

# Antibiotics Gone Viral: Reduce Their Use For Acute Bronchitis

Esther Steinhaus, MSN

Faculty Mentor: Laura Herbener, MSN, CRNP, FNP-c

## INTRODUCTION

- Antibiotic resistance has become a global healthcare crisis (CDC, 2016b).
  - When antibiotics are taken, sensitive bacteria are killed while resistant bacteria grow and flourish (CDC, 2016b).
  - The more often antibiotics are taken, the greater the ability for resistant bacteria to grow; leading to an increase in drug-resistant organisms (CDC, 2017).
- 2 million people are infected by resistant bacteria each year in the U.S and about 23,000 people die of their infections (CDC, 2017).
- Antibiotic resistance poses a risk to advances in medicine, such as organ transplantation and chemotherapy treatment, because there are less antibiotics to treat immunocompromised patients who develop an infection caused by a drug resistant organism (WHO, 2018).
- Antibiotic resistance, if not properly dealt with, can bring the world to a post-antibiotic era where simple infections will once again be life-threatening (WHO, 2018).

## BACKGROUND

- Thirty percent of antibiotic prescribed in the out-patient setting are unnecessary and inappropriately prescribed (CDC, 2016b).
- Acute upper respiratory tract infections are the leading cause of inappropriate antibiotic prescriptions (CDC, 2016b).
  - Acute bronchitis tops all upper respiratory tract infections in this regard (CDC, 2016b).
- Over 90% of patients who present with a cough and are diagnosed with acute bronchitis have an infection caused by a virus (Harris, Hicks & Qaseem, 2016).
- Providers have a responsibility to keep up to date with current antibiotic practice guidelines and to educate patients accordingly.
  - Providers can help curb the growing healthcare crisis of antibiotic resistance by prescribing antibiotics only when necessary.

## PICOT QUESTION

**Among primary care providers treating adults in a primary care setting, does a web-based educational program aimed at appropriate antibiotic prescribing decrease the number of inappropriate antibiotic prescriptions issued during the initial visit to low risk adults diagnosed with uncomplicated acute bronchitis, over a 3-month period?**

## SEARCH METHODOLOGY

- Databases:** CINAHL, MEDLINE & PubMed
- Keywords:** antibiotics, upper respiratory tract infection, acute bronchitis, continuing education & antibiotic stewardship
- The PICOT question was support by one randomized controlled trial, one systematic review and one clinical practice guideline.

## CRITICAL APPRAISALS

### RCT (Level II Evidence) Gjelstad et al. (2013)

#### Objective

- Determine the effects of an educational program for general practitioners in reducing the number of inappropriate antibiotics prescribed to patients diagnosed with upper respiratory infections.

#### Intervention

- Intervention group- educational program regarding current treatment guidelines for upper respiratory infections presented by peer academic detailers.
- Control group- education regarding appropriate drug treatment in patients > 70 years old presented by peer academic detailers.
- Retrospective data was collected at the start and one year after the completion of the intervention.

#### Results

- Reduction in the number of antibiotic prescriptions issued for upper respiratory infections with a 95% CI.
  - Reduction in antibiotic prescriptions issued for acute bronchitis with a P value < 0.01.

### SR (Level I Evidence) Kochling et al. (2018)

#### Objective

- Review the current evidence and summarize the effectiveness of interventions used to reduce the number of antibiotics prescribed for upper respiratory infections in the primary care setting.

#### Intervention

- Compared 17 RCTs that used one or more of the following interventions: educational seminars, feedback on prescribing habits, patient education, communication skills training for providers and diagnostic tools.

#### Results

- Interventions that target providers rather than patients were more successful in reducing antibiotic prescription rates for upper respiratory infections.
- Interventions that target providers via an educational program regarding antibiotic prescription guidelines for upper respiratory infections showed a statistically significant change.

- These interventions did not meet the researchers' definition of a clinically relevant reduction with an absolute reduction rate of 10%.

### Guideline (Level I Evidence) Harris et al. (2016)

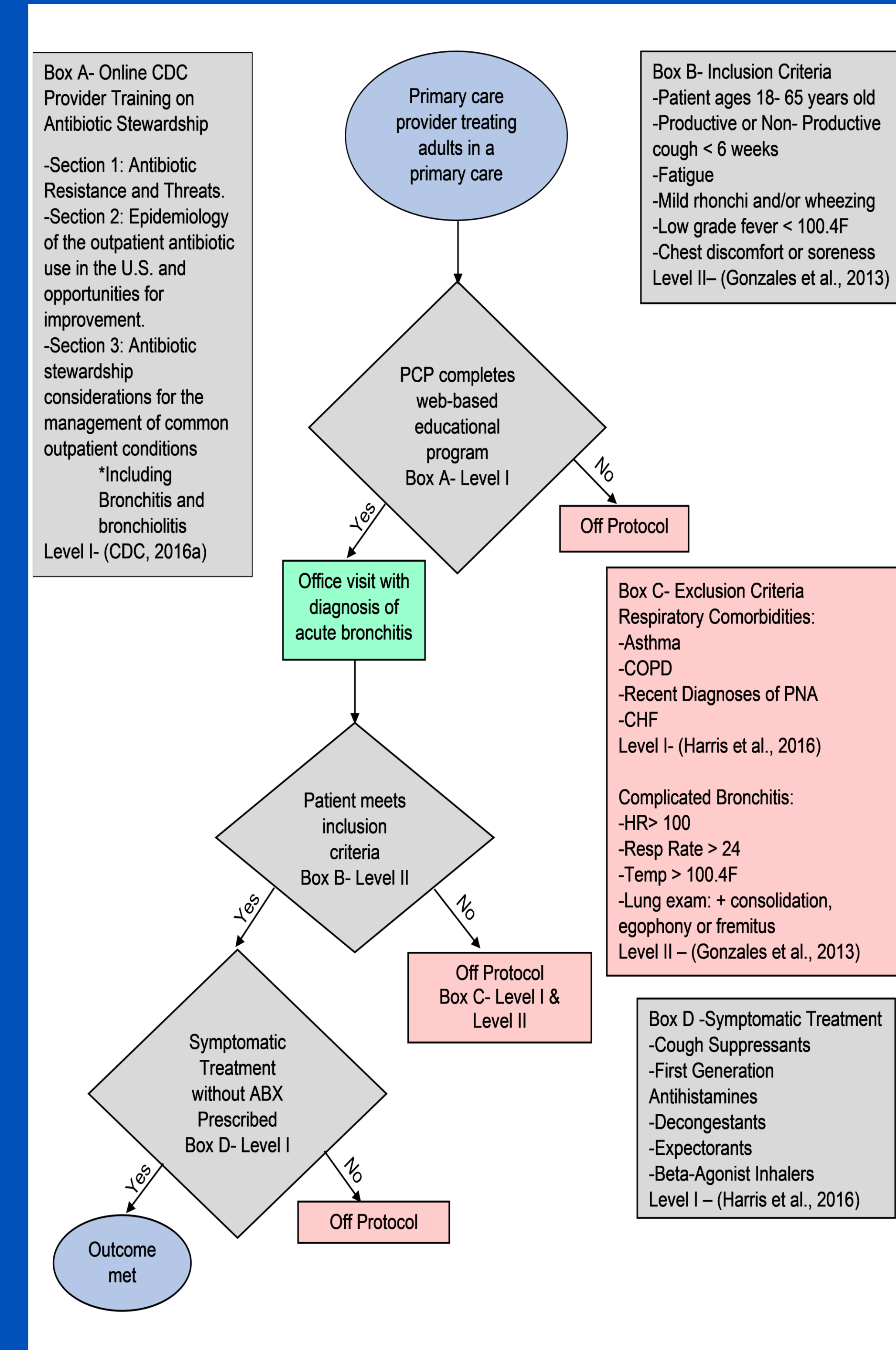
#### Objective

- To provide best practice guidelines for prescribing antibiotics to healthy adult patients diagnosed with acute upper respiratory tract infections.

#### Recommendation

- Antibiotics should not be prescribed for acute bronchitis unless pneumonia is suspected.
  - Symptomatic treatment may be prescribed.
- In a patient who presents with a cough, no further testing is warranted unless tachycardia, tachypnea, fever and/or abnormal findings on chest examination are present.

## ALGORITHM



## BENEFITS AND RISKS

#### Benefits:

- Reduction in the number of drug resistant organisms (CDC, 2016b).
- Reduction in the number of adverse events caused by antibiotics (Harris et al., 2016).
- A \$6.5 million direct reduction and \$30 billion indirect reduction to the U.S. economy per year (Harris et al., 2016).

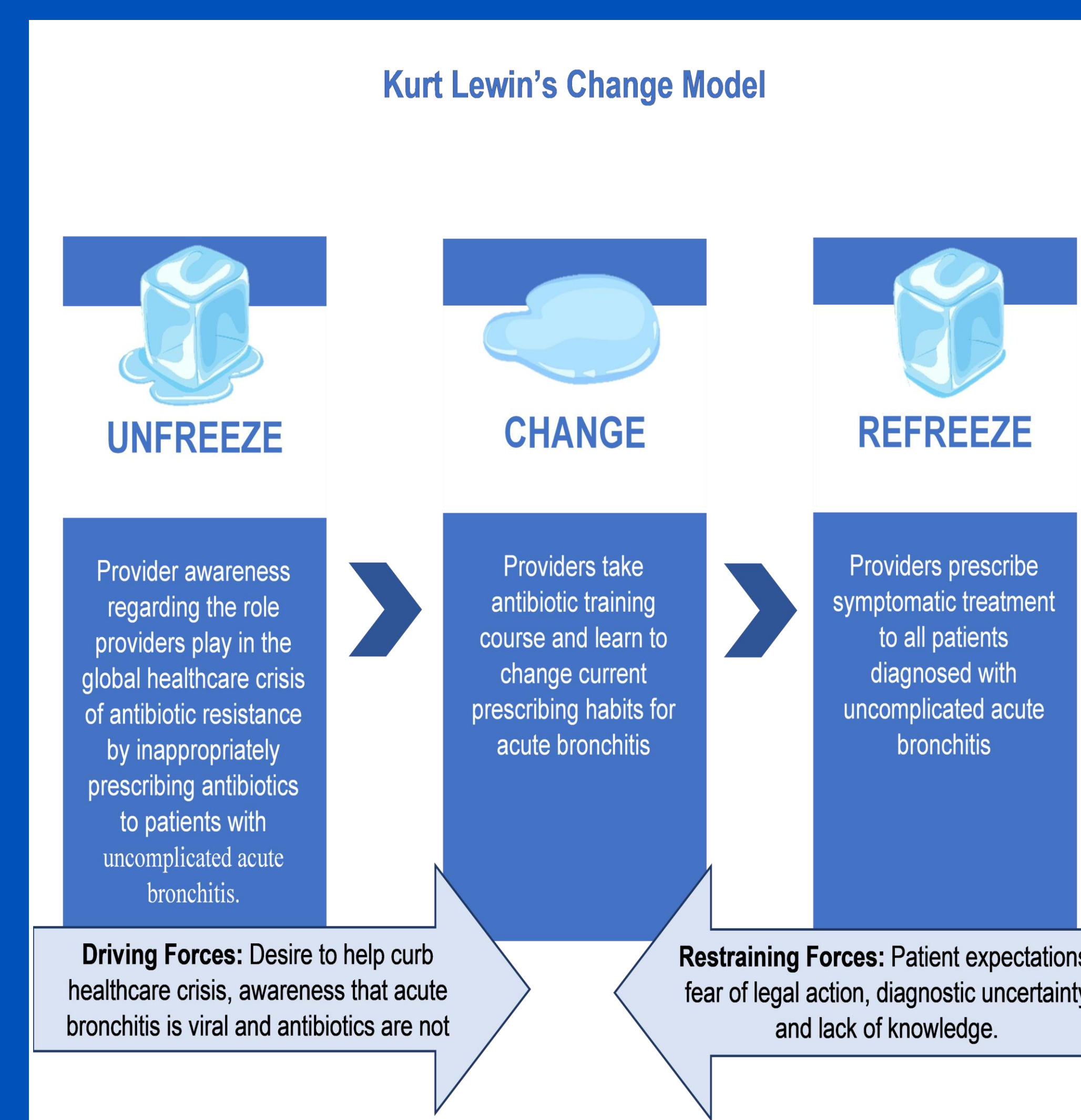
#### Risks:

- Provider fears (Harris et al., 2016):
  - Decrease in patient satisfaction rates
  - Legal action
  - Diagnostic uncertainty
  - Secondary bacterial infection

## APPLICABILITY FOR CHANGE IN PRACTICE

- Implementing this evidence-based practice project in practice will benefit the provider, patient and the global healthcare community.
- Critical appraisal of the current literature has shown that provider education is instrumental in reducing antibiotic prescriptions for acute bronchitis.
- The antibiotic stewardship program provided by the CDC is easily accessible, free and available to the public.
- This EBPP, which is in line with current practice guidelines, can assist in creating a positive change to providers' practice for acute bronchitis making this EBPP highly applicable and recommended for the APN in the primary care setting.

## THEORETICAL FRAMEWORK



## REFERENCES

- Centers for Disease Control & Prevention. (2016a). Antibiotic prescribing and use in doctor's offices: Continuing education and informational resources. Retrieved from <https://www.cdc.gov/antibiotic-use/community/for-hcp/continuing-education.html>
- Centers for Disease Control & Prevention. (2016b). Fast facts about antibiotic resistance. Retrieved from <https://www.cdc.gov/antibiotic-use/community/about/fast-facts.html>
- Centers for Disease Control & Prevention. (2017). Antibiotic resistance questions and answers. Retrieved from <https://www.cdc.gov/antibiotic-use/community/about/antibiotic-resistance-faqs.html>
- Gjelstad, S., Høye, S., Straand, J., Brekke, M., Dalen, I., & Lindbaek, M. (2013). Improving antibiotic prescribing in acute respiratory tract infections: Cluster randomised trial from Norwegian general practice. *British Medical Journal*, 347(7920). doi:10.1136/bmj.f4403
- Gonzales, R., Anderer, T., McCulloch, C. E., Maselli, J. H., Bloom, F. J., Graf, T. R., . . . Metlay, J. P. (2013). A cluster randomized trial of decision support strategies for reducing antibiotic use in acute bronchitis. *Journal of American Medical Association*, 307(4), 267-273. doi:10.1001/jamainternmed.2013.1589
- Harris, A. M., Hicks, L. A., & Qaseem, A. (2016). Appropriate antibiotic use for acute respiratory tract infection in adults: Advice for high-value care from the American College of Physicians and the Centers for Disease Control and Prevention. *Annals of Internal Medicine*, 164(6), 425-434. doi:10.7326/m15-1840
- Kochling, A., Löffler, C., Reinsch, S., Hornung, A., Bohmer, F., Altner, A., . . . & Chenot, J. F. (2018). Reduction of antibiotic prescriptions for acute respiratory tract infections in primary care: A systematic review. *Implementation Science*, 13(47), 1-25. doi:10.1186/s13012-018-0732-y
- Shirley, M. R. (2013). Lewin's theory of planned change as a strategic resource. *Journal of Nursing Administration*, 43(2), 69-72. doi: 10.1097/NNA.0b013e31827f20a9
- Wagner, J. I. (2018). *Leadership and Influencing Change in Nursing*. Regina, SK, CA: University of Regina Press.
- World Health Organization. (2018). Antibiotic resistance. Retrieved from <https://www.who.int/news-room/fact-sheets/detail/antibiotic-resistance>