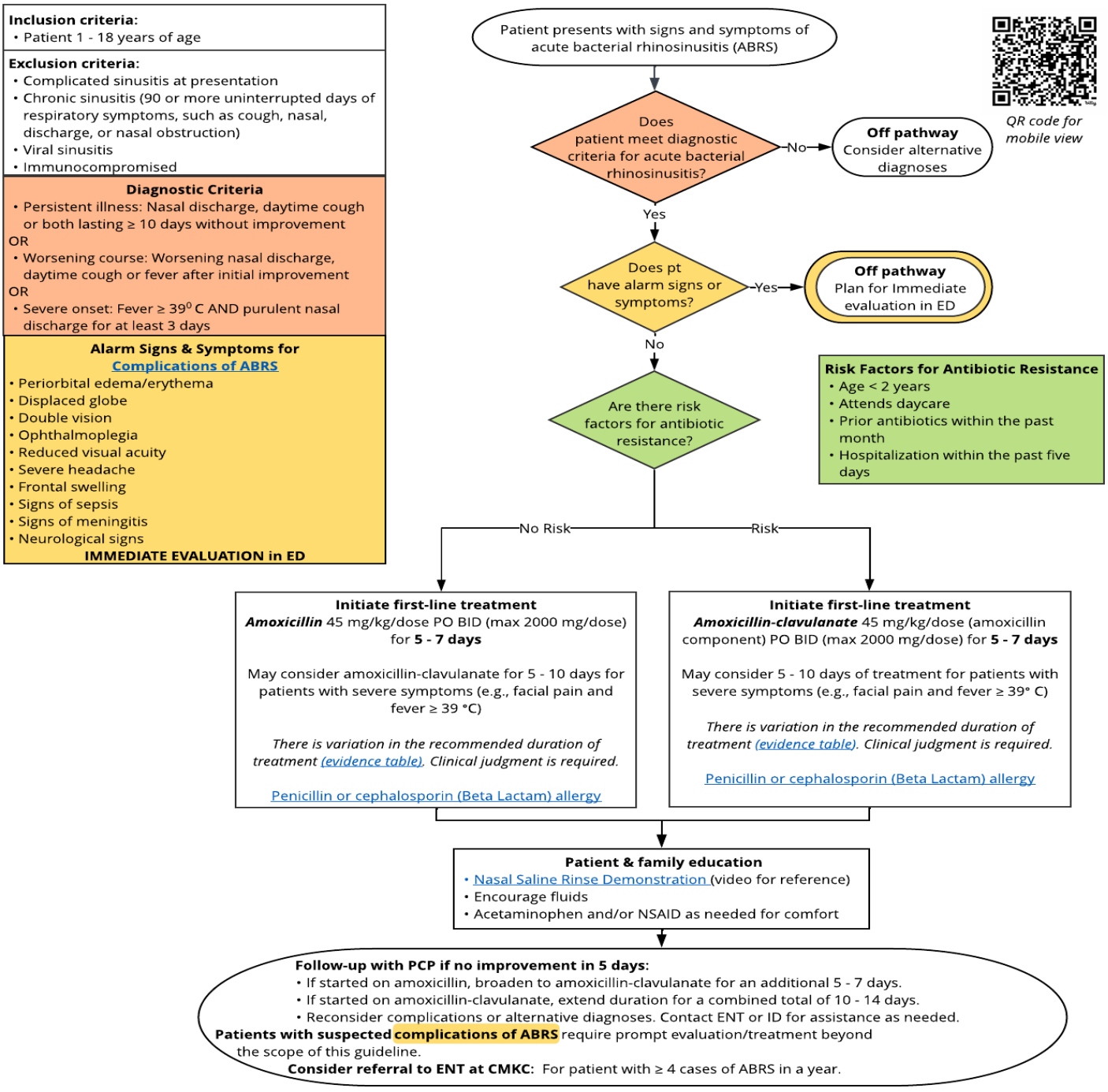
10-2024

Sinusitis: Acute Bacterial

Children's Mercy Kansas City

Sinusitis: Acute Bacterial
Clinical Pathway Synopsis

Acute Bacterial Rhinosinusitis Algorithm



** These clinical pathways do not establish a standard of care to be followed in every case. It is recognized that each case is different, and those individuals involved in providing health care are expected to use their judgment in determining what is in the best interests of the patient based on the circumstances existing at the time. It is impossible to anticipate all possible situations that may exist and to prepare a clinical pathway for each. Accordingly, these clinical pathways should guide care with the understanding that departures from them may be required at times.*

Table of Contents

Objective of Clinical Pathway

The objective of this clinical pathway is to provide care standards for patients with concern for acute bacterial rhinosinusitis (ABRS). The aim is to provide guidance regarding evaluation, treatment, and follow-up for eligible patients to maximize patient safety and minimize variation in care.

Background

Acute bacterial rhinosinusitis (ABRS) often arises as a complication from viral upper respiratory infections (URIs) or allergic inflammation. The diagnosis of ABRS is typically made when a child with an acute URI exhibits one or more of the following: **persistent symptoms** such as nasal discharge or daytime cough lasting over 10 days without improvement, **a worsening condition** marked by new or aggravated nasal discharge, daytime cough, or fever after initial improvement, or **a severe onset** characterized by a fever of a least 39°C (102.2°F) and purulent nasal discharge for a minimum of three consecutive days (Meltzer et al., 2004). Determining the appropriateness of antibiotic use for ABRS is critical to ensure proper treatment and reduce unnecessary prescribing of antibiotics (Conway et al., 2024). While the recommendations for assessment, diagnosis, and antibiotic selection remain consistent among national and international guidelines, there are differences in antibiotic treatment duration and follow-up care. This clinical pathway was created to provide evidence-based diagnostic and treatment recommendations, including addressing variations in antibiotic treatment duration and follow-up care.

Target Users

- Physicians (Primary Care Clinicians and/or Children's Mercy Kansas City Affiliated Partners, Emergency Department, Urgent Care, Ambulatory, Infectious Diseases, Ear, Nose, and Throat, Fellows, Residents)
- Nurse Practitioners
- Physician Assistants

Target Population

Inclusion Criteria

- Patient 1 - 18 years of age with signs and symptoms of sinusitis

Exclusion Criteria

- Complicated sinusitis at presentation
- Chronic sinusitis
- Viral sinusitis
- Immunocompromised

Practice Recommendations

The American Academy of Pediatrics (Wald et al., 2013) and the Infectious Diseases Society of America (Chow et al., 2012) Clinical Practice Guidelines provided guidance to the ABRS Clinical Pathway. See Appendices A and B for the AGREE II. Please refer to these guidelines for full practice recommendations, apart from treatment duration, which will be addressed under additional questions posed by the clinical pathway committee.

The two national guidelines, AAP and IDSA, provide guidance for the care and treatment of patients suspected of having ABRS (Wald et al., 2013; Chow et al., 2012). However, their recommendations for antibiotic durations are based on a limited number of studies with low certainty of the evidence. Since the AAP (2013) and IDSA (2012) guidelines were developed, additional guidelines and consensus papers have been published, covering countries outside the United States and/or referencing studies on the adult population (see Table 1). These guidelines and consensus papers introduce newer recommendations that suggest a trend toward reducing antibiotic duration, supported by literature showing little to no compromise in illness recovery (AAP, 2024; World Health Organization [WHO], 2022; Orlandi et al., 2021; Fokkens et al., 2020; NICE, 2017; Rosenfeld et al., 2015; Kaplan et al., 2014).

Additional Question Posed by the Clinical Pathway Committee

Should antimicrobial therapy for ABRS be administered for 5–7 days versus 10–14 days?

Recommendations from the ABRS Clinical Pathway Committee

Based on the current literature, the committee recommends treatment for 5-7 days when there is no concern for complicated disease (see Table 1). The committee recognizes the paucity of evidence in the pediatric population. Therefore, it is reasonable to consider 10 days of treatment for patients with severe symptoms (e.g., facial pain and fever over 39°C). If the patient does not begin to improve within 5 days of antibiotic therapy, then broadening coverage or lengthening duration is recommended. If the patient was initially treated with amoxicillin, then broaden to amoxicillin-clavulanate for an additional 5-7 days. If the

patient was initially treated with amoxicillin-clavulanate, then extend the duration of amoxicillin-clavulanate for a combined total of 10-14 days. In addition to adjusting the antibiotic treatment plan, providers should reconsider the possibility of complicated diseases or alternative diagnoses.

Table 1
Sinusitis in Children: Evidence for Antibiotic Duration for Acute Bacterial Rhinosinusitis

What is the efficacy of antimicrobial therapy administered for 5 -7 days versus 10 – 14 days for children with ABRS?		
Source	**Treatment Duration**	**Comments**
Committee on Infectious Diseases, AAP. (2024) RED BOOK	**5 - 7 days**	• Same bacteria triggering infections for acute otitis media (AOM) and ABRS (*S pneumoniae* or *Haemophilus influenzae)* **Based on guidelines for acute otitis media (Lieberthal et al., 2013)*
World Health Organization (2022) WHO AWaRe Antibiotic Book	**5 days**	Diagnostic criteria: • Fever ≥ 39.0 °C and purulent nasal discharge or facial pain for at least 3-4 consecutive days • Increased risk of complications • "Red flag" signs/symptoms suggestive of complication **Based on a review of three position papers*
Orlandi et al. (2021) International Consensus Statement on Allergy & Rhinology	**≤ 10 days**	• Shorter courses of antibiotics favor fewer adverse events and higher medication compliance **Based on meta-analyses of RCTs*
Fokkens et al. (2020) European Position Paper	**< 10 days**	• No significant difference between placebo and antibiotic treatment was found in limited pediatric literature • If antibiotics are prescribed, a short course of antibiotics of less than 10 days **Based on two studies of RCTs*
NICE (2017) Clinical Practice Guideline	**5 days**	Recommendations for adults and children: • Recommendation takes into account the overall efficacy and safety of antibiotics and minimizing the risk of resistance • Some studies included in the review had antibiotic courses greater than 5 days **Based on high-quality evidence from one systematic review (Falagas et al., 2009)*
Rosenfeld et al. (2015) American Academy of Otolaryngology-Head and Neck Surgery Clinical Practice Guideline	**Option for "watchful waiting"** **5 – 10 days**	Recommendations for adult patients • Fewer adverse events with shorter duration of therapy • In a systematic review, no consistent benefits with 10 days compared to shorter courses • A longer course of therapy may be appropriate for severe illness or when symptoms persist despite a shorter course **Based on systematic reviews of RCTs, the quality of evidence is moderate*

Kaplan et al. (2014) College of Family Physicians of Canada Clinical Practice Guideline	**10 days**	• Suggested that non-severe disease may not require antibiotics, but the study definition of non-severe disease may have encompassed those with viral illness • When antibiotics are prescribed, recommend a 10-day course • Improvement in symptoms despite their incomplete disappearance is not cause for immediate use of a second antibiotic **Based on two systematic reviews and a multi-center RCT. The strength of evidence is strong (based on potential benefit and harm), and the strength of recommendation is moderate (based on the panel of experts on the guideline)*
Wald et al. (2013) AAP Clinical Practice Guideline	**≥ 10 days** (or 7 days from improvement)	• Recognizes that data on pediatric patients is very limited **Based on one RCT and clinical observation*
Chow et al. (2012) IDSA Clinical Practice Guideline	**10-14 days for children** (5 -7 days for adults)	• Recognizes that data on pediatric patients is very limited ***Based on systematic reviews of RCTs and one meta-analysis. The strength of the evidence is low-moderate**

Target Users
- Physicians (Primary Care Clinicians and/or Children's Mercy Kansas City Affiliated Partners, Emergency Department, Urgent Care, Ambulatory, Infectious Diseases, Ear, Nose, and Throat, Fellows, Residents)
- Nurse Practitioners
- Physician Assistants

Target Population
Inclusion Criteria
- Patient 1 - 18 years of age with signs and symptoms of sinusitis

Exclusion Criteria
- Complicated sinusitis at presentation
- Chronic sinusitis
- Viral sinusitis
- Immunocompromised

Measures
- Increase in prescribing lower duration (5-7 days) of antibiotics
- Improved identification of ABRS vs. viral sinus infection as evidenced by a lower rate of inappropriate prescriptions

Value Implications

The following improvements may increase value by reducing healthcare costs and non-monetary costs (e.g., missed school/work, loss of wages, stress) for patients and families and reducing costs and resource utilization for healthcare facilities.
- Decreased risk of overdiagnosis
- Decreased risk of overtreatment (i.e., decreased use of antibiotic treatment when a patient has viral rhinosinusitis rather than bacterial rhinosinusitis)
- Decreased adverse events due to antibiotics with shorter treatment duration and/or narrower spectrum medication
- Increased recognition of complicated disease
- Decreased unwarranted variation in care

Organizational Barriers and Facilitators

Potential Barriers

- Variability of acceptable level of risk among providers
- Challenges with follow-up faced by some families

Potential Facilitators

- Collaborative engagement across care continuum settings during clinical pathway development
- High rate of use of the clinical pathway

Diversity/Equity/Inclusion

Our aim is to provide equitable care. Literature on healthcare equity was reviewed and factors potentially impacting equity were discussed by the committee. A systematic review of 61 studies demonstrated that individuals from racial or ethnic minority groups are less likely to be diagnosed with conditions requiring antibiotics, less likely to receive antibiotics overall, and less likely to receive broad-spectrum antibiotics (Kim et al., 2023), which, depending on the clinical circumstances, may be more consistent with evidence-based recommendations. However, findings on the association of race or ethnicity with antibiotic prescribing practices have varied. A large study reported that Black and Hispanic patients have higher rates of inappropriate prescribing and broad-spectrum antibiotics compared to White patients (Young et al., 2022). The drivers of these observed differences are still unclear.

Power Plans

- There are no power plans associated with this clinical pathway

Associated Policies

- There are no associated policies associated with this clinical pathway

Education Materials

- Nasal Sinus Rinse Demonstration (video)
  - Intended to provide a step-by-step demonstration for the patient and caregiver
  - Found via a hyperlink on the clinical pathway algorithm
- Sinusitis Infection: How to Care for Your Child
  - Intended to guide parents/caregivers on how to care for their child with an acute sinus infection. This includes care instructions, when to reach out to their healthcare provider, and when to go to the Emergency Room
  - Found via Depart Instructions in Cerner under Sinusitis, Acute
- Nasal Irrigation/Rinse Instructions
  - Intended to provide steps to perform a nasal rinse in printed instructions for the patient and caregiver
  - Found via Depart Instructions in Cerner under Allergy Clinic: Sinus Rinse

Clinical Pathway Preparation

This pathway was prepared by the Evidence Based Practice (EBP) Department in collaboration with the Acute Bacterial Rhinosinusitis Clinical Pathway Committee (ABRS), composed of content experts at Children's Mercy Kansas City. Literature analysis for additional questions posed by the ABRS Committee was performed by EBP Scholars and the EBP team. If a conflict of interest is identified, the conflict will be disclosed next to the committee member's name.

Acute Bacterial Rhinosinusitis Clinical Pathway Committee Members and Representation

- Rana El Feghaly, MD, MSCI | Infectious Diseases | Committee Chair
- Joshua Saucedo, MD | Pediatric Emergency Medicine Fellow | Committee Member
- Leslie Hueschen, MD | Pediatric Emergency Medicine | Committee Member
- Marsha Dannenberg, MD | Urgent Care | Committee Member
- Elie Khalifee, MD | Otolaryngology | Committee Member
- Alaina Burns, PharmD, BCPPS | Infectious Diseases | Committee Member

EBP Committee Members

- Kathleen Berg, MD, FAAP | Hospitalist, Evidence Based Practice
- Andrea Melanson, OTD, OTR/L | Evidence Based Practice

Clinical Pathway Development Funding

The following departments/divisions underwrote the development of this clinical pathway: Emergency Medicine, Urgent Care, Ear, Nose, and Throat, Infectious Diseases, and Evidence Based Practice.

Conflict of Interest

The contributors to the Acute Bacterial Rhinosinusitis Clinical Pathway have no conflicts of interest to disclose related to the subject matter or materials discussed.

Approval Process

- This pathway was reviewed and approved by the Acute Bacterial Rhinosinusitis Committee, Content Expert Departments/Divisions, and the EBP Department, after which they were approved by the Medical Executive Committee.
- Pathways are reviewed and updated as necessary every 3 years within the EBP Department at CMKC. Content expert teams are involved with every review and update.

Review Requested

Department/Unit	Date Obtained
Infectious Diseases	October 2024
Emergency Medicine	October 2024
Urgent Care	October 2024
Ear, Nose, and Throat	October 2024
Evidence Based Practice	October 2024

Version History

Date	Comments
October 2024	Version one – algorithm and synopsis were developed

Date for Next Review

- October 2027

Implementation & Follow-Up

- Once approved, the pathway was presented to appropriate care teams and implemented. Care measurements will be assessed and shared with appropriate care teams to determine if changes need to occur.
- Education was provided to all stakeholders:
  - Departments of Emergency Medicine, Urgent Care, Infectious Diseases, and Ear, Nose, and Throat
  - Fellows
  - Resident physicians
- Additional institution-wide announcements were made via email, the hospital website, and relevant huddles.

Disclaimer

When evidence is lacking or inconclusive, options in care are provided in the supporting documents and the power plan(s) that accompany the clinical pathway.

These clinical pathways do not establish a standard of care to be followed in every case. It is recognized that each case is different, and those individuals involved in providing health care are expected to use their judgment to determine what is in the best interests of the patient based on the circumstances existing at the time.

It is impossible to anticipate all possible situations that may exist and prepare clinical pathways for each. Accordingly, these clinical pathways should guide care with the understanding that departures from them may be required at times.

References

Chow, A. W., Benninger, M. S., Brook, I., Brozek, J. L., Goldstein, E. J. C., Hicks, L. A., Pankey, G. A., Seleznick, M., Volturo, G., Wald, E. R., & File, T. M. (2012). Executive Summary: IDSA Clinical Practice Guideline for Acute Bacterial Rhinosinusitis in Children and Adults. *Clinical Infectious Diseases*, *54*(8), 1041–1045. https://doi.org/10.1093/cid/cir1043

Committee on Infectious Diseases, AAP. (2024). *Red Book: 2024–2027 Report of the Committee on Infectious Diseases*. American Academy of Pediatrics. https://doi.org/10.1542/9781610027373

Dankbaar, J.W., van Bemmel, A.J., & Pameijer, F.A., (2015). Imaging findings of the orbital and intracranial complications of acute bacterial rhinosinusitis. *Insights into imaging, 6*(5), 509-518. https://doi.org/10.1007/s13244-015-0424-y

DeBoer, D.L., Kwon, E. (2023, August 7). *Acute Sinusitis* [*StatPearls*]. https://www.ncbi.nlm.nih.gov/books/NBK547701/

Desrosiers, M., Evans, G.A., Keith, P.K. *et al.* (2011). Canadian clinical practice guidelines for acute and chronic rhinosinusitis. *Allergy, Asthma & Clinical Immunology,* 7(2), 1 - 38. https://doi.org/10.1186/1710-1492-7-2

Fokkens, W. J., Lund, V. J., Hopkins, C., Hellings, P. W., Kern, R., Reitsma, S., Toppila-Salmi, S., Bernal-Sprekelsen, M., Mullol, J., Alobid, I., Terezinha Anselmo-Lima, W., Bachert, C., Baroody, F., von Buchwald, C., Cervin, A., Cohen, N., Constantinidis, J., De Gabory, L., Desrosiers, M., Diamant, Z., … Zwetsloot, C. P. (2020). European Position Paper on Rhinosinusitis and Nasal Polyps 2020. *Rhinology*, *58*(Suppl S29), 1–464. https://doi.org/10.4193/Rhin20.600

Kaplan, A. (2014). Canadian guidelines for acute bacterial rhinosinusitis: clinical summary. *Canadian family physician Medecin de famille canadien*, *60*(3), 227–234.

Kim, C., Kabbani, S., Dube, W. C., Neuhauser, M., Tsay, S., Hersh, A., Marcelin, J. R., & Hicks, L. A. (2023). Health Equity and Antibiotic Prescribing in the United States: A Systematic Scoping Review. *Open forum infectious diseases*, *10*(9), ofad440. https://doi.org/10.1093/ofid/ofad440

Lieberthal, A.S., Carroll, A.E., Chonmaitree, T., et al. (2013). Clinical practice guideline: Diagnosis and management of acute otitis media. *Pediatrics*, *131*(3), e964-e999.

Meltzer, E.O., Hamilos, D.L., Hadley, J.A., et al. (2004). Rhinosinusitis: Establishing definitions for clinical research and patient care. *J Allergy Clin Immunol*, *114*, 155–212.

National Institute for Health and Care Excellence. (October 2017). Sinusitis (acute): antimicrobial prescribing. NICE guideline NG79.

Orlandi, R. R., Kingdom, T. T., Smith, T. L., Bleier, B., DeConde, A., Luong, A. U., Poetker, D. M., Soler, Z., Welch, K. C., Wise, S. K., Adappa, N., Alt, J. A., Anselmo-Lima, W. T., Bachert, C., Baroody, F. M., Batra, P. S., Bernal-Sprekelsen, M., Beswick, D., Bhattacharyya, N., Chandra, R. K., … Zhou, B. (2021). International consensus statement on allergy and rhinology: rhinosinusitis 2021. *International forum of allergy & rhinology*, *11*(3), 213–739. https://doi.org/10.1002/alr.22741

Patel, Z. M., & Hwang, P. H. (2018). Acute Bacterial Rhinosinusitis. *Infections of the Ears, Nose, Throat, and Sinuses*, 133–143. https://doi.org/10.1007/978-3-319-74835-1_11

Rosenfeld, R. M., Piccirillo, J. F., Chandrasekhar, S. S., Brook, I., Ashok Kumar, K., Kramper, M., Orlandi, R. R., Palmer, J. N., Patel, Z. M., Peters, A., Walsh, S. A., & Corrigan, M. D. (2015). Clinical Practice Guideline (Update): Adult Sinusitis. *Otolaryngology–Head and Neck Surgery*, *152*(2_suppl), S1-S39. https://doi.org/10.1177/0194599815572097

Wald, E. R., Applegate, K. E., Bordley, C., Darrow, D. H., Glode, M. P., Marcy, S. M., Nelson, C. E., Rosenfeld, R. M., Shaikh, N., Smith, M. J., Williams, P. V., & Weinberg, S. T. (2013). Clinical Practice Guideline for the Diagnosis and Management of Acute Bacterial Sinusitis in Children Aged 1 to 18 Years. *PEDIATRICS*, *132*(1), e262–e280. https://doi.org/10.1542/peds.2013-1071

World Health Organization. (2022). *The WHO AWaRe (Access, Watch, Reserve) antibiotic book*. World Health Organization. https://www.who.int/publications/i/item/9789240062382

Young, E. H., Strey, K. A., Lee, G. C., Carlson, T. J., Koeller, J. M., Mendoza, V. M., & Reveles, K. R. (2022). National Disparities in Antibiotic Prescribing by Race, Ethnicity, Age Group, and Sex in United States Ambulatory Care Visits, 2009 to 2016. *Antibiotics (Basel, Switzerland)*, *12*(1), 51. https://doi.org/10.3390/antibiotics12010051

Appendix A

The American Academy of Pediatrics (AAP) national guideline for the Diagnosis and Management of Acute Bacterial Sinusitis in Children Aged One to Eighteen guided the ABRS Committee (Wald et al., 2013). See Table 2 for AGREE II.

Table 2
AGREE II[a] Summary for the Guideline, Wald et al. (2013)

Domain	Percent Agreement	Percent Justification^
Scope and purpose	100%	The guideline's aim, the clinical questions posed, and the target populations **were** identified.
Stakeholder involvement	72%	The guideline **was developed** by the appropriate stakeholders and represents the views of its intended users. However, patient or public views do not appear to have been included.
Rigor of development	96%	The process used to gather and synthesize the evidence, the methods to formulate the recommendations and to update the guidelines **were** explicitly stated.
Clarity and presentation	100%	The guideline recommendations **are** clear, unambiguous, and easily identified. Different management options are also presented.
Applicability	65%	The guideline addressed barriers and facilitators to implementation, strategies to improve utilization, and resource implications. Each key action statement contained these.
Editorial independence	92%	Competing interests did not bias the recommendations.
Overall guideline assessment	88%	
See Practice Recommendations		

Note: Three EBP Scholars and one EBP Program Manager completed the AGREE II on this guideline.
^Percentage justification is an interpretation based on the Children's Mercy EBP Department standards.

Appendix B

The Infectious Diseases Society of America (IDSA) national guideline provided guidance to the ABRS Committee (Chow et al., 2012). See Table 3 for AGREE II.

Table 3
AGREE II[a] Summary for the Guideline, Chow et al. (2012)

Domain	Percent Agreement	Percent Justification^
Scope and purpose	97%	The aim of the guideline, the clinical questions posed, and the target populations **were** identified.
Stakeholder involvement	76%	The guideline **was developed** by the appropriate stakeholders and represents the views of its intended users.
Rigor of development	95%	The process used to gather and synthesize the evidence, the methods to formulate the recommendations and to update the guidelines **were** explicitly stated.
Clarity and presentation	100%	The guideline recommendations **are** clear, unambiguous, and easily identified. In addition, different management options are presented.
Applicability	81%	Barriers and facilitators to implementation, strategies to improve utilization, and resource implications **were addressed** in the guideline.
Editorial independence	100%	The recommendations **were not** biased with competing interests.
Overall guideline assessment	92%	
See Practice Recommendations		

Note: Two EBP Scholars and one EBP Program Manager completed the AGREE II on this guideline.
^Percentage justification is an interpretation based on the Children's Mercy EBP Department standards.