scheduling the first meeting, particularly if off-site academic detailing personnel are conducting the visits.

Provider performance on ARI metrics should be reviewed and personnel performing academic detailing should review the materials in detail prior to meeting with provider.

The academic detailing outreach visits can be conducted with individual providers or in small groups (5 maximum) in a manner that is conversational and engaging, rather than as a formal didactic presentation. Examples may include discussing encounter types that the provider has difficulties with or discussing the provider’s approach to common problematic situations.

The Key Messages of the ARI Campaign should be discussed with the provider as needed based on the review of performance and needs.

It may also be beneficial to have providers log into CPRS and direct them to find and experiment with the ARI tools (CPRS menus, patient materials, provider materials).

Provider or clinic performance on ARI Campaign metrics may be discussed after Key Messages and provider tools are covered in a non-confrontational format if appropriate within the context of the visit.

Each session should conclude with a clear plan for follow-up and elicits commitment to practice behaviors related to Key Messages directed towards improvement. Providers should be offered the opportunity to ask questions and provide feedback on ways to improve the academic detailing process. Detailers should follow-up with providers as needed to facilitate improvement in ARI management

If applicable, each outreach visit should be documented within SalesForce. (See TRACKING section, pg. 14)

It may be advantageous for academic detailers to continue meeting with clinic key personnel throughout the campaign. Nursing, pharmacy, and/or administrative support staff may help facilitate aspects of the ARI campaign such as patient triage for ARIs, obtaining accurate symptom histories, initiating diagnostics tests, patient education and follow-up. Sometimes a provider may suggest meeting with his or her staff, if this is the case, it may be advantageous to meet with them.

It may also be advantageous for academic detailers to meet with additional providers not identified through the priority provider panel including “best practice” providers. These providers may be able to share their approach to ARI management so that this information can be shared with other providers

## TRACKING

**Components of dashboard access and methods of utilization:**

The VA Academic Detailing Service SharePoint site hosts dashboards for the ARI Campaign this dashboard hosts the following tools: the ARI priority panel report, ARI prescribing dashboard, ARI prescribing trend charts (e.g. summary metrics), and SalesForce for documenting ARI Campaign activities.

**ARI Priority Panel Report:** This report will allow the steward and/or academic detailer to identify and track providers with large numbers of ARI encounters who perform poorly on campaign metrics. These providers should be targeted for academic detailing. In addition, the report displays the performance of each provider on ARI campaign metrics compared to the facility averages, which will allow academic detailers to target their education to campaign Key Messages. Provider priority reports can be sorted at the clinic level to allow for targeting the ARI Campaign to specific clinics and teams.

**ARI Prescribing Dashboard:** The ARI Prescribing Dashboard will display current performance of each ARI campaign metric for selected VISN(s), facility(ies), and compare provider(s) to the national average. This report allows for drill down capabilities to the provider level to enable feedback to targeted clinicians.

**ARI CAMPAIGN SUMMARY METRICS:**

**Overall Antibiotic Prescribing Rate for Uncomplicated ARI** (see DEFINITIONS section, pg. 3)

**Numerator:** Uncomplicated ARI cases where any systemically administered antibiotic is filled within two days before or three days after index visit.

**Denominator:** All uncomplicated ARI Cases

**Rationale:** The time-window for antibiotic prescription data is based upon VA research that determined that antibiotics can be prescribed for ARI prior to visits with providers and up to several days afterwards. 2,3 Generally, antibiotics are not indicated for most uncomplicated ARI visits, and a lower value is preferable.

**Proportion of uncomplicated ARI diagnoses that are rhinosinusitis**

**Numerator:** Diagnoses of rhinosinusitis

**Denominator:** All uncomplicated ARI diagnoses

**Rationale:** Of all targeted ARI, antibiotics are most frequently indicated in patients with confirmed rhinosinusitis, and there is a strong relationship the percentage of rhinosinusitis diagnoses of total ARI cases and ARI antibiotic prescribing rates. The clinical diagnostic criteria to differentiate acute rhinosinusitis from the common cold and other ARIs is based on threshold criteria for antibiotic treatment including determination of acute bacterial rhinosinusitis symptoms (e.g. duration >10 days, worsening after improvement or initially severe symptoms). While the optimal absolute value is unknown, lower relative values are preferable.

**Antibiotic prescribing rate for uncomplicated bronchitis and URI/NOS**

**Numerator:** Uncomplicated acute bronchitis and URI/NOS cases where any systemically administered antibiotic is filled within two days before or three days after index visit.

**Denominator:** All uncomplicated acute bronchitis and URI/NOS cases

**Rationale:** Generally, antibiotics are not indicated for most uncomplicated acute bronchitis cases or URI/NOS (colds), and a lower value is preferable. 5

**Preferred Antibiotic Prescribing for uncomplicated rhinosinusitis**

**Numerator:** 1st line recommended antibiotic filled (oral amoxicillin or amoxicillin/clav.) or 2nd line recommended antibiotic (doxycycline, moxifloxacin, or levofloxacin) if patient has any β-lactam allergy for acute rhinosinusitis cases within two days before or three days after index visit. 6,7

**Denominator:** All rhinosinusitis cases prescribed an antibiotic within same time-frame.

**Rationale:** Professional guidelines recommend one of these specific antibiotic regimens for patients who meet threshold criteria for antibiotic treatment, and specifically suggest that several other common regimens [(e.g. macrolides, trimethoprim/sulfamethoxazole (TMP/SMX)] are poor choices. Generally, a higher value is preferable.

**Preferred Antibiotic Prescribing for uncomplicated pharyngitis**

**Numerator:** 1st line recommended antibiotic (oral/IM penicillin or oral amoxicillin) filled or 2nd line recommended antibiotic (oral cephalexin or clindamycin) filled if patient has any beta-lactam allergy for acute pharyngitis cases within two days before or three days after index visit. 8

**Denominator:** All uncomplicated pharyngitis cases prescribed an antibiotic

**Rationale:** Professional guidelines recommend one of these specific antibiotic regimens for patients who meet threshold criteria for antibiotic treatment, and suggest that several other common regimens (e.g. macrolides, (TMP/SMX) are poor choices. Generally, a higher value is preferable.

**Workload documentation, tracking performance, and reporting:**

It is important to document steward and detailer workload expended on the ARI Campaign, as these activities are not captured by traditional VA patient-encounter workload measures. SalesForce is a customer relationship management platform utilized by the Academic Detailing Service that may be used to document and track ARI Campaign activities. Access to SaleForce and training on its use for documenting campaign activities will be made available to personnel engaging in the ARI Campaign. SalesForce licenses will be granted to personnel and the Academic Detailing Service will provide training on how to access and document workload within the platform after completion of Academic Detailing basic skills training. Details regarding AD workload documentation can be found in the workload section of the Academic Detailing Service SharePoint Site.

ASTF strongly endorses that all personnel involved in the ARI Campaign document their workload effort within SalesForce; however, stewardship personnel are not required to document ARI Campaign workload. VISN-level academic detailing personnel and any stewards who complete the 2-day academic detailing course (See COMMITMENT AND PREPERATION section, pg. 5) are required by the Academic Detailing service to use SalesForce to document ARI Campaign academic detailing visits.

Facility Stewards and academic detailers can document the following activities in SalesForce:

* Time spent on preparatory activities including planning meetings, development and dissemination of CPRS menus and patient education materials, preparing campaign documents, preparatory meetings, educating key personnel, running reports.
* Time spent on campaign activities including running and generating feedback reports, detailing providers, delivering reports and providing feedback to providers.

**Provider performance tracking:**

After ARI Campaign kick-off, designated campaign personnel should review providers’ performance on ARI metrics using the ARI priority panel report. Providers will accrue ARI encounters at different rates depending on clinical duties and the seasonal fluctuation in ARI diagnoses. The optimal frequency of provider monitoring will vary depending on these factors; however, monthly to quarterly intervals are reasonable targets. Likewise, the optimal timing of follow-up academic detailing visits will vary, but scheduling at least one follow-up visit with priority panel providers who do not improve on ARI metrics performance is recommended; more visits may be appropriate on a case by case basis. Annual refresher ARI kick-off activities followed by additional academic detailing sessions are appropriate for new providers and those who revert to poor performance on metrics during subsequent seasons.

**Clinic/Facility ARI Campaign metric tracking:**

Stewards are encouraged to track the clinic and facility-level metrics for the ARI Campaign from the Academic Detailing ARI Prescribing Dashboard and use these data to provide feedback on ARI Campaign outcomes to clinical leadership, clinical staff, and appropriate facility administration.

ARI Campaign summary metric data, as well as, Academic Detailing Service personnel workload expended on the campaign are tracked by the Academic Detailing Service for both internal and external reporting on the ARI campaign.

Tracking of metrics over time along with the Academic Detailing Workload allows for analysis to determine the impact of the ARI campaign overall and the impact of the academic detailing outreach visits performed. Academic Detailing Outreach Visit activity will be reported as part of the quarterly Academic Detailing Service workload reports, aggregated in the Academic Detailing Service annual report, and analyses may be performed to determine the impact of academic detailing on the ARI metrics at the facility, VISN, and national level.

## REPORTING

Stewards are encouraged to incorporate clinic and/or facility-level metrics from the ARI Campaign into routine ASP program reporting (e.g. ASP Annual Report) and other locally appropriate quality improvement reports. Activity of academic detailing outreach visits are reported as part of the quarterly Academic Detailing Service workload reports, aggregated in the Academic Detailing Service annual report, and analyses may be performed to determine the impact of academic detailing on the ARI metrics at the facility, VISN, and national level.

 If appropriate, ARI Campaign data may be reported to locally designated committees (e.g., Pharmacy & Therapeutics Committee) to provide an overview of clinic behavior and foster action to increase responsible antibiotic use. In addition, SalesForce data coupled with prescribing behavior information may be useful for clinic leadership when delegating or justifying future resources for outpatient stewardship or academic detailing within the facility.

**References**

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# **Appendix A: Checklist**

**ARI CAMPAIGN CHECKLIST**

The following checklist supplements the suggested approach for implementation document for the ARI Campaign based on the Core Elements of Antibiotic Stewardship. Use this checklist to create a local plan for implementation of the ARI Campaign in your facility. Retain the checklist and refer to the answers during ARI Campaign roll-out

Facility Name: [Name] Date: [date]

**COMMITMENT AND PREPARATION** (See pgs. 4-5; Section Identifying and gaining commitment)

1. Can your facility demonstrate the support of leadership for the ARI Campaign through one or more of the following actions? 🞏 **Yes** 🞏 **No**

If yes, indicate which of the following have been completed (select all that apply)

🞏 Initial meetings with facility leadership (Chief of Staff, Chief of Medicine or Ambulatory Care services, and/or the Chief of Pharmacy) to ensure support of ARI Campaign goals, intervention components, and to explain personnel roles in campaign facilitation

🞏 Initial meetings with clinic leadership (physician clinic heads, clinic nurse managers and/or clinic pharmacists within clinics targeted for intervention) to ensure support of ARI Campaign goals, intervention components, and to explain personnel roles in campaign facilitation

🞏 Initial meetings with academic detailing personnel (Antimicrobial Stewardship personnel or other local personnel who complete AD service endorsed academic detailing training) to determine the targets and scope of the ARI Campaign as well as determine the delegation of work for each service.

🞏 Written statement of leadership (Chief of Staff or Chief of Medicine) (see ARI Campaign Link)

2. Determine which clinics will implement the ARI Campaign. These should be prioritized based on the volume of ARI encounters and availability of VA pharmacy prescription data. It may be helpful to review AD ARI dashboards to determine the scope of intervention (see pg. 12; Section Tracking). Select which type of clinic you plan to implement the ARI Campaign (Select all that apply):

🞏 Emergency Department

🞏 Urgent Care

🞏 Primary Care

🞏 Community Outreach Clinic

3. Estimate how many of each of the following types of providers **independently** and **routinely** see patients presenting with ARI symptoms at each clinic location pargeted for intervention? (See pg. 12; Section Tracking to identify providers)

 🞏 Physician \_\_
 🞏 Physician Assistant (PA) \_\_
 🞏 Nurse Practitioner (NP) \_\_

4. Are you planning to implement all ARI campaign activities within the facility (See pgs. 6-12; Section Action)? 🞏 **Yes** 🞏 **No**

If yes, indicate who will fill the role and responsibilities of each position to implement components of the ARI Campaign (See pgs. 2-3; Section Definitions)

🞏 Facility Provider Antimicrobial Stewardship Champion: [Enter Name]

🞏 Facility Pharmacy Antimicrobial Stewardship Champion: [Enter Name]

🞏 Campaign Coordinator (if not Antimicrobial Steward Champions: [Enter Name]

🞏 Facility Clinic Provider Champion (identify one individual for each clinic): [Enter Name]

🞏 Facility Clinic Provider Champion (identify one individual for each clinic): [Enter Name]

🞏 Facility Clinic Provider Champion (identify one individual for each clinic): [Enter Name]

🞏 Academic Detailer(s): [Enter Name] (See pg 4. Section Structure of the academic detailing [..])

🞏 Additional Assistance Staff: [Name (Title)]

5. Identify which academic detailing training or personnel best fits the clinic (select all that apply):

**🞏 Option 1:** Facility antimicrobial stewardship providers, pharmacy champions or other local campaign personnel will perform the academic detailing visits after they have completed the TMS training “Academic Detailing in Acute Respiratory Tract Encounters: Real Provider Resources. Real Patient Results” and carefully study the provider academic detailing materials. Practice of academic detailing skills is encouraged before engaging in academic detailing visits with providers. In addition, conducting the initial visits with providers who are supportive of the ARI Campaign will be useful in practicing academic detailing skills.

**🞏 Option 2:** Local or VISN AD personnel conduct academic detailing visits with VISN AD program manager support. Academic detailing personnel should meet with stewards or local campaign coordinators during the preparation phase of the ARI campaign to coordinate activities. Academic detailing will be more effective if detailers understand the facility’s current approach to outpatient stewardship activities (i.e., CPRS menus, availability of rapid antigen detection tests for Group A Streptococcus, preferred antibiotic and symptom management medications etc.) as well as, discussing the ARI priority panel report before initiating contact with providers. The detailers will then initiate contact with the provider. If initial kick-off Activities are planned, the detailer should be aware of the extent and timing of these activities.

**🞏 Option 3:** **Option 3:** Facility provider or pharmacy antimicrobial stewardship champions or other local campaign personnel may conduct the academic detailing visits, after applying to the Academic Detailing Service to complete a two-day face to face intensive academic detailing course. In this option, stewards can receive additional ongoing National AD Service educational support as an academic detailer.

🞏 Other (i.e. hybrid): Describe:

**ACTION**

6. Who will be responsible for informing clinic providers about the ARI Campaign activities (see ARI Campaign Link; Notification of Activities Example Resource)? [Name]

7. Does your facility use CPRS/ Order set menus that display appropriate diagnosis and treatment recommendations for ARI related visits to assist provider decision making within ARI encounters?

 🞏 **Yes** 🞏 **No**

If no, which menus are you going to add? (Select all that apply)

🞏 Acute Bronchitis

🞏 Acute Pharyngitis

🞏 Acute Rhinosinusitis

🞏 ARI- NOS (Common Cold)

🞏 ARI Symptomatic Therapy Menus

🞏 N/A- Not planning to add menus

8. Where is the ideal location for ARI related order set menus at your facility? [List location within CPRS]

9. Who is responsible for the development and implementation of order-set menus? [Name, Service]

10. What are the necessary steps and approvals to initiate the process to implement order set menus? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11. How long will it take for menus to be built, tested and integrated into existing systems? [Estimated time]

**Educational materials**

***Patient Education Materials***

12. Does your facility provide outpatient patient education materials focused on antibiotic use or ARIs?

🞏 **Yes** 🞏 **No**

If yes, indicate which materials are/ will be available for patients presenting with ARIs (see pgs. 8-9; AD SharePoint Site; Patient Materials):

🞏 Patient Posters

🞏 The Viral RX Pad

🞏 Systematic Relief for Viral Illnesses

13. Who will be responsible for navigating the local educational approval process; printing; and disseminating ARI related patient-directed educational materials within the facility and/or clinics. [Name, Service]

***Academic Detailing Materials***

14. Estimate the number of AD materials needed to academic detail providers identified in target clinics by the Provider Priority Panel. The suggested amount includes 1 Clinician’s Guide and 2 Quick Reference Guides ( the latter can be provided to support personnel and providers) per provider (see pg. 12; ARI Campaign Link; Provider Materials)

 Clinician’s Guide: \_\_\_

Quick Reference Guide: \_\_\_

15. Based on question 5 above, who will be responsible for navigating the educational approval process; ordering; and disseminating ARI related provider-directed educational materials. [Name, Service]

**Kick-Off Presentation (Optional)**

16. Have you identified times and dates to Kick-Off the ARI Campaign? 🞏 **Yes** 🞏 **No**

If yes, when will the kick-off occur: [Location] Where will the Kick-Off occur: [Scheduled Room]

17. Who will notify providers of the Kick-Off presentation (See ARI Campaign Site; Resource Example Notification Letter)? [Name]

18. Who will review the ARI Kick-Off Presentation and edit it to suit the specific needs of the facility? **[Name]**

19. Who will be responsible to deliver the ARI Kick-Off Presentation? **[Name, Service]**

20. How will the ARI campaign be announced to clinic providers if a Kick-Off Presentation is not being utilized? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Academic Detailing**

(*Option 1 & 3: Refer to Question 5 above*)

21. Who will identify providers for academic detailing? [Name, Service]

22. Who will schedule academic detailing visits? [Name, Service]

23. Who will conduct academic detailing? [Name, Service]

**TRACKING & REPORTING**

Stewards are encouraged to track the clinic and facility-level metrics for the ARI Campaign from the Academic Detailing ARI Prescribing Dashboard and use these data to provide feedback on ARI Campaign outcomes to clinical leadership, clinical staff, and appropriate facility administration. In addition, ARI Campaign summary metric data, as well as, Academic Detailing Service personnel workload expended on the campaign are tracked by the Academic Detailing Service for both internal and external reporting.

24. Who will be responsible for retrieving and reporting aggregate ARI summary metrics periodically to Clinic Champions or Key Clinic Personnel in target clinics (see pgs 13; Section ARI Campaign Summary Metrics)? [Name]

25. How often will summary reports be provided to targeted clinics?

🞏 Monthly

🞏 Quarterly

🞏 Other: \_\_\_\_\_\_\_\_\_\_\_

26. Who will be responsible for tracking and reporting facility ARI campaign monthly workload through Salesforce (optional but encouraged for antimicrobial stewards who complete AD training Option 1 & 3; See pg. 14)? [Name]

27. Who will be responsible for tracking and reporting clinic and facility level performance on ARI metrics to administration and facility committees? [Name]

28. How often will of clinic and facility level performance on ARI metrics be tracked and reported?

29. In what venues will ARI metric performance be reported ( i.e. Annual Antimicrobial Stewardship Program report, P&T committee, etc)? [Anticipated Venues]

30. Document any other items that are of consideration for local implementation of the ARI campaign in your facility.

**Appendix 4. VHA ARI Campaign Antibiotic-Related Metrics\***

|  |  |  |  |
| --- | --- | --- | --- |
| **Measure** | **Numerator** | **Denominator** | **Comment** |
| Overall ARI antibiotic prescribing (%) | Uncomplicated ARI cases with antibiotic filled within 3 days | All uncomplicated ARI | Lower is generally better as antibiotics not indicated for most uncomplicated ARI |
| Antibiotic prescribing for acute bronchitis and URI-NOS (%) | Uncomplicated acute bronchitis/URI-NOS cases with antibiotic filled within 3 days | All uncomplicated acute bronchitis/URI-NOS | Lower is generally better as antibiotics not indicated for most uncomplicated acute bronchitis/URI-NOS |
| Preferred antibiotic prescribing for acute pharyngitis (%) | Uncomplicated acute pharyngitis cases with penicillin or amoxicillin prescribed within 3 days or cephalexin or clindamycin in the case of penicillin allergy | Uncomplicated acute pharyngitis cases with an antibiotic prescribed within 3 days | Higher is generally better. Guideline recommended antibiotics over non-preferred regimens.  |
| Preferred antibiotic prescribing for acute rhinosinusitis (%) | Uncomplicated acute rhinosinusitis cases with amoxicillin or amoxicillin/clavulanate prescribed within 3 days or doxycycline or levofloxacin in case of penicillin allergy | Uncomplicated acute rhinosinusitis cases with an antibiotic prescribed within 3 days | Higher is generally better. Guideline recommended antibiotics over non-preferred regimens.  |
| Proportion of uncomplicated ARI cases that are acute rhinosinusitis (%) | Uncomplicated acute rhinosinusitis cases  | All uncomplicated ARI cases | Lower is generally better if clinician’s antibiotic prescribing rate was higher than peers. Intent was to encourage clinicians to differentiate between acute rhinosinusitis and URI-NOS and only prescribe antibiotics for patient’s meeting guideline recommended criteria for ABS.  |

**Legend:** ARI= Acute Respiratory Infection, URI-NOS= Upper Respiratory Infection =Not Otherwise Specified, ABS= Acute bacterial sinusitis.

**Appendix 5. Most Common Diagnoses of Infection-Related Hospitalization\***

|  |  |  |
| --- | --- | --- |
| **Diagnoses** | **Hospitalizations****(*N*)** | **Hospitalizations (%)** |
| Pneumonia/Influenza | 645 | 22.0 |
| Bronchitis/URI-NOS | 215 | 7.3 |
| Sepsis | 200 | 6.8 |
| Septicemia/Bacteremia | 145 | 4.9 |
| Pharyngitis and Complications | 111 | 3.8 |

**Legend:** \* Percentages based on 2,935 total hospitalizations. URI-NOS- Upper respiratory tract infection not otherwise specified. Pharyngitis complications include peritonsillar abscess and tonsillitis.