

## Protocol Development on Evidence Based Guidelines for Management of Signs and Symptoms of Respiratory Tract Infections in Children

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### Abstract

Evidence based guidelines for management of signs and symptoms of respiratory tract in children. The purpose of the guideline is to implement Evidence based guidelines for management of signs and symptoms of respiratory tract infections in children. This guideline aims to improve the knowledge and practice of staff nurses and enables them to take measures to manage signs and symptoms of respiratory tract infections in children. The Objectives of the guidelines are- To Implement the evidence based guidelines for management of signs and symptoms of respiratory tract infections in children, To improve the knowledge of staff nurses for management of signs and symptoms of respiratory tract infections in children, To improve the practice of staff nurses for management of signs and symptoms of respiratory tract infections in children and to reduce incidence of respiratory tract infections in children Implementation of guidelines has both long term and short term outcome. Rossum and Larrobe model is used to prepare the guidelines for this project. The objective of the systematic review is to find the evidence on management of respiratory tract infections in children. The Secondary objectives are to improve the knowledge of staff nurses for management of signs and symptoms of respiratory tract infections in children, to improve the practice of staff nurses for management of signs and symptoms of respiratory tract infections in children and to reduce the incidence of signs and symptoms of respiratory tract infections in children. The type of studies included are Clinical practice guidelines, Systematic reviews on management of signs and symptoms of respiratory tract infections, Randomized controlled trials on management of signs and symptoms of respiratory tract infections, Cross sectional and Expert opinion. The Type of intervention include the non-pharmacological management include dietary management, oxygen therapy, Hygiene and nebulizer therapy were included. The Electronic searches include PubMed, CINHAL and Cochrane.

**Keywords:** Management; Signs and Symptoms; Respiratory Tract Infection; Children.

### Introduction

Children constitute foundation of a nation. Healthy children grow to become healthy adults with

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optimal physical strength and emotional poise to become useful members of our society and contribute effectively in the nation building process. Infections of respiratory tract are described according to the anatomic area of involvement. The upper respiratory tract or upper airway consists of oropharynx, larynx and upper part of trachea. The lower respiratory tracts consists of lower trachea, mainstem bronchi, segmental bronchioles, terminal bronchioles and alveoli. Infections often spread from one structure to

another because of the contagious nature of the mucous membrane lining the entire tract. Consequently respiratory tract infections involves several areas rather single structure, although the effect of one area may predominate in any given illness.

Many different pathogenic organisms are responsible for respiratory tract infections. They can be spread from person to person in minute droplets of water, on the hands, on dust particles, or on solid objects in the environment such as door knobs. The pathogenic organisms multiply rapidly in the mucous membranes of newly infected individual, who then becomes a source of infection to others. Whether or not an individual acquires an infection and the type of infection acquired depend on persons age, extent of present contact with organism and resistance. Most pathogenic organisms die quickly in outdoor air because of the action of ultraviolet light from the sun and a temperature unfavourable to their growth. Children at nursery school or kindergarten, where upper respiratory tract infections may be virtually epidemic, are likely to have more upper respiratory tract infections because they are more frequently exposed and have not built resistance to infection as has the healthy older child. Infected preschool age and school children become a source of infection for younger siblings at home.

## Background

WHO report of 2002 estimates the probability of dying for under-five children to be around 91 per 1000 [1]. Globally, acute respiratory infections (ARI) constitute 19% of mortality respectively in under-five age group [2]. Morbidity is similar for ARI in developing and developed country but mortality 30 times greater in developing countries. In India mortality of under-five children is mainly due to acute respiratory infections (ARI) 23% as per WHO report 2002.

A community-based cross-sectional study was conducted in urban and rural areas of Puducherry, India to estimate the prevalence of ARI and selected associated factors among under-five children. Data were collected from 509 parents of under-five children regarding ARI incidence along with socio-demographic and selected associated factors. The result showed that overall prevalence of ARI was observed to be 59.1%, with prevalence in urban and rural areas being 63.7% and 53.7%

A cross sectional study was conducted among 500 under 5 children living in urban (five zone) and rural

(five PHC of sanand taluka) area of Ahmedabad district from September 2008 to March 2009. The results revealed that Prevalence of ARI was found to be 22%, it was higher in low social class (III, IV and V) (26.56%), Illiterate mothers (24.4%) and primary (23.9%) mothers, Overcrowded houses (28.5%). In rural area, it is more because of lack of availability of basic health services, lack of awareness, and other associated factors like overcrowding, low socio-economic status, absence of cross ventilation, indoor air pollution are responsible factors.

The epidemiology of some of the respiratory tract infections varies according to the regions. The preparation of guidelines for the management of respiratory tract infections is a timely intervention to improve patient care. It will facilitate nurse practitioners to make clinical decisions which are supported by evidence based nursing

This guideline development process makes an effort to search the literature for providing specific guidelines to the care providers for prevention of pressure ulcer.

## Need Analysis for Evidence Based Guidelines for Management of Signs and Symptoms of Respiratory Tract Infections in Children

### Objective

The objective of the need assessment is to assess the knowledge of care givers regarding management of signs and symptoms of respiratory tract infections in children.

### Setting

The need assessment was conducted among staff nurses working in pediatric ward of AIIMA, Patna.

### Population

Staff nurse working in pediatric ward of AIIMS patna, Bihar.

### Sample and Sample Size

The need assessment was conducted among 10 staff nurses working in pediatric ward of AIIMS Patna, Bihar.

### Tool for Data Collection

A structured knowledge interview schedule consisting 18 multiple choice questions was developed by referring various literature from Child Health Nursing text books, NICE guide lines. Expert opinion and suggestions were taken from the field of

Child Health Nursing in determining the important areas to be included.

*Data Collection*

The data was collected on 13/3/17 by administering the structured knowledge interview schedule to staff nurses working in Pediatric ward. The permission was obtained from Deputy Nursing Superintendent, AIIMS patna, Bihar.

The staff nurses were visited by the investigator in the pediatric ward and were explained about the purpose of the study. The data was collected from

the staff nurses after obtaining their consent. They were also informed that their answers will be kept confidential. Sample consisted of 10 staff nurses. Data was collected from 3 staff nuses on day 1, 5 staff nurses on day 2 and 2 staff nurses on day 3. The data was collected and recorded systematically on each participant and was organized on master data sheet.

*Data Analysis*

In order to find out the level of knowledge of care providers a 3 point scale was used. The scales were graded arbitrarily as follows: Good Knowledge 60-

**Table 1:**

S. No.	Knowledge Score	Frequency (f)	Percentage %
1	Good	1	10%
2	Average	3	30%
3	Poor	6	60%

75% ; Average knowledge - 50-60%, Poor Knowledge - Less than 50%

The obtained data was analyzed in terms of descriptive statistics.

Assessment of knowledge among the staff nurses reveal that 10% had good knowledge, 30% had average knowledge and 60% had poor knowledge

**Summary**

From the need assessment it was found that majority of the staff nurses does not have adequate knowledge regarding management of signs and symptoms of respiratory tract infection in children. The need assessment gave a clear cut indication for the development of evidence based guidelines to staff nurses for management of respiratory tract infections in children

**Situational Analysis**

There was no guidelines present in for management of signs and symptoms of respiratory tract infections in children. The permission was also obtained from concerned authorities.

**Title of the Guideline**

Evidence based guidelines for management of signs and symptoms of respiratory tract in children.

**Purpose**

The purpose of the guideline is to implement

Evidence based guidelines for management of signs and symptoms of respiratory tract infections in children.

This guideline aims to improve the knowledge and practice of staff nurses and enables them to take measures to manage signs and symptoms of respiratory tract infections in children.

*Objectives*

The Objectives of the guidelines are to :

1. Implement the evidence based guidelines for management of signs and symptoms of respiratory tract infections in children.
2. To improve the knowledge of staff nurses for management of signs and symptoms of respiratory tract infections in children.
3. To improve the practice of staff nurses for management of signs and symptoms of respiratory tract infections in children.
4. To reduce incidence of respiratory tract infections in children.

**Out Come**

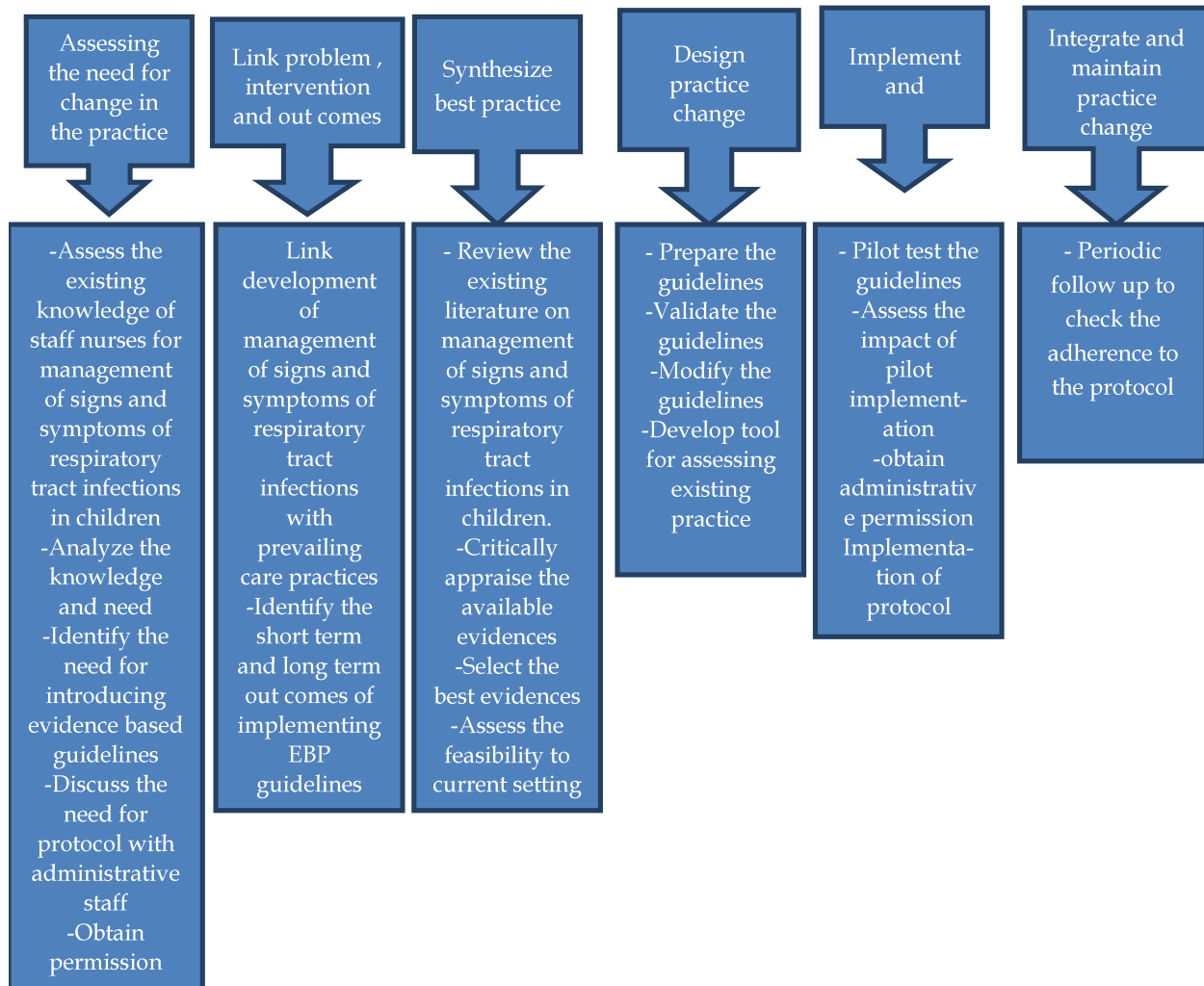
Implementation of guidelines has both long term and short term outcome. Outcome can be assessed with post audit.

*Long Term Outcome*

Reduction in the rate of respiratory tract infections among children

*Shortterm Outcome*

- Improvement in the knowledge of staff nurses for management of signs and symptoms of respiratory tract infections in children
- Improvement in the practice of staff nurses for management of signs and symptoms of respiratory tract infections in children

*Application of Evidence Based Model*

Rossum and Larrobe model is used to prepare the guidelines for this project. It incorporates elements of evidence based practice, research utilization and change theory.

**Systematic Review**

Health professionals like staff nurses does not have adequate knowledge regarding management of signs and symptoms in children. Lack of knowledge is a barrier for management of signs and symptoms of respiratory tract infections. Therefore providing evidence based guidelines to staff nurses not improves the practice of management of signs and symptoms of respiratory tract infections in children.

An attempt is made to increase awareness by developing evidence based clinical practice guidelines for staff nurses for management of signs and symptoms of respiratory tract infections in children.

Respiratory infections are one of the most frequently reported among children. It is essential to ensure that staff nurses have adequate knowledge regarding management of signs and symptoms by providing evidence based practice guidelines.

*PICO Questions*

In this systematic review PICO Question was:

P- Children

I - Management of signs and symptoms of respiratory tract infections

C - Nil  
 O - Absence of signs and symptoms of respiratory tract infections

**Review Objectives**

*Primary Objective*

- The objective of the systematic review is to find the evidence on management of respiratory tract infections in children.

*Secondary Objectives*

- To improve the knowledge of staff nurses for management of signs and symptoms of respiratory tract infections in children.
- To improve the practice of staff nurses for management of signs and symptoms of respiratory tract infections in children.
- To reduce the incidence of signs and symptoms of respiratory tract infections in children.

*Type of Studies Included*

- Clinical practice guidelines.
- Systematic reviews on management of signs and symptoms of respiratory tract infections.
- Randomized controlled trials on management of signs and symptoms of respiratory tract infections.
- Cross sectional
- Expert opinions

*Type of Participants*

Children who are having signs and symptoms of respiratory tract infection such as cough, common cold, sinusitis, rhinitis, pharyngitis, bronchiolitis, respiratory distress.

*Type of Intervention*

- The non-pharmacological management include dietary management, oxygen therapy, Hygiene and nebulizer therapy were included.

*Electronic Searches*

- PubMed
- CINHAL
- Cochrane

**Data Collection and Analysis**

*Selection of Studies*

Studies selected were in English language and were with free full text. The studies were selected and assessed for quality using Cochrane risk assessment tool.

*Inclusion Criteria*

- Studies in English only.
- Studies between the period of 2013-2017.
- Studies which had interventions management of signs and symptoms of respiratory tract infections.

*Exclusion Criteria*

- Published pilot study findings of RCT.
- Studies excluded by Cochrane risk assessment tool.

*Search History*

The data bases were selected for relevant studies using the search strategy and full text studies were selected. 18 studies were found suitable to be considered potentially relevant following screening of the search results out of which 5 were excluded of poor evidence.

**Table 2:**

Guideline Status	Development and Implementation
Clinical specialty	Child Health Nursing
Intended Users	Staff nurses
Guideline objective	To develop evidence based guidelines for management of signs and symptoms of respiratory tract infections in children
Target population	children
Intervention and practice considered	Various measures taken to manage signs and symptoms of respiratory tract infections in children
Major outcomes considered	Absence of signs and symptoms of respiratory tract infections in children
Methods used to obtain evidences	<ul style="list-style-type: none"> <li>• Clinical practice guidelines</li> <li>• Systematic reviews</li> </ul>

Process of guideline development	<ul style="list-style-type: none"> <li>• RCT</li> <li>• case control studies</li> <li>• case reports</li> <li>• Expert opinions</li> <li>• Assess the existing knowledge of staff nurses</li> <li>• Develop guidelines</li> <li>• Conduct pilot study</li> <li>• Implement clinical practice guidelines</li> </ul>
Description of Implementation strategy	<ul style="list-style-type: none"> <li>• Administrative approval</li> <li>• Training of care providers</li> <li>• Monitoring the performance</li> </ul>

Out of 12 remaining studies, 4 is systematic review, 2 is clinical guideline, 1 RCT's., 2 cross sectional study, 1 individual cohort study, 2 expert opinion

Guideline Title: Evidence Based Guidelines for Management of Signs and Symptoms of Respiratory Tract Infections in Children.

Table 4:

S. No.	Recommendations	Evidence Category	
<b>1</b>	<b>Dietary Management</b>		
1.1	Delayed initiation of breastfeeding beyond the first hour of life and infants who are partially breast fed are at greater risk of developing respiratory tract infections	1	11
1.2	Small frequent feed/frequent fluid intake is recommended for children with common cold	1	
1.3	Adequate oral hydration helps in the treatment of pharyngitis in children	11	
1.4	Fluid therapy should be restricted to 100ml/kg/day for infants in the absence of dehydration in respiratory distress syndrome	1	
1.5	Supplementation of Vitamin D can be effective means of preventing respiratory tract infections in children	1	
1.6	Oral zinc supplementation reduces acute lower respiratory tract infections in children >6 months	1	
1.7	Children of all ages should be encouraged to follow healthy balanced diet including fruits and vegetables to prevent rhinitis		
1.8	Consumption of atleast 200mg of Vitamin C per day reduces the duration of cold symptoms by an average of 14% in children	V	13
1.9	Dietary habits such as frequent consumption of processed or high sugar foods, picky eating habits and high meat diet are associated with recurrent respiratory infections	1V	14
	<b>Oxygen Therapy</b>		
2.1	Nasal prongs are the preferred method of delivering oxygen to infants and children < 5 years of age with hypoxaemia who require oxygen therapy	1	16
2.2	Where nasal prongs are not available, nasal or nasopharyngeal catheters can be used as alternative delivery methods. Facemasks and head boxes are not recommended	1	16
2.3	Standard flow rates for oxygen through nasal prongs or nasal catheters are 0.5-1 L/min for neonates, 1-2 L/min for infants, 1-4 L/min for older children	1	16
2.4	Children with emergency signs (severe respiratory distress) should receive oxygen therapy during the resuscitation phase if their SpO <sub>2</sub> is < 94%	1	16
2.4	When oxygen is delivered at a standard flow rate (0.5-1 L/min for a neonate, 1-2 L/min for an infant, 1-4 L/min for an older child) through a nasal catheter or nasal prongs, humidification is not necessary	1	
2.5	When oxygen is delivered at a higher-than-standard flow rate (> 4 L/min) through a nasal catheter or nasal prongs, humidification is necessary	1	16
2.6	helium-oxygen considered as adjunct therapy for severe bronchiolitis.	1	12,

3	<b>Hygiene</b>		
3.1	Hand hygiene will reduce incidence of symptoms of respiratory tract infection which will improve the childrens hand hygiene attitude and behaviour	1	15
3.2	Avoidance of environmental tobacco smoke will reduce incidence of common cold in children	1	
3.3	Gargling with water was effective against acute respiratory tract infections	1	
3.4	Hand hygiene is considered to be the best method for preventing the spread of the common cold	1V	15
4.	<b>Nebulizer Therapy</b>		
4.1	Nebulized 3% hypertonic saline can reduce hospital length of stay	1V	

**Major Recommendations for Staff Nurses for the Management of Signs and Symptoms of Respiratory Tract Infections in Childrens.**

**References**

1. Tyrrel DA, Cohen S, Schlarb JE. Signs and symptoms in common colds. *Epidemiological Infection* 1993; 111:143-56.
2. Sperber Sj, Hayden FG. Chemotherapy of rhinovirus colds. *Antimicrobial Agent* 1988;32:409-19.
3. Blake KD. Dangers of common cold treatment in children. *Lancet* 1993;341:640.
4. Nelson Textbook of Pediatrics. 16th Edition. W.B. Saunders Company. Year 2000.
5. Jacobs RF. Judicious use of antibiotics for common pediatric respiratory infections. *Pediatric Infect Dis J*, 2000;19:938-43.
6. Acute respiratory infections in children: Case management in small hospitals in developing countries. A manual for Doctors and other Senior Health Workers; 1994, WHO, Geneva.
7. Steinhoff MC, El Khalek MAK, Khallaf N, et al. Effectiveness of clinical guidelines for the presumptive treatment of streptococcal pharyngitis in Egyptian children. *Lancet*. 1997;350:918-21.
8. Glezen WP, Denny FW. Epidemiology of acute lower respiratory disease in children. *N Eng J Med* 1973;288:498-505.
9. Chan PWK, Goh AYT, Chua KB, Khairullah NS, Hooi PS. Viral aetiology of lower respiratory tract infection in young Malaysian children. *J Paediatr Child Health* 1999;35:287-90.
10. United Nations Inter-agency Group for Child Mortality Estimation. Levels and trends in child mortality. Report 2015. New York: United Nations Children's Fund; 2015.
11. Jehangir Khan & Linda Vesel & Rajiv Bahl & Jose Carlos Martines Published online on 4 June 2014 Springer Science & Business Media New York 2014.
12. HERBERT L. MUNCIE, JR., MD, Louisiana State University Health Sciences Center, 200 W. Esplanade Ave., Suite 412, Kenner, LA 70065.
13. Harvard Health Letter, Harvard Health Publications, Copyright 2017 by President and Fellows of Harvard College.
14. Claire Williamson, Nutrition Scientist, British Nutrition Foundation, Imperial House, 15-19 Kingsway, London WC2B 6UN, UK.
15. George Boskou Assistant Professor, Department of Nutrition and Dietetics, Harokopio University, 70, El. Venizelou, Kallithea 17671, Athens, Greece.