بسم الله الرحمن الرحيم

University of Shendi

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The impact of an intervention Program for Nurses about The Nursing Care of Children with Pneumonia at Al-Mak Nemir University Hospital & Shendi Teaching Hospital

A thesis Submitted for fulfillment Ph.D in Pediatric Nursing

Submitted by/

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بسم الله الرحمن الرحيم

قال تعالي

" قل اعملوا فسيرى الله عملكم ورسوله والمؤمنون "

صدق الله العظيم

Dedication

To my mother,

My father,

My brothers and sisters ,

My husband and my sons,

I dedicate this study

Researcher

Acknowledgments

I would like to express my deepest thanks to Dr Mohammed Osman Mutwakil , Dr Nabila Hassan for supervisions and assistance to carry out this study.

I am grateful to the faculty of nursing of Shendi university (staff, workers and students), for their assistance especially in the collection of data.

Finally I appreciate the cooperation of nursing staff in Al mak Nimer university hospital and Shendi teaching hospital without them the study could not have been completed .

Abstract

This work was conducted to study the impact of an intervention program for nurses about nursing care provided to children with pneumonia . The study was carried out at Al mak Nimer university hospital and Shendi teaching hospital , Shendi city River Nile state , Sudan , between August 2009 --- May 2012 .

The sample composed of sixty nurses (45 from Al mak Nimer university hospital and 15 from Shendi teaching hospital). Quasi experimental design was used in this study . Structured interview sheet

and observational checklist was used to collect data to achieve the purpose of study . An educational program to the study nurses was designed based on actual assessment of nurses needs , this program was conducted in four sections

The results of this study found that study nurses were lacking knowledge about definition of pneumonia in pre program test , while the post program results showed increasing knowledge of nurses to more than seventy percent. Sixty percent of study nurses thought that pneumonia is caused by viruses only in the preprogram testing . After conduction of the program seventy six percent became aware about all causative organisms of pneumonia .

Concerning knowledge and practice of nurses regarding use of medical stethoscope, this study found that there is a gap between nurse knowledge and the practice of using the stethoscope . Most of nurses were aware about the benefit of using stethoscope in diagnosis of pneumonia in preprogram results. But only twenty six percent were aware about the correct site of chest should be auscultator in pre program results . After conduction of the program sixty six percent became aware about that .

Also the study reveals that both groups have poor knowledge and practice about chest physiotherapy in pre program result . After the program was implemented , nurses were oriented about chest physiotherapy and their performance increased in it is procedures .

On conclusion, the current study showed that knowledge and practice of the nurses in Al mak Nimer university hospital and Shendi teaching hospital towards the children affected with pneumonia was generally improved after conduction of the program .

Finally the study recommend for administration staff to report every

year to the faculty of nursing Shendi university about nurses performance so that any nursing defect is to be detected and corrected , Importance of introduce training program and work shops on regular basis so that problems concerning nursing knowledge and practice is identified and managed . And for nursing staff Reassurance about the importance of using stethoscopy in nursing practice .

ملخص البحث

اجريت هذه الدراسة بغرض معرفة تاثير البرنامج التعليمى للتمريض عن العناية التمريضية التى تقدم للطفل المصاب بالالتهاب الرئوى . تم تطبيق هذه الدراسة بمستشفى المك نمر الجامعى ومستشفى شندى التعليمى بمدينة شندى , ولاية نهر النيل, السودان فى الفترة من اغسطس 2009 – مايو 2012.

بلغت عينة الدراسة 60 ممرضا (45 من مستشفى المك نمر الجامعى , 15 من مستشفى شندى التعليمى) , استخدمت الطريقة شبة الاختبارية لاجراء هذة الدراسة حيث تم تصميم استمارة مقابلة واستمارة ملاحظة لجمع المعلومات بغرض تحقيق اهداف الدراسة , ثم تم تصميم برنامج تعليمى للممر ضين بناءا على حاجاتهم الاساسية للمعرفة والمهارة للعناية بالطفل المصاب

بالالتهاب الرئوى , وتم تنفيذ هذا البرنامج على اربعة فصول .

اوضحت الدراسة ان معظم مجموعة الدراسة يفتقد المعرفة عن التعريف الصحيح للالتهاب الرئوى , بينما اوضحت النتائج بعد تنفيذ البرنامج ان اكثر من سبعين بالمئة توصلوا الى المعرفة الصحيحة .

بينت الدراسة وجود فارق بين المعرفة والممارسة فى استخدام السماعة الطبية , لان معظم مجموعة الدراسة لديهم المعرفة التامة بفائدة السماعة الطبية فى تشخيص المرض ولكن 26% فقط لديهم العرفة عن المكان الصحيح فى الصدر لاستخدام (وضع) السماعة فى المرحلة قبل تنفيذ البرنامج . بعد تنفيذ البرنامج 66% تمكنوا من المعرفة الصحيحة فى استخدام السماعة الطبية .

وكذلك وجدت الدراسة ان معظم العينة فى كلتا المستشفيين لديهم معرفة ضعيفة عن الاصوات الشاذة التى تظهر عند الطرق فى حالة الاصابة بالامراض الصدرية , كما بينت الضعف فى المعرفة والمهارة عن العلاج الطبيعى للصدر وطرقة فى المرحلة فبل تنفيذ البرنامج .

كما اوضحت الدراسة الحالية ان المعرفة والمهارة للممرضين بمستشفى المك نمر الجامعى ومستشفى شندى التعليمى تجاه الطفل المصاب بالالتهاب الرئوى قد تحسن بعد تطبيق البرنامج .

وفى الختام اوصت الدراسة الحالية القائمين بالادارة باهمية اقامة الدورات التدريبية وورش العمل لتجديد المعرفة وتطوير المهارات التمريضية كما اوصت الممرضبين باهمية معرفة كيفية استخدام السماعة الطبية .

Abbreviations

ARI	**Acute Respiratory Infection**
URI	**Upper Respiratory Infection**
LRI	**Lower Respiratory Infection**
RSV	**Respiratory Syncytial Virus**
Hib	**Haemophilus Influenzae type B**
COPD	**Chronic Obstructive Pulmonary Disease**
GERD	**Gastro Esophageal Reflex Disorder**
CAP	**Community Acquired Pneumonia**

SARS	**Sever Acute Respiratory Syndrome**
HAP	**Hospital Acquired Pneumonia**
PCV	**Pneumococcal Conjugate Vaccine**
PPSV	**Pneumococcal Poly Saccharide Vaccine**
BAL	**Broncho Alveolar Lavage**
CPT	**Chest Physical Therapy**
WHO	**World Health Organization**
ECG	**Electro Cardio Gram**
ICU	**Intensive Care Unit**
HIV	**Human Immunodeficiency Virus**
AIDS	**Acquired Immunodeficiency Syndrome**
IMCI	**Integrated Management of Child hood Illness**
ARDs	**Acute Respiratory Distress**
BSC	**Bachelor of Science**
URT	**Upper Respiratory Tract**
LRT	**Lower Respiratory Tract**

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coughing exercise, tracheal suction & manual ventilation	

1.1- Introduction

Respiratory tract infection is a frequent cause of acute illness in infant and children. Many pediatric infections are seasonal. Child response to infection will vary based on age of the child, causative organism: general health of child, existence of chronic medical conditions and degree of contact with other children [1] . Infection of upper and lower respiratory tract continue to be a major cause of morbidity and mortality throughout the world with patients at extremes of age or with preexisting lung disease or immune suppression being at particular risk [2]. Acute respiratory infection, especially pneumonia is more serious and can be life threatening , it is a leading cause of death killing up to 5 million under 5 year old in developing countries. Most commonly seen in infant and young children, and one of the major causes of mortality in the age group of 1-14 years . [3,4,5]

Pneumonia is an inflammation of lung parenchyma it can be caused by a virus, bacteria mycoplasma or fungus it may also result from aspiration of foreign material into lower respiratory tract (aspiration pneumonia), pneumonia occur more often in winter and early spring it is common in children but is seen most frequently in infants and young toddlers. Viruses are common cause of pneumonia in younger children and least common cause in older children. Viral pneumonia is usually better tolerated in children of all ages. Children with bacterial pneumonia more present with a toxic appearance but rapid recovery generally occur if appropriate antibiotic is instituted early. [3]

Currently, over 3 million people develop pneumonia each year in the Africa, especially in Sudan [6]. Over a half a million of these people are admitted to a hospital for treatment. Although most of these people recover, approximately 5% will die from pneumonia. Pneumonia is the

sixth leading cause of death in the United States. Some cases of pneumonia are contracted by breathing in small droplets that contain the organisms that can cause pneumonia. [7, 8]

Potential complication of pneumonia include bacteremia, pleural effusion, Empyema, Lung abscess and pneumothorax . Excluding bacterium these are often treated with thoracentesis and or chest tubes as well as antibiotic if appropriate. Therapeutic management of children with less severe disease includes antipyretics. Adequate hydration and close observation. even bacterial pneumonia can be successfully managed at home if the work of breathing is not sever and oxygen saturation is within normal limits however hospitalization is required for children with more sever disease. [9 , 10]

Role of pediatric nurse in relation to morbidity and mortality in children according to pneumonia involves educating family and community regarding usual causes of deaths, types of child hood illnesses and symptoms that require health care. The goal is to raise awareness and provide guidance and counseling to prevent deaths and illnesses in children. Health of children is basic to their well being and development. Pediatric nurse is in an excellent position to improve future health of children . Disorder of the respiratory system, especially pneumonia, requires close monitoring and active therapeutic. [11]

Nursing care of a patient with pneumonia must be directed to meet his/her physical, psychological and social needs. It must also be remembered that the patients need will relate directly to the severity of his illness. Nursing care is based on the degree of respiratory distress and age of patient than on the type of pneumonia. The nursing care includes skilled observation of the child's respiratory status, providing adequate rest, maintaining patient airway, ease respiratory efforts, control fever, prevent dehydration, provide nutrition, direct care of skin and mouth

cleanliness, administration of antibiotics, reducing anxiety and detect early complication. These children are often debilitated and frightened, so they need quiet reassurance as they undergo painful treatment and long period of care. So that nurses need to be acquainted with the knowledge and most recent techniques in the art of nursing and they need to improve their performance in the clinical area. [12, 13]

1.2-Rationale

The Nurse must be familiar with respiratory conditions affecting children in order to provide guidance and support to families. When children become ill, families often encounter nurses in outpatient settings first, nurses must be able to ask questions that can help determine the severity of the child illness and determine their need for farther care .

Since respiratory illness account for the majority of pediatric admissions to general hospitals ,The nurse caring for children should a quire expert assessment and intervention skills in that area .Early detection of worsening respiratory status early in the course of deterioration allows for timely treatment and preventing a minor problem from becoming a critical illness. Farther more the child and the family need the nurses support throughout the course of respiratory illness .

Nurse are also in the unique position of being able to have a significant impact upon the burden of respiratory illness in children by the appropriate identification of ,health education and encouragement of prevention of respiratory infection .

The need to assess the knowledge and practice of the nurse towards these issues , and appropriate training for them since to be essential . No similar study was conducted on that regard in Sudan

1.3 -Aims of the Study

The main goal of this study is to improve knowledge and practice of nurses caring for children with Pneumonia .

Specific objectives:

The specific objectives for this study are to:

1- Assess nurses knowledge and practice about pneumonia.

2-Develop a training program for nurses about pneumonia .

3-Implement a training program based on actual needs of nurses .

4- Evaluate the impact of the implemented program on knowledge and practice.

2-Literature review:

Infection of the respiratory tract are described to the areas of involvement. The upper respiratory tract, or upper airway, consists of the oronaso pharynx, pharynx, larynx, and upper part of the trachea. The lower respiratory tract consists of the bronchi, bronchioles, and alveoli. The bronchi and bronchioles are considered the reactive portion of the lower respiratory tract, since they have smooth muscle content and the ability to constrict. Respiratory infections spread from one structure to another because of the contiguous nature of the mucous membrane lining the entire tract. Consequently, infections of the respiratory tract involve several areas rather than single structure, although the effect on one may predominate in any given illness. (14)

Respiratory infections account for the majority of acute illness in children. The cause and course of these infections are influenced by the age of the child, season, living conditions, and preexisting medical problems .The respiratory tract is subject to a wide variety of infective organisms. Most infections are caused by viruses, particularly respiratory syncytial virus (R.S.V), and the Para influenza viruses. Other agents involved in primary or secondary invasion include group A.B hemolytic-strepto cococci (GABHS), staphylococci, haemophilus influenzae, Chlamydias, mycoplasma and pneumococci. (15 , 16)

The ability to resist invading organisms depends on several factors, deficiencies of the immune system place the child at risk for infection. Other conditions that decrease resistance are malnutrition, anemia, fatigue, and chilling of the body. Condition that weaken defenses of the respiratory tract and predispose a child to infection include allergies, broncho pulmonary dysplasia, asthma, cardiac anomalies that cause pulmonary congestion, day care attendance, especially if the caregivers

smoke, also increases the likelihood of infection. [17]

Pneumonia is a lung infection that can make child very sick it most commonly in infants and young child hood, usually caused by an infection of the lung tissue by one of different germs (micro-organism) , Clinically may occur either as a primary disease or as a complication of another illness The child may cough, run a fever, and have a hard time breathing , most pneumonia can be treated at home. It often clears up in 2 to 3 weeks.[17]

Children can get pneumonia in daily life, such as school. This is called community-associated pneumonia. Also can get it from a hospital or nursing home. This is called healthcare-associated pneumonia. It may be more severe because patient already are ill Frequently, it is described as inflammation of alveolar filling with fluid (consolidation and exudation It is general considered to be localized acute inflammation of the lung tissue without accompanying toxemia, it may be diagnosed at any age [18]

2.1 Path physiology:

Pneumonia-causing agents reach the lungs through different routes; in most cases, a patient breathes in the infectious organism, which then travels through the airways to the lungs. Sometimes, the normally harmless bacteria in the mouth, or on items placed in the mouth, can enter the lungs. This usually happens if the body's "gag reflex," an extreme throat contraction that keeps substances out of the lungs, is not working properly. Infections can spread through the bloodstream from other organs to the lungs. However, in normal situations, the airways protect the lungs from substances that can cause infection. [19]

The nose filters out large particles .If smaller particles pass through, sensors along the airway prompt a cough or sneeze. This forces many particles back out of the body. Tiny particles that reach the small tubes in

the lungs (bronchioles) are trapped in a thick, sticky substance called mucus. The mucus and particles are pushed up and out of the lungs by tiny hair-like cells called cilia, which beat like a drum. This action is called the "mucociliary escalator. " If bacteria or other infectious organisms manage to avoid the airway's defenses, the body's immune system attacks them. Large white blood cells called macrophages destroy the foreign particles The above-mentioned defense systems normally keep the lung healthy. If these defenses are weakened or damaged, however, bacteria, viruses, fungi, and parasites can easily infect the lung, producing pneumonia. [20 , 21]

Also Pneumonia can result from a variety of causes, including infection with bacteria, viruses, fungi, or parasites, and chemical or physical injury to the lungs. Its cause may also be officially described as idiopathic—that is, unknown—when infectious causes have been excluded. Some cases of pneumonia are contracted by breathing in small droplets that contain the organisms that can cause pneumonia. These droplets get into the air when a person infected with these germs coughs or sneezes. In other cases, pneumonia is caused when bacteria or viruses that are normally present in the mouth, throat, or nose inadvertently enter the lung. However, if a child is in a weakened condition from another illness, a severe pneumonia can develop. Child with recent viral infections, lung disease, heart disease, cancer ,diabetes and swallowing problems, drug users and those who have suffered a stroke or seizure are at higher risk For developing pneumonia than the general population .[22 , 23]

2.2 Causes:

A- Bacteria:

Bacteria are the most common cause of pneumonia. However, pneumonia can also be caused by viruses, fungi, and other agents. It is

often impossible to identify the specific culprit. . Less common causes of infectious pneumonia are fungi and parasites. [3] Many bacteria are grouped into one of two large categories by the laboratory procedure used to look at them under a microscope. The procedure is known as Gram staining. Bacteria are stained with special dyes, then washed in a special solution. The color of the bacteria after washing determines whether they are Gram-negative or Gram-positive. Knowing which group the bacteria belong to helps determine the severity of the disease, and how to treat it.[24 , 25]

Gram-Positive Bacteria. These bacteria appear blue on the stain and are the most common organisms that cause pneumonia. They include:

*** Streptococcus (S.) pneumoniae** (also called pneumococcus), the most common cause of pneumonia. This Gram-positive bacterium causes 13 - 38% of all community-acquired bacterial pneumonia (CAP) in children.[26]

*** Staphylococcus (S.) aureus**, the other major Gram-positive bacterium responsible for pneumonia, causes about 2% of CAP and 10 - 15% of hospital-acquired pneumonias. It is the organism most often associated with viral influenza, and can develop about 5 days after the onset of flu symptoms. Pneumonia from S. aureus most often occurs in child with weakened immune systems, very young children, hospitalized patients, and drug abusers who use needle .[26]

*** Streptococcus pyogenes** or Group A streptococcus. Gram-Negative Bacteria. These bacteria stain pink. Gram-negative bacteria commonly cause infections in hospitalized or nursing home patients, children with cystic fibrosis, and people with chronic lung conditions[26]

*** Haemophilus (H.) influenzae** is the second most common organism causing community-acquired pneumonia, accounting for 3 - 10% of all

cases. It generally occurs in patients with chronic lung disease, older people, and alcoholics.[26]

*** Klebsiella (K.)** pneumoniae may be responsible for pneumonia in child who are physically debilitated. It is also associated with recent use of potent antibiotics.[26]

*** Pseudomonas (P.)** aeruginosa is a major cause of hospital-acquired pneumonia (nosocomial pneumonia). It is a common cause of pneumonia in patients with chronic or severe lung disease.[27]

*** Moraxella (M.)** catarrhalis is found in everyone's nose and mouth. Experts have identified this bacterium as an uncommon cause of certain pneumonias, particularly in child with lung problems such as asthma or emphysema.[27]

*** Neisseria (N.) meningitidis** is one of the most common causes of meningitis (central nervous system infection), but the organism has been reported in pneumonia, particularly in epidemics of military recruits. Other Gram-negative bacteria that cause pneumonia include E. coli, proteus (found in damaged lung tissue), enterobacter, and acetinobacter.[27]

B-virus:

A number of viruses can cause pneumonia, either directly or indirectly. They include:

- Influenza (Flu). Pneumonia is a major complication of the flu and can be very serious. Influenza-associated pneumonia is particularly risky for the child with underlying heart disease. It can develop about 5 days after flu symptoms start. The flu weakens the body's defense systems, making it easier for bacteria to grow in the lungs.[28]

- Respiratory syncytial virus (RSV). Most infants are infected with RSV at some point, but it is most often mild. However, RSV is a major cause of pneumonia in infants, as well as child with damaged immune systems.[28]

- Severe acute respiratory syndrome (SARS). SARS is a respiratory infection caused by a newly-described corona virus, which appears to have jumped from animals to humans. The disease was first reported in China in 2003.[29]

- Human Para influenza virus. This virus is a leading cause of pneumonia and bronchitis in children and patients with damaged immune systems.[29]

- Adenoviruses. Adenoviruses are common and usually are not problematic, although they have been linked to about 10% of childhood pneumonias. Adenovirus 14 has been linked to an outbreak of severe community-acquired pneumonia .[29]

- Avian influenza. Type A influenza subtype H5N1 in birds is spreading around the globe. Fortunately, only a few hundred human cases have been identified. Most have resulted from close contact with infected birds. Person-to-person contact is rare. All patients diagnosed with "bird flu" show signs of pneumonia, although symptoms may be mild.[29]

C- Pneumocystis carinii

renamed Pneumocystis jiroveci in 2002, is an atypical organism. Originally thought to be protozoa, it is now classified as a fungus. P. jiroveci is very common and generally harmless in people with healthy immune systems. It is the most common cause of pneumonia in AIDS patients.[30]

D- Fungi, such as Mycobacterium avium [30]

E- pneumonia caused by anthrax, brucella, and Coxiella burnetii (which causes Q fever). [30]

2.3- Risk factor (high risk individuals)

Specific Risk Factors for Recurrent Pneumonia in Children

While healthy children have strong immune system that can sufficiently fight off pneumonia infections and prevent serious

complications , some of them at highest risk for developing the disease , those include :-

- Babies and infants, Small children who develop pneumonia and survive are at risk for developing lung problems in adulthood, including chronic obstructive pulmonary disease (COPD) .

- Abnormalities in muscle coordination of the mouth and throat
- Asthma
- Certain genetic disorders such as sickle-cell disease, cystic fibrosis, and Kartagener's syndrome, which result in poorly functioning cilia, the hair-like cells lining the airways
- Gastroesophageal reflux disorder (GERD)
- Impaired immune system . This is especially true for AIDS child, in whom pneumonia causes about half of all deaths
- Inborn lung or heart defects
- Infection with the respiratory syncytial virus (RSV)
- Leukemia

- Child with Serious Medical Conditions. Pneumonia is also very dangerous in child with diabetes, cirrhosis , cancer, and in those whose spleens have been removed HIV and Child in coma

- Chronic respiratory disease
- Regularly exposed to harsh chemicals. [31 , 32]

Risk by organisms:

Specific organisms vary in their effects. Mild pneumonia is usually associated with the atypical organisms mycoplasma and chlamydia. Severe pneumonia is most often associated with a wide range of organisms. Some are very potent (virulent) but extremely curable, while others are difficult to treat. [33]

- Mycoplasma and chlamydia are the most common causes of mild pneumonias and are most likely to occur in children and young

adults. They rarely require hospitalization when they are appropriately treated, although recovery may still be prolonged. Severe and life-threatening cases are more likely to occur in child with other medical conditions.[33]

- Streptococcus pneumoniae is the most common cause of pneumonia and, in fact, all bacterial upper respiratory infections. It can produce severe pneumonia, with mortality rates of 10%.

- Nevertheless, pneumococcal pneumonia responds very well to many antibiotics. [33]

- Staphylococcus aureus is a Gram-positive bacterium that often causes severe pneumonia in hospitalized and high-risk patients and following influenza A and B. People who get this form of pneumonia may develop pockets of infection in their lungs (abscesses) that are difficult to treat and can cause the death of lung tissue (necrosis). Mortality rates are 30 - 40%, in part because the patients who develop this infection are generally very ill or vulnerable. [34]

- Pseudomonas aeruginosa and Klebsiella pneumoniae are Gram-negative bacteria that pose a risk for abscesses and severe lung tissue damage. [34]
- Legion Ella pneumophila is very virulent and can cause widespread damage. Treatments have improved dramatically since it was first identified. However, a 2002 study suggested that many patients experience long-term problems, including coughing, shortness of breath, fatigue, and neurological and muscular complications. [34]
- Viral pneumonia is usually very mild, but there are exceptions. Respiratory syncytial virus (RSV) pneumonia rarely poses a danger for healthy young adults, but it can be life-threatening in infants and serious in the elderly. [34]

2.4- Incidence:

Pneumonia affects about eight in every 1,000 children annually. It's more common in the very young (small age). Most infections occur in the autumn or winter. About a quarter of patients with pneumonia are admitted to hospital. Every year, more than 60,000 Africans die of pneumonia - an inflammation of the lungs that's usually caused by infection with bacteria, viruses, fungi or other organisms. .Pneumonia is a particular concern for children with chronic illnesses or impaired immune systems, but it can also strike young, healthy people. Worldwide, it's a leading cause of death in children. and common illness which occurs in all age groups .WHO data2 suggest that there are 450 million cases of pneumonia each year and that it causes 3.9 million deaths. In the sub-Saharan region of Africa, 1 022 000 die and 702 000 die in south Asia. Approximately 10-20% of all children less than 5 years old in developing countries develop pneumonia each year.[35, 36]

Between 5 and 10 million child get pneumonia in the United States each year, and more than 1 million are hospitalized due to the condition. As a result, pneumonia is the third most frequent cause of hospitalizations (births are first, and heart disease is second). About 500,000 children are hospitalized for respiratory infections each year, and a third of them have pneumonia. Although the majority of pneumonias respond well to treatment, the infection kills 40,000 - 70,000 child each year, the death rate is 10 - 25%. If pneumonia develops in patients already hospitalized for other conditions, death rates range from 50 - 70%, and are higher in female than in male.[37, 38, 39]

2.5- Prognosis:

The 'prognosis' of Pneumonia usually refers to the likely outcome of Pneumonia. The prognosis of Pneumonia may include

the duration of Pneumonia, chances of complications of Pneumonia, probable outcomes, prospects for recovery, recovery period for Pneumonia , survival rates, death rates, and other outcome possibilities in the overall prognosis of Pneumonia. Naturally, such forecast issues are by their nature unpredictable. Prognosis is generally good, although viral infection of the respiratory tract render the affected child more susceptible to secondary bacterial invasion and The out come for pneumoccal and streptococcal infection is usually good with rapid recovery if treatment is prompt. Strraphylococcal infection requires hospitalization of several weeks and has a mortality rate of 10-30% the morbidity and mortality rate for children who have H. influenza are high because of the several complications that may occur.Young children who have viral pneumonia generally have an uneventful recovery but complication such as acute bacteria pneumonia may occur.[40 , 41 , 42]

2.6- Classification:

Pneumonia can be classified according to morphology, etiologic agent, or clinical form. The most useful classification is based on the etiologic agent, (viral – bacterial, ect.). The clinical manifestations of pneumonia vary depending on the etiologic agent, the child age, the child's systemic reaction to the infection, the extent of lesion, and the degree of bronchial and bronchiolar obstruction.[43]

The etiologic agent is identified largely from the clinical history, the child's age, the general health history, the physical examination radiography, and the laboratory examination. Child with infectious pneumonia often have a cough producing greenish or yellow sputum, or phlegm and a high fever that may be accompanied by shaking chills. Shortness of breath is also common, as is pleuritic chest pain, a sharp or stabbing pain, either experienced during deep

breaths or coughs or worsened by them.[44]

Child with pneumonia may cough up blood, experience headaches, or develop sweaty and clammy skin. Other possible symptoms are loss of appetite, fatigue, blueness of the skin, nausea, vomiting, mood swings, and joint pains or muscle aches. Less common forms of pneumonia can cause other symptoms; for instance, pneumonia caused by Legionella may cause abdominal pain and diarrhea, while pneumonia caused by tuberculosis or Pneumocystis may cause only weight loss and night sweats.[45]

In some children manifestations of pneumonia may not be typical. They may develop a new or worsening confusion or may experience unsteadiness, leading to falls. Infants with pneumonia may have many of the symptoms above, but in many cases they are simply sleepy or have a decreased appetite. Symptoms of pneumonia need immediate medical evaluation. Physical examination by a health care provider may reveal fever or sometimes low body temperature, an increased respiratory rate, low blood pressure, a high heart rate, or a low oxygen saturation, which is the amount of oxygen in the blood as indicated by either pulse oximetry or blood gas analysis. Child who are struggling to breathe, who are confused, or who have cyanosis (blue-tinged skin) require immediate attention.The symptoms of infectious pneumonia are caused by the invasion of the lungs by microorganisms and by the immune system's response to the infection. Although more than one hundred strains of microorganism can cause pneumonia, only a few are responsible for most cases.[46]

1- Types of pneumonia according to causative agent:

***-Bacterial pneumonia:**

Is often serious infection. The cause depends in the child age and degree of immunosuppression or immunocompetence. . Many

types of bacteria can cause pneumonia. Bacterial pneumonia can occur on its own, at the same time as viral pneumonia, or the child develop it after a viral upper respiratory infection such as influenza. Signs and symptoms, which are likely to come on suddenly, include shaking chills, a high fever, sweating, shortness of breath, chest pain, and a cough that produces thick, greenish or yellow phlegm. Ironically, high-risk groups such as child with a chronic illness or compromised immune system may have fewer or milder symptoms than less vulnerable child do. And instead of the high fever that often characterizes pneumonia, The pathogenic mechanisms involved are often aspiration or hematogenous dissemination. Each specific type of bacterial pneumonia produces a distinctive disease entity in children. the onset is abrupt and turn with other bacterial pneumonia [47]

Staphylococcus pneumonia is most common bacterial pathogen responsible for community – acquired pneumonia. Other bacteria that cause pneumonia in children are the group A-streptococci, S. aureus, M. catarrhalis and H. influenzae. In the 3 month to 5 years age group, S. pneumonia, m catarrhalis and group A streptococci are common cause. H. influenzae type is causing fever infections because of the Hib vaccine. [48]

Symptoms of pneumonia caused by bacteria usually come on quickly. They may include:

- Cough. The child cough up mucus (sputum) from lungs. Mucus may be rusty or green or tinged with blood.
- Fever.
- Fast breathing and feeling short of breath.
- Shaking and "teeth-chattering" chills. Child have this only one time or many times.
- Chest pain that often feels worse when cough or breathe in.

- Fast heartbeat.
- Feeling very tired or feeling very weak.
- Nausea and vomiting.
- Diarrhea.[48]

The onset of bacterial pneumonia may be sudden or insidious and is usually accompanied by general systemic symptoms, including fever, chills (in older child), headache, malaise, anorexia, and muscle pain (myaegia). These symptoms are followed by rhinitis, sore throat, and a dry hacking cough. The cough initially non productive, produces seromucoid sputum that later becomes muco purulent or blood streaked. The degree of fever varies widely, and it may last from several days to 2 weeks. Dyspnea occurs in frequently.[49]

***- Viral pneumonia:**

Viral pneumonia occurs more frequently than bacterial pneumonias and are seen in children of all age-groups. They are often associated with viral (upper respiratory infections) and the pathologic changes involve interstitial pneumonitis with inflammation of the mucosa and the walls of bronchi and bronchioles ,Viruses that cause pneumonia in children include (R.S.V) in infants and Para influenza, influenza, and adenovirus in older children. There are few clinical symptoms to distinguish between the responsible organisms, and viruses can be differentiated only by laboratory examination .[50 , 51]

Symptoms caused by viruses are the same as those caused by bacteria. But they may come on slowly and often are not as obvious or as bad.

The onset may be acute or insidious, and symptoms vary from mild fever, severe cough and fatigue. Early in the illness, the cough is likely to be unproductive or productive of small amounts of whitish sputum. Breath sounds may include a few wheezes or fine crackles.

Radiography reveals diffuse or patchy infiltration with aperibronchial distribution., although viral infections of the respiratory tract render the affected child more susceptible to secondary bacterial invasion. [51].

***- Mycoplasma pneumonia:** (walking pneumonia)

This tiny organism causes signs and symptoms similar to those of other bacterial and viral infections, although symptoms appear more gradually and are often mild and flu-like. Child may not be sick enough to stay in bed or to seek medical care. That's why this type of pneumonia is often called walking pneumonia. Mycoplasma pneumonia spreads easily in situations where people congregate and is common among schoolchildren and young adults. Mycoplasma pneumonia responds well to treatment with the appropriate antibiotics, although child may continue to have a dry, nagging cough and continue to feel weak during convalescence.[52 , 53]

***- Fungal pneumonia.**

Certain types of fungus also can cause pneumonia, although these types of pneumonia are much less common. Most child experience few if any symptoms after inhaling these fungi, but some develop symptoms of acute pneumonia, and still others may develop a chronic pneumonia that persists for months . [54 , 55]

***- Pneumocystis carinii.**

Pneumonia caused by P. carinii is an opportunistic infection that affects child living with AIDS. Child whose immune systems are compromised by organ transplants, chemotherapy, or treatment with corticosteroids or other immune-suppressing drugs such as tumor necrosis factor (TNF) inhibitors also are at risk. The signs and symptoms of Pneumocystis carinii pneumonia include a cough that doesn't go away, fever and shortness of breath. [56 , 57]

***- Chemical Pneumonia:**

The severity of intensity of the manifestations of chemical pneumonia depends on three factors which should be considered in every case of aspiration or ingestion. The material ingested, the amount involved most chemical pneumonia seen in clinical pediatrics fall into one of two categories hydrocarbon and lipid pneumonias, some authorities believe that aspiration of lipids and hydrocarbons during swallwing, vomiting or gastric large is the cause of lung involvement (58 , 59)

***-Hydrocarbon Pneumonia:**

Kerosene, gasoline and turpentine are potentially harmful substances which are often accidentally ingested by children, particularly curious toddler other substances include furniture polish certain insect spray and lighter and cleaning fluids. If the amount swallowed is in excess of 10cc, the toxicity increases greatly, within an hour after ingestion nausea, Vomiting and coughing may occur with evidence of central nervous system involvement. Such as drowsiness'. Gastro interites will be present in those youngsters who have ingested kerosene, but it does not occur in those children who have swallowed gasoline, these patient are frequently febrile about 40 percent of these children develop pulmonary complications synosis and dysphea may also be manifested.(60 , 61)

On physical examination there may be suppressed breath sounds, rales, and diminished resonance on percussion. Although complications such as pnemothorax subcutaneous emphysema of the chest wall and pleural effusion including emypema may occur . recovery is in 3 to 7 days, the different in subsequent recovery depend upon the patient and in the case of a kerosene ingestion . (62).

***-Lipid Pneumonia:**

Lipid pneumonia caused by the aspiration or accumulation of oil in the alveoli is a chronic debilitated infants with improper swallwing or

depressed cough reflexes. In children who are force- fed or maintained in a horizontal position. The aspiration of milk is a common cause of lipid bronchopneumonia in the first year of life . As a rule, vegetable oils are the least toxic and the least irritating lipids they are not hydrolyzed by lung lipases. Cause little damage and are removed, mainly by expectoration. Further more, animal oils . are very dangerous because they have a very high fatty acid content, and when hydrolyzed by lung lipases the liberated fatty acids combine with those present in the originally aspirated substance and produce sever inflammatory responses. (63 , 64)

A cough is present and dyspnea may be evident in sever cases however there may be no other manifestation unless there is a superimposed infection. As expected secondary bronchopneumonic infection are common. The prognosis is dependent upon the extent of involvement . Treatment is symptomatic and the prevention of secondary infection is essential. Surgical resection may be considered later, should pulmonic involvement be localized to one segment or lobe. (65)

***- Primary atypical pneumonia:**

M. pneumonia is the most common cause of pneumonia in children between age 5 and 12 years. It occurs principally in the fall and winter months and is more prevalent in crowded living conditions.

The onset may be sudden or insidious and is usually accompanied by general systemic symptoms, including fever, chills (in older child), headache, malaise, anorexia, and muscle pain (myaegia). These symptoms are followed by rhinitis, sore throat, and a dry hacking cough. The cough initially non productive, produces seromucoid sputum that later becomes muco purulent or blood streaked. The degree of fever varies widely, and it may last from several days to 2 weeks. Dyspnea occurs in frequently. (66)

***-severe a typical pneumonia (Severe acute respiratory syndrome):**

A severe form of a typical pneumonia identified as severe acute respiratory syndrome (S.A.R.S) , is caused by a previously un recognized corona virus called SARs-Co-V. Clinical manifestations Include a fever , headache, cough, shortness of breath, difficulty breathing and dyspnea. In some patients the symptoms are severe enough to require intubations and mechanical ventilation. This form of pneumonia is spread by close contact with a person with SARs . Nursing care and management include hand washing and isolation. [67 , 68]

According to reports from the WHO, more than 8,000 child became sick with SARS during the outbreak. Of that group, 774 died. The outbreak is also an example of how quickly a networked health monitoring system can respond to an emerging threat [69]

The estimated incubation period is 2 - 10 days . While droplet transmission through close contact has been responsible for most cases of SARS, there is evidence that SARS might also spread by infected droplets carried on hands and other objects the droplets touch. Airborne transmission was a real possibility in some cases. Live virus had even been found in the stool of child with SARS, where it has been shown to survive for up to 4 days. And the virus may be able to live for months or years when the temperature is below freezing [70 , 71]

The best way to prevent SARS is to avoid direct contact with child who have SARS until 10 days after their fever and other symptoms are gone. Reduce travel to locations where there is an uncontrolled SARS outbreak. Wash hands often with soap and water, or use an alcohol-based instant hand sanitizer. Cover mouth and nose when sneezing or coughing. Clean commonly touched surfaces with disinfectant. In some situations, masks, and goggles may help prevent the spread of airborne or droplet

infection. Wear gloves when handling potentially infectious secretions. [72, 73]

2-**Types of pneumonia according to anatomic distribution;**

***-Bronchial pneumonia:**

Bronchial pneumonia happens when the pneumonia spreads to several patches in the lungs. is prevalent in infants, young children and aged adults and it is usually caused by Streptococcus pneumonia. Bronchial pneumonia also called as bronchopneumonia involves inflammation of the bronchial tubes due to infection. Bronchial pneumonia is not confined to a single anatomic location. Begins in the terminal bronchioles, which become clogged with muco purulent exudates to form consolidated patches in nearby lobules. Symptoms are typical , which cause cough , rapid breathing , chest pain and shortness of breath . In addition to fever , headaches and sweats . [74]

***- Lobar pneumonia:**

Lobar pneumonia is a form of pneumonia that affects a large and continuous area of the lobe of a lung. All or a large segment of one or more pulmonary lobes is involved. When both lungs are affected it is known as bilateral or double pneumonia. usually has an acute progression. The most common organisms which cause lobar pneumonia are *Streptococcus pneumoniae*, also called pneumococcus, and *Haemophilus influenzae* [74]

***- Interstitial pneumonia:**

Inflammatory process more or less confined within the alveolar walls (interstitial) and the per bronchial and interlobular tissues. Interstitial pneumonia A category of chronic lung diseases characterized by scarring and/or inflammation of the lungs which cause Fever , Fatigue , Muscle pain and Joint pain . [74]

3-Types of pneumonia according to IMCI:

***- No pneumonia:**

A child with cough or difficult breathing who has no general danger signs, no chest in drawing, no stridor when calm and no fast breathing is classified as having no pneumonia :cough or cold . [75 , 76]

***- Pneumonia:**

A child with cough or difficult breathing who has fast breathing and no general danger signs, no chest in drawing and no stridor when calm is classified as having pneumonia. A child with pneumonia needs treatment with an appropriate antibiotic **.**

***- severe pneumonia:**

A child with cough or difficult breathing and with any of the following signs—any general danger sign, chest in drawing or stridor in a calm child—is classified as having sever pneumonia or very sever disease .

A child with chest indrawing usually has severe pneumonia. Or the child may have another serious acute lower respiratory infection such as bronchiolitis, pertussis, or a wheezing problem. Chest indrawing develops when the lungs become stiff. The effort the child needs to breathe in is much greater than normal. A child with chest indrawing has a higher risk of death from pneumonia than the child who has fast breathing and no chest indrawing. If the child is tired, and if the effort the child needs to expand the stiff lungs is too great, the child's breathing slows down.

Therefore, a child with chest indrawing may not have fast breathing. chest indrawing may be the child's *only* sign of severe pneumonia.

A child classified as having sever pneumonia or very sever disease is *seriously* ill. He or she needs urgent referral to a hospital for treatments In very severe pneumonia the child has all previous manifestation plus the following danger signs:

- Grunting.
- Not able to drink.
- Abnormal sleep or difficulties.
- Severe mal nutrition

Hospitalization is indicated when pleural effusion or emphysema accompanies the disease. [77]

2.7- Diagnosis 0f pneumonia:

If pneumonia is suspected on the basis of a patient's symptoms and findings from physical examination, further investigations are needed to confirm the diagnosis. Information from a chest X-ray and blood tests are helpful, and sputum cultures in some cases. The chest X-ray is typically used for diagnosis in hospitals and some clinics with X-ray facilities. However, in a community setting (general practice), pneumonia is usually diagnosed based on symptoms and physical examination alone. Diagnosing pneumonia can be difficult in some child , especially those who have other illnesses. Occasionally a chest CT scan or other tests may be needed to distinguish pneumonia from other illnesses. [78]

1- Medical and Personal History:

The patient's history is an important part of making a pneumonia diagnosis. Patients should be sure to report any of the following:

- Drug abuse
- Exposure to people with pneumonia or other respiratory illnesses (such as tuberculosis)
- Occupational risks
- Recent or chronic respiratory infection
- Recent travel [79]

2-Physical examination:

Physical examination of the lungs may be normal, but often shows decreased expansion of the chest on the affected side, bronchial breathing

on auscultation with a stethoscope (harsher sounds from the larger airways transmitted through the inflamed and consolidated lung), and rales (or crackles) heard over the affected area during inspiration. Percussion may be dulled over the affected lung, but increased rather than decreased vocal resonance (which distinguishes it from a pleural effusion) While these signs are relevant, they are insufficient to diagnose or rule out a pneumonia; moreover, in studies it has been shown that two doctors can arrive at different findings on the same patient . [79]

Use of the Stethoscope.

The most important diagnostic tool for pneumonia is the stethoscope. Sounds in the chest that may indicate pneumonia include:

- Rales, a bubbling or crackling sound. Rales on one side of the chest or that are heard while the child is lying down strongly suggest pneumonia .
- Rhonchi, abnormal rumblings indicating that there is sputum in the large airways .

A dull thud. The examiners will use a test called percussion, in which the chest is tapped lightly. A dull thud, instead of a hollow drum-like sound, indicates certain conditions that suggest pneumonia. These conditions include consolidation (in which the lung becomes firm and inelastic) and pleural effusion (fluid build-up in the space between the lungs and the lining around it). [80]

3- Laboratory diagnosis :

An important test for pneumonia in unclear situations is

***- chest x-ray:**

Chest x-rays can reveal areas of opacity (seen as white) which represent consolidation. Pneumonia is not always seen on x-rays, either because the disease is only in its initial stages, or because it involves a part of the lung not easily seen by x-ray. In some cases, chest CT

(computed tomography) can reveal pneumonia that is not seen on chest x-ray. X-rays can be misleading, because other problems, like lung scarring and congestive heart failure, can mimic pneumonia on x-ray. Chest x-rays are also used to evaluate for complications of pneumonia. [81])

***- culture for sputum & blood:**

If antibiotics fail to improve the patient's health, or if the health care provider has concerns about the diagnosis, a culture of the child sputum may be requested. Sputum cultures generally take at least two to three days, so they are mainly used to confirm that the infection is sensitive to an antibiotic that has already been started. A blood sample may similarly be cultured to look for bacteria in the blood. Any bacteria identified are then tested to see which antibiotics will be most effective. [82]

***- complete blood count**

A complete blood count may show a high white blood cell count, indicating the presence of an infection or inflammation. In some child with immune system problems, the white blood cell count may appear deceptively normal. Blood tests may be used to evaluate kidney function (important when prescribing certain antibiotics) or to look for low blood sodium. Low blood sodium in pneumonia is thought to be due to extra anti-diuretic hormone produced when the lungs are diseased. [83]

***-Specific blood serology tests**

Specific blood serology tests for other bacteria (Mycoplasma, Legionella and Chlamydophila) and a urine test for Legionella antigen are available. Respiratory secretions can also be tested for the presence of viruses such as influenza, respiratory syncytial virus, and adenovirus. Liver function tests should be carried out to test for damage caused by sepsis. [84]

4-Invasive diagnostic procedures

Invasive diagnostic procedures may be required when:

- AIDS or other immune problems are present

- Patients have life-threatening complications
- Standard treatments have failed for no known reason [85]. Invasive procedures include:

***-Thoracentesis**

If a doctor detects pleural effusion during the physical exam or on an imaging study, and suspects that pus (empyema) is present, a thoracentesis is performed.

- Fluid in the pleura is withdrawn using a long thin needle inserted between the ribs.
- The fluid is then sent to the lab for multiple tests

Other diseases to be taken into consideration include bronchiectasis, lung cancer and pulmonary embolism . [85]

-Bronchoscopy:*

Bronchoscopy is an invasive test to examine respiratory secretions. It is not usually needed in patients with community-acquired pneumonia, but it may be appropriate for patients with severely compromised immune systems who need immediate diagnosis, or in patients whose condition has worsened during treatment [86]

***-Broncho alveolar lavage (BAL):**

(BAL) may be done at the same time as bronchoscopy. This involves injecting high amounts of saline through the bronchoscope into the lung and then immediately sucking the fluid out. The fluid is then analyzed in the laboratory. Studies find BAL to be an effective method for detecting specific infection-causing organisms. The procedure is usually very safe, but complications can occur [87]

***-Lung Biopsy:**

In very severe cases of pneumonia or when the diagnosis is unclear, particularly in patients with damaged immune systems, a lung biopsy

may be required. A lung biopsy involves taking some tissue from the lungs and examining it under a microscope. [87 , 88]

***-Lung Tap**

. This procedure typically uses a needle inserted between the ribs to draw fluid out of the lung for analysis. It is known by a number of names, including:

- Lung aspiration
- Lung puncture
- Thoracic puncture
- Transthoracic needle aspiration
- Percutaneous needle aspiration
- Needle aspiration

It is a very old procedure that is not done often any more, since it is invasive and poses a slight risk for collapsed lung. Some experts argue, however, that a lung tap is more accurate than other methods for identifying bacteria, and the risk it poses is slight. Given the increase in resistant bacteria, they believe its use should be reconsidered in young people [89]

5-Chest Therapy:

Chest therapy using incentive spirometry, rhythmic inhalation and coughing, and chest tapping are all important techniques to loosen the mucus and move it out of the lungs. It should be used both in the hospital and during recovery at home.[90]

Incentive Spirometry. The patient uses an incentive spirometer at regular intervals to improve breathing and loosen sputum. The spirometer is a hand-held clear plastic device that includes a breathing tube and a container with a movable gauge. The patient exhales and then inhales forcefully through the tube, using the pressure of the inhalation to raise the gauge to the highest level possible. . [90]

Rhythmic Breathing and Coughing. During recovery, the patient performs rhythmic breathing and coughing every 4 hours:

- Before starting the breathing exercise, the patient should tap lightly on the chest to loosen mucus within the lung. If available, a caregiver should also tap on the patient's back.
- The patient inhales rhythmically and deeply 3 or 4 times.
- The patient then coughs as deeply as possible with the goal of producing sputum [90]

Diagnostic Difficulties in Community-Acquired Pneumonia (CAP):

It is important to determine whether the cause of CAP is a bacterium, atypical bacterium, or virus, because they require different treatments. In children, for example, S. pneumonia is the most common cause of pneumonia, but respiratory syncytial virus may also cause the disease. Although symptoms may differ, they often overlap, which can make it difficult to identify the organism by symptoms alone. The cause of CAP is found in only about half of cases. Nevertheless, in many cases of mild-to-moderate CAP, the diagnose and treat pneumonia based solely on a history and physical examination. [90]

Diagnostic Difficulties with Hospital-Acquired (Nosocomial) Pneumonia:

Diagnosing pneumonia is particularly difficult in hospitalized patients for a number of reasons: Many hospitalized patients have similar symptoms, including fever or signs of lung infiltration on x-rays. In hospitalized patients, sputum or blood tests often indicate the presence of bacteria or other organisms, but such agents do not necessarily indicate pneumonia.[90]

***-Differential diagnosis;**

Several diseases and/or conditions can present with similar clinical features to pneumonia and as such care must be taken in the proper

diagnosis of the disease. Chronic obstructive pulmonary disease (COPD) or asthma can present with a polyphonic wheeze, similar to that of pneumonia. Pulmonary edema can be mistaken for pneumonia due to its ability to show a third heart sound and present with an abnormal ECG. (90)

2.8- Treatment of pneumonia :

Treatment depends on the type of pneumonia, severity of symptoms and age. For bacterial pneumonia, doctor will probably prescribe antibiotics. Most of symptoms should improve within a few days, although a cough can last for several weeks . For viral pneumonia, doctor will likely talk about ways to treat symptoms. Over-the-counter (OTC) medicines are available to lower fever, relieve pain and ease cough. However, some coughing is okay because it can help to clear lungs.(91)

For any type of pneumonia, it's important to get lots of rest and drink plenty of fluids is usually symptomatic and includes measures to promote oxygenation and comfort, such as oxygen administration with cool mist, chest physical therapy (C.P.T), and postural drainage, antipyretics for support. Although some authorities recommend antimicrobial therapy in the hope of reducing or preventing secondary bacterial infection, it is usually reserved such infection is demonstrated by appropriate cultures. The majority of older children with pneumococci pneumonia can be treated at home, especially if the condition is recognized and treated at early stage of infection. Bed rest, antibiotic therapy, oral fluid intake, administration of antipyretic for fever and anti tussive for dry hacking cough constitutes the principle therapeutic reassures .(91)

approach to treat patients with pneumonia

This approach generally involves:

1-Deciding who can be treated at home and who needs to be in the hospital

2-Deciding whether a patient needs antibiotics, and which antibiotics are appropriate

3-Providing appropriate supportive care

4-Deciding what follow-up and preventive care are needed [91]

Determining the Need for Hospitalization

Important factors used to make a decision include:

Demographics:

- Patients who have been living in a nursing home or other residential facility are of greater concern.

Infants, particularly infants who are less than 1 month old, are more likely to be admitted.

Other Medical Illnesses. Patients may be considered at greater risk if they have: Cancer, Heart failure, history of stroke, Kidney failure andLiver disease

Findings on a Physical Exam. Concerning findings include

- altered mental status (confused, less responsive)
- Appearance of being dehydrated, especially if the child is unable to drink fluids
- Fast breathing (more than 30 breaths per minute)
- Heart rate greater than 120 beats per minute
- Systolic blood pressure less than 90 mm Hg
- Temperature greater than 104° F. [91]

Laboratory and X-ray Findings. Laboratory findings that are of concern include:

- Elevated blood sugar

- Fluid in the sac around the lung (on chest x-ray)
- Low oxygen in the blood
- Low sodium levels
- Poor kidney function
- Significant anemia (hematocrit less than 30%) . [92]

Patients with very few of these risks often can be discharged with outpatient care only. This determination can often be done with a simple physical examination and history. Sometimes a patient only needs to be hospitalized for 24 hours for observation. Patients with higher scores on these assessment tests often have many risk factors and usually are hospitalized . When possible, treatment of community-acquired pneumonia should be started within 4 hours of admission to the emergency room or hospital to reduce the chances of mortality and decrease the amount of time a child needs to spend in the hospital. Home care may be possible, even in severe cases, when there is good support and available home nursing services. Often, caregivers can even be trained to administer intravenous antibiotics and chest therapy to patients at home. [92]

***-Home Treatment**

The following tips are suggested:

- Drink plenty of liquids.
- Do not suppress a cough. Coughing is an important reflex for clearing the lungs. Some doctors advise taking expectorants to loosen mucus. However, there is no proof that this products make much difference in outcome.
- Mild pain can be treated with acetaminophen (Tylenol), or ibuprofen (Advil, Motrin). For severe pain, codeine or another stronger pain reliever may be prescribed. It should be noted, however, that codeine

and other narcotics suppress coughing, so they should be used with care in pneumonia. Such pain relievers often require monitoring. [93]

- Practice chest therapy

***-Hospitalization Guidelines:**

Treatment. If the pneumonia is severe enough for hospitalization, the standard treatment is intravenous antibiotics for 5 - 8 days. In cases of uncomplicated pneumonia, many child may need only 2 or 3 days of intravenous antibiotics followed by oral therapy. Antibiotics taken by mouth are prescribed when the child has improved substantially or leaves the hospital. Any child admitted to the hospital (but not the ICU) be treated with fluoroquinolones or a beta-lactam plus a macrolide (preferably cefotaxime or ceftriaxone and ampicillin) .[94]

Duration of Stay. Child should remain in the hospital until all their vital signs are stable. Most children become stabilized in 3 days. Many experts use seven variables to measure stability and to determine whether the child can go home:

- Temperature. (Some experts believe that child can go home when their temperature drops to 101° F. Stricter criteria require that it be at or close to 98.6° F.)
- Respiration rate. (Goal is a normal breathing rate, although expert opinion differs on the degree of normality required to be discharged.)
- Heart rate. (Goal is 100 beats per minute or less.)
- Blood pressure. (Goal is systolic blood pressure of 90 mm Hg or greater.)
- Oxygenation. (Goal is determined by the physician.)
- The ability to eat. (Goal is regular appetite.)
- Mental function. (Goal is normal.) [94]

Patients or their families should discuss these criteria with their doctor. In a 2002 study, 42% of child who had two or more signs of instability when

they left the hospital were either readmitted or died within 30 days, compared with 10.5% of completely stabilized patients [95]

***-Nursing management:**

Pneumonia kills more children than any other disease. To reduce child pneumonia deaths by two- thirds if we scale up existing interventions to prevent pneumonia infections, protect children from conditions that increase the risk of pneumonia and treat infections that occurs with life – saving antibiotics .[96]

management should be applied according to level of prevention (primary , secondary and tertiary level)

1- Prevention (primary level)

A very common method for transmitting a cold is by shaking hands. Everyone should always wash hands before eating and after going outside. Ordinary soap is sufficient. Waterless hand cleaners that contain an alcohol-based gel are also effective for every day use and may even kill cold viruses. Daily diets should include foods such as fresh, dark-coloredfruits and vegetables, which are rich in antioxidants and other important food chemicals that help boost the immune system. Deep-breathing exercises and therapy to clear secretions help prevent pneumonia in child at high risk, such as a child had chest or abdominal surgery and debilitated child [97]

Several types of pneumonia can be prevented with the use of vaccines. Vaccines are available to protect against pneumococcal pneumonia, pneumonia caused by the bacterium Haemophilus influenzae, and pneumonia caused by the influenza virus, which also often leads to a secondary bacterial pneumonia. Child in high-risk groups are advised to receive the pneumonia vaccine. The vaccine is effective in approximately 80 percent of healthy young child ; however, it may be less effective in child in high risk groups. Healthy older adults usually need only one shot

for lifetime protection. Child with a chronic medical problem are encouraged to have the vaccine every 5 to 6 years. [98]

There isn't a vaccine for all types of pneumonia, but 2 vaccines are available. The first is called the pneumococcal conjugate vaccine (PCV). It is recommended for all children younger than 5 years of age. The pneumococcal polysaccharide vaccine (PPSV) is recommended for children 2 years of age and older who are at increased risk for pneumonia (such as children who have weakened immune systems). This vaccine is recommended if the child:

- Have certain chronic conditions, such as asthma, diabetes, heart disease or lung disease.
- Have cirrhosis.
- Have a condition that weakens immune system, such as the human immunodeficiency virus (HIV), acquired immunodeficiency syndrome (AIDS), kidney failure or a damaged spleen.
- Spleen removed for any reason.
- Have sickle cell disease.
- Have cochlear implants (an electronic device that helps in hear)
- Are taking medicine for a recent organ transplant (these medicines suppress immune system).
- Receiving chemotherapy. [99]

The pneumococcal vaccines can't prevent all cases of pneumonia. But they can make it less likely that child at risk will experience the severe, and possibly life-threatening, complications of pneumonia.

Vaccine to help prevent pneumonia are available .But research shows that they might not help every one. For some causes of pneumonia. The pneumococcal vaccine is safe, it works, and one shot lasts most child up to 10 years. Child who get the vaccine are protected against almost all of

the bacteria that cause pneumococcal pneumonia and other pneumococcal diseases as well. The shot, which is covered by Medicare, can be a lifesaver. There are many different kinds of pneumonia, and having one kind does not protect against the others. The vaccine, however, does protect against 88 percent of the pne umococcal bacteria that cause pneumonia. It does not guarantee that never get pneumonia. It does not protect against viral pneumonia. Most people need to get the shot only once. However some older people may need a booster; check with doctor to find out if this is necessary. (100)

The following tips can help prevent pneumonia:

Practice good hygiene. hands come in contact with many germs throughout the day. Pick them up from surfaces such as doorknobs, other people's hands and computer keyboard. Take time to wash hands often, especially after using the restroom and before eating. Use lukewarm water and soap for at least 20 seconds. If soap and water are not available, using an alcohol-based hand sanitizer is the next best thing..

Practice a healthy lifestyle. Eat a balanced diet full of fruits and vegetables. Exercise regularly. Get plenty of sleep. These things help immune system stay strong.

Avoid contact with smokers (negative smoking) . Smoking damages lung's .

Avoid sick people. Being around people who are sick increases risk of catching what they have. (101)

Nursing interventions (Secondary level) :-

Nursing interventions and responsibilities in caring for the patient with pneumonia include administering oxygen and medications as prescribed and monitoring for thier effects. Monitoring vital signs including oxygen level, monitoring lung sounds, watching for edema and patients feeling of shortness of breath. It may also include doing chest

physiotherapy, educating on the use of incentive spirometry and flutter valve. If the patient is immobile it is imperative that the patient be turned every two hours and encouraged to cough and deep breathe. If the patient has a tracheostomy proper trach care and suctioning after hyperoxygenating is also a responsibility. (101)

Nursing care of child with pneumonia is primary supportive and symptomatic but necessitates thorough respiratory assessment and administration of oxygen and antibiotics. The child respiratory rate and status as well as general disposition and level of activity are frequently assessed. Isolation procedures are instituted according to hospital policy rest and conservation of energy are encouraged by the relief of physical and psychologic stress. The child is disturbed as little as possible by clustering care to foster a regular sleep cycle. If the cough is disturbing the use of antitussives especially before rest time and meals is often helpful. To prevent dehydration. Fluids are frequently administrated intravenously during the acute phase.(101)

Oral fluids, if allowed, are given cautiously to avoid aspiration and to decrease the possibility of aggravating a fatiguing cough . If needed, supplemental oxygen may be administered by nasal cannula or rarely via a mist tent, newborns may receive oxygen via a plastic head hood. Children are usually more comfortable in a semi erect position but should be allowed to determine the position of comfort (lying on the affected side if pneumonia is unilateral) . Fever is controlled by the cool environment and administration of antipyretic drugs as prescribed. Temperature is monitored regularly to detect a rise that might trigger a febrile seizure . (101)

Vital sings and oxygenation are monitored to assess the progress of the disease and to detect early sings of complication, children with ineffectual cough or those with difficulty handling secretion s especially

infants, require suctioning to maintain a patent airway. A simple bulb suction syringe is usually sufficient for clearing the nares and naso pharynx of infants but mechanical suction should be readily available if needed: older children can usually handle secretion without assistance. Postural drainage and chest phase therapy are generally prescribed every four hour or more often depending on child condition . Child with pneumonia also need to clear secretions and benefit from deep-breathing exercises and therapy as well. If child with pneumonia are short of breath or their blood is low in oxygen, supplemental oxygen is provided. Although rest is an important part of treatment, moving often and getting out of bed and into a chair are encouraged. (102)

The nurse observe the child for signs of tension pnumo thorax due to empyema, particularly if the pneumonia is staphylococcal in origin an abrupt onset of pain, dyspnea cyanosis and absent or diminished chest movement on one side indicates the need for a Thoracentesis..(102)

*** Tertiary prevention**

Tertiary prevention can be very effective in reducing the severity and progression of disease and injury, limiting disabilities and improving suffering people's quality of life. According to "Prevention of Disease -- Tertiary Prevention," "Tertiary prevention efforts have demonstrated that it is possible to slow the natural course of some progressive diseases and prevent or delay many of the complications associated with diseases."

***-Medical treatment**

Dozens of antibiotics are available for treating pneumonia, but selecting the best drug is sometimes difficult. Patients with pneumonia need an antibiotic that is effective against the organism causing the disease. When the organism is unknown, "empiric therapy" is given, based on factors such as the patient's age, health, and severity of the illness. (103)

In determining the appropriate antibiotic, the physician must first answer a number of questions:

- How severe is the pneumonia? Mild-to-moderate cases can be treated at home with oral antibiotics, while severe pneumonia usually needs intravenous antibiotics administered in the hospital.
- If the organism causing the pneumonia is not known, was the disorder community- or hospital-acquired? Different organisms are usually involved in each setting, and the physician can use this information to guess the most likely organism causing the pneumonia.
- If the organism is known, is it typical or atypical ?
- Does the patient have an impaired immune system? Antibiotics used to treat such patients may differ from those used in patients with healthy immune systems.(103)

Exact duration of antibiotic therapy 7 - 10 days of treatment for *S.* pneumoniae and 10 - 14 days for Mycoplasma pneumoniae and Chlamydia pneumoniae. patients with mild-to-moderate community-acquired pneumonia may be successfully treated with 7 days or less of antibiotics. The shorter treatment may increase patient tolerance, and improve the likelihood of adherence to the treatment regimen, as well as help limit the growing problem of antibiotic resistance. (32) Patients with viral pneumonias are at risk for what are called "super infections," which generally refers to a secondary bacterial infection, usually caused by S. pneumoniae, S. aureus, or H. influenzae. (104)

1-Antibiotic and Antiviral Drug Classes (first line of medical treatment)

***Beta-Lactams** , They include penicillins, cephalosporins, and some newer similar medications. They interfere with bacterial cell walls.*(94)(104)*

***Macrolides and Azalides**

Macrolides and azalides also affect the genetics of bacteria. These medications include: Azithromycin (Zithromax, Zmax) Clarithromycin ,Erythromycin, These antibiotics are effective against atypical bacteria such as mycoplasma and chlamydia. Macrolides are also used in some cases for S. pneumoniae and M. catarrhalis, but there is increasing bacterial resistance to these agents. All but erythromycin are effective against H. influenzae. azithromycin (Zmax) is the first anti-pneumonia antibiotic that can be given in a single dose. It is effective against Gram-positive, Gram-negative, and atypical pathogens[(94)(104)]

***Ketolides**. Ketolides are a new class of antibiotic drugs. They are derived from erythromycin and were developed to combat organisms that have become resistant to macrolides.[(94 , 104)]

***Aminoglycosides**

Aminoglycosides (gentamicin, kanamycin, tobramycin, amikacin) are given by injection for very serious bacterial infections. They can be given only in combination with other antibiotics. Some are available in inhaled forms or by applying a solution directly to mucus membranes, skin, or body cavities. They can have very serious side effects, including: Balance problems, Hearing damage and Kidney damage. [(94 , 104)]

***Glycopeptides**.

Glycopeptides (vancomycin, teicoplanin) are used for Staphylococcus aureus infections that have become resistant to standard antibiotics. The drug can be taken by mouth or given intravenously. The latest generation of glycopeptides, a derivative of vancomycin, is called telavancin. Currently in phase III studies of hospital-acquired pneumonia, it looks positive for the treatment of Gram-positive pneumonia. [(94 , 104)]

*** Inhaled polymyxin**, a drug used in cystic fibrosis patients, is showing efficacy against pneumonia caused by multidrug-resistant Gram-negative

bacteria, including pseudomonas and klebsiella [94 , 104]

2-Surgical treatment (second line of medical treatment)

Although most patients with pneumonia do not need invasive therapy, it may be necessary in patients with abscesses, empyema, or certain other complications.([105]

***Thoracotomy:**

Thoracotomy is the standard surgery for pneumonia. It requires general anesthesia and an incision to open the chest and view the lungs. This procedure allows the surgeon to remove dead or damaged lung tissue. In severe cases, the entire lobe of the lung is removed. This is called a lobectomy. Remaining healthy lung tissue re-expands after surgery to make up for tissue that has been removed.[105]

***Chest Tubes:**

Chest tubes are used to drain infected pleural fluid. Tubes are not typically required for pneumonia or abscesses. The tubes are inserted after the patient is given a local anesthetic. They remain in place for 2 - 4 days, and are removed in one quick movement. This can be very distressing, although some patients experience no discomfort [105]

2.9- Complication of pneumonia ;

Every year, while five million patients receive treatment for pneumonia, over 60,000 die from this respiratory infection. An individual's risk of contracting pneumonia depends on: Age, current state of health, occupation and particular strain of infection. Serious pneumonia and pediatric pneumonia complications can occur if a patient does not receive the necessary treatment for his infection. [104] [105]

Pneumonia complications can include: Pleurisy ,Lung necrosis Lung cavitations - hollow cavities forming ,Lung scar tissue, Lung abscess ,Pulmonary consolidation, Abdominal pain, Breath sounds , bronchial Haemoptysis and Vocal fremitus increased .[105]

***Abscesses:**

An abscess is a pus or liquid-filled cavity that develops in the lung. While abscesses are usually treated with antibiotics, in rare cases, they may need to be surgically removed.. An abscess in the lung is a thick-walled, pus-filled cavity that forms when infection has destroyed lung tissue. It typically occurs as a result of aspiration pneumonia, when a mixture of organisms is carried into the lung. Untreated abscesses can cause hemorrhage (bleeding) in the lung, but targeted antibiotic therapy significantly reduces their danger. Abscesses are more common with Staphylococcus aureus, Pseudomonas aeruginosa, or Klebsiella pneumoniae, and are uncommon with Streptococcus pneumoniae. [36]

***Acute Respiratory Distress Syndrome (ARDS):**

ARDS is a pneumonia complication that occurs when the inflammation or fluid build-up in the lung lead to low oxygen levels in the blood. Any disease that injures or distresses the lungs, including pneumonia, can cause ARDS. ARDS Symptoms include blue lips or skin (cyanosis), breathing difficulties, low blood pressure and shock. This symptoms, seek immediate medical attention.[36]

***Bacteremia:**

Bacteria in the blood - is the most common complication of pneumococcus infection, although it rarely spreads to other sites. Bacteremia is a frequent complication of infection from Gram-negative organisms, including Haemophilus influenzae Bacteremia occurs when the bacteria causing pneumonia spreads into a patient's bloodstream. It is the most common pneumonia complication and is quite dangerous. Once in the bloodstream, infectious bacteria can spread to other organs, like the brain, and cause abscesses that must be removed. Septicemia is one type of bacteria notorious for spreading throughout the body. [42]

***Collapsed lungs:**

In some cases, air may fill up the area between the pleural membranes, causing the lungs to collapse. This is called pneumothorax. It may be a complication of pneumonia (particularly Streptococcus pneumoniae) or of the invasive procedures used to treat pleural effusion.(9)Also When pneumonia causes fluid to build up in the lungs, it generally accumulates between the pleura (the transparent membrane that covers the lungs) and the lungs themselves. If this fluid continues to build up and isn't drained, it can cause the lungs to collapse from excessive pressure. (42)

***Hemoptysis:**

This pneumonia complication causes patients to cough up blood. It typically occurs in patients who also suffer from other lung illnesses like cystic fibrosis. (43)

***Respiratory Failure:**

Respiratory failure is one of the top causes of death in patients with pneumococcal pneumonia. Acute respiratory distress syndrome (ARDS) is the specific condition that occurs when the lungs are unable to function and oxygen is so severely reduced that the patient's life is at risk. Failure can occur if pneumonia leads to mechanical changes in the lungs (ventilatory failure) or oxygen loss in the arteries (hypoxemic respiratory failure). (43.)

***Pleural Effusions and Empyema.**

The pleura are two thin membranes that line the chest and lungs:The visceral pleura cover the lungs and parietal pleura cover the chest wall.

In some cases of pneumonia the pleura become inflamed, which can result in breathlessness and acute chest pain when breathing.In about 20% of pneumonia cases fluid builds up between the pleural membranes, a condition known as pleural effusion. Ordinarily, the narrow zone

between the two membranes contains only a tiny amount of fluid, which lubricates the lungs.In most cases, particularly in Streptococcus pneumoniae, the fluid remains sterile (no bacteria are present), but occasionally it can become infected and even filled with pus, a condition called empyema. Empyema is more likely to occur with specific organisms such as Staphylococcus aureus or Klebsiella pneumoniae infections. The condition can cause permanent scarring. (38)

***Complications in heart, brain and kidny**

While infants are susceptible to developing the above pneumonia complications, they are also especially at risk for developing meningitis, an infection and inflammation of the tissue lining the brain and spinal cord. Because meningitis is fatal, infants with pneumonia should be hospitalized for immediate medical care . In rare cases, infection may spread from the lungs to the heart and possibly throughout the body. This can cause abscesses in the brain and other organs. increased risk of acute heart problems, such as heart attack or arrhythmia. Kidney complications and electrolyte imbalances are common in patients admitted to the hospital with pneumonia. If not treated, these problems cause more severe illness and increase the risk of death . Research has suggested that the C. pneumoniae may trigger the immune system to react. This may cause inflammation and damage over time in the arteries of the heart and elsewhere, a process called atherosclerosis or hardening of the arteries. Atherosclerosis can lead to heart attacks and strokes.(41)

3-Material and Methods

Subjects and methods of this study presented under four main designs as follows:

1- Technical design.

2- Operational design.

3- Administrative design.

4- Statistical design.

1) Technical Design

Technical design of the study included research design, setting, subjects, and tools of data collection.

Research design

A quasi-experimental design used in the conduction of this study.

Setting

This study was carried out at Al-mak Nemir university hospital and Shendi teaching hospital at Shendi city, River Nile State, Sudan .

Subjects

The population of this study was constituted of all the nurses (either diploma nurses or faculty of nursing graduates regardless of their age) who were caring for children with pneumonia at Al-mak Nemir university hospital .and Shendi teaching hospital during the period of study.

Exclusion criteria

- nurses during the houseman period
- Nurses who working as part- timers.

Sampling technique and Sample Size:

All the nurses on pediatric ward who were caring for children with pneumonia at El-mak Nemir university hospital (45 nurses) and all the nurses on pediatric ward at Shendi teaching hospital (15 nurses) with the total number of all nurses on the study (60 nurses) constitute the

size of these sample . Each nurse was observed twice before and after implementing the program.

Tools of Data Collection:

Two tools were used to collect the necessary data to achieve the aim of this Study, namely :

1- Structured Interview Sheet

2- Observational Checklist

1. Structured Interview Sheet

A structured interview sheet was developed by the researcher. It included four parts :

The first Part –

The first part used to collect data about socio-demographic characteristics of the studied nurses including age, sex, educational level. This part included (8) closed questions

The second Part –

The second part was developed to collect data about the nurse's knowledge on respiratory system such as structure of respiratory system ,and constituents of upper and lower respiratory system . This part included (2)closed questions

The third Part

The Third part included thirteen (13) closed questions testing the knowledge of the nurses on the study about pneumonia such as definition, causes, mode of transmitions, risk factors and clinical features.

The fourth Part

The fourth part included twenty one (21) closed questions to collect data about the nurses knowledge on nursing assessment and nursing procedures that are applied to children with pneumonia.

2-Observational Checklist

An observational checklist was designed by the researcher to check the steps of the procedures . This checklist included important procedures to collect data about the nurses practice applied to patient with pneumonia .every procedure include important steps . To evaluate the performance of nurses at the different procedures the researcher used the following grads on assessing the performance of the subject (Good, Fair & poor)

Good for the best performance of the procedure is considered as (3) three

Fair for the average performance of the procedure is considered as (2)

Poor for those how fails to perform satisfactory is considered as (1) one .

The check list was divided farther into eleven (11) check list for the different procedure , to evaluate each procedure may have different steps to be checked .

Score system.

The total grade score in every procedure is considered as good if the nurse scored between > 2- 3n where (n) is the number of steps, and considered fair if score > 1-2n and considered poor if scored one n or less. For this the total number of degree may vary. For rescue breathing in infant & oxygen administration 0 – 14 poor performance , 15 – 28 fair performance , 29 – 42 good performance . For rescue breathing in child 0 – 15 poor performance , 16 – 30 fair performance , 31 – 45 good performance . For airway maintenance 0 – 8 poor performance , 9 – 16 fair performance , 17 – 24 good performance .

For postural drainage, vibration & manual ventilation 0—17 poor performance ,18 – 34 fair performance , 35 – 51 good performance . For percussion 0—18 poor performance ,19 – 36 fair performance , 37—54 good performance . For coughing exercise 0—13 poor performance ,

14 – 26 fair performance , 27 – 39 good performance . For tracheal suction 0—19 poor performance , 20 – 38 fair performance , 39 – 57

good performance . For pulse ox meter 0 – 11 poor performance , 12 – 22 fair performance and 23 – 33 good performance .

(2) Operational Design

Operational design included a pilot study , ethical consideration and a field work.

Pilot Study

A pilot study carried out after the development of the study and before embarking on the actual study (data collection). It was conduct during august 2010 in order to test applicability of the tools of data collection, and to estimate the time required for filling the required forms , It was carried out on (8 nurses) to evaluate the contents of the tools so as to find out if the items were under stood by the nurses . The results of this pilot study were as follows :

-- The nurses understand the method used to fulfill each tool . They commented that some items needed to be modified .

-- Based on this pilot results modifications were made , and at the end the researcher was satisfied that each tool is most likely going to achieved the aim of the study . The samples of pilot study were not included in the research result.

Ethical consideration

Before conducting the study, nurses were assured that the data collected from this questionnaire will remain confidential and that no personal identification will be included . The required steps were taken to get the approval to carry out the study , from the directorate of hospitals . Letters of their agreement were issued .The researcher also met with nurses and explained to them the purpose of the study , and took their approval .

Educational Program

Each nurse in the study was individually interviewed to assess his or

her knowledge about pneumonia and its care. The researcher used interview sheets to collect the data about nursing knowledge and the checklist to collect data about nursing practice to be able to assess the needs of the study group after the analysis of the data . Collection of data and analysis in this step took three months. An educational program to study group was then designed by the researcher based actual assessment of nurse's needs. The intervention program was implemented to the nurses in small groups. The researcher distributed the study group (60 nurses) into four (4) small groups, each group includes (15) nurses. (One study group on Shendi teaching hospital and three groups on El Mak Nemir university hospital). This implementation program was conducted as ten (10)lectures , five lectures for knowledge & five lectures for procedures .This step took two months on teaching (8 weeks) ,

These lectures were given on four (4) sections, every section conducted in two weeks .

Section One

Included information about respiratory system and acute respiratory infections. Different teaching methodos as lectures and discussion groups were used .This section was conducted on one lecture (one hours)

Section Two

Included information about pneumonia (definitions , it causes , symptoms &signs and classification) this section was conducted in three lectures (three hours).

Section Three

Included information about the methods of treatment and advices given to the patient about the danger signs .This section was given in one lecture (one hours).

Section Four

Included important nursing procedures applied to the patient with

pneumonia. . In this section the researcher used checklist for these procedures. Different teaching methodology were used ,such as lectures ,demonstration, and redemonstration on the skill lab and used models to demonstrate the information of the particular procedure This section took five lectures (5 hours) to be conducted, every lectures was constituted of two procedure .

Also different assisting learning methods were also used in all sections such as hand outs , small books, photos , posters, and real equipments. Every lecture was given four times during the period of implementation to cover all the four groups .The rest period after implementing the program six (6) month .

(3) Administrative Design

To conduct the study the permission and the approval of the directors of the two hospitals and of the pediatric consultants was taken through the Dean of the Faculty of post graduate studies . The researcher assured them that all the information obtained is going to be confidential and will be used only for purpose of the this study.

(4) Statistical Design

The collected data in pretest and post test was organized, and analyzed statistically using percentage , chi- square test and one way a nova test to find out the relation . using an a computerized statistical package for social sciences (SPSS version) . The result were demonstrated as tables showing numbers and percentages .

4-Results

The results of current study are presented into the following sequences :

Part 1 : characteristics of study population . Table 1 ----- table 2

Part 11 : Knowledge of study population regarding to respiratory system & pneumonia . Table 3---- table 22

Part 111: Study population skills and performance in management of pneumonia . Table 23 ----- table 26

Table (1) Shows distribution of the study population according to socio-demographic characteristic (sex, age, marital status and address)

Study group		
Variable	**Frequency**	**Percent**
Sex		
Male	5	8.3%
Female	55	91.7%
Age		
< 25 year	14	23.3%
25-35 year	42	70.0%
36-45 year	3	5.0%
> 45 year	1	1.7%
Marital status		
Single	34	56.6%
Married	24	40.0%
Divorced	1	1.7%
Widowed	1	1.7 %
Total	60	100%

Table No (1) shows that most of study group are females . They constituted 91.7 % .And most (70%) of the nurses in this study were in age range 25- 35 year . Also more than half (56.7%) of the studied nurses were single .

Table (2) Shows distribution of the study population according to socio-demographic characteristic (Academic qualification and years of experience)

Study group		
Variable	**Frequency**	**Percent**
Academic qualification		
Technique certificate	6	10.0%
Intermediate diploma	8	13.3%
B S c	36	60.0%
Master	10	16.7%
Years of experience		
1-3 years	18	30.0%
3-6 years	31	51.7%
> 6 years	11	18.3%
Total	60	100%

Table No (2) shows that more than half (60%) of study group have a BSC as their academic qualification . 23.3% of the nurses of the study group are either having a technique certificate or intermediate diploma . The years of experience is more or less similar as one third of the study group (30%) are having an experience of 1-3 years . More than half (51.7%) their experience 3-6 years .

Table (3) distribution of Study group (pre & post intervention) in relation to their knowledge about component of upper & lower respiratory tract.

Variables	Study group				P -value
	Before Program		After Program		
	Frequency	percent	Frequency	percent	
Component of URT					
Mouth	3	5.0%	0	0.0%	0.002
Nose	21	35.0%	4	6.7%	
Larynx	3	5.0%	2	3.3%	
All the above	30	50.0%	54	90.0%	
Don't know	3	5.0%	0	0.0%	
Component of LRT					
Trachea	8	13.3%	4	6.7%	0.002
Lungs	30	50.0%	18	30.0%	
Both of them	22	36.7%	38	63.3%	
Total					

Table No (3) clarifies that half (50.0%) of study group have good knowledge about all the components of URT in the preprogram testing , and their knowledge in this regard rises to (90.0%) in the post program checking , with highly significant statistical different (p- value < 0.05) .

About the knowledge of component of lower respiratory tract only 36.7% of study group were aware about that regard in pre program results . After interventional program their knowledge rises to 63.3% .With significant statistical different .(p value < 0 .05)

Table (4) distribution of Study group (pre & post intervention) in relation to the knowledge of the nurses about the definition of pneumonia & its location in the respiratory tract.

Variables	Study group				P – value
	Before Program		After Program		
	Frequency	percent	Frequency	percent	
Definition					
Inflammation of alveoli	9	15.0%	5	8.3%	0.001
Incidence of bacteria, virus in lungs	13	21.7%	5	8.3%	
Acute infection affects lungs	17	28.3%	7	11.7%	
All the above	19	31.7%	43	71.7%	
I don't know	2	3.3%	0	0.0%	
Part of infection					
UR system	4	6.7%	5	8.3%	0.001
LR system	32	53.3%	41	68.3%	
Both of them	24	40.0%	14	23.3%	
Total	60	100%	60	100%	

Table No (4) explains that the study group have poor knowledge about definition of pneumonia in the preprogram testing as 31.7 % were knowledge about the definition, this knowledge increased after program to 71.7% . About the part of the respiratory tract that is affected by pneumonia , more than half (53.3%) have good knowledge in preprogram testing while their knowledge increased in post program to 68.3% with a significant statistical difference (p value < 0.05) .

Table (5)) distribution of Study group (pre & post intervention) in relation to the knowledge of the nurses about causes of Pneumonia & the age group mostly affected with Pneumonia.

Variables	Study group				P –value
	Before Program		After Program		
	Frequency	percent	Frequency	percent	
Causes					
Bacteria	5	8.3%	4	6.7%	0.003
Fungi	3	5.0%	2	3.3%	
Virus	36	60.0%	7	11.7%	
All above	11	18.3%	46	76.7%	
I don't know	5	8.3%	1	1.6%	
Age categories					
New Born	12	20.0%	9	15.0%	0.002
Infant	26	43.3%	12	20.0%	
Early child hood	13	21.7%	8	13.3%	
All age group	9	15.0%	31	51.7%	
Total	60	100%	60	100%	

Table No (5) shows that the study group have poor knowledge about causes of pneumonia in preprogram testing as less than quarter (18.3%) were aware of all the causative organism . This is in contrast to the post intervening checking where this awareness rises to 76.7% with significant statistical different (p – value < 0.05) .

Concerning knowledge about age groups affected with pneumonia 15.0% were aware about the all age group affected with pneumonia in preprogram checking . The post intervention results showed an increased to 51.7 % with significant statistical different .

Table (6)) distribution of Study group (pre & post intervention) in relation to the knowledge of the nurses about types, classification & principles of classification of Pneumonia.

Variables	Study group				P -value
	Before Program		After Program		
	frequency	percent	Frequency	percent	
Knowledge about types of Pneumonia					
Types	48	80%	54	90.0%	0.05
One type	12	20%	6	10.0%	
Knowledge about classification					
Know○○	51	85.0%	55	91.7%	0.05
Doesn't know	9	15.0%	5	8.3%	
Principles of classification					
Infected part of ○○ lung	29	56.9%	5	9.1%	
Causative agent	3	5.9%	3	5.5%	
Clinical features	7	13.7%	6	10.9%	
All the above	12	23.5%	41	74.5%	
Total	51	100%	55	100%	

Table No (6) reveals that most of study group have good knowledge about types & classification of pneumonia in preprogram testing while their knowledge increased in post program to 90.0% for types , with significant statistical test (p value equal 0.05) . About principles of classification the study group have poor knowledge in pre program testing as only 23.5% were aware about that . The post intervention results showed an increase to 74.5 % with significant statistical test (P value equal 0.05) .

Table (7)) distribution of Study group (pre & post intervention) in relation to the knowledge of the nurses about predisposing factors for Pneumonia.

Variables	Study group				P -value
	Before Program		After Program		
	Frequency	percent	Frequency	percent	
Knowledge about risk factors					
Know	50	83.3%	54		0.04
Not know	10	16.7%	6		
Types of risk factors					
Small age	6	12.0%	4	7.4%	0.001
Low immunity	9	18.0%	6	11.1%	
Abnormality on respiratory system	5	10.0%	3	5.6%	
Environmental pollution	4	8.0%	5	9.3%	
Asthma	6	12.0%	5	9.3%	
All the above	20	40.0%	31	57.4%	
Total	60	100%	60	100%	

Table No (7) show that most (83.3%) of study group have good knowledge about the presence of predisposing factors for pneumonia in pre program testing .But have poor knowledge about the actual factors predisposing to pneumonia in the preprogram testing as only 40.0 % were aware about that . This is awareness rises to 57.4 % with significant statistical different (p- value < 0.05) after intervention of the program .

Table (8)) distribution of Study group (pre & post intervention) in relation to the knowledge of the nurses about clinical features, occurrence of these clinical feature in all types of Pneumonia and difference in these clinical features according to causes of Pneumonia.

Variables	Study group				P – value
	Before Program		After Program		
	Frequency	percent	Frequency	percent	
Clinical features					
Fever	9	15.0%	8	13.3%	0.002
Cough	9	15.0%	6	10.0%	
Chest pain	10	16.7%	3	5.0%	
Difficult breathing	8	13.3%	7	11.7%	
All above	2	3.3%	28	46.7%	
Don't know	22	36.7%	8	13.3%	
Are symptoms & sign similar in all types of Pneumonia					
Yes	43	71.7%	20	33.3%	0.002
No	17	28.3%	40	66.7%	
Do symptoms & sign differ according to causes					
Yes	42	70.0%	20	33.3%	0.001
No	18	30.0%	40	66.7%	
Total	60	100%	60	100%	

Table No (8) illustrates that 36.7 % of study group don't know about clinical feature of pneumonia , and only 3.3% know about all the clinical features in preprogram checking . After the intervention program only 13.3 % were still not aware about clinical features compared to

46.7% got familiar with all clinical features of pneumonia . With significant statistical difference (p value < 0.05)

In pre intervention testing 71.8 % of study group were think that sign and symptoms are similar in all types of pneumonia , this percentage drop to 33.3% after intervention of program . Also preprogram results showed that 70% of the study group think that there is differences in sign and symptoms according to causes of pneumonia . Compared to 66.7% get the knowledge after intervention of program with significant test (P- value < 0.05) .

Table (9) distribution of Study group (pre & post intervention) in relation to the knowledge of the nurses about method (ways) of transmission of pneumonia .

Study group					P - value
Variables	Before the program		After the program		
	Frequency	percent	Frequency	percent	
Inhalation of contaminated air	36	60.0%	13	21.7%	0.005
Use equipment of patients	5	8.3%	5	8.3%	
All the above	19	31.7%	42	70.0%	
Total	60	100.0%	60	100.0%	

Table No (9) explains that concerning the knowledge about modes of transmission of pneumonia 60% of the study group were aware that it can be transmitted by inhalation of contaminated air . While only 8.3% were aware that use of equipment of patient can transmit it .Also only 31.7% were aware that both modes transmit the disease . This was in the pre intervention checking . This awareness rises to 70.0% in post intervention checking .with significant statistical difference between pre & post intervention (p value < 0.05) .

Table (10):) distribution of Study group (pre &post intervention) in relation to the knowledge of the nurses about nursing management for child with pneumonia

Study group					P – value
Variables	Before the program		After the program		
	Frequency	percent	Frequency	percent	
Give antibiotic	8	13.3%	4	6.7%	0.004
Give oxygen	6	10.0%	5	8.3%	
Give more fluids	9	15.5%	3	5.0%	
General observation	5	8.3%	4	6.7%	
All the above	32	53.3%	44	73.3%	
Total	60	100.0%	60	100.0%	

Table No (10) reveals that 53.3 % of the study group were knowledgeable about all modalities of nursing management before intervention . This rise to 73.3% after intervention of program . With significant statistical difference between pre & post intervention (p value < 0.05) .

Table (11):) distribution of Study group (pre & post intervention) in relation to the knowledge of the nurses about methods of diagnosis of pneumonia

Study group					P – value
Variables	**Before the program**		**After the program**		
	Frequency	**percent**	**Frequency**	**percent**	
Clinical Examination	12	20.0%	10	16.7%	0.002
Medical history	3	5.0%	4	6.7%	
Chest X-Ray	13	21.7%	10	16.7%	
Clinical feature	17	28.3%	4	6.7%	
All the above	11	18.3%	31	51.7%	
I don't know	4	6.7%	1	1.7%	
Total	60	100.0%	60	100.0%	

Table No (11) clarifies that only 18 % of study group know all the methods used for diagnosis of pneumonia before intervention . The percentage rises to 51.7% after intervention of program .with significant statistical different (p value < 0.05) .

Table (12)) distribution of Study group (pre & post intervention) in relation to their knowledge about the Benefit of using the stethoscope in the diagnosis and the correct site of chest for using stethoscope to hear respiratory sounds .

Variables	Study group				P – value
	Before Program		After Program		
	Frequency	percent	Frequency	percent	
Is there is a benefit of using stethoscope in diagnose					
Yes	48	80.0%	53	88.3%	0.005
No	12	20.0%	7	11.7%	
Correct site on chest for using stethoscope					
Intercostals space	16	26.7%	40	66.7%	0.002
Directly over the rips	9	15.0%	8	13.3%	
I don't know	35	58.3%	12	20.0%	
Total	60	100.0%	60	100.0%	

Table No (12) explains that most (80%) of study group ware aware about the benefit of using stethoscope in diagnosis of pneumonia in preprogram testing . The percentage of hole who become aware of the benefit of stethoscope to diagnose pneumonia rises to 88.3% with significant statistical difference (p- value < 0.05) .

Concerning the sites to put the stethoscope only 26.7% of study group were aware about the correct site before intervention . This awareness has developed to 66.7% with significant statistical test (p-value $< 0,05$) .

Table (13)) distribution of Study group (pre & post intervention) in relation to their knowledge about distinguish of normal chest sounds and other chest sounds occurring with Pneumonia.

Variables	Study group				P - value
	Before Program		After Program		
	Frequency	percent	Frequency	percent	
Is it able to distinguish normal chest sound					
Yes	43	71.6%	51	85.0%	0.01
No	17	28.3%	9	15.0%	
Kind of chest sound occur with disease					
Wheezes	12	27.9%	12	23.5%	0.05
Stridor	2	4.7%	3	5.9%	
Crackles	3	7.0%	4	7.8%	
All of the above	26	60.4%	32	62.7%	
Total	43	100.0%	51	100.0%	

Table No (13) illustrates that 71.6 % of study group were aware about the normal chest sound in preprogram testing , with significant statistical test (p- value < 0.05) . More than half (60.4%) of study group were aware about the all types of chest sound that occur with the diseases in preprogram results , this awareness show minim raised (62.7%) after intervention of the program . with significant statistical difference (p value equal 0.05) .

Table (14):) distribution of Study group (pre & post intervention) in relation to their knowledge about the percussion note .

Study group					P – value
Variables	**Before the program**		**After the program**		
	Frequency	**percent**	**Frequency**	**percent**	**0.003**
Tympany	3	5.0%	2	3.3%	
Dullness	5	8.3%	4	6.7%	
Stony dullness	3	5.0%	2	3.3%	
All above	3	5.0%	40	66.7%	
Don't know	46	76.7%	12	20.0%	
Total	60	100.0%	60	100.0%	

Table No (14) show that 76.7 % of study group were not aware about abnormal chest sound in percussion in pre program testing .Knowledge increased to more than half (66.7%) after intervention of the program. With significant statistical test (p value < 0.05)

Table (15) distribution of Study group (pre & post intervention) in relation to their knowledge about the sites of chest retraction .

Variables	Study group				P - value
	Before the program		After the program		
	Frequency	percent	Frequency	Percent	0.001
Intercostal	3	5.0%	2	3.3%	
Retrosternal	2	3.3%	2	3.3%	
Suprasternal	3	5.0%	2	3.3%	
Supraclvicular	3	5.0%	2	3.3%	
Substernal	3	5.0%	1	1.7%	
Subcostal	2	3.3%	3	5.0%	
All above	8	13.3%	38	63.3%	
Don't know	36	60.0%	11	18.3%	
Total	60	100%	60	100%	

Table No (15) reveals that more than half (60%) of study group were not aware about the sites of chest retraction in pre program checking . After conduction of the program 63.3% became aware about all sites of chest retraction, with significant statistical difference between pre & post intervention (P value < 0.05) .

Table (16)) distribution of Study group (pre & post intervention) in relation to their knowledge about ability and type of Pneumonia treated at home.

Variables	Study group				P – value
	Before Program		After Program		
	Frequency	percent	Frequency	percent	
Does he know how to treat pneumonia at home					
Yes	35	58.3%	52	86.7%	0.005
No	25	41.7%	8	13.3%	
Awareness about type s of pneumonia treated at home					
No pneumonia	12	34.3%	33	63.5%	0.003
Pneumonia	7	20.0%	8	15.4%	
Sever pneumonia	3	8.6%	3	5.8%	
I don't know	13	37.1%	8	15.4%	
Total	35	100.0%	52	100.0%	

Table No (16) reveals that 58.3% of study group have know how treat pneumonia at home in pre program checking .These rises to 86.7% after intervention program With significant statistical difference between pre & post intervention (P value < 0.05) .

Concerning the types of pneumonia that are supposed to be treated at home 37.1% are lacking knowledge about them in the pre intervention checking . This drops to 15.4% after intervention program with significant statistical difference between pre & post intervention (p value < 0.05).

Table (17) :) distribution of Study group (pre & post intervention) in relation to their knowledge about type of pneumonia treated in hospital

Study group					P – value
Variables	Before the program		After the program		
	Frequency	percent	Frequency	percent	0.001
No pneumonia	5	8.3%	2	3.3%	
Pneumonia	14	23.3%	15	25.0%	
Sever pneumonia	19	31.7%	39	65.0%	
All of the above	15	25.0%	3	5.0%	
I don't know	7	11.7%	1	1.7%	
Total	60	100.0%	60	100.0%	

Table No (17) clarifies that 31.7% of study group know that sever pneumonia should be treated on hospital in the pre intervention questioning . This rises to 65% after intervention program . With significant statistical test (p value < 0.05) .

Table (18)) distribution of Study group (pre & post intervention) in relation to their knowledge about the way to give oxygen, methods of oxygen administration and the way to perform suctioning.

Variables	Study group				P – value
	Before Program		After Program		
	Frequency	percent	Frequency	percent	
Knowledge about the way to give oxygen					
Yes	48	80.0%	56	93.3%	0.05
No	12	20.0%	4	6.7%	
Method of oxygen administration					
Nasal catheter	6	12.5%	3	5.4%	0.005
Mask	18	37.5%	10	17.9%	
Oxygen tent	3	6.3%	3	5.4%	
Amubo bag	9	18.8%	8	14.3%	
All of the above	8	16.7%	31	55.4%	
I don't know	4	8.3%	1	1.8%	
Total	48	100.0%	56	100.0%	
Ability of nurse to perform suction					
Yes	32	53.3%	55	91.7%	0.004
No	28	46.7%	5	8.3%	
Total	45	100.0%	45	100.0%	

Table No (18) explains that most of study group (80%) in Al mak have good knowledge about the way to give oxygen in preprogram testing , but only 16.7% are aware of all methods to deliver oxygen in the pre intervention checking .This rises to 55.4% after conduction of the program with significant statistical difference (p value < 0.05) .

Concerning the ability of the nurse to perform suction more than half (53.3%) of nurses were able to perform suction in preprogram testing . This rises to 91.7% After intervention of program .With significant statistical difference between pre & post intervention .(p value < 0.05) .

Table (19):) distribution of Study group (pre & post intervention) in relation to their knowledge about nutrition for child with pneumonia .

Study group					P - value
Variables	**Before the program**		**After the program**		
	Frequency	**percent**	**Frequency**	**percent**	**0.005**
The used food	20	33.3%	7	11.7%	
Warm fluids & continuation of breast feeding	20	33.3%	11	18.3%	
All of the above	14	23.3%	40	66.7%	
I don't know	6	10.0%	2	3.3%	
Total	60	100.0%	60	100.0%	

Table No (19) show that 23.3% of study group were knowledgeable about the ideal nutrition for child with pneumonia in preprogram testing . This knowledge increased after implementation of the program to two thirds (66.7%) with significant statistical difference (p value < 0.05) .

Table (20):) distribution of Study group (pre & post intervention) in relation to their knowledge about the person who should perform personal hygiene for child with pneumonia .

Study group					P – value
Variables	**Before the program**		**After the program**		
	Frequency	**percent**	**Frequency**	**percent**	**0.002**
Mother	27	45.0%	5	8.3%	
Nurse	5	8.3%	25	41.7%	
Mother & nurse	23	38.3%	28	46.7%	
Did not now	5	8.3%	2	3.3%	
Total	60	100.0%	60	100.0%	

Table No (20) clarifies that study group were not familiar that hygiene of the child should be cared for by both the mother and nurse as only 38.3% were aware of that in preprogram testing . This information is raised to 46.7% in post program testing .With significant statistical difference (p value < 0.05).

Table (21) distribution of Study group (pre & post intervention) in relation to their knowledge about importance of chest physiotherapy to the child with pneumonia (postural drainage, vibration and percussion).

Variables	Study group				
	Before Program		After Program		P – value
	Frequency	percent	Frequency	percent	
Is any child with Pneumonia needs chest physiotherapy					
Yes	54	90.0%	27	45.0%	0.003
No	6	10.0%	33	55.0%	
Knows how to perform postural drainage					
Yes	18	30.0%	44	73.3%	0.002
No	42	70.0%	16	26.7%	
Knows how to perform vibration					
Yes	18	30.0%	44	73.3%	0.002
No	42	70.0%	16	26.7%	
Knows how to perform percussion					
Yes	19	31.7%	44	73.3%	0.003
No	41	68.3%	16	26.7%	
Total	60	100.0%	60	100.0%	

Table No (21) illustrates that 90% of study group they think that any child with pneumonia need for chest physiotherapy in pre program result . 55% change their thinking in pots intervention result . With significant statistical test between pre & post intervention (P value < 0.05) .

Only less than third (30%) of study group were aware to perform chest physiotherapy procedures (percussion , vibration and postural drainage) in pre program checking . Most (73.3%) of study group become aware about that in post intervention results . with significant statistical difference between pre & post checking (P value < 0.05 for).

Table (22): distribution of Study group (pre & post intervention) in relation to their knowledge about the danger signs of a child with pneumonia .

Study group					P – value
Variables	Before the program		After the program		
	Frequency	percent	Frequency	Percent	0.005
Chest indrawing	6	10.0%	3	5.0%	
Fast breathing	23	38.3%	4	6.7%	
Stridor when calm	2	3.3%	1	1.7%	
Not able to drink or breast feed	6	10.0%	4	6.7%	
Convulsions	1	1.7%	1	1.7%	
All above	4	6.7%	43	71.7%	
Not know	18	30.0%	4	6.7%	
Total	60	100.0%	60	100.0%	

Table No (22) shows that 30% of study group are completely unaware of any of the danger signs that should occur on child with pneumonia , compared to only 6.7% were aware about all these danger signs in pre program results . After intervention of the program 71.7% become aware about the danger signs and only 6.7% still unaware about that , with significant statistical test (P value < 0.05) .

Table (23) pre & post intervention study group in relation to their performance about rescue breathing in infant &child ,oxygen administration ,air way maintenance and pulse oximetery .

Procedure	Study group												p-value
	Preprogram						Post program						
	Good		Fair		Poor		Good		Fair		Poor		
	F.	%	F.	%	F	%	F.	%	F.	%	F	%	
Rescue breathing in infant	6	10.0	15	25.0	39	65.0	19	31.7	32	53.3	9	15.0	0.001
Rescue breathing in child	7	11.7	14	23.3	39	65.0	18	30.0	33	55.0	9	15.0	0.011
Oxygen administration	29	60.4	7	14.6	12	25.0	42	75.0	11	19.6	3	5.4	0.002
Air way maintenance	27	45.0	26	43.3	7	11.7	34	56.7	22	36.7	4	6.7	0.001
Pulse ox meter	34	56.7	13	21.7	13	21.6	36	60.0	12	20.0	12	20.0	0.005

Table No (23) explains that 65% of study group have poor performance for rescue breathing in infant and child in pre program checking . This poor skill drops to 15 % after interventional training for both procedures with significant statistical test (P- value < 0.05).

The oxygen administration skills were good in 60% and poor in 25 % in the pre intervention checking . After interventional training 75% become good at oxygen administration and the poor conduct drop to 5.4% . With significant difference (p value < 0.05)

The airway maintenance skills were also good in 45% and poor in 11.7% in pre program checking . After interventional training 56.7% become good at maintaining airway and the poor performance drop to 6.7% with significant statistical difference .(p value < 0.05)

Concerning pulse ox meter skills were good in 56.7% and poor in 21.7% in preprogram checking . After training 60% become good to conduct the procedure and 20% is still poor in performance with significant statistical test (p value < 0 .05).

Table (24) pre & pos intervention for Study group in relation to their performance about postural drainage , vibration , percussion , coughing exercise , tracheal suction & manual ventilation.

Procedure	Study group												p- value
	Preprogram						Post program						
	Good		Fair		Poor		Good		Fair		Poor		
	F.	%	F.	%	F.	%	F.	%	F.	%	F.	%	
Postural drainage	2	11.1	5	27.8	11	61.1	19	43.2	15	34.0	10	22.8	0.005
Vibration	2	11.1	5	27.8	11	61.1	19	43.2	15	34.0	10	22.8	0.005
Percussion	3	15.7	5	26.3	11	57.9	20	45.5	16	36.4	8	18.2	0.005
Coughing exercise	4	6.7	19	31.7	37	61.7	12	20.0	27	45.0	21	35.0	0.001
Tracheal Suction	15	46.9	9	28.1	8	25.0	29	52.7	22	40.0	4	7.3	0.002
Manual ventilation	27	45.0	24	40.0	9	15.0	29	48.3	24	40.0	7	11.7	0.001

Table No (24) reveals that 61.1% of study group have poor performance about postural drainage and vibration ,only 11.1% are good at the procedures in pre intervention test .In the post intervention results 43.2 got good and 22.8% were still poor in performing it . with significant statistical difference between pre & post intervention (p value < 0.05) .

Only 15.7% have a good performance about percussion and only 6.7% on coughing exercise in pre program results . After interventional training 45.5% become good to perform percussion & 20.0% become good in performing coughing exercise .with significant statistical test . (p value < 0.05) .

The tracheal suction were good in 46.9% and poor in 25% in pre program result . After conduction of program 52.7% got good and 7.3% were poor in conduction . With significant statistical test (P value <0.05) Also manual ventilation skills were good in 45% and poor in 15% in preprogram checking . After interventional training good performance noticed in 48.3% and poor performance drop to 11.7% With significant statistical difference (p value < 0.05)

5-1 Discussion

Nurses are in direct contact and relationship with children in the pediatric ward during the whole day and the time of work : Therefore they need high level of knowledge and skills in practice to provide nursing management for the diseased child . This study was designed to help the nurses in Al mak Nimer university hospital and Shendi teaching hospital to provide good nursing management and care to the child with pneumonia . The objectives of this study is to assess the need of nurses in knowledge and practice about pneumonia , design an intervention program according to needs of nurses and evaluate the effectiveness of the implementation program .

This study included sixty nurses from Al mak Nimer university hospital and Shendi teaching hospital , most of them are females , probably because nursing study is desired by females more than males , they were in age group 25-35 years and more than half of them were single .

This study showed that fifty percent (half) and thirty seven percent of study group were aware about all components of upper & lower respiratory tract respectively in the preprogram checking . This percentage can be explained by the difference of their academic qualification , since most of nurses in Al mak Nimer hospital were BSC and master degree graduates . This is in contrast to the nurses in Shendi hospital where are either technique certificate or an intermediate diploma graduates .

Regarding the definition of pneumonia, only thirty one percent of study group are knowledgeable about the definition in pre program test , while the post program results showed increasing knowledge of nurses to more than seventy percent with significant statistical difference (p value < 0.05) . The reference definition used in this regard was that

pneumonia is an acute respiratory illness associated with recently developed radiological pulmonary shadowing which may be segmental ,lobar or multi lobar [44].

There was improving in the knowledge of nurses in both hospitals towards all causative organisms of pneumonia , as sixty percent of nurses in the study thought that the main causative organism of pneumonia was only virus in pre program checking . While in the post intervention checking : seventy seven percent became aware about all the causative organisms of pneumonia . The reference knowledge used was that: streptococcus was the most common infective agent of pneumonia , other organisms may be involved depending on the age of children and the clinical context but viral infections were important cause of pneumonia in children [53] and that both bacteria and viruses are major causes of pneumonia in children [110] .

The nurses in the study have poor knowledge Concerning the fact that most age groups of children are affected with pneumonia , because only fifteen percent of study group were aware that all pediatrics age groups are affected with pneumonia in pre program testing as reported in literature [87 , 55]. . After the intervention program their knowledge increased about that fact to fifty one . The change was statistically significant (p value < 0.05) .

There are acceptable changes in the knowledge of nurses towards the types of pneumonia , as eighty percent of study groups were knowledgeable about types of pneumonia in preprogram results , and this knowledge increased to ninety percent after intervention of program . The reference information used classifies pneumonia to three types No pneumonia cough or cold , pneumonia and sever pneumonia or very severe disease [60, 100] .

The knowledge about the principles of classification of these types were poor in the preprogram testing , since sixty percent of nurses were aware about this classification and thought that the infected part of lung is the only means of classification while only 23% of them were aware about all correct principles of these classification . The basic principles of classification of pneumonia used for the purpose of this work , clarifies that pneumonia has an anatomical classification , etiological classification [31] and to lobules , lobar or bronchopneumonia [68] , or according to the severity as used in the IMCI [101]

This study showed that nurses in both hospitals had a good knowledge about presence of predisposing factors for pneumonia , while their knowledge about the actual factors was poor before conduction of program . Even after receiving education about that issue , the post assessment reveals that only fifty seven percent of the study group became well aware about these factors , the difference was shown to be significant (P value < 0.05) . The reference information about this was depending on the work of Rober Klein & Krik Smith in Nepal which defines the risk factors as malnutrition, low birth weight, non-exclusive breastfeeding, indoor air pollution and crowding [111] .

There was improvement in the knowledge of nurses towards the clinical features of pneumonia after implementation of the program with significant statistical difference (P value < 0.05) . The study revealed that seventy two percent of the study group thought that signs and symptoms are similar for all types of pneumonia , also seventy percent of nurses in the study thought that sign and symptoms differ according to causes of pneumonia in preprogram testing . The percentage showed an increase of knowledge for all above concepts after the conduction of program . The literature used as the base for this part of the study states that pneumonia usually presents as an acute illness in which systemic

features such as fever , rigors , shivering and vomiting predominate . Rust colored sputum may be seen in children with streptococcus pneumoniae infection , and that upper abdominal tenderness is sometimes apparent in children with lower lobe pneumonia[69] .and on another reference stating that the clinical presentation varies according to the immune state of the child and the infecting agent [107] .

Only thirty one percent of the study group were aware about the all modes of transmission the disease in pre program results . Post program results showed an increase in knowledge , as seventy percent of the study group became aware about all modes of transmission with statistically significant difference (P value < 0.05) . The basic information concerning this states that some pneumonia are contagious while others are not . The modes of transmission is by droplets through blowing the nose , sneezing or coughing [71,72].

53.3% of the study group were aware about all modalities of nursing management in pre program results . After implementation of the program seventy three percent of the study group become oriented about all modalities of nursing management . Our reference for assessment of the modalities in both pre and post intervention checking was obtained from (Medical surgical nursing , critical thinking in client care) which states that : Nursing interventions and responsibilities in caring for the patient with pneumonia include administering oxygen and medications as prescribed and monitoring for their effects. Also include monitoring vital signs including oxygen level, lung sounds . Also The child respiratory rate and status as well as general disposition and level of activity are frequently assessed. Isolation procedures are instituted according to hospital policy [108] .

In Regards to methods of diagnosis of pneumonia , only eighteen percent of study group were aware about all methods of diagnosis of

pneumonia in pre program checking , the nurses got acceptable knowledge after implementation of program , since fifty one percent of study group became knowledgeable about all method of diagnosis of pneumonia with significant statistical difference (P value < 0.05) . Reference knowledge for this purpose states that: If pneumonia is suspected on the basis of a patient's symptoms and findings from physical examination, further investigations are needed to confirm the diagnosis. Information from a chest X-ray and blood tests are helpful, and sputum cultures in some cases [88].

Concerning knowledge and practice of nurses regarding use of medical stethoscope , this study found that there is wide gap between nurse knowledge and practice of using the stethoscope , since eighty percent of study group were aware of the importance of using stethoscope in diagnosis of pneumonia , while only twenty six percent of study group were aware about the correct sites of chest should be auscultator in pre program results . The post intervention result showed an increase in nursing knowledge as sixty six percent of study group became knowledgeable about that , the difference was statistically significant .(P value < 0.05). Also the majority of nurses (85.%) became aware about the normal chest sounds after conduction of program , but only sixty two percent out of them were aware about the type of chest sound that occur with disease . This results may be explained by the fact that : the nurses in both hospitals don't use the stethoscope during the daily work and they think that the use of the stethoscopy is only for the doctor and medical student . Also , unluckily , no similar works were found on the authors search to compare and contrast with the results of this work .

Also the study found that there is a poor knowledge about percussion note and about sites of chest retractions , since seventy

seven percent of the study group in pre program testing not aware the chest sound that appear on percussion examination , and that : sixty percent of the study group were not aware about sites of chest retractions ,probably because those issues are not discussed in details in under graduate curriculum , and the absence of training program and workshops to the nursing staff make them familiar with these importance issues . After conduction of the program the result showed increase in knowledge with change statistically significant (P value < 0.05).

The results illustrate that thirty percent of the study group were not aware about the danger signs in the child with pneumonia in pre program results . The post intervention results showed an increase in knowledge as seventy one percent became well aware about those danger signs because the program contain more details about them .

The results revealed that thirty seven percent of the study group were not aware about the type of pneumonia that are supposed to be treated at home in pre program checking . After interventional program two third of nurses became oriented about that , with significant statistical difference (P value < 0.05) . Also the results showed that eleven percent of the study group were not aware about the type of pneumonia treated at hospital in pre program checking . After conduction of program sixty five percent of study group get the knowledge about the type of pneumonia treated at hospital . The reference information used for this purpose state that Mild-to-moderate cases can be treated at home with oral antibiotics, while severe pneumonia usually needs intravenous antibiotics administered at hospital [105] .Generally speaking , the poor knowledge about all aspects of pneumonia in children among the nurse is probably due to lack of appropriate and sufficient tacking of this issue during their qualifying studies or during their nursing work in

hospitals . The evidence for this , is the dramatic improvement on that regard following the intervention program .

Despite the good knowledge of nurses in both hospitals about the ways to give oxygen in pre intervention checking , only sixteen percent of study group were aware about the all the ways to deliver oxygen . And only sixty percent of nurses were able to perform oxygen administration in a good way . This result is probably due to lack of supervision and teaching rounds of the senior nursing staff which is mandatory for the life saving procedures. The knowledge and practice regarding that point increased after the implementation of program which it contains simplified knowledge and practice . The change was statistically significant (p value < 0.05).

The results of this study founds that few (23.3%) of study group were had enough knowledge about the nutrition for the child with pneumonia before conduction of program , however after application of the program two thirds of nurses got acquainted about the nutrition of the child with pneumonia .This point probably needs more stress in future interventions to guarantee better outcome of this very important point of nursing management .

There are acceptable changes in the knowledge of nurses towards the personal hygiene of child with pneumonia , as forty six percent of the study group became familiar that hygiene of the child with pneumonia should be cared for by both the mother and nurse , with significant statistical difference (P value 0.05) .

Although most of nurses already performed the life saving procedures , this study reflects that two thirds of nurses demonstrated poor practice regarding rescue breathing in infant and children before program was introduced . Most of the nurses mentioned when discussed in a groups , these issues were not taught in practical details in their

undergraduates study . However when the program was implemented one third of them shows increase in good performance , and more than half of them showed an increase in the average performance regarding these procedures .with significant statistical difference (P value < 0.05) .

As a mater , despite the fact that the nurses usually use the pulse ox meter in their daily practice , no more than fifty six percent of study group demonstrated the procedure in a good practice prior to educational program . This due to the lack of this instrument in Shendi hospital fore this reasons the nurses were absence of practice about it . The post program results showed a little increase in performance regarding procedure , as sixty percent got good performance , with significant statistical difference (P value < 0.05) .

Despite repeated demonstration about manual ventilation and tracheal suction , only fifty two percent of the study group performed tracheal suction in good practice . Also forty eight percent of study group were perform manual ventilation in good practice in post intervention results . This poor practicing concerning these life saving procedure necessitates the need for a better approach for conduction of training about them .

This program emphasized on chest physiotherapy and the ways to perform it , because the majority nurses thought that any child with pneumonia need this procedure to encourage the cough in the pre program testing . But the reference information used for this purpose is not favoring their thinking , because it state that cough should be normally encouraged , physiotherapy is needed in some cases to help and encourage the child to cough [105, 109] . Therefore , After the program was implemented , nurses were oriented about chest physiotherapy and their performance increased in it is procedure ,since the good performance in postural drainage vibration and percussion increased to

more than forty percent ,and to twenty percent for cough exercise , the test was statistically significant for all procedures (P value < 0.05) .

5.2 -Conclusion

Based on the findings of the present study , it is concluded that knowledge and practice of the nurses in Al mak Nimer university hospital and Shendi teaching hospital towards the children affected with pneumonia was generally improved after conduction of the program . This improvement was statistically significant .

This program emphasized on chest physiotherapy and the ways to perform it . Therefore , After the program was implemented , nurses were oriented about chest physiotherapy and their performance increased in it is procedure . This study also showed that there is no statistical relationship considering the years of experience of the nurses in their improvement after the program .

5.3-Recommendations

In the light of the findings and conclusions of this study the following is recommended :

For administration staff:

1. To report every year to the faculty of nursing Shendi university about nurses performance so that any nursing defect is to be detected and corrected .
2. A better communication between the nurses in the two hospitals (Al mak Nimer university hospital &Shendi teaching hospital) is needed to reassures them self about any performance .
3. Training program and work shops should be provided on regular basis so that problems concerning nursing knowledge and practice is identified and managed .
4. Regular similar intervention program to the newly coming nurses to consolidate this important part of practice .

For nursing staff :

1. Provide weakly deachi.g rounds by senior nurses .
2. Practical sections`should be provided to reassurance the nurwes about thd importance of using s\euhoscopy in nursing practice .
3. Small$group discussion about the new cases on the word should be applied to make nurses knmwledgeable about new topics and their diagnosas and malageme~t .
4. Self learning `nd continuEc edtcation is needed$.

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بسم الله الرحمن الرحيم

جامعة شندي

كلية الدراسات العليا

برنامج تعليمي للتمريض عن المعالجة التمريضية للطفل المصاب بمرض الالتهاب الرئوي

(Program for nurses on nursing care provided to child with pneumonia, at Al- mak Nimer university hospital & Shendi teaching hospital, in Shendi city, river Nile state, Sudan)

إستبيان لطاقم التمريض عن الالتهاب الرئوي عند الاطفال

الباحث: لمياء الطيب الهادي محمد سعيد

تحت اشراف: 1- د/ محمد عثمان متوكل 2- د/ نبيلة حسن عبدالله

1- النمرة المتسلسلة:.....

2- التاريخ:.....

ا- البيانات الشخصية:

1- الاسم:.....

2- الجنس:

ا- ذكر ( )

ب- أنثي ( )

3- العمر:

ا- اقل من 25 سنة ( )

ب- من 25-035سنة ( )

ج- من36-45 سنة ( )

د- اكثر من 45 سنة ( )

4- السكن:

ا- داخل مدينة شندى ( )

ب- ريفى شندى ( )

5- المؤهل الاكاديمي:

ا- شهادة التمريض الفنية ( )

ب- دبلوم التمريض ( )

ج-يكالريوس في التمريض ( )

د- ماجستير في التمريض ( )

6- الحالة الاجتماعية:

ا- غير متزوج ( )

ب- متزوج ( )

ج- مطلق ( )

د- ارمل ( )

7- عدد سنوات الخبرة:

ا- من 1-3 سنوات ( )

ب- من3-6 سنوات ( )

ج- اكثر من 6سنوات ( )

8- مكان العمل:

ا- مستشفي شندي التعليمي ( )

ب- مستشفي المك نمر الجامعي ( )

2- معلومات عن الجهاز التنفسي:

1- ما هي مكونات الجهاز التنفسي العلوي

حسب معلوماتك:

ا- الأنف ( )

ب- الفم ( )

ج- الحنجرة ( )

د- كل ما سبق ذكرة ( )

هـ-لا اعلم ( )

2- ما هي مكونات الجهاز التنفسي السفلي:

ا- القصبة الهوائية ( )

ب- الرئتين ( )

ج- الاثنان معا ( )

د- لااعلم ( )

3- **بيانات عن المرض:**

1- ما هو الالتهاب الرئوي:

ا- هو عبارة عن التهاب في الحويصلات الرئوية التي تمتلئ بسائل صديدي ( )

ب- هو الإصابة البكترية أو الفيروسية أو الفطرية الحاصلة في كلتا الرئتين أو إحداهما ( )

ج- هو شكل من اشكال العدوي التنفسية الحادة التي تصيب الرئتين ( )

د- كل ما سبق ( )

و- لا اعلم ( )

2- **في أي جزء من القناة التنفسية يحدث الالتهاب الرئوي:**

ا- في الجهاز التنفسي العلوي ( )

ب- في الجهاز التنفسي السفلي ( )

ج- في الاثنان معا ( )

د- لااعلم ( )

3- **ما هي مسببات الالتهاب الرئوي:**

ا- بكتريا ( )

ب- فطريات ( )

ج- فيروسات ( )

د- بكتريا وفطريات وفيروسات ( )

هـ-لا ا علم ( )

4- **ما هي الفئة العمرية الاكثر اصابة بالالتهاب الرئوى**

ا- الاطفال حديثى الولادة (من عمر يوم الي شهر) ( )

ب- الاطفال الرضع ( )

ج- الطفولة المبكرة ( )

د- جميع الفئات العمرية للأطفال ( )

هـ-لااعلم ( )

5- هل للالتهاب الرئوى انواع :

أ- نعم ( )

ب- لا ( )

6- **ما مدى علمك بتصنيف الالتهاب الرئوى:**

1-اعلم ( )

2-لااعلم ( )

7-**إذا كنت تعلم على اى اساس تم هذا التصنيف:**

ا- بناءا علي الجزء المصاب من الرئة ( )

ب- بناءا علي نوع المسبب ( )

ج- بناءا علي شدة الاعراض السريرية ( )

د- كل ما سبق صحيح ( )

8-**هل تعلم بوجود عوامل مؤهبة للالتهاب الرئوى:**

ا-اعلم ( )

ب- لا اعلم ( )

9- **إذا كنت تعلم ما هي هذه العوامل (المؤهبة للالتهاب الرئوي):**

ا- صغر السن ( )

ب- ضعف المناعة ( )

ج- عيوب خلقية فى الجهاز التنفسي ( )

د- التلوث البيئى ( )

هـ- الربو ( )

و- كل ما سبق ( )

10- ما هي الاعراض السريرية للالتهاب الرئوي:

ا- حمى ( )

ب- سعال ( )

ج- الم في الصدر ( )

د- صعوبة فى التنفس ( )

و- كل ما سبق ذك ( )

ى- لا اعلم ( )

11- هل تحدث كل هذه الاعراض في جميع انواع الالتهاب الرئوي:

ا- نعم ( )

ب- لا ( )

12- هل هناك اختلاف في الاعراض والعلامات باختلاف المسبب:

1- نعم ( )

ب- لا ( )

13- **ما هي طرق انتقال المرض :**

أ- استنشاق الهواء الملوث بالجراثيم من عطاس أو سعال تخص المريض ( )

ب- استعمال ادوات المريض ( )

ج- كل ماسبق ذكرة ( )

د لا اعلم ( )

4- بيانات عن دور التمريض في العناية التمريضية:

1- كيف تتم المعالجة التمريضية لمريض الالتهاب الرئوى:

أ- تنفيذ اعطاء المضادات الحيوية ( )

ب- تنفيذ اعطاء الاكسجين ( )

ج- تنفيذ اعطاء السوائل ( )

د- متابعة الحالة العامة ( )

هـ- كل ما سبق ذكره ( )

و- لااعلم ( )

2- ما هي طرق تشخيص المرض:

أ -الفحص السريرى ( )

ب-القصة المرضية ( )

ج-صورة اشعة للصدر ( )

د-حسب الاعراض والعلامات ( )

هـ- جميع الطرق السابقة ( )

و- لااعلم ( )

3- هل يفيد سماع صوت الصدر بالسماعة الطبية فى التشخيص:-

ا- نعم ( )

ب- لا ( )

4- هل تتمكن من تميز الاصوات الطبيعية للصدر من الاصوات التى تحدث مع الالتهاب الرئوى :

أ- نعم ( )

ب- لا ( )

5-إذا كانت الإجابة بنعم مانوع صوت الصدر عند الاصابة بالمرض؟

ا- ازيز ( )

ب- صرير ( )

ج- خرير ( )

د-كل ماسبق ذكرة ( )

6- في أي اماكن الصدر يتم وضع السماعة لسماع اصوات التنفس:

ا- في المسافة بين الاضلاع ( )

ب- فوق الاضلاع مباشرة ( )

ج-لا اعلم ( )

7- في حالة الإصابة بالأمراض الصدرية ما هى انواع الاصوات الشاذة التى يمكن سماعها عند الطرق:

أ- الطبلية Tympany ( )

ب- الاصمية dullness ( )

ج- الاصمية الصخرية Stony dullness ( )

د-كل ما سبق ( )

هـ- لا اعلم ( )

8- فى اى اماكن الصدر يحدث الانسحاب :

ا- بين الاضلاع ( )

ب- تحت الاضلاع ( )

ج - خلف القص ( )

د- فوق القص ( )

هـ - فوق الترقوة ( )

و- تحت القص ( )

ر- كل ما سبق ( )

ى- لا اعلم ( )

9- هل يمكن معالجةالالتهاب الرئوى بالمنزل:

1- نعم ( )

ب- لا ( )

10- اذا كانت الاجابة بنعم مانوع الالتهاب الرئوى الذى يتم علاجة بالمنزل:

ا- البسيط ( )

ب- الشديد ( )
ج- الوخيم ( )
د- كل ماسبق ( )
هـ- لا اعلم ( )

11-اى أنواع الالتهاب الرئوي يعالج بالمستشفى:

ا- البسيط ( )
ب- الشديد ( )
ج- الوخيم ( )
د- كل ما سبق ( )
هـ - لااعلم ( )

12- اذا قرر الطبيب العلاج بالاوكسجين للمريض هل تستطيع اجراء ذلك:

ا- نعم ( )
ب- لا ( )

13- إذا كانت الإجابة بنعم ما هي طرق اعطاء الاكسجين:

ا- القسطرة الأنفية ( )
ب- الكمامة ( )
ج- النفخ اليدوي amubobag ( )
د- خيمة الاكسجين ( )
هـ- جميع ما ذكر ( )
و- لا اعلم ( )

14- اذا قرر الطبيب شفط السوائل والقشع للمريض هل تستطيع اجراء ذلك:

ا- نعم ( )
ب- لا ( )

15- ما هي انواع الاغذية التي يجب التركيز عليها:

1- الاغذية العادية ( )

2- الاكثار من السوائل ومواصلة الرضاعة الطبيعية ( )

3- كل ما سبق ( )

4- لااعلم ( )

16- كيف تتم العناية او النظافة الشخصية لهذا المريض:

ا- بواسطة الام ( )

ب- بواسطة الممرضة ( )

ج- بواسطةالام والممرضة معا ( )

د - لااعلم ( )

17- هل يحتاج كل طفل مصاب بالالتهاب الرئوى الي المعالجة الطبيعية للصدر Chest physiotherapy :

ا- نعم ( )

ب- لا ( )

18- هل تستطيع تطبيق عملية Postural drainage التفريغ الوضعى

ا- نعم ( )

ب- لا ( )

19- هل تستطيع تطبيق عملية: التبخير Vipration

ا- نعم ( )

ب- لا ( )

20 - هل تستطيع تطبيق عملية الطرقPercussion :

ا- نعم ( )

ب- لا ( )

21- ما هي علامات الخطورة التي يجب علي ضوءها اعادة الطفل الي المستشفي:

ا- انسحاب الصدر ( )

ب- ظهور صوت مع التنفس عندما يكون الطفل هادى او نائم ( )

ج- زيادة سرعة التنفس ( )

د- عدم المقدرة علي الشرب و الرضاعة الطبيعية ( )

هـ- حدوث التشنجات ( )

و - جميع ما سبق ( )

ى - لااعلم ( )

Check list (1)
Procedure for rescue breathing in infant

No	*Step*	*Good*	*Fair*	*poor*
1.	Checked if airway is clear or not .			
2.	Checked for breathing			
3.	Looked for chest movements			
4.	Listened for breath sounds			
5.	Felled for breath on cheek			
6.	Looked , listened and felled for no more than 10 seconds. If the client is not breathing get help, then:			
7.	Lied infant flat on their back			
8.	Tilt head and lift chin into neutral position			
9.	Placed lips securely around the infant's mouth and nose			
10.	Blow into the infant's mouth for approximately 1–1.5 seconds, watching for the chest rising			
11.	If chest fails to rise rechecked position and airway			
12.	Removed lips from the infant's mouth and allow the chest to fall			
13.	Repeated at a rate of 20 breaths per minute until the infant starts to breathe on their own			
14.	Assisted the infant to find a comfortable position once normal respiratory function is restored Seek assistance			
	Total			

Check list (2)

Procedure for rescue breathing in child

No	*Step*	*Good*	*Fair*	*poor*
1.	Checked if airway is clear or not			
2.	Checked for breathing			
3.	Looked for chest movements			
4.	Listened for breath sounds			
5.	Felled for breath on your cheek			
6.	Looked, listened and feel for no more than 10 seconds. If the client is not breathing get help, then:			
7.	Lied client flat on their back			
8.	Tilt head and lift chin into ‘sniffing’ position			
9.	Pinch the child’s nose (unless mouth-to-mouth-and-nose ventilation is to be used)			
10.	Placed lips securely around the child’s mouth (or mouth and nose in a small child)			
11.	Blow into the child’s mouth for approximately 1–1.5 seconds, watching for the chest rising			
12.	If chest fails to rise recheck position and airway			
13.	Removed your lips from the child’s mouth and allow the chest to fall			
14.	Repeated at a rate of 20 breaths per minute until the child starts to breathe on their own			
15.	Assisted the child to find a comfortable position once normal respiratory function is restored Seek assistance			
	Total			

Check list(3)

Procedure for Oxygen administration

No	***Step***	***Good***	***Fair***	***poor***
1	Check the patient file.			
2	Gather the necessary equipment.			
3	Select the most appropriate oxygen delivery device, based on the order and the patient's status.			
4	Check the patient's room to ensure safety for administration (no smoking sine).			
5	Ensure appropriate disutted water in humidifier			
6	Assess the patient's condition, ensuring a patent airway.			
7	Explain the procedure to the patient.			
8	Place the oxygen delivery device securely on the patient, ensuring proper fit.			
9	Frequent child monitoring (ex: child mucosa) & promptly report any change in condition			
10	Adjust the oxygen flow rate as ordered.			
11	Place an oxygen precaution sign over the patient's bed and on the door to his room.			
12	Observe skin integrity around the delivery device.			
13	Monitor the patient's response and pulse oximetry or arterial blood gas levels 20 to 30 minutes after adjusting the flow rate as ordered.			
14	Document the procedure			
	Total			

Check list (4)

Procedure for airway maintenance

No	*Step*	*Good*	*Fair*	*poor*
1.	Listened for breath sounds			
2.	Observed chest and abdominal movement			
3.	Observed color of skin/mucous membranes			
	.			
4.	Greated care should be further into the air passage.			
5.	**CHILD** (1–16 years)/INFANT (0–12 months) If the client is a child or infant only removed the obstruction if it is possible to do so without swiped the mouth with a finger			
6.	**CHILD** If the child is unconscious gently lifted the chin and tilt the head only slightly (i.e. sniffing position.			
7.	**INFANT** The desirable degree of tilt in the infant is neutral			
8.	**CHILD/INFANT** Assisted the child to find a comfortable position once normal respiratory function is restored			
	Total			

Check List(5)

Procedure for postural drainage:

No	*The candidate did the following*	*Good*	*Fair*	*poor*
1.	Greeted the patient, introduced himself/herself, and explained what is going to do			
2.	Prepared the equipments			
3.	Loosen any tight clothing			
4.	Lower head of bed slowly so that client's head is positioned at no greater than a 25 downward angle			
5.	Place sputum container and tissues in client's reach			
6.	Tell client to remain in position for 3-15 min			
7.	Instruct client to expectorate secretions			
8.	Instruct client to turn to other side, then to supine position, then repeat procedure			
9.	Assist client to slowly return to normal sitting position after coughing in dependent positions			
10.	Auscultated chest areas for improved breath sounds			
11.	Don gloves			
12.	Noted character and measure sputum, then discard			
13.	Removed gloves			
14.	Performed hand hygiene			
15.	Offered oral hygiene following secretion expectoration			
16.	Retuned the equipment			
17.	Documented the procedure			
	Total			

Check List (6))

Procedure for vibration:

No	*The candidate did the following*	*good*	*fair*	*Poor*
1.	Greeted the patient, introduced himself/herself, and explained what is going to do			
2.	Prepared the equipments			
3.	Loosen any tight clothing			
4.	Performed vibration following postural drainage and percussion in each position			
5.	Instructed client to breathe in through nose and exhale slowly			
6.	Placed your hands flat over area to be vibrated			
7.	Kept his/her arms and shoulders straight and wrists stiff			
8.	Instructed the patient inhales deeply			
9.	Performed vibration following postural drainage and percussion in each position			
10.	Auscultated chest areas for improved breath sounds			
11.	Don gloves			
12.	Noted character and measure sputum, then discard			
13.	Removed gloves			
14.	Performed hand hygiene			
15.	Offered oral hygiene following secretion expectoration			
16.	Retuned the equipment			
17.	Documented the procedure			
	Total			

Check List(7))

Procedure for percussion

No	***The candidate did the following***	***good***	***fair***	***Poor***
1.	Greeted the patient, introduced himself/herself, and explained what is going to do			
2.	Prepared the equipments			
3.	Loosen any tight clothing			
4.	Covered area to be percussed with gown or cloth towel			
5.	Hold arms with elbows slightly flexed, cup your hands with thumbs and fingers closed			
6.	Kept wrists loose and relaxed rhythmically flex and extend wrists to clap over to be drained			
7.	Percussed by alternative hands and listen for hollow sound with strikes			
8.	Slowly and rhythmically percussed each area for 3-5min			
9.	Don not percussed over bony prominence, breast or tender area			
10.	Encouraged client to cough			
11.	Auscultated chest areas for improved breath sounds			
12.	Don gloves			
13.	Noted character and measure sputum, then discard			
14.	Removed gloves			
15.	Performed hand hygiene			
16.	Offered oral hygiene following secretion expectoration			
17.	Retuned the equipment			
18.	Documented the procedure			
	Total			

Check List (8)

Procedure for coughing exercise

No	***The candidate did the following***	***good***	***fair***	***Poor***
1.	Greeted the patient, introduced himself/herself, and explained what is going to do			
2.	Followed the sequence of the procedure			
3.	Place the patient in semi-fowler's position, leaning forward			
4.	2- Provided a pillow or folded bath blanket to use in support the incision			
5.	Ask the patient to: • Inhale and exhale deeply and slowly through the nose three times • Cough deeply once or twice • Take another deep breath • Repeat the exercise every 2hours while a wake			
6.	Auscultated chest areas for improved breath sounds			
7.	Don gloves			
8.	Noted character and measure sputum, then discard			
9.	Removed gloves			
10.	Performed hand hygiene			
11.	Offered oral hygiene following secretion expectoration			
12.	Retuned the equipment			
13.	Documented the procedure			
	Total			

Check list(10)

Procedure for Manual ventilation

N	*Step*	*Good*	*Fair*	*poor*
1.	Put on gloves and other personal protective equipment.			
2.	Before using the handheld resuscitation bag, check the patient's upper airway for foreign objects.			
3.	If present, remove them because this alone may restore spontaneous respirations in some instances. Also, foreign matter or secretions can obstruct the airway and impede resuscitation efforts.			
4.	Suction the patient to remove any secretions that may obstruct the airway.			
5.	If necessary, insert an oropharyngeal or nasopharyngeal airway to maintain airway patency.			
6.	If the patient has a tracheostomy or ET tube in place, suction the tube.			
7.	If appropriate, remove the bed's headboard and stand at the head of the bed to help keep the patient's neck extended and to free space at the side of the bed for other activities such as cardiopulmonary resuscitation.			
8.	Tilt the patient's head backward, if not contraindicated, and pull his jaw forward to move the tongue away from the base of the pharynx and prevent obstruction of the airway. (See How to apply a handheld resuscitation bag and mask.)			
9.	Keeping your nondominant hand on the patient's mask, exert downward pressure to seal the mask against his face.			
10.	For an adult patient, use your dominant hand to compress the bag every 5 seconds to deliver approximately 1 L of air.			
11.	PEDIATRIC ALERT For a child, deliver 20 breaths/minute, or one compression of the bag every 3 seconds; for an infant, 20 breaths/minute, or one compression every 3 seconds. Infants and children should receive 250 to 500 cc of air with each bag compression.			
12.	Deliver breaths with the patient's own inspiratory effort, if it's present. Don't attempt to deliver a breath as the patient exhales.			
13.	Observe the patient's chest to ensure that it rises and falls with each compression.			
14.	If ventilation fails to occur, check the fit of the mask and the patency of the patient's airway; if necessary, reposition his head and ensure patency with an oral airway.			
15.	Avoid neck hyperextension if the patient has a possible cervical injury; instead, use the jaw-thrust technique to open the airway.			
16.	If you need both hands to keep the patient's mask in place and maintain hyperextension, use the lower part of your arm to compress the bag against your side.			
17.	Observe for vomiting through the clear part of the mask. If vomiting occurs, stop the procedure immediately, lift the mask, wipe and suction the vomitus, and resume resuscitation.			
18.	Underventilation commonly occurs because the handheld resuscitation bag is difficult to keep positioned tightly on the patient's face while ensuring an open airway.			
19.	Furthermore, the volume of air delivered to the patient varies with the type of bag used and the hand size of the person compressing the bag. An adult with a small or medium-sized hand may not consistently deliver 1 L of air. For these reasons, have someone assist with the procedure, if possible.			
	Total			

Check list (9)

Procedure for Tracheal suction

No	*Step*	*Good*	*Fair*	*poor*
1	Explain procedure			
2	Perform hand hygiene and done gloves			
3	Place client in semi flower position and turn on suction source			
4	Remove cap from saline bottle .			
5	Open catheter kit ,pour sterile saline into - cup			
6	Done gloves			
7	Administer 100% oxygen for 1---2 minutes .			
8	Hold catheter in protective covering and attach end to suction tubing			
9	Retracted sleeve enough to lubricate sterile catheter tip by dipping it into cup with sterile saline			
10	Advanced catheter into client artificial airway approximately 28 cm ,wile retracting protective sleeve with out appling suction			
11	With draw catheter applying suction and used rotating motion .			
12	Suction intermittently by placing and releasing thumb over catheter suction port			
13	Limit suction to no more than 5—10 seconds			
14	Reattach oxygen delivery device to artificial airway and have client to take several deep breath			
15	Flush suction catheter and tubing with sterile saline and retract back into protective sleeve .			
16	Catheter remain in sleeve and attached to suction tubing .			
17	Discard gloves and turn off suction source and perform hand hygiene			
18	Reassessment			
19	Put the client on comfortable position			
	Total.			

Check list (11)

Procedure for Pulse Oxy meter

No	*Step*	*Good*	*Fair*	*poor*
1	Check the doctor's order			
2	Gather the appropriate equipment			
3	Review the manufacturer's instructions for oximeter assembly			
4	Explain the procedure to the patient			
5	Choose an appropriate site (usually the index finger) for probe placement			
6	Select the appropriate finger and remove nail polish if present			
7	Hold the patient's hand at heart level and place the transducer correctly over the finger with the light beam and sensor opposing each other. If the patient is an infant, wrap the probe around the neonate's or small infant's foot or larger infant's great toe			
8	Secure the probe correctly			
9	Turn on the power switch, listen for the beep, and observe display lights. Read the arterial oxygen saturation and the pulse rate displayed			
10	Cover the probe if excessive light interferes with the results, or reposition the probe with patient movement			
11	Document the procedure			
	Total			

University of shendi
Faculty of post gradate studies

program for nurses in Al mak Nimer university hospital about pneumonia

prepared by :
Lmya Eltib Alhadi Mohmmed Saeed

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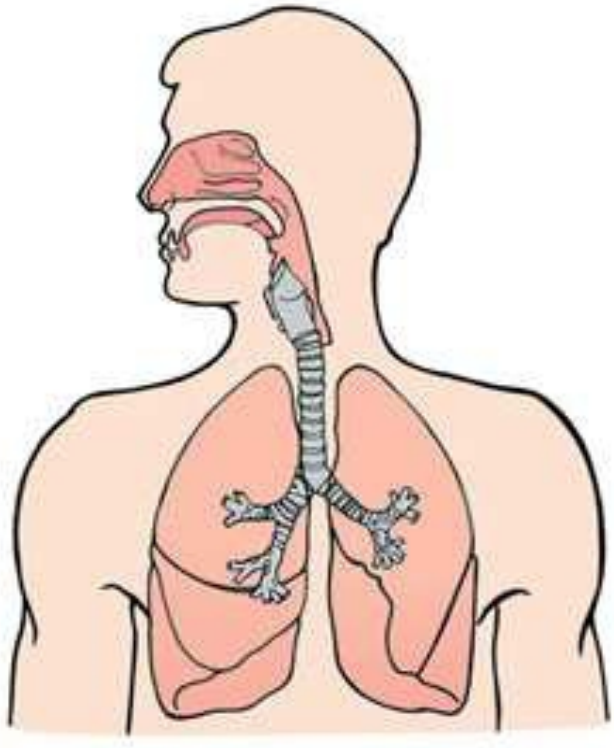


Section one

Introduction about respiratory system and respiratory tract infection .

Objectives:-

At the end of this section the nurse should be able to :-

1- discus The important of respiratory system in relation to other system
2- illustrate structure and function of respiratory system
3- explain Information about respiratory tract infection

Respiratory system

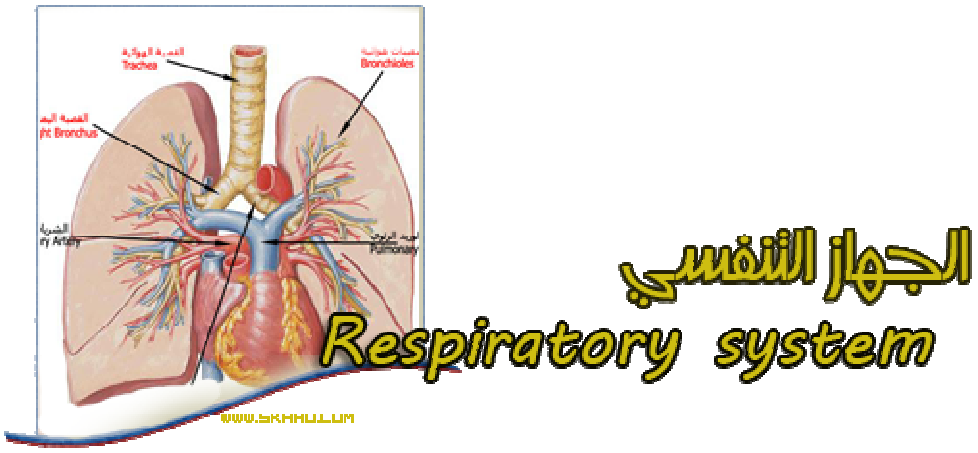


Figure (1) Respiratory system

Introduction about respiratory system:

The respiratory system is the biological system , that introduce respiratory gases to the interior humans and perform gas exchange . It is one of important system in the body , the major purpose is to provide oxygen for the combustive process of metabolism and to remove carbon dioxide from the body . The respiratory tract perform several secondary functions , including maintenance of acid base balance .Divided into upper and lower respiratory tracts ,this complex system makes respiration and ultimately , the support of all other vital functions possible.

The primary function of the respiratory system is the supply of oxygen to the blood so this in turn delivers oxygen to all parts of the body

*- Non-respiratory functions

[1- Lung defense mechanisms

2-Metabolic and endocrine functions of the lungs

3-Vocalization

4- Temperature control

5- Coughing and sneezing

Content of respiratory system :-

1-upper respiratory tract (consist of nose ,sinuses ,pharynx and larynx)

2- lower respiratory tract (consist of the trachea , bronchi ,lobar and alveoli ducts) .

Upper respiratory tract :-

1-The nose

It is a rigid structure that is bony in the upper one third and cartilaginous in the lower two thirds , contains two passages that are separated in the middle by the septum . The septum and interior walls of nasal cavity are lined with mucus membrane , as is the rest of the respiratory tract .

2-Sinuses

The Para nasal sinuses are air filled cavities within the hollow bones that surround the nasal passages and are lined with ciliated epithelium . The function of the sinuses is to provide resonance during speech .

3-The pharynx or throat

Is located behind the oral and nasal cavities and is divided in to the nasopharynx , oropharynx and laryngopharynx

4-The larynx (voice box)

Is located above the trachea , just below the pharynx at the root of the tongue , is composed of several cartilage is largest and is commonly referred to as Adams apple . The epiglottis is a leaf shaped , elastic structure that is attached a long one edge to the top of the larynx

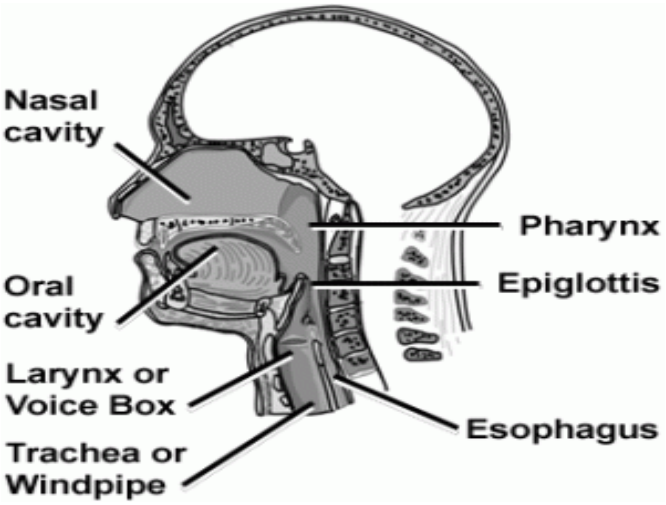


Figure (2) component of upper respiratory tract

Lower respiratory tract :-

1- The trachea

Is located in front of the esophagus , beginning at the lower border the cricoid cartilage of the larynx and extending to the level of the sixth or seventh thoracic vertebra . It branch into the right and left mainstem bronchi and it is composed of six to ten (6-10) C shaped cartilaginous rings .

2- Bronchi

The mainstem or primary bronchi begin at the carina . the structure of the bronchi resembles that of the trachea .the right bronchus is slightly wider ,shorter and more vertical than the left .the mainstem bronchi future divide into lobar bronchi that enter the lob of the lung .the bronchi are lined with ciliated mucus secreting epithelium serve to propel mucus up and away from the lower airway .

3- Bronchioles

Branching from the secondary bronchi , subdivided into smaller and smaller tubes : the terminal and respiratory bronchioles which are 1 mm in diameter have no cartilage and no cilia and not participate in gas exchange .

4-Alveolar ducts

It is branches from respiratory bronchioles , from these ducts alveolar sacs arise , that contain clusters of alveoli the basic unit of gas exchange .it estimated that the lung contain about 300 million alveoli surrounded by pulmonary capillaries . certain cells located in the walls of alveoli secrete surfactant (a phospholipids protein that reduce the surface tension in the alveoli and prevents their collapse).

5- Lungs

Are elastic organs extended from the diaphragm to the just above the clavicles at the apex , the right lung which is larger than the left is divided in to three lobes : upper , middle and lower . the left lung , which is somewhat narrow than the right to accommodate the heart is divided in to two lobes , all five lobe of the lungs are further divided into segments that correspond to the segmental bronchi . The pleura (smooth membrane) totally encloses the lung (the parietal pleura lines the inside thoracic cavity , the visceral pleura cover the lung surface .

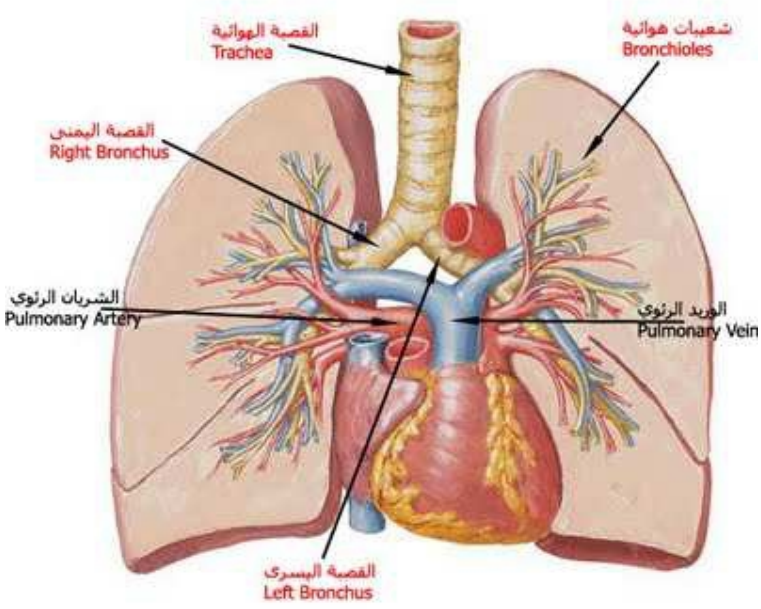


Figure (3) component of lower respiratory tract

Respiratory tract infections

Respiratory tract infections are divided into two :-

1-upper airway infections

2- lower air way infections

upper air way infections

Are the illness caused by an acute infection which involves the upper respiratory tract .These are common occurrences during ones life span . These disease can be acute or chronic ,emergent or scheduled ,self limiting or terminal . And this infections include rhinitis ,sinusitis , laryngitis , pharyngitis and tonsillitis , presents with a sudden onset of sore throat, pain with swallowing and fever. Strep throat does not usually cause runny nose, voice changes or cough

Lower airway infections

the term lower respiratory tract infection refer to the partition of respiratory from the trachea to the lungs .There are a number of acute and chronic infections that can affect the lower respiratory tract. The client with lower respiratory infections can be extremely ill from an acute or chronic infection . this infection include pneumonia ,bronchitis ,asthma and others) .

general sign and symptoms of respiratory infection

- Cough
- Fever
- Ear discharge and pain
- Fast or difficult breathing

Complication of respiratory infection

- Otitis media
- Rheumatic fever
- pneumonia

Section two

This section include information about pneumonia (definition ,classifications , S&S for each type , diagnosis and prevention)

Objectives

At the end of this section the nurse should be able to :-

1-define pneumonia
2-explain cases and risk factor of pneumonia
3-clarify types of pneumonia according to different classification and S &S of every type .
4-explain different method of diagnosis of pneumonia
5- know method of transition of pneumonia

Definition

Pneumonia is an inflammatory process that result in edema of interstitial lung tissue and extravasation of fluid into alveoli , also it is defined as infection of pulmonary tissue including the interstitial space , the alveoli and often the bronchioles .Or incidence of bacteria or virus in lungs .

Etiology

In general individuals develop pneumonia when their defense mechanisms are unable to combat the virulence of the invading organisms .Certain environments predispose young and otherwise healthy individuals to develop pneumonia ,for example dormitory settings or communal living situations can promote an epidemic spread of organisms The pneumonia may develop after upper respiratory tract infection or influenza virus infection , several types of organisms cause pneumonia including bacteria , viruses ,mycoplasmas ,fungi ,rickettsiae ,protozoa and helminthes . Non infectious causes of pneumonia include inhalation of toxic gases ,Chemicals ,smoke and aspiration of water food and vomits Pneumonia affected all age groups of children .

Risk factor for pneumonia

1- Chronic disease such as chronic obstructive pulmonary disease , diabetes mellitus ,or heart disease.
2-inadequte nutrition .
3- impaired swallowing or gag reflex.
3- aspiration of fluid ,food ,or other substance.
4-immunosuppression by either disease or drug.
5- tracheal intubation .
6-prolonged immobility (especially bed rest).
7-altered level of consciousness .

Types of pneumonia

There are several types of pneumonia according to :-
1- causative agent (bacterial ,viral ,mycoplasma ,fungal and atypical pneumonia).
2-acording to infected area (lobar , bronchial ,and interstitial pneumonia
3- according to IMCI (pneumonia ,No pneumonia and sever pneumonia) .

1- According to causative agent

bacterial pneumonia

Example for this type streptococcus pneumoniae ,staphylococcus aureus. This type occur at late fall and winter and to hospitalized compromised clients and clients with history of viral infection and for post surgical clients.

Sign & Symptoms

High fever ,shaking chills ,shortness of breath ,productive cough with green ,gray or brick red sputum and pleuritic chest pain

viral pneumonia

For example influenza virus , adenovirus and others .this type occur at late fall and winter .Occur shortly after viral symptoms arise begins as acute coryza in many client ,bronchitis and pleurisy in some client , gastrointestinal symptoms in others.

Sign & Symptoms

Acute illness with anxiety and agitation ,fever ,tachypnea ,peripheral cyanosis , productive cough with possibly bloody sputum .

Mycoplasma pneumonia

Occur in all seasons with gradual onset , fatigue ,headache ,fever less than (38 .9c). Chills ,anorexia ,and nonproductive cough .possible rhonchi or rales on auscultation ,wheezing and bronchospasm .

fungal pneumonia

For example Candida, histoplasma and others .presented by erratic fever , chest pain ,hemoptysis and productive cough .

2-According to infected area

Bronco pneumonia

Begins in the terminal bronchioles, which become clogged with muco purulent exudates to form consolidated patches in nearby lobules, also called lobular pneumonia.

Lobar pneumonia

All or a large segment of one or more pulmonary lobes is involved. When both lungs are affected it is known as bilateral or double pneumonia.

Interstitial pneumonia

Inflammatory process more or less confined within the alveolar walls(interstitial) and the per bronchial and interlobular tissues.

3-According to IMCI

No Pneumonia

A child with cough or difficult breathing who has no general danger signs, no chest indrawing, no stridor when calm and no fast breathing is classified as having NO PNEUMONIA:COUGH OR COLD . This child treated at home and the mother reassured about important of continuous of breast feeding , increasing of fluids and meals .

pneumonia

A child with cough or difficult breathing who has fast breathing and no general danger signs, no chest indrawing and no stridor when calm is classified as having PNEUMONIA . This child should be treated at hospital .

severe pneumonia

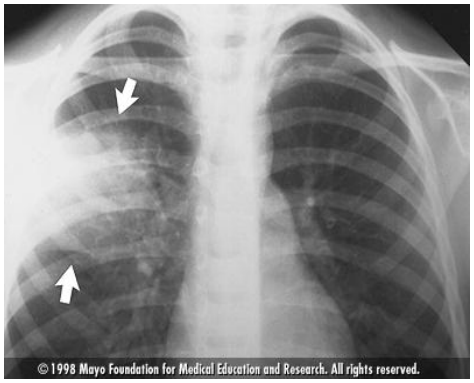
A child with cough or difficult breathing and with any of the following signs—anygeneral danger sign, chest indrawing or stridor in a calm child—is classified as havingSEVERE PNEUMONIA OR VERY SEVERE DISEASE.A child with chest indrawing usually has severe pneumonia. Or the child may have another serious acute lower respiratory infection such as bronchiolitis, pertussis, or awheezing problem. Chest indrawing develops when the lungs become stiff. The effort
the child needs to breathe in is much greater than normal. A child with chest indrawing has a higher risk of death from pneumonia than the child who has fast breathing and no chest indrawing. If the child is tired, and if the effort the child needs to expand the stiff lungs is too great, the child's breathing slows down.Therefore, a child with chest indrawing may not have fast breathing. Chest indrawing may be the child's *only* sign of severe pneumonia , this child treated in hospital .

Diagnose of pneumonia

Pneumonia diagnosed by the following steps

1- history taking
2-physical examination
3-Laboratory test
4- Chest X ray

Figure ( ) chest X- ray



Method of transmition

1- close contact with patient
2-use equipment and cloths of patient
3- by droplet contaminated by organism

Section three

Medical and nursing management

At the end of this section the nurse should be able to :-

1-explain medication of pneumonia

2-discus with patient the danger sign that made the patient came back to hospital

3-Apply the steps of physical assessment for patient with pneumonia

Medical management

Depend on types of pneumonia , bacterial pneumonia treated by antibiotic such as Amoxicillin .pencillin .a mpacillin .erythromycin ,zitromax,) the duration of treatment from 10 to 15 days as doctors ordered .

Viral pneumonia depend on treatment the symptoms , like lower fever , relive pain , ease cough .

In pneumonia and sever pneumonia patient admitted to hospital because he need to be under closed observation and supportive treatment like oxygen .

Danger sign

- Chest in drawing in respiration (chest retraction or indrawing should appear on intercostal space , Suprasternal , clavicular , Substernal and Subcostal space).
- Presence of sound during breathing(stridor when calm)
- Fast breathing (if the child age 2 – 12 month fast breathing when breath 50 breath per minute or more , if the child age more than 12 month – 5 years fast breathing 40 breath per minute or more) .

In addition to general danger sign

- High fever or convulsions
- Chest pain
- Difficulties in breathing
- Decrease in respiratory rate
- Cyanosis
- Difficulties in breast feeding or drink

Nursing Assessment

Nursing care of patient with pneumonia depend on nursing assessment or physical assessment of the lungs and thorax , this involve inspection ,palpation ,percussion and auscultation .This assessment is vital for formulating nursing diagnoses and planning care for client .

Localization of physical assessment findings depends on accurate numbering of the ribs, intercostal space ,and vertebrae and on accurate identification of imaging lines drawn on the chest .

Inspection :-

Inspection of the chest begins with assessment of the posterior thorax with the client in a sitting position if possible .The client should be undressed to the waist and draped for privacy and warmth ,the nurse observed from the top (apex of the lung) to the bases .The nurse note the

rate ,rhythm ,and depth of respiration ,as well as symmetry of movement and type of breathing , also nurse check for abnormal retraction .

Palpation :-

Palpation follows inspection to assess symmetry of respiratory movement , observable abnormalities , to identify areas of tenderness .

In palpation , the nurse thumb are placed posteriorly on the spine at the level of the nine ribs , the fingers are extended laterally around the rib cage . As the client inhales , both sides of chest should move upward and outward together in one symmetric movement , the nurse thumb thus move apart , on exhalation the thumb should come back together as they return to the midline . Impairment of thoracic movement may indicate pneumonia and other disease .

The thorax is palpated for any abnormalities found on inspection .to elicit tactile fremitus , the nurse places the palm or the base of the finger against the client chest wall and instruct the client to say (99) the vibration are compared (with the same hand) from one side of the chest to the other , moving from the apex to the bases of the lung . Tactile fremitus increased in pneumonia .

Percussion :-

Percussion is used to assess for pulmonary resonance . percussion involves tapping the chest wall , which sets the underlying tissue into motion and produces audible sounds .the nurse places distal joint of the middle finger of the less dominant hand firmly on the surface to be

percussed .No other part of the nurse hand should touch the client chest wall because such touching dampens the vibration , the plexor is used to deliver quick , sharp strikes to the distal joint of the positioned finger the nurse repeats this technique two or three time and listens to the intensity ,quality and duration of the sound produced . percussion of the thorax is done over the rib interspaces because percussing the sternum ,ribs , and or scapulae would indicate the sold nature of bone .

The percussion technique begins with client sitting in an upright position , the posterior thorax is assessed first , the nurse proceeds systematically , beginning at the apexes and working toward the bases . the nurse continues assessment of the thorax with percussion of the anterior chest . The percussion note changes from resonance of the normal lung to dullness at the borders of the heart and liver , if a dull percussion is noted over lung tissue , the nurse expects fluid or solid material to be replacing the normal air containing lung (as in client with pneumonia) . Abnormal chest sound a pears on percussion include : tympany , dullness and stony dullness .

Auscultation

Auscultation is the final and most reliable assessment technique and includes listening for normal breath sounds , adventitious (abnormal) sounds and voice sound . auscultation provides information about the flow of air through the tracheobronchial tree and enables the nurse to identify the presence of fluid , mucus or obstruction in the respiratory system . the nurse use the diaphragm of the stethoscope for auscultation because it is designed to detect high pitched sounds .

The auscultation procedure begins with the client sitting in an upright position . the nurse use systematic approach and works from the apexes of the lungs to the basal segments . Auscultation is performed on the posterior , anterior ,and lateral thorax using the diaphragm of the

stethoscope pressed firmly against the client chest wall because clothing can distort sounds , the nurse instruct the client to breath slowly and deeply with an open mouth . the nurse listens to a full respiratory cycle and note the quality and intensity of the breath sounds .

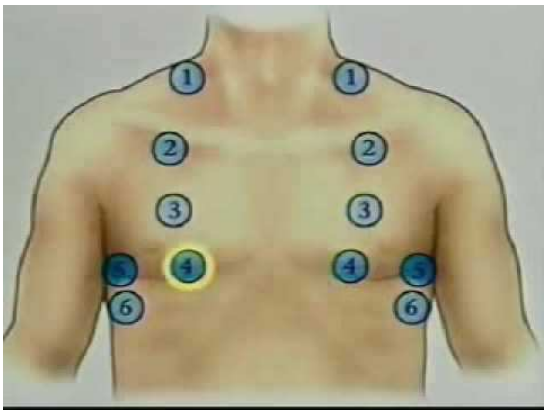
The normal breath sound are produced as air vibrates while passing through the respiratory passages from the larynx to the alveoli . normal breath sound are known as vesicular , bronchovesicular and bronchial or tubular , the nurse describes these sounds as decreased ,diminished or absent .

Vesicular sounds are normal breath sound that are heard over most of the peripheral lung fields with the expectation of the area between the scapulae posteriorly or above the sternum anteriorly.

Bronchovesicular breath sounds are mixture of vesicular and bronchial sounds , it heard over the thorax where the bronchi are closest to the chest wall , anteriorly near the mainstem bronchi at the level of first and second intercostal space and in the intrascapular region posteriorly .

Bronchial breath (tubular) are normally heard over the trachea , when these sound are heard peripherally they become abnormal sound such as in clients with pneumonia .

How to use the stethoscope



The correct site for using stethoscope

Abnormal breath sounds

- **Rales (crackles) :** like hair being rolled between fingers near the ear occur in case of pneumonia , tuberculosis and others .
- **Rhonchi:** caused by fluid , secretions or obstruction in large air ways likely to change with coughing or suctioning , occur in case of pneumonia ,tumors and others
- **Wheezes :** associated with air rushing through narrowed small airway may be heard with out stethoscope occur in case of bronchospasm and other .
- **Pleural friction rub:** grating sounds caused by inflamed surfaces of the pleura rubbing together occur in case of pneumonia ,pleurisy and others .

Section four

At the end of this section the client should be able to perform :-
1- Rescue breathing
2- Oxygen administration
3- Air way maintenance
4- chest physiotherapy
5- Tracheal suction
6-manual ventilation
7- pulse ox meter

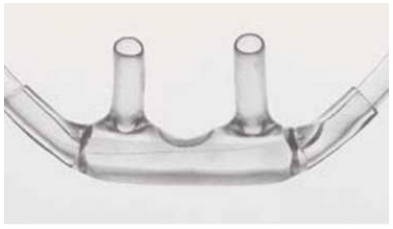
This section discussed on the lab according to the check list on (chapter six).

How to perform rescue breathing

Method of oxygen administration

A- oxygen slender

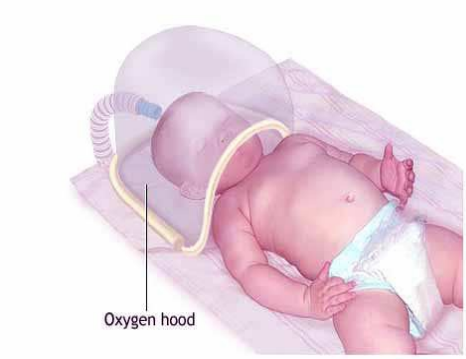
C- Ambobage



B- nasal cannula

D- Face Mask

How to maintain the air way



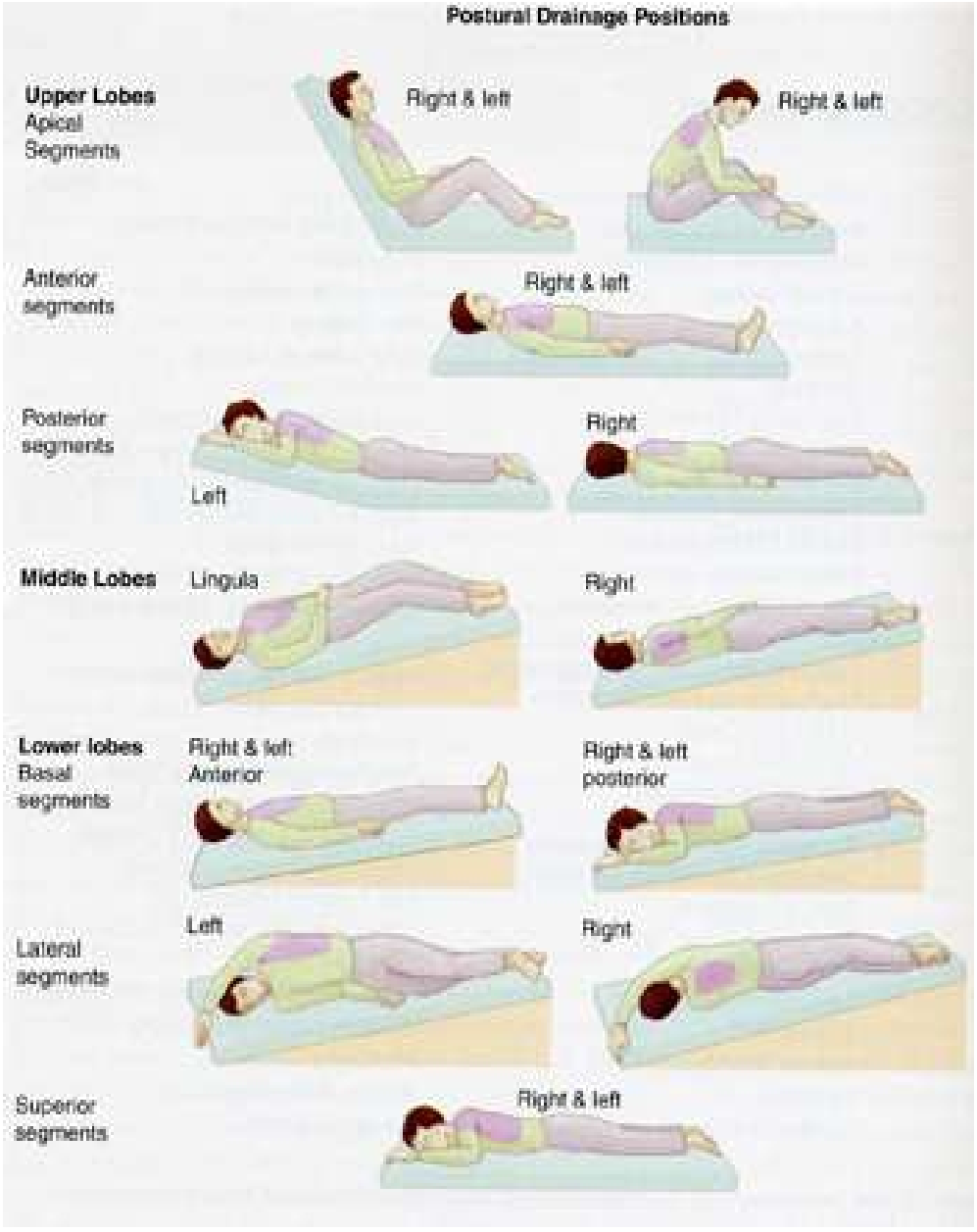
•Can delivered fiO2 up to 100%

How to apply Manual ventilation

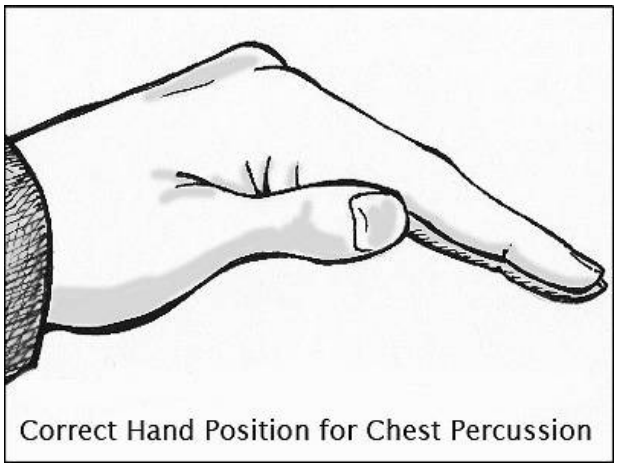
How to use Pulse ox meter

The tubes used in tracheal suction

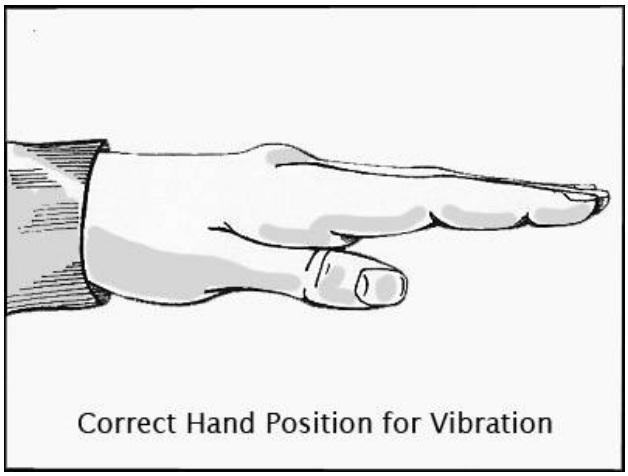
Chest physiotherapy



Postural drainage is a technique for loosening mucus in the airway so that it may be coughed out



Correct Hand Position for Chest Percussion

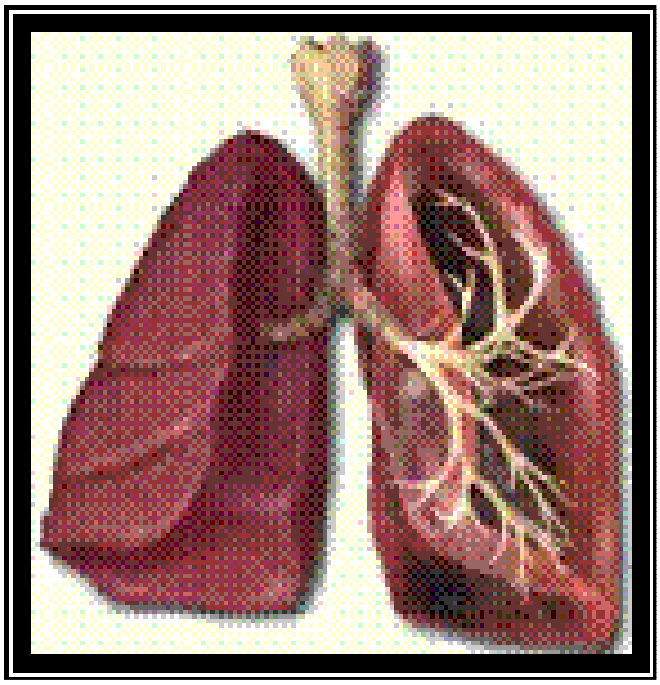


Correct Hand Position for Vibration

بسم الله الرحمن الرحيم

جامعة شندي
كلية الدراسات العليا

برنامج للتمريض بمستشفى شندى التعليمى عن الالتهاب الرئوى عند الاطفال



اعداد : لمياء الطيب الهدى محمد سعيد
كلية التمريض – جامعة شندى

الجزء الاول

مقدمة عن الجهاز التنفسى

هذا الجزء يتناول بالشرح اهمية الجهاز التنفسى ومكوناتة ووظائفة والخطوط الدفاعية الموجودة به . كما يتناول مقدمة مختصرة عن التهابات الجهاز التنفسى الحادة بالاضافة الى اعراضها ومضاعفاتها) .

الاهداف :-

بنهاية هذا الفصل يستطيع الدارس :

1.معرفة اهمية الجهاز التنفسى بالنسبة لاجهزة الجسم المختلفة.

2.ان يوضح مكونات ووظائف الجهاز التنفسى .

3.ان يبين معلومات عن التهابات الجهاز التنفسى وعراضها ومضاعفاتها .

الجهاز التنفسى :-

هو احد أجهزة الجسم الحيوية الهامة حيث يذود الجسم بالاكسجين الضرورى ويخلصة من ثانى اكسيد الكربون
وهو على اتصال دائم بالبيئة المحيطة من خلال عمليتى الشهيق والزفير اثناء التنفس .

وظائف التنفس

1.تذويد الجسم بالأكسجين وطرح ثانى اكسيد الكربون.
2.المحافظة على التوازن الحمضى القاعدى .
3.المحافظة على حرارة الجسم.

خطوط الدفاع الموجودة بالجهاز التنفسى

وهى تشمل :-

1. عملية العطس التى تعمل على طرد اى مواد غريبة تدخل الانف.
2. شعيرات الانف الداخلية التى تعمل ملى تنقية الغبار.
3. الافرازات المخاطية بالانف التى تعمل على تنقية الهواء من الغبار والجراثيم .
4. السعال ,حيث يعمل على طرد الجراثيم من القصبة الهوائية.
5. الغشاء المبطن للجهاز التنفسى الذى يحتوى على خلايا المناعة لمهاجمة الفيروسات والبكتريا.

عندما يتاثراى خط من خطوط الدفاع المزكورة سابقا يكون الجهاز التنفسى عرضة لكثير من الامراض ومن ضمنها الالتهابات التنفسية الحادة والمزمنة
تكون الجهاز التنفسى فى شكلة العام من ثلاثة اجزاء وهى :-

1. المجارى التنفسية:

وهى الانف ,البلعوم ,الحنجرة ,الرغامى ,الشعب الهوائية

2.الرئتان

3.الاوعية الدموية الرئوية

اولا المجارى التنفسية

حيث تتكون من :-

- 1-الانف هى جهاز غضروفى وهما مبطنتنتان بغشاء مخاطى مهدب برطب الهواء وينفبة
2-البلعوم وهو الممر المباشر والممتد من ممر الانف من الخلف ,الجزء الامامى منه مبطن بغشاء مخاطى والجزء الخلفى عبارة عن ممر مشنرك للغذاء والهواء معا تتصل به من الامام الفصبه الهوائية ومن الخلف المرئ
- 3-الحنجرة عضو غضروفى تمتد فى داخلة ثنيات غشائية عضلية تكون الحبال الصوتية
- 4-الرغامى وهى تتكون من غضاريف شبه دائرية يبطنها غشاء مخاطى ذو اهداب مهتزة تستوقف الغبار والجزيئات التى ترافقة

ثانيا الرئتان

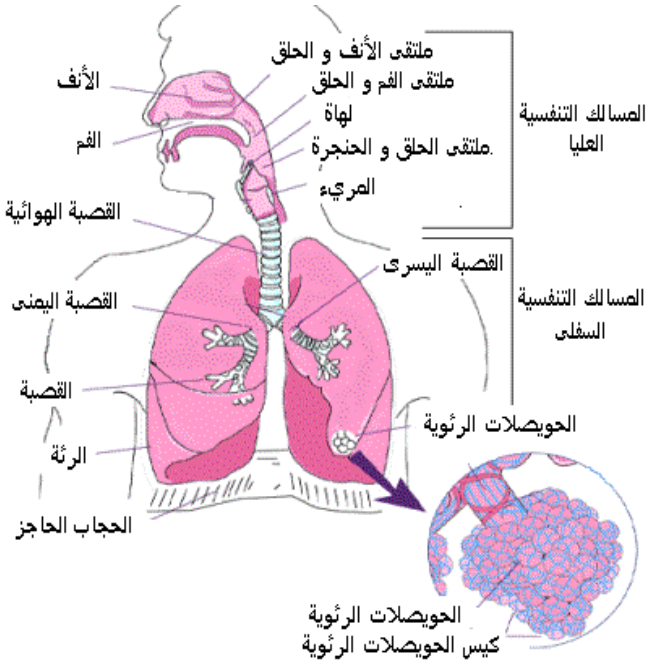
- الرئتان توجد محاطة بالغشاء البلورى وتتكون كل رئة من مجموعة من الحويصلات الرئوية والفصيصات الرئوية حيث يبلغ عدد الفصوص فى الرئة اليمنى ثلاثة وفى اليسرى اثنان
- كما يتبع للرئتان الغشاء الجنبى هو عبارة عن وريقتان تحيطان بالرئة تلتصق الوريقة الداخلية بالرئة بينما الخارجية تلتصق بالوجة الداخلى للقفص الصدرى

ثالثا الأوعية الدموية الرئوية

وهى تمثل المصدر الاساسى للتروية الدموية لهذا الجهاز كما تمثل المكان الرئسى للتبادل الغازى حيث تنتهى بالاسناخ (الحويصلات التى يتم فيها التبادل الغازى الرئوى)

ينقسم الجهاز التنفسى عموما الى جزئين :-

- الجهاز التنفسى العلوى وهو يشمل (الانف ,الفم , الجيوب الانفية , الحنجرة , القصبة الهوائية والشعبتين .
- الجهاز التنفسى السفلى وهو يشمل (الشعيبات الهوائية والرئتين)



التهابات الجهاز التنفسى الحادة :-

وهى عبارة عن مجموعة من الاتهابات التى يسببها عدد من الميكروبات سواء كانت بكتيريا او فيروسات او غيرها من الكائنات الحية الدقيقة , وقد تصيب هذة الميكروبات اى جزء من اجزاء الجهاز التنفسى بداية من الانف الى الرئتين وما يتصل بهما من اجزاء الجسم الاخرى مثل الحلق واللوزتين او الاذن .

- تعرف التهابات الجهاز التنفسى ايضا على انها مجموعة الالتهابات التى تصيب الجهاز التنفسى عامة وهى تتراوح ما بين الالتهابات البسيطة الى الشديدة وتشمل هذة **الالتهابات :-**
- الالتهابات التى تصيب الجزء العلوى من الجهاز التنفسى (اى الاجزاء الواقعة فوق الحنجرة) ومن امثلتها

(الرشح ,الزكام , الانفلونزا , التهاب الجيوب الانفية و التهاب الحلق) وتشكل هذة الالتهابات الغالبية العظمى من التهابات الجهاز التنفسى وهى عادة غير خطيرة وتستمر لعدة ايام ثم تزول

- الالتهابات التى تصيب الجزء السفلى من الجهاز التنفسى ومن امثلتها (التهاب الرئة والشعب الهوائية) وهى عادة اقل انتشارا ولكنها اكثر خطورة وقد تؤدى الى الوفاة .
- تعتبر التهابات الجهاز التنفسى العلوى والسفلى السبب الرئيس للمراضة والوفيات على مستوى العالم , ويتفاقم خطرها فى حالات الاطفال صغار السن والذين يعانون من امراض رئوية سابقة وكذلك الذين يعانون من كبح جهاز المناعة .

- تنتشر التهابات الجهاز التنفسى الحادة بين الاطفال دون الخمس سنوات بصورة كبيرة , حيث يصاب الطفل الواحد (5-8) مرات فى السنة ولكن من حسن الحظ ان معظمها اصابات فيروسية تصيب الجزء العلوى .
- اهم اسباب الالتهابات التنفسية بنوعيها العلوية والسفلية , البكتريا التى تسبب التها ب اللوزتين , الاذن الوسطى والتهاب الجيوب الانفية الحاد .و اسباب فيروسية ينتج عنها التهاب الحلق ,التهاب الحنجرة , التهاب القصبة الهوائية والتهاب الرئة .

أعراض الالتهابات التنفسية الحادة :-

الكحة ,الرشح , ارتفاع الحرارة , الام وافرازات صديدة من الاذن , ذيادة سرعة التنفس , وصعوبة فى التنفس . تتراوح مدة الاصابة بهذة الالتهابات ما بين (2-5) ايام وتتحسن معظمها تلقائيا بدون اى تدخل علاجى او استخدام ادوية غير ان اهمالها قد يحدث بعض المضاعفات .

مضاعفات الالتهابات التنفسية:

1.التهاب الاذن الوسطى المزمن الذى قد يصل الى فقدان السمع .
2.الحمى الروماتزمية .
3.الالتهاب الرئوى الذى يتسبب فى وفاة الكثير من الاطفال اقل من خمسة سنوات خاصة اقل من سنة .

الجزء الثانى

يشمل هذا الجزء نبذة عن الالتهاب الرئوى (تعريفة , تصنيفة , الاعراض والعلامات لكل نوع):

الأهداف

بنهاية هذا الفصل يستطيع الدارس ان :-

1. يعرف الالتهاب الرئوي تعريف صحيح .

2.ان يعدد الأسباب والعوامل المؤهبة للالتهاب الرئوى .
3.ان يتمكن من معرفة انواع الالتهاب الرئوى حسب تقسيماتة المختلفة مع معرفة الاعراض والعلامات لكل نوع.
4.ان يبين الطرق المختلفة لتشخيص الالتهاب الرئوى.
5.ان يعرف الدارس طرق انتقال العدوى .

تعريف الالتهاب الرئوى:

يشمل تعريف الالتهاب الرئوى فى المضمون العام التعاريف الاتية:-

* هو عبارة عن التهاب فى الحويصلات الرئوية ,التى تمتلئ بسائل صديدى ,وبذلك يجد الاوكسجين صعوبة فى الانتقال من الحويصلات الى الاوعية الدموية.

- تعرف منظمة الصحة العالمية الالتهاب الرئوى على انة شكل من اشكال العدوى التنفسية الحادة التى تصيب الرئتين.
- هو الإصابة البكتيرية أو الفيروسية او الفطرية الحاصلة فى كلتا الرئتين او احداهما .ويحتل المرتبة السادسة من اسباب الوفاة فى العالم.

- أو هو حدوث التهاب فى النسيج الرئوى بسبب تجرثم النسيج باحد انواع البكتريا او الفيروسات.
- هو التهاب في أنسجة الرئة بسبب وصول ميكروب معين . وعادة يكون نوعا من انواع البكتريا ولكن فى احيان اخرى يكون السبب فيروسى او فطرى وعندما يستقر الميكروب فى الحويصلات الهوائية فانة يبدا بالتكاثر وتمتلئ الرئة بالسوائل وكرات الدم البيضاء لمحاربة الميكروب . ومن الممكن ان يصيب الالتهاب فصا او اكثر من فصوص الرئة .

ويصيب الالتهاب الرئوى جميع الفئات العمرية للاطفال ز

أسباب الالتهاب الرئوى:-

إن الالتهاب الرئوى لايرجع الى سبب واحد , ولكن هنالك اكثر من ثلاثين مسببا يمكن تلخيص اهما فى الاتى :-

1. بكتريا .(مثل المتكورة الرئوية وغيرها)
2. فيروسات .
3. المتفطرات الرئوية (ينتج عنها التهاب لانوعى).
4. الفطريات.
5. التعرض للمواد الكيميائية المختلفة.
6. احيانا يحدث نتيجة لمصدر ميكروب موجود بالتهاب بالجلد او الاذن او الحمى القرمزية.

العوامل المؤهبه للاصابة بالالتهاب الرئوى:

هنالك عدة عوامل تجعل الاطفال عرضة للاصابة بهذا المرض اكثر من غيرهم وهى :-

1.الاطفال المصابون بنقص المناعة وكذلك الذين يتناولون الادوية التى تؤدى الى نقص المناعة
2.المصابون بالارتجاع المعدى المريئى
3.المصابون بتشوة خلقى فى القلب او الرئة
4.المصابون بالربو او بامراض مزمنة فى الرئتين مثل الامفيزيما
5.المصابون بسوء التغذية
6. الاصابة السابقة او الحالية بمرض السل
7. مسببات الهزال العام مثل السهر وعدم الراحة والاجهاد العام
8.الامراض العصبية التى يصحبها صعوبة فى البلع او السعال
9. الالتهابات الرئوية تزداد فى فصل الشتاء او حين التعرض للتيارات الهوائية الباردة

انواع الالتهاب الرئوى:

يتم تقسيم الالتهاب الرئوى حسب الطرق الاتية :-

1- بناءا على نوع المسبب حيث يقسم الى (التهاب رئوى بكتيرى ,التهاب رئوى فيروسى , التهاب رئوى بسبب الفطريات ,التهاب رئوى استنشاقى والتهاب رئوى بسبب المتفطرات الرئوية **).**

2- بناءا على مكان الاصابة حيث يقسم الى (التهاب رئوى فصى والتهاب رئوى قصبى)

3-بناءا على شدة الاعراض والعلامات حيث يقسم الى (التهاب رئوى بسيط ,التهاب رئوى متوسط والتهاب رئوى وخيم او شديد) .

أولا أنواع الالتهاب الرئوى بناء على نوع المسبب :-

الالتهاب الرئوى البكتيرى:

يصيب كل الفئات العمرية ولكن اكثر الناس عرضة للاصابة هم الرضع ,كبار السن , المعرضون للتدخين السلبى ,المصابون بنقص المناعة ,الاشخاص اللذين اصيبوا بالتهاب رئوى فيروسى وبعد العمليات الجراحية الكبرى.

توجد البكتريا المسببة للمرض بشكل طبيعى فى بلعوم الاشخاص الاصحاء وعند التعرض لاحد الاسباب السابقة تتكاثر البكتريا وتشق طريقها الى الرئتين مسببة الالتهاب الرئوى البكتيرى .

يصيب الالتهاب فصا كاملا او جزءا منة او اجزاء متفرقة من فصوص مختلفة ,وتتمتلئ الحويصلات بالسوائل الالتهابية والصديد , اكثر انواع البكتري المسببة هىالمكورات الرئوية streptococcus pneumonia.

اعراض الالتهاب الرئوى البكتيرى

يحدث الالتهاب الرئوى البكتيرى بشكل مفاجئ او تدريجى ويشتكى المريض من الاعراض الاتية :-

- الم فى الصدر.
- سعال مع بلغم اخضر او مغير اللون.
- ارتفاع الحرارة مع تعرق شديد.
- رعشة.
- إزرقاق فى الشفتين والاظافر فى الحالات الشديدة
- اختلاط ذهني وهذيان فى الحلات الشديدة

وينقسم الالتهاب الرئوى البكتيرى الى ثلاثة فئات :-

- الالتهاب الرئوى المكتسب فى المستشفيات hospital a quired pneumonia
- الالتهاب الرئوى بسبب الشفط aspiration pneumonia
- الالتهاب الرئوى المكتسب فى المجتمع community aquired pneumonia
- يمكن أن ينتقل الالتهاب البكتيرى الى الدم مسببا التسمم الدموى البكتيرى والى السحايا مسببا التهاب السحايا .

2- الالتهاب الرئوى الفيروسى:

يمثل التهاب الرئة الفيروسى نصف حالات التهاب الرئة فى الاطفال ,لكن عادة الاصابة تكون بسيطة ويتماثل المصاب للشفاء من تلقاء نفسة ,وفى بعض الاحيان يمكن ان تكون الاصابة خطيرة ,واحيانا قاتلة وخاصة فى المصابين بامراض القلب او الرئة

الاعراض :

تكون الإصابة شبيهة بالانفلونزا , وتتمثل فى الاعراض الاتية :-

- ارتفاع فى الحرارة
- سعال جاف
- صداع
- الم فى العضلات

تتغير هذة الاعراض بعد 24 ساعة ، فترتفع درجة الحرارة اكثر ,يصبح السعال رطبا ويخرج المصاب بعض البلغم وقد يشعر المريض بصعوبة فى التنفس.

يمكن ان يصاب المريض بالتهاب بكتيرى ثانوى بعد الاصابة بالالتهاب الرئوى الفيروسى وهنا تكون الاعراض كالتى اشرنا اليها فى الالتهاب الرئوى البكتيرى.

3.الالتهاب الرئوى بالمتفطرات الرئوية :

تعد المتفطرات الرئوية اصغر الكائنات المسببة للامراض فى الانسان , وهي تختلف عن البكتريا والفيروسات وتحمل خصائص من كل منهما , وتشكل حالات الالتهاب الرئوى بسبب المتفطرات الرئوية حوالى 20% من اجمالى حالات طلتهاب الر□ة.

□ ! يصيب الالتهاب جميع الاعلار لكنة اكثر فى الاطـــل الكبار□المراه□ين(, وعلى الرغم م□ انة يشمل áلرئتين جميظهما الا انة عادة□يك□ن"بسيطا шلا يحمل اى خطورة ونسةP□لوفيات بة ق□يلب جدق .

تختلف الاعراض والعلامات عن تلك ٧المصاحب□ للالتهاب الفيروسى والبكتيرى ولذلك تسمى الاصابة التهاب رئوى لانمطى او لانوعى .

الاعراض:

- نوبات سعال عنيفة مع قليل من البلغم.
- حرارة ورعشة.
- غثيان وقئ .
- ضعف عام يستمر لعدة اسابيع.

4. الالتهاب الرئوى بسبب الفطريات :

يتعرض المصابون بنقص المناعة للاصابة بالتهاب الرئة الفطرى , ويكون الالتهاب الرئوى فى هذة الحالة هو العلامة الاولى لمرض نقص المناعة , والفطر المسبب هو pneumocystis carinii ، يمكن علاج الالتهاب بسهولة ونجاح فى كثير من الاحوال ولكن الاصابة تعود بعد اشهر من الشفاء.

5.الالتهاب الرئوى الاستنشاقى:

يحدث نتيجة استنشاق طعام او شراب او غاز او فطر او اى جسم غريب , ويصيب عادة المرضى المنومين فى المستشفى او بعد العمليات الجراحية ويمكن ان يكون خطيرا أن ام يعالج.

ثانيا أنواع الالتهاب الرئوى بناءا على مكان الاصابة :

1. الالتهاب الرئوى الفصى وهو ان يصيب الالتهاب فصا واحدا من الرئة او جزءا من الفص
2. الالتهاب الرئوى القصبى او الشعبى وهو شائع الحدوث عند الاطفال ويكون الالتهاب منتشر فى الشعب الهوائية الصغيرة التى تتشعب منها الحويصلات .

ثالثا أنواع الالتهاب الرئوى بناءا على كيفية العلاج الشامل لأمراض الطفولة

1. لايوجد التهاب رئوى (وجود كحة وصعوبة فى التنفس مع عدم وجود علامات خطورة) .هذا النوع من الالتهاب يعالج بالمنزل مع إرشاد الأم إلى أهمية الاستمرار فى الرضاعة الطبيعية والإكثار من السوائل والتغذية الجيدة .
2. يوجد التهاب رئوى(وجود سرعة فى معدل التنفس) . هذا النوع يتم علاجة بالمستشفى .
3. الالتهاب الرئوى الشديد (ظهور علامات الخطورة مثل انسحاب الصدر وحدوث صوت مع التنفس والطفل هادى). هذا النوع يتم علاجة بالمستشفى .

طرق انتقال العدوى :

إن فرصة نقل العدوى للالتهاب الرئوى البكتيرى ضعيفة لان الالتهاب يكون عميقا فى الرئتين , اما بالنسبة للالتهاب الفيروسى والاتهاب الانوعى فان فرصة العدوى تكون اكثر.

ينتقل المرض باحدى الطرق الاتية :-

1. استنشاق الهواء الملوث بالجراثيم من عطاس او سعال شخص مصاب .
2. استعمال ادوات المائدة الخاصة بشخص مصاب
3. احيانا تحدث العدوى عندما يدخل جزء من البكتيريا او الفيروسات الموجودة اصلا فى الفم او الانف الى الحلق ثم الى الرئتين من غير قصد (كما يحدث عند النوم حيث يستنشق بعض الناس افرازات من الحلق او الانف).

تشخيص الالتهاب الرئوى:-

يتم تشخيص الالتهاب الرئوى على خطوات تبدا اولا :-

*** التاريخ المرضى:-**

حيث تتركز هذة الخطوة على الاعراض التى يشتكى منها المريض ,بداية هذة الاعراض , شدتها كخطوة اساسية لبداية التشخيص وتحديد نوعية المرض

*** الفحص السريرى :-**

حيث يتم فى هذة الخطوة فحص المريض سريريا باستخدام السماعة الطبية والمعينات الاخرى فى الفحص وربط النتائج الموجودة سريريا بالاعراض والعلامات التى يشتكى منها

المريض . يستطيع الفاحص ان يسمع صوت قرقعة او صفير او ازيز او قد يكون صوت التنفس ضعيف فى منطقة معينة من الصدر لذا يتم التاكد من التشخيص عن طريق الاشعة السينية للصدر , كذلك يوجد ارتفاع فى درجة الحرارة , زيادة التنفس ويظهر ذلك بمشاهدة حركة الانف والصدر كما يوجد ايضا زيادة فى النبض .

*** .الأشعة السينية للصدر**

وهى تؤكد التشخيص حيث تبين مكان الالتهاب ونوعة اذا كان فصى او شعبى

.الفحص المجهرى :-

حيث يتم فى هذة الخطوة اخذ عينات من المريض لفحصها عن طريق المجهر وتشمل هذة العينات:-

- عينات من الدم ,حيث يعطى عدد الكريات البيضاء فى دم المصاب فكرة عن شدة الاصابة وما اذا كان السبب بكتريا او فيروسات (حيث يذداد عدد العدلات فى حالة الاصابة البكتيرية ويذداد عدد المفاويات فى حالة الاصابة الفيروسية).
- عينات من البلغم لتحديد نوع الجرثومة والمضاد الحيوى المناسب لها (يكون لهذا الفحص اهمية فى حالة الالتهاب الرئوى الناتج عن عدوى المستشفيات).
- فى بعض الحالات يتم استخدام التنظير القصبى , حيث يتم ادخالة عن طريق الانف للتمكن من فحص المجرى التنفسى مباشرة واخذ عينة من المناطق المصابة من الرئتين .

استخدام السماعة الطبية وفائدته فى التشخيص:-

يفيد التسمع بالسماعة الطبية فى التشخيص لأنة بواسطتها يستطيع الفاحص تميز الاصوات الطبيعية من غيرها وتتمثل الأصوات الطبيعية للصدر فى:-

- الصوت الحويصلى يسمع فوق معظم نسيج الرئتين .
- (صوت الرغامى الذى يسمع فوق الرغامى فى القصبة).
- الصوت القصبى يسمع فوق عظمة القص.
- الحويصلى القصبى يسمع فوق المسافتين الوربيتين الاولى والثانية فى الصدر وكذلك بين لوحتى الكتف من الخلف.

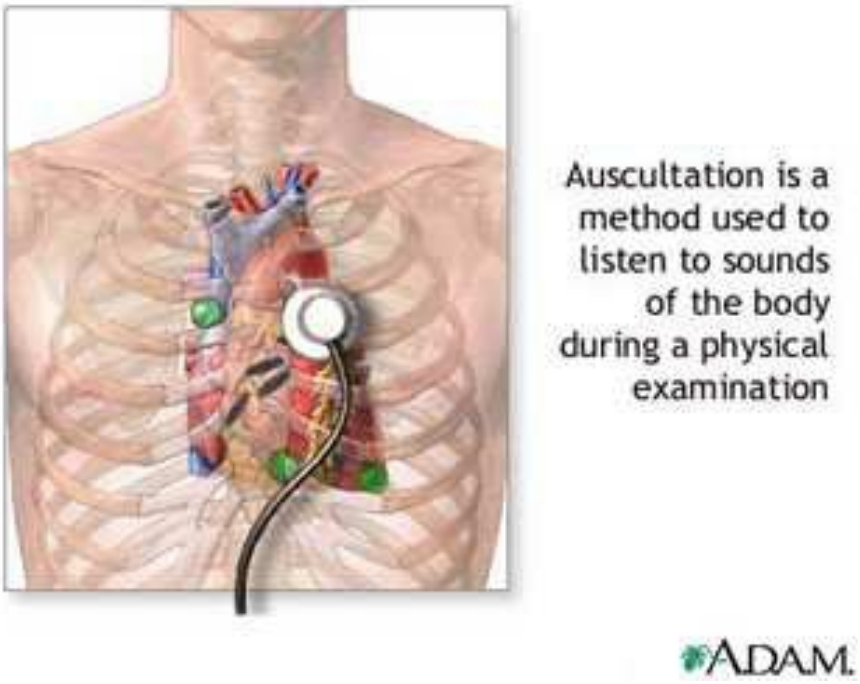
تتمثل الاصوات الغير طبيعية للصدر فى :

- الخرير crackles
- الازيز wheezing
- الغطيط Rhonchi
- الصريرstridor

يكون صوت الصدر فى حالة الإصابة بالالتهاب الرئوى من نوع الازيز فى حالة العدوى الفيروسية.

كيفية التسمع:-

نقل السماعة فوق المناطق المتناظرة من الصدر للمقارنة , اطلب من المريض التنفس بعمق خلال التسمع , يجب التسمع فى كل موضع حتى ينتهى المريض نفس واحد عميق على الاقل , توضع السماعة عند التسمع فى المسافة بين الإضلاع.



الطرق (القرع) وفائدتة فى التشخيص:

عادة يعطى معلومة حتى عمق 6 سم من المنطقة المقروعة , وهو يفيد لتحديد المكان المقروع هل هو صلب , مملوء بالهواء ام مملوء بسائل (القرع لايتم فوق لوح الكتف بينما يتم فوق المناطق المتناظرة وتتم المقارنة بينهما

- الصوت الطبيعى لفرع الرئتين هو الرنين (الوضاحة) resonance
- أما الأصوات الغير طبيعية عند الطرق فهى (الطبلية tympany , الاصمية , dullnessوالاصمية الصخرية flatness).

الجزء الثالث
كيفية المعالجة الطبية والتمريضية

الأهداف

بنهاية هذا الفصل يستطيع الدارس معرفة :-

1. الأدوية التى تستخدم لمعالجة الطفل المصاب بالالتهاب الرئوى.
2. علامات الخطورة التى يجب بموجبها عودة المريض الى للمستشفى.
3. أن يستطيع الدارس معرفة وتطبيق الخطوات الصحيحة للمعالجة التمريضية لمريض الالتهاب الرئوى.

معالجة الالتهاب الرئوى:

الالتهاب ب الرئوى من الامراض التى تتم معالجتها حيث تساعد المضادات الحيوية فى سرعة الشفاء من الالتهاب الرئوى البكتيرى والالتهاب الرئوى اللانوعى , ام الالتهاب الرئوى الفيروسى فيتماثل المصاب به عادة للشفاء من تلقاء نفسه ولا تفيد المضادات الحيوية التى لاتنفع فى علاج الفيروسات , ويحتاج المصاب بالالتهاب الرئوى الفيروسى الى مضادات الفيروسات التى تعطى فى حالات الاصابة الشديدة او الذين يعانون من نقص المناعة .

يقرر الطبيب بعد التشخيص نوعبة الالتهاب ونوع المضاد الحيوى والجرعة المناسة , وفى هذة الحالة لابد من الاللتزام التام بالتعليمات الطبية واكمال فترة العلاج المقررة منعا لحدوث الانتكاسات والمضاعفات فى المستقبل ومن امثلة المضادات الحيوية التى تعطى

للمرضى (الاموكسيسيلن ,البنسلين , الامبسلين ,الارثيروميسين , الزيترومكس) وتتراوح فترة المعالجة بالمضاد الحيوى من عشرة ايام الى اسبوعان بناءا على قرار الطبيب.

يتماثل بعض المصابين للشفاء وهؤلاء هم :-

1. صغار السن
2. الذين تلقوا العلاج بالمضادات الحيوية مبكرا
3. الذين لديهم مقاومة جيدة للامراض
4. الذين لا يعانون من اى امراض اخرى

متى يجب مراجعة الطبيب :

ينصح المصاب بمراجعة الطبيب على وجة السرعة فى الاحوال التالية وذلك لبدء سرعة العلاج وتجنب المضاعفات **:-**

1- عدم المقدرة على الرضاعة الطبيعية او الشرب .
2- .حدوث صوت عند التنفس
3- انسحاب الصدر (وهو يحدث فوق وتحت وخلف القص , بين الاضلاع وتحت الاضلاع , وعند الترقوة).

بالإضافة إلى علامات الخطورة العامة وهى

1. ارتفاع الحرارة الشديد
2. الاحساس بالم فى الصدر
3. الاحساس بصعوبة فى التنفس
4. ذيادة معدل التنفس لاكثر من 50 مرة فى الدقيقة بالنسبة للطفل (2-12 شهر) , واكثر من 40 مرة فى الدقيقة بالنسبة للطفل من عمر(سنة إلى 5 سنوات) وكذلك عند نقصان معدل التنفس
6. إذا لاحظت الأم انسحاب الجزء السفلى من القفص الصدرى

نصائح تعطى للطفل المصاب بالاتهاب الرئوى:-

1. الاكثار من شرب السوئل لتعويض المفقود بسبب ارتفاع الحرارة كما انها تساعد على تميع البلغم وقشعة.
2. الراحة التامة فى السرير حتى تتحسن الحالة العامة.
3. رفع راس السرير للمساعدة على اخراج البلغم.
4. الابتعاد عن المدخنين.
5. تجنب تناول مثبطات السعال , لان السعال عملية دفاعية للتخلص من الجراثيم والافرازات التى تتجمع فى الرئتين لذلك ينصح بتناول الادوية التى تساعد على اخراج البلغم.
6. لابد من الاستمرار فى العلاج بعد تماثل المريض للشفاء ورجوع الحرارة الى مستواها الطبيعى تجنبا لعودة المرض مرة اخرى.
7. اعتمادا على شدة الاعراض وحالة المريض العامة يمكن معالجة المريض فى المنزل , غير ان المصابين بنقص المناعة والامراض المزمنة والرضع يحتاجون للعلاج بالمستشفى.

المعالجة التمريضية لمريض الالتهاب الرئوى:

تتمثل العناية التمريضية لمريض الالتهاب الرئوى فى المتابعة العامة وإجراء التقبم السريرى عن طريق الملاحظة والتسمع والجس والطرق لمعرفة حالة المريض السريرية .

وتتمثل العناية التمريضية الشاملة فى الاتى:

1. الراحة التامة للمريض ومتابعة الحالة العامة.
2. تنفيذ اعطاء الدواء وخافضات الحرارة فى الزمن الصحيح والجرعة الصحيحة.
3. قياس العلامات الحيوية كل ساعتين (التركيز على الحرارة ومعدل التنفس) وذلك بالنسبة للاطفال اقل من سنة , وكل ستة ساعات بالنسبة للاطفال كبار السن (سنة الى 5 سنوات). وذلك فى حالة الالتهاب البسيط , اما فى حالة الالتهاب الوخيم فتتم قياس العلامات الحيوية كل 30 دقيقة (نصف ساعة) لتجنب مضاعفات ارتفاع الحرارة .

4.تنفيذ اعطاء السوائل المقررة للمريض بالصورة الصحيحة.
5.تنفيذ اعطاء الاوكسجين المفرر للمريض وكلما احتاج المريض لذلك.
6. اعطاء الاغذية المناسبة التى تتمثل فى (الاكثار من السوائل الدافئة , تركيز الام على الرضاعة الطبيعية بالنسبة لصغار السن , اعطاء العصائر الطبيعية بالاضافة الى اغذية الاسرة العادية).
7.الاهتمام بنظافة المريض والعناية الشخصية به (التركيز على العناية بالفم) وذلك من قبل الممرض او الام او الاثنان معا عند وجود تنبيب او اوكسجين او غيرة.
8.المساعدة فى وضع الانابيب التى توضع فى حالة المضاعفات والعناية التمريضية بها (مثل انبوب الصدر , انبوب الرغامى وانبوب الحنجرة) .
9. اجراء عملية شفط ا لمفرزات بطريقة صحيحة عند حوجة المريض لذلك.
10.تنبية الأم غالى علامات الخطورة التى يجب على ضوءها اعادة الطفل الى النستشفى (مزكورة سابقا).

الجزء الرابع

الأهداف

بنهاية هذا الفصل يستطيع الدارس ان :

1. تطبيق العلاج الطبيعى للصدر بصورة صحيحة
2. ان ينفذ إعطاء الأوكسجين بصورة صحيحة
3. يستخدم جهاز (plus ox miter)
4. يطبق عملية التنفس المساعد والتهوية اليدوية (manual ventilation).
5. إجراء عملية شفط السوائل والقشع

6. يطبق كيفية إبقاء المجرى التنفسية مفتوحة .

طرق إعطاء الأوكسجين:

1.كمامة الوجة simple face mask

هذه الطريقة تعطى كمية من الأوكسجين تصل الى10 ليتر فى الدقيقة ,لكنة غير دقيق فى نسبة الأوكسجين التى تصل إلى المريض كما أنها تتعارض مع حاجة المريض للأكل والشرب لانة يعطى عن طريق الفم مما يستدعى ابعادة عند الحاجة للتحدث مثلا (توضع فى حالة العمليات الجراحية أيضا)

2.قسطرة الأنف) nasal cannula

تعطى (1 -9) لتر فى الدقيقة , مريحة بالنسبة للمريض بحيث يستطيع الاكل والشرب من دون إبعاد الأوكسجين لكنها تسبب بعض الجفاف مم يستدعى استخدام بعض الكريمات للترطيب (توضع لمرضى العناية المركزة)

3- صندوق الراس .وغيرها من الطرق الأخرى .

واجبات الممرض أثناء إعطاء الأوكسجين:

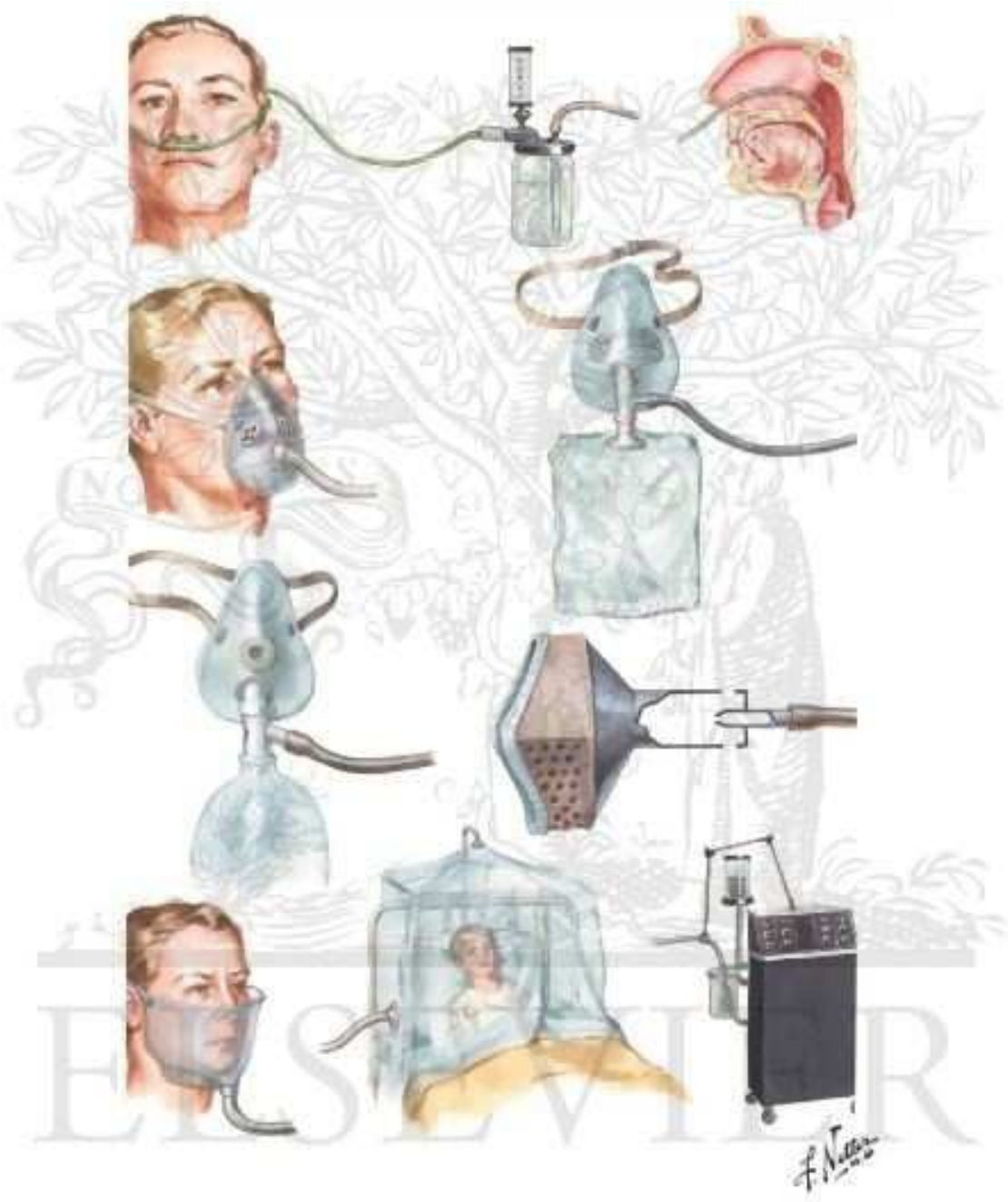
للاشتعال ومصادر اللهب , عدم السما ح بالتدخين , تدوين الملاحظات وتبليغ الطبيب عند اللزوم.
الملاحظة الشاملة للمريض , قياس وتدوين العلامات الحيوية مثل الحرارة والنبض , ملاحظة درجة تركيز الأوكسجين , التحكم فى درجة رطوبة الغاز وذلك بامرارة على مصدر الرطوبة , التأكد من عدم وجود مواد قابلة.

العلاج الطبيعى للصدر:

يساعد فى الحفاظ على صحة المريض والتخفيف من صعوبة التنفس وتحسين وظائف الرئة كما يقلل من لزوجة البلغم وبالتالي يسهل خروجة كلما سعل المريض مما يقلل من تكاثر الميكروبات . وله عدة طرق.

1. التبخير vipration
2. الطرق percussion
3. التفريغ الوضعى postural drainage

.



الطرق المختلفة لإعطاء الأكسجين

كيفية إجراء الهوية اليدوية (manual ventilation)

كيفية استخدام pulse ox meter

كيفية العلاج الطبيعى للصدر