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# Adherence to Evidence Based Guidelines for Acute Otitis Media: A Comparison of Nurse Practitioners and Physicians

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ADHERENCE TO EVIDENCE BASED GUIDELINES FOR ACUTE OTITIS MEDIA: A  
COMPARISON OF NURSE PRACTITIONERS AND PHYSICIANS

by

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A RESEARCH PROJECT

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### Abstract

This research study was conducted to compare the treatment patterns of Nurse Practitioners (NPs) and Physicians when treating children, aged 6 months to 12 years, diagnosed with Acute Otitis Media (AOM) based on the Centers for Disease Control and Prevention (CDC) and American Academy of Pediatrics (AAP) guidelines. An anonymous, non-experimental, cross-sectional, 9-item, web-based survey that differentiated information by provider was collected. A total of 39 surveys from NPs and Physicians was received. Findings conclude that providers are not consistently following the CDC and AAP recommendations. Survey analysis show that 35% percent of NPs incorrectly prescribe antibiotics compared to 18.2% of Physicians. Research shows no significance between provider type when prescribing “Watchful Waiting” as a treatment for AOM.

*Keywords:* acute otitis media, nurse practitioner, physician, antibiotics, watchful waiting, evidence-based guidelines

## Adherence to Evidence Based Guidelines for Acute Otitis Media: A Comparison of Nurse Practitioners and Physicians

Antibiotic resistance is one of the fastest growing medical concerns around the globe. With the misuse of antibiotics, bacterial resistance has resulted in infections that no longer respond to antibiotic therapy. Statistics show, in children, a diagnosis of Acute Otitis Media (AOM) is the most common infection for which antibiotics are prescribed (Boatright, 2015). In an effort to reduce the spread of antibiotic-resistant bacteria (ARB), the Centers for Disease Control and Prevention (CDC) and the American Academy of Pediatrics (AAP) have provided treatment guidelines (Appendices A and B) for AOM that focus on evidence based clinical practice and recognizes not all cases of AOM require antibiotics.

According to the CDC (2017), unnecessary antibiotic prescriptions and misuse of antibiotics are key factors in ARB. Children are of great concern because statistics have shown that they are prescribed more antibiotics than any other age group (Boatright, 2015). Research by McCormick et al. (2005), found that up to 60% of antibiotics written for children are related to AOM. In addition, Abbo, Smith, Pereyra, Wyckoff, and Hooton (2012) estimate that, as much as, 30-50% of antibiotics are prescribed inappropriately. This is significant, as each unnecessary antibiotic prescribed has the potential to encourage growth in a strain of ARB. When this occurs, simple, uncomplicated infections have the potential to cause harm, suffering, and even death.

It is common for children to develop AOM after having a viral respiratory infection, such as the common cold (Klein & Pelton, 2016). When antibiotics are prescribed unnecessarily, the risk of adverse reactions and ABR is greatly increased. In a landmark study from the Netherlands, Damoiseaux, van Balen, Hoes, Verheij, and Melker (2000), studied children age 6 months to 2 years in a randomized, double-blind clinical trial using amoxicillin versus placebo

for the treatment of AOM. Outcome measures were based on persistence of symptoms, fever, and pain or crying. Their findings show that an antibiotic prescription given at the first visit is not justified if close observation could be guaranteed, which helped to shape the AAP recommendations for treatment guidelines when diagnosing AOM.

When the AAP first published their original AOM treatment guidelines in 2004, research on the topic of watchful waiting was just becoming available, and many practitioners were inexperienced with using diagnostic tools such as the pneumatic otoscope. When the guidelines were updated in 2013, they were given as a frame-work for primary care providers (PCP) to diagnose AOM and included more detailed diagnostic criteria, as well as addressing “therapeutic options, analgesia, prevention, appropriate antibiotic selections...and recurrent AOM” (Lieberthal et al., 2013, p. e964). Guidelines, such as these, provide a framework for providers and help to establish a standard of care in treating children with AOM. When followed, these guidelines are helpful in reducing the number of unnecessary antibiotics prescribed for AOM.

The benefits of the CDC and AAP recommended guidelines promoting watchful waiting in children with uncomplicated AOM include reducing microbial resistance, decreasing healthcare costs, and improving healthcare outcomes (Lieberthal et al., 2013). One goal of watchful waiting is to decrease the number of unnecessary antibiotics prescribed. Watchful waiting involves observing select children with uncomplicated AOM for 48 to 72 hours to allow for spontaneous recovery without antibiotics. This option is available for children between the ages of 6 months to 2 years who are otherwise generally healthy, have an uncertain diagnosis of AOM, and non-severe symptom presentation (Lieberthal et al., 2013). The symptoms associated with AOM are often similar to those associated with viral upper respiratory infections.

Watchful waiting can be seen by parents as a lack of treatment. Up to 40% of parents surveyed in a study by Finkelstein, Stille, and Rifas-Shiman (2005), stated they would be extremely dissatisfied if a provider suggested watchful waiting for their child with AOM. Finkelstein et al. (2005) deduced that the parent's lack of education regarding ABR, or failure to "buy-in" to the evidence on watchful waiting, is seen in several studies as a barrier against recommended AOM treatment. Evidence provided by Céлинд, Södermark, and Hjalmarson (2014) shows that adherence to treatment recommendations for AOM, particularly watchful waiting, is poor. Additional educational tools are needed to help educate parents and providers on the benefits of watchful waiting when combined with pain management.

Considering the adherence to guidelines with Nurse Practitioners (NPs) treating children with AOM, a primary study by Weddle, Goldman, Myers, and Newland (2017) found that NPs inappropriately prescribe antibiotics for AOM as much as 23% of the time. Overall, research comparing the prescribing patterns of NPs with Physicians states that NPs prescribe antibiotics more frequently than Physicians (17% vs 12%,  $P < .0001$ ) (Sanchez, Hersh, Shapiro, Cawley, and Hicks, 2016). The study by Boatright (2015) found no relationship between provider type and antibiotic prescribing when treating children with AOM. However, it was noted that none of the NPs surveyed had prescribed watchful waiting. Further investigation is warranted to determine the rationale for the NPs failure to prescribe watchful waiting.

The evidence has shown that one in four NPs inappropriately prescribe antibiotics for AOM. Fong, Buckley, and Cashin (2015) imply that current research is skewed because many NPs with restricted prescriptive authority are issuing prescriptions under a supervising Physician. NPs have been prescribing medication since the 1960s, yet, Fong et al. (2015) were surprised at the limited research available on NP prescribing patterns. At the time of their research, only 21

states in the United States allowed NPs full prescriptive authority. Theoretically, one could question if the data supporting greater adherence to treatment guidelines by Physicians is influenced by the hidden treatment patterns of NPs falling into this category.

This information only validates the limitations of research available on NP treatment and prescribing patterns. Barriers to access of information on NPs are, in part, due to state mandated supervisory and/or collaborative agreement requirements between NPs and Physicians. Investigative research by Rudner and Kung (2017) notes that in restricted practice states, NPs are limited to practice with a “physician willing to be the supervising physician” (Discussion, para.4). Often this includes prescribing, billing, and documentation that is given under the name of the supervising Physician resulting in hidden data on NP practice.

Evidence provided by Boatright (2015) suggests that additional education and antibiotic stewardship intervention is necessary to improve the overall misuse and inappropriate prescribing of antibiotics. Boatright (2015) also suggests that while antibiotic stewardship programs (ASP) are available, they focus on disseminating the information to Physicians, leaving NPs with knowledge gaps. In a study on NPs’ knowledge of ASP, Abbo et al. (2012) reveal that 66% of the NPs surveyed in their study “were not familiar with ASPs and only 17% perceived it as useful” (Perceptions, para.1). Data from the review of literature supports that both NPs and Physicians fail to adhere to the guidelines laid out by the CDC and AAP when treating AOM.

The purpose of this research is an attempt to provide a comparison of the treatment patterns of NPs and Physicians and their adherence to the CDC and AAP guidelines for treating AOM in pediatric patients, age 6 months to 12 years.

### **Method**

In an effort to truly compare NPs and Physicians adherence to the CDC and AAP treatment guidelines for AOM, this research study gathered data from providers within the state of Georgia. The research tool consisted of an anonymous, 9-item, web-based survey that differentiates information by provider type to eliminate hidden data caused by state mandated Physician supervision of NPs. This non-experimental, cross-sectional survey focused on diagnosis and treatment patterns for AOM based on CDC and AAP guidelines.

Using the CDC and AAP recommendations for diagnosis and treatment of AOM, the survey tool (Appendix C) was developed specifically for this research project. To help ensure the content validity of the research tool, an expert panel was consulted to provide content validity by external review of experts. The panel was chosen based on years of experience, professional education, and area of expertise. The panel consisted of a master's prepared Pediatric NP, a doctorate prepared Pediatric NP, a master's prepared Family NP, a doctorate prepared Family NP, and a Medical Doctor with a fellowship in pediatrics.

The survey tool features several variables from the CDC and AAP treatment guidelines for AOM and one demographic identifier. The demographic information collected was to identify provider type (NP or Physician). One variable question focused on the perceptions of the providers and belief that unnecessary antibiotic prescriptions contribute to antibiotic resistant bacteria. One question confirmed the survey participant provided treatment for patients within our specified age range of 6 months to 12 years. The remaining six questions used measures to determine the degree of knowledge and compliance with the CDC and AAP treatment guidelines for AOM.



After receiving approval for the study by the institutional review board (IRB) (Appendix D), an electronic invitation link was distributed via e-mail to registered members of United Advanced Practice Registered Nurses (UAPRN) of Georgia, via direct e-mail to NPs and Physicians employed through Northeast Georgia Physicians Group (NGPG), and an attempt was made to distribute via survey link to Physician members of the Medical Association of Georgia (MAG). Even though permission was obtained from MAG during the IRB review process, they declined to submit the survey to their registered members during the survey collection period. In an email response, they cited conflict of interest between Physician members and NPs due to current legislation negotiation for SB 351 (Unterman, et al., 2018), which would expand NP practice authority in the state of Georgia.

The survey was internet based, using SurveyMonkey.com, and the link was open January 19 – February 16, 2018. No incentives for participation were offered. Data analyses were performed utilizing SPSS Statistics 25 (IBM Corp, 2017). Descriptive statistics was used to differentiate survey responses. Due to the small sample size, Fisher's Exact testing statistics was used to identify differences between NPs and Physicians. Statistical significance was considered for  $p < .05$ .

### **Results**

There were 56 surveys collected at the end of the four-week period. Of those, 44 were submitted by NPs and 12 from Physicians. Sixteen surveys were excluded as the providers did not see patients within our target age group of 6 months to 12 years. One survey was incomplete and excluded for missing data. The final adjusted sample size was 39 participants ( $N=39$ ), NPs ( $n=28$ ) and Physicians ( $n=11$ ).

Of the NPs surveyed, 32.1% followed the CDC and AAP guidelines by using a pneumatic otoscope to diagnose AOM. Physicians surveyed stated they used pneumatic otoscopy 18.2% of the time when diagnosing AOM. Running a crosstabulation between groups, the Fisher exact test statistic value is not significant ( $p = .461$ ). When asked if pressure from parents influenced the provider to prescribe an antibiotic when an antibiotic was not recommended, 14.3% of NPs and 18.2% of Physicians stated pressure from parents frequently influenced their decisions to prescribe an antibiotic.

Providers were asked to identify how often they recommended “watchful waiting” for children who met the CDC and AAP criteria. Nearly 70% of Physicians surveyed reported they occasionally use watchful waiting when treating AOM. NPs used watchful waiting occasionally to frequently approximately 67% of the time (Table 1). While the statistical results of this variable did not meet our significance standards, the data proves promising for future studies as the likelihood ratio and Fisher’s exact test results are approaching significance (Table 2).

Both groups had similar results when asked their frequency in prescribing antibiotics without evidence of middle ear effusion, but based on symptoms of ear pain or pulling, fussiness, and/or low-grade temperature. Approximately one-third of all providers stated they rarely prescribed antibiotics based on symptoms alone. As previously mentioned, Klein & Pelton (2016) noted that it is common for children to develop AOM after having a viral respiratory infection, supporting that an antibiotic would be unnecessary. All the providers surveyed (N=39) agreed that prescribing antibiotics unnecessarily contributes to antibiotic resistant bacteria.

The CDC and AAP have clear recommendations on which antibiotic class and strength to prescribe for AOM (Appendices A and B). Based on survey results collected, NPs prescribe an incorrect class and dosage strength more often than the Physicians surveyed (Figure 1). This

information is consistent with the primary study by Weddle, Goldman, Myers, and Newland (2017).

### **Limitations**

Small sample size made comparisons between groups difficult. Limited resources restricted the survey to the North Georgia region; therefore, study findings are not generalized to the population at large. It is noteworthy to mention that in Georgia where this survey was conducted, NPs do not have full practice authority and must practice under a collaborative agreement with a supervising Physician. Timing for our survey coincided with legislation to increase practice authority for NPs which currently faces resistance from members of the Physician community. This had a significant effect on our research project as evidenced by MAG's defaulting on an agreement to distribute the survey.

### **Conclusion and Future Research**

In conclusion, this research project confirms data from the previous review of literature which found that both NPs and Physician groups failed to consistently adhere to CDC and AAP guidelines for treatment and diagnosis of AOM. When asked if pneumatic otoscopy was used to determine the mobility of the tympanic membrane (TM), most of the providers surveyed (67.9 % of NPs and 81.8 % of Physicians) stated they did not use pneumatic otoscopy to diagnose AOM. The authors of this study agree with findings by Weddle, Goldman, Myers, and Newland (2017), which found that further education is needed for NPs regarding appropriate antibiotic choices to treat AOM based on guidelines. As Boatright (2015) found that most ASPs focus on disseminating the information to Physicians, leaving NPs with knowledge gaps, we conclude that additional measures must be implemented to get this information to the NP population.

Pressure from parents to prescribe an antibiotic influenced both NP and Physician providers. Therefore, a greater effort to educate parents on the dangers of prescribing unnecessary antibiotics is necessary. No parent wants to see their child in pain or suffering. This fear could explain the parent's rationale for pressing the prescriber for an antibiotic. Careful explanation regarding similarities of symptoms between AOM and viral infections, treatment guidelines involving watchful waiting and assurance of pain management may help to alleviate parent's concerns and garner cooperation with treatment plans.

Retrospective review of the survey tool used for this research project concluded that a question to determine if the NP prescribed and /or diagnosed based on the protocol agreement in place with the collaborating Physician would have been of significance when determining patterns between NPs and Physicians. The years of practice experience would be a useful variable when considering differences in treatment patterns as well.

Previous research has shown that providers who work in a facility with an ASP or have chart audits for accountability of treatment by guidelines, are more consistent in following the CDC and AAP guidelines for treatment of AOM (Boatright, 2015). Considering the cost of unnecessary antibiotics and the increase in morbidity and mortality due to ARB, should we consider implementing a mandated ASP in private practice? Future studies and research could focus on pre and post implementation of an outpatient ASP to determine if such programs help to standardize treatment patterns amongst providers.

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Table 1

In an otherwise healthy child over 6 months of age, how often have you recommend pain relief with observation or “watchful waiting” for 48 hours in non-severe, unilateral, AOM?

| What is your medical specialty? |       |                 | Frequency | Percent | Cumulative Percent |
|---------------------------------|-------|-----------------|-----------|---------|--------------------|
| Nurse<br>Practitioner           | Valid | Never           | 3         | 10.7    | 10.7               |
|                                 |       | Rarely          | 4         | 14.3    | 25.0               |
|                                 |       | Occasionally    | 10        | 35.7    | 60.7               |
|                                 |       | Frequently      | 9         | 32.1    | 92.9               |
|                                 |       | Very Frequently | 2         | 7.1     | 100.0              |
|                                 |       | Total           | 28        | 100.0   |                    |
| Physician                       | Valid | Rarely          | 2         | 18.2    | 18.2               |
|                                 |       | Occasionally    | 8         | 72.7    | 90.9               |
|                                 |       | Very Frequently | 1         | 9.1     | 100.0              |
|                                 |       | Total           | 11        | 100.0   |                    |



Table 2

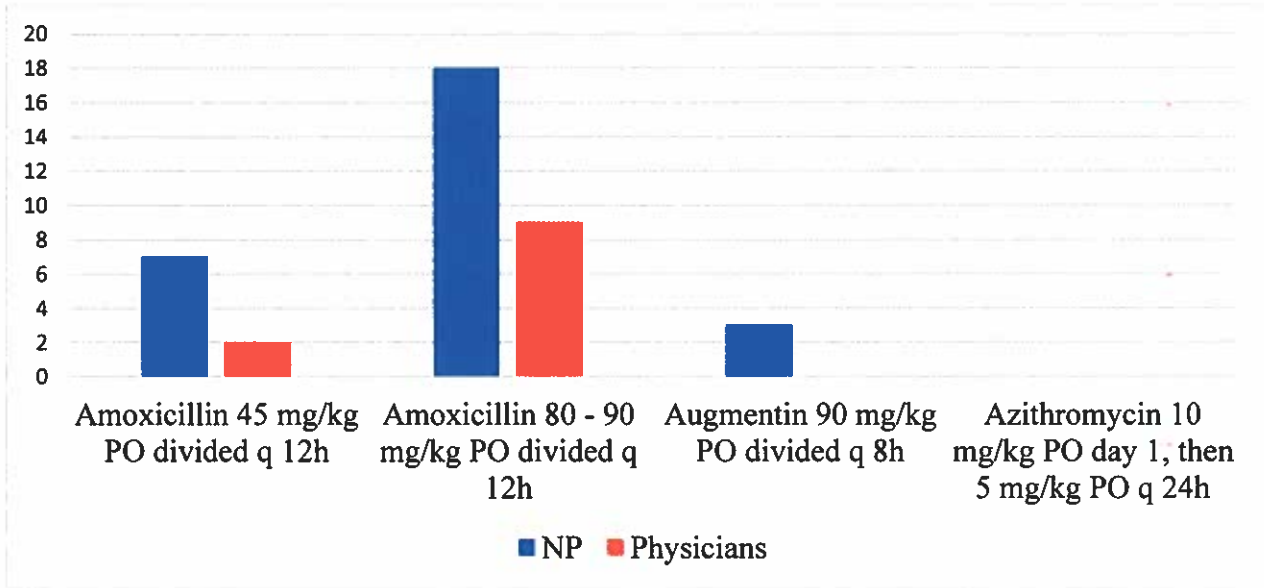
In an Otherwise Healthy Child over 6 Months of Age, How Often Is “Watchful Waiting” with pain relief recommend for non-severe, unilateral, AOM?

|                     | Value  | df | Asymptotic Significance |                      |
|---------------------|--------|----|-------------------------|----------------------|
|                     |        |    | (2-sided)               | Exact Sig. (2-sided) |
| Likelihood Ratio    | 10.213 | 4  | .037                    | .059                 |
| Fisher's Exact Test | 7.117  |    |                         | .096 <sup>a</sup>    |
| N of Valid Cases    | 39     |    |                         |                      |

a. The Fisher's Exact test is not significant at  $p = .096$

Figure 1

First-line Antibiotic for Treating Uncomplicated AOM in an Otherwise Healthy Child



## Appendix A

### AAP Updated Guidelines for the Diagnosis and Management of Acute Otitis Media (excerpted)

(Khane, 2014)

#### Diagnosis of Acute Otitis Media

- Key Action Statement 1A: Clinicians should diagnose AOM in children who present with moderate to severe bulging of the tympanic membrane (TM) or new onset of otorrhea not due to acute otitis externa. (Evidence Quality: Grade B, Strength: Recommendation)
- Key Action Statement 1B: Clinicians should diagnose AOM in children who present with mild bulging of the TM and recent (< 48 hours) onset of ear pain (holding, tugging, rubbing of the ear in a nonverbal child) or intense erythema of the TM. (Evidence Quality: Grade C, Strength: Recommendation)
- Key Action Statement 1C: Clinicians should not diagnose AOM in children who do not have middle ear effusion (based on pneumatic otoscopy and/or tympanometry). Evidence Quality: Grade B, Strength: Recommendation)

#### Pain Management for Acute Otitis Media

- Key Action Statement 2: The management of AOM should include an assessment of pain. If pain is present, the clinician should recommend treatment to reduce pain. (Evidence Quality: Grade B, Strength: Strong Recommendation)

#### Antibiotic Treatment or Observation for Management of Acute Otitis Media

- Key Action Statement 3A: Severe AOM – The clinician should prescribe antibiotic therapy for AOM (bilateral or unilateral) in children aged > 6 months with severe signs or symptoms (i.e., moderate or severe otalgia or otalgia for at least 48 hours, or temperature 39°C [102.2°F] or higher). (Evidence Quality: Grade B, Strength: Strong Recommendation)
- Key Action Statement 3B: Nonsevere bilateral AOM in young children – The clinician should prescribe antibiotic therapy for bilateral AOM in children aged < 24 months without severe signs or symptoms (i.e., mild otalgia for < 48 hours, temperature < 39°C [102.2°F]). (Evidence Quality: Grade B, Strength: Recommendation)
- Key Action Statement 3C: Nonsevere unilateral AOM in young children – The clinician should either prescribe antibiotic therapy or offer observation with close follow-up based on joint decision making with the parent(s)/caregiver for unilateral AOM in children aged 6 months to 23 months without severe signs or symptoms (i.e., mild otalgia for < 48 hours, temperature < 39°C [102.2°F]). When observation is used, a mechanism must be in place to ensure follow-up and begin antibiotic therapy if the child worsens or fails to improve within 48 to 72 hours of onset of symptoms. (Evidence Quality: Grade B, Strength: Recommendation)
- Key Action Statement 3D: Nonsevere AOM in older children – The clinician should either prescribe antibiotic therapy or offer observation with close follow-up based on joint decision-making with the parent(s)/caregiver for AOM (bilateral or unilateral) in children aged ≥ 24 months without severe signs or symptoms (i.e., mild otalgia for < 48

hours, temperature < 39°C [102.2°F]). When observation is used, a mechanism must be in place to ensure follow-up and begin antibiotic therapy if the child worsens or fails to improve within 48 to 72 hours of onset of symptoms. (Evidence Quality: Grade B, Strength: Recommendation)

#### Choice of Antibiotics for Acute Otitis Media

- Key Action Statement 4A: Clinicians should prescribe amoxicillin for AOM when a decision to treat with antibiotics has been made and the child has not received amoxicillin in the past 30 days or the child does not have concurrent purulent conjunctivitis, or the child is not allergic to penicillin. (Evidence Quality: Grade B. Strength: Recommendation)

- Key Action Statement 4B: Clinicians should prescribe an antibiotic with additional beta-lactamase coverage for AOM when a decision to treat with antibiotics has been made, and the child has received amoxicillin in the last 30 days or has concurrent purulent conjunctivitis or has a history of recurrent AOM unresponsive to amoxicillin. (Evidence Quality: Grade C. Strength: Recommendation)

- Key Action Statement 4C: Clinicians should reassess the patient if the caregiver reports that the child's symptoms have worsened or failed to respond to the initial antibiotic treatment within 48 to 72 hours and determine whether a change in therapy is needed. (Evidence Quality: Grade B. Strength: Recommendation)

Appendix B

Get Smart About Antibiotics; CDC Pediatric Treatment Guidelines (CDC, 2017)

| Condition                       | Epidemiology   | Diagnosis   | Management   |
|---------------------------------|--|---|--|
| <p>Acute Otitis Media (AOM)</p> | <ul style="list-style-type: none"> <li>• AOM is the most common childhood infection for which antibiotics are prescribed.</li> <li>• 4-10% of children with AOM treated with antibiotics experience adverse effects</li> </ul> | <p>Definitive diagnosis requires either</p> <ul style="list-style-type: none"> <li>• Moderate or severe bulging of tympanic membrane (TM) or new onset otorrhea not due to otitis externa.</li> <li>• Mild bulging of the TM AND recent (&lt; 48h) onset of otalgia (holding, tugging, rubbing of the ear in a nonverbal child) or intense erythema of the TM.</li> </ul> <p>AOM should not be diagnosed in children without middle ear effusion (based on pneumatic otoscopy and/or tympanometry).</p> | <ul style="list-style-type: none"> <li>• Mild cases with unilateral symptoms in children 6-23 months of age or unilateral or bilateral symptoms in children &gt;2 years may be appropriate for watchful waiting based on shared decision-making.</li> <li>• Amoxicillin remains first line therapy for children who have not received amoxicillin within the past 30 days.</li> <li>• Amoxicillin/clavulanate is recommended if amoxicillin has been taken within the past 30 days, if concurrent purulent conjunctivitis is present, or if the child has a history of recurrent AOM unresponsive to amoxicillin.</li> <li>• For children with a non-type I</li> </ul> |

|  |  |  |   |
|--|--|--|---|
|  |  |  | <p>hypersensitivity to penicillin: cefdinir, cefuroxime, cefpodoxime, or ceftriaxone may be appropriate choices.</p> <ul style="list-style-type: none"><li>• Prophylactic antibiotics are not recommended to reduce the frequency of recurrent AOM.</li><li>• For further recommendations on alternative antibiotic regimens, consult the American Academy of Pediatrics guidelines</li></ul> |
|--|--|--|---|

## Appendix C

### Consent and Survey

You have been invited to participate in a research survey. While there is no direct benefit to you, your willingness to share your valuable knowledge and expertise, can help to uncover knowledge gaps, educational opportunities, and shape future practice recommendations.

The purpose of this research survey is to compare the treatment patterns of Nurse Practitioners and Physicians and their adherence to the Centers for Disease Control and American Academy of Pediatrics guidelines for treating Acute Otitis Media in pediatric patients, age 6 months to 12 years. This research is being conducted by Ashley Dunson, RN, BSN, FNP-S; Jena Jaragoski, RN, BSN, FNP-S; and Tonya Moretz, RN, BSN, CNOR, FNP-S, as part of a Graduate Nursing Capstone project, under the supervision of Deb Dumphy DNP, APRN, FNP-BC, NP-C, Associate Professor of Nursing, at the University of North Georgia.

Your participation in this research study is voluntary. You may choose not to participate. If you decide to participate in this research survey, you may withdraw at any time. The procedure involves completing an online survey regarding diagnoses and treatment patterns for acute otitis media that will take approximately 3 minutes. To minimize the risks to confidentiality, we will not collect identifying information such as your name, email address or IP address. Any data collected will be subject to survey monkey privacy policy (<https://www.surveymonkey.com/mp/policy/privacy-policy/>) and stored on a password protected computer to be used for research purposes only. There are no known risks associated with participation in this study.



If you have any questions about the research study, or wish to receive post-survey follow up, please contact Tonya Moretz (tmmore4646@ung.edu). This research project has been reviewed according to University of North Georgia IRB procedures for research involving human subjects. By continuing with this survey, you agree that you have read the above information, you voluntarily agree to participate, and that you are over the age of 18.

1. What is your medical specialty?
  - a) Family Nurse Practitioner
  - b) Pediatric Nurse Practitioner
  - c) Acute Care Nurse Practitioner
  - d) Medical Doctor
  - e) Doctor of Osteopathy
  - f) Other
2. Do you see patients between the ages of 6 months to 12 years of age?
  - a) Yes
  - b) No
3. How many cases of acute otitis media do you see in your practice each week?
  - a) 0-5 cases
  - b) 6-10 cases
  - c) 11-15 cases
  - d) > 15 cases
4. Do you use a pneumatic otoscope to diagnose AOM?
  - a) Yes
  - b) No

5. In an otherwise healthy child over 6 months of age, how often have you recommended pain relief with observation or “watchful waiting” for 48 hours in non-severe, unilateral, AOM?
- a) Never
  - b) Rarely
  - c) Occasionally
  - d) Frequently
  - e) Very frequently
6. How often does pressure from parents to prescribe antibiotics influence your decision to prescribe even when an antibiotic is not recommended?
- a) Never
  - b) Rarely
  - c) Occasionally
  - d) Frequently
  - e) Very frequently
7. What is your first line antibiotic for treating uncomplicated AOM in an otherwise healthy child?
- a) Augmentin 90 mg/kg po BID
  - b) Amoxicillin 80-90 mg/kg po BID
  - c) Amoxicillin 45 mg/kg po BID
  - d) Azithromycin 10 mg/kg, then 5 mg/kg

8. How often do you prescribe an antibiotic without evidence of middle ear effusion based on patient or parent complaint of symptoms of upper respiratory illness such as ear pain or pulling, low-grade temperature, and fussiness?
- a) Never
  - b) Rarely
  - c) Occasionally
  - d) Frequently
  - e) Very frequently
9. Do you agree that inappropriate use of antibiotics greatly contributes to antibiotic resistant bacteria?
- a) Yes
  - b) No

## Appendix D

## IRB Exempt Waiver

IRB Protocol Code: 2017-184

**UNG** UNIVERSITY of  
NORTH GEORGIA  
Institutional Review Board (IRB)

**IRB Exempt Waiver**  
IRB Protocol Code: 2017-184  
Decision Date: 12/05/2017

Tonya Moretz  
Department of Nursing

**Project Title: Adherence to Evidence Based Guidelines for Acute Otitis Media: A Comparison of Nurse Practitioners and Medical Doctors**

Dear Ms. Moretz

Your IRB application 2017-184 entitled "Adherence to Evidence Based Guidelines for Acute Otitis Media: A Comparison of Nurse Practitioners and Medical Doctors" has been evaluated in light of the federal, state and institutional guidelines that govern the protection of human subjects. Based on the review, the proposed research has been deemed EXEMPT under Category 1: 45 CFR 46.101(b)(1).

Please note that – unlike projects that involve expedited and full reviews which are approved for one year – exempt research does not have an expiry date. However, while your project is exempt from continued IRB review, the research must adhere to the proposal submitted to the IRB. If changes to protocol/s become necessary during research project, you will need to submit *IRB Form 1.4* to the IRB. Please note that any changes to existing research protocols may prevent the research from qualifying for exempt review and thus may necessitate the submission of additional other documents/materials. Important, any changes to your research and research protocols will require prior IRB approval before implementation.

Once you complete the study (or if you decide to terminate your project prematurely) please submit *IRB Form 1.3* to inform the IRB about the status of the project. The IRB will send courtesy reminders but it is the responsibility of the principal investigator to complete the research process by submitting the form.

One of the primary goals of the IRB is to prevent negative incidences during research. Despite our best efforts, however, unforeseen circumstances or events may arise over the course of a project. If an unanticipated problem and/or adverse event happens during your study, please immediately notify the IRB and submit *IRB Form 4.1* to the IRB Chair. Other actions also may be required depending on the nature of the incidence.

Finally, please include the IRB protocol code denoted above in all your communication or correspondence related to your application and this letter. Should you have additional questions or require clarification of the contents of this letter, please contact me.

Good luck with the project!

Best,

Lisa Jones-Moore, PhD  
UNG IRB Chair  
irbchair@ung.edu