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CONTAGIOUS COMMENTS
Department of Epidemiology

Outpatient Antimicrobial Stewardship

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Introduction

Ambulatory settings (outpatient clinics, urgent care centers, and emergency departments) account for nearly 80% of antimicrobials prescriptions written.[1] In the US, an estimated 1 in 3 of outpatient antibiotics are prescribed unnecessarily, resulting in over 15 million inappropriate courses of antibiotics to children annually.[1,2] There has been a modest downward trend in prescribing over the last two decades, yet patients with viral pathology still commonly receive antibiotics despite a lack of clear benefit.[1,3-9] Even when antibiotics *are* indicated, the regimens are often too broad or dosed incorrectly.[9,10] The goal of this publication is to discuss the risks of antibiotics, challenges faced by prescribing physicians in the ambulatory setting, and the tools and strategies available to clinicians for effective communication and judicious prescribing.

An estimated 50-75% of all outpatient pediatric antibiotic prescriptions are for acute respiratory tract infections (ARTI), including AOM, sinusitis, pharyngitis, bronchitis, & URI.[6]

Risks of Antibiotics

Thoughtful prescribing is an essential clinician responsibility, and its absence is concerning from both a patient safety and a public health perspective. Antimicrobial agents increase medical costs and cause harmful side effects and allergic reactions, ranging from diarrhea and rash to anaphylaxis or Stephens-Johnson Syndrome. Antibiotics are the top reason pediatric patients present to the emergency department for adverse drug events.[11] Emerging data demonstrates that antimicrobial use in children alters the microbiome, which may increase risk of chronic diseases including obesity, inflammatory bowel disease, and juvenile idiopathic arthritis.[12-14]

The literature has long demonstrated the direct effect of antibiotics on the development of resistant organisms. Pediatricians are increasingly diagnosing antibiotic resistant infections in outpatient clinics**. Children are at highest risk of acquiring an antibiotic-resistant infection within 2 months of receiving common antibiotics (e.g. amoxicillin) for acute respiratory tract infection or UTI.[10]** Children that receive multiple courses and longer durations of common antibiotics are at highest risk for developing antibiotic resistant infections.[10,15] If antibiotics are necessary, it is important to choose the most narrow option (e.g. amoxicillin) for the shortest duration possible. Microbial resistance results in limited treatment options and subsequently increased morbidity and mortality in otherwise healthy children.[15]

Overcoming Challenges in Ambulatory Prescribing

Principles

Clinicians should consider the principles of judicious prescribing in each clinic visit.[3]

Determine the likelihood of a bacterial infection	Weigh the benefits and harms of antibiotics	Implement judicious prescribing strategies
• Integrate literature and current guidelines regarding etiology of common infections • Perform thoughtful physical exam looking for particular features	• Benefits: cure rate, reduce symptoms, prevent complications • Harms: diarrhea, rash, anaphylaxis, *C. difficile*, cost, resistance, adverse drug events, risk for chronic diseases	• Reference local epidemiology and resistance patterns • Consider "wait and see" approach if appropriate • Use thoughtful course duration and narrowest spectrum appropriate for each pathology

Hersh AL, Jackson MA, Hicks LA. Principles of judicious antibiotic prescribing for upper respiratory tract infections in pediatrics. *Pediatrics*. 2013 Dec;132(6):1146-54.

Challenges

In outpatient pediatrics, antibiotic prescribing decisions are often complex and wrought with challenges. Clinicians identify parental pressure and expectations for antibiotics, diagnostic uncertainty, and time constraints as barriers to judicious prescribing.[7,16,17] Although parents expect antibiotics in about half of sick visits, providers incorrectly identify parental expectations 50% of the time.[16] It is vital to address these expectations and to communicate effectively to produce safe and satisfying outcomes for both parent and provider. In previous studies, receiving an antibiotic prescription was shown to have no effect on parental satisfaction.[18,19] **Instead, clear communication during the visit and the provision of a contingency plan were associated with significantly higher satisfaction scores.**

A variety of national and institutional guidelines exist for prescribing antimicrobials for common pathologies. Education and access to guidelines during a visit can assist with diagnostic uncertainty and choosing an appropriate agent and duration. Combining precise communication strategies and regular implementation of guidelines can improve conversations with parents regarding treatment plans and optimize visit efficiency.

Tools

Communication Tools Shown to Improve Prescribing[12]

Establish expectations

- Ask what is most important to the parent, what symptom is the most bothersome, and what remedies they have already tried. Address this specifically.
- Explain what to expect from the illness (e.g. days of fever and cough expected in a typical illness) and highlight importance of helping symptoms, not duration of illness.
- i.e. "It is important to use ibuprofen every 6 hours as needed to treat his ear pain."

Use "online commentary"

- Name findings aloud to parents as the exam is performed to create mutual understanding. **Using 'no problem' verbiage to support your treatment decision is reassuring and decreases parental questioning of the plan.**
- i.e. "There is no bulging or pus behind the eardrum, which tells me there is no bacteria there."

Name a specific diagnosis

- Use specific and understandable terms.
- **Avoid stating that it is 'just a virus.'**
- i.e. "This is a really bad stomach bug/cold."

Frame the discussion

- Start with the negative recommendation and promptly follow it with a positive recommendation. This clearly states the plan and limits parental resistance until the full plan is presented.
- i.e. "**On one hand**, antibiotics will not help him to get better faster, **on the other hand**, we can give ibuprofen to help with pain and decrease fever."

Create a contingency plan/ return precautions

- Empower parents to have a role in care
- **State specific symptoms of when to worry**
- Given an option to return if symptoms worsen
- i.e. "It is important that you know to come back if his breathing gets more labored, where you can see his ribs."

Guidelines to Bookmark

- CDC: Be Antibiotics Aware https://www.cdc.lgov/antibiotic-use/
- AAP guidelines https://pediatrics.aappublications.org/content/131/3/e964 https://pediatrics.aappublications.org/content/132/1/e262
- ABIM: Choosing Wisely https://www.choosingwisely.org/getting-started/lists/

Communication Training

- DART communication modules https://www.uwimtr.org/dart/

Systems Level Interventions shown to improve prescribing practices.[18-20]

- Audit and feedback
- Peer Comparison
- Commitment posters in exam rooms
- Communication training
- Clinical Decision Support
- Electronic Medical Record Prompts
  - Accountable Justification/ Required indications
  - Suggested alternatives

Review the Literature on Communication and Outpatient Antibiotic Prescribing

Poole NM. Judicious antibiotic prescribing in ambulatory pediatrics: Communication is key. Curr Probl Pediatr Adolesc Health Care. 2018 Nov; 48(11):306-317.

https://doi.org/10.1016/j.cppeds.2018.09.004

Antimicrobial Stewardship

Multidisciplinary efforts often under the title of 'antimicrobial stewardship programs' (ASPs) are among the most effective methods to improve judicious prescribing.[20] These programs often employ interventions in a variety of formats and avenues to address population specific education.[18-20] ASPs have expanded across many inpatient centers and demonstrated reduced resistance, improved outcomes, decreased antimicrobial use, decreased prescription errors, and cost savings.[21,22]

Here at Children's Hospital Colorado, our unique 'handshake' stewardship program has been in place under the direction of Dr. Sarah Parker since 2013. After five years of implementation, it boasts a 25% decrease in mean antimicrobial use hospital-wide without detriment to mortality or length of stay.[23] Though there is great need and several identified targets, only in recent years have ASPs begun to target the ambulatory setting. Studies suggest that sustained outpatient ASPs could be an effective way to maintain impactful change in regard to antimicrobial prescribing.[20,24,25] With the goal of expanding stewardship into the ambulatory setting in mind, we are excited to introduce Dr. Nicole Poole to our CHCO pediatric infectious disease team as Associate Medical Director of our ASP. Be on the lookout for new resources and strategies for thoughtful prescribing, and please reach out to her with any questions at Nicole.Poole@ChildrensColorado.org

CDC Core Elements of Outpatient Antibiotic Stewardship[26]

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