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Autogenic Drainage for Bronchopneumonia in Children

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I. Introduction:

The child is the heritage of the family and children's health is India's health. The rights of the child defines a child as "A human being below the age group of 18 years unless the law applicable to the child, majority is attained earlier" **(United Nations Convention).** Children are having a developing immune response to various infectious diseases. Their ability to resist infections are in budding stage and because of this reason they are more vulnerable to various diseases. The most common childhood diseases include diarrhoea, worm infestation, whooping cough, protein energy malnutrition and pneumonia. Now a day's pneumonia is one of the most common health problems among children. Among pneumonia, bronchopneumonia is common among children. A child dies of pneumonia every 39 seconds. Pneumonia kills more children than any other infectious disease, claiming the lives of over 800,000 children under five every year, or around 2,200 every day. This includes over 153,000 newborns . Almost all of these deaths are preventable. Globally, there are over 1,400 cases of pneumonia per 100,000 children, or 1 case per 71 children every year, with the greatest incidence occurring in South Asia (2,500 cases per 100,000 children) and West and Central Africa (1,620 cases per 100,000 children). **(UNICEF,APRIL 2021)**

Bronchopneumonia begins in the terminal bronchioles, which become clogged with muco-purulent exudate to form consolidated patches in nearby lobules; also called as lobular pneumonia**. (Whaley and wong's,2013)**

HISTORY

Autogenic Drainage (AD), is an airway clearance technique that is characterised by breathing control, where the individual aims to adjust the rate, depth, and location of lung volumes during respiration. Autogenic drainage was developed in Belgium in the year 1967 by Jean Chevaillier. During 1980's, it was utilized throughout Europe to treat asthmatic patients who had suffered retention of secretions in the chest and difficulty in clearing the secretions.

DEFINITION

Autogenic drainage (AD) is an airway clearance technique which utilises controlled breathing at different lung volumes to loosen, mobilise and move secretions in three stages towards the larger central airways . AD means "self-drainage."

AIM

To reach the highest possible expiratory airflow in different generations of the bronchi simultaneously with an active, but not forced expiration.

BENEFITS OF AD

- No equipment is required
- It can be performed at any place, at anytime
- Patients can perform their airway clearance independently
- Less effort is be required to expectorate which reduces stress on the pelvic floor
- Reduced cough frequency with reducing fatigue

WHO WOULD BENEFIT FROM AUTOGENIC DRAINAGE?

Autogenic drainage is particularly useful in conditions where large amount of thick secretions are produced and it is recommended for age 8 and older . These include

- **Cystic Fibrosis (CF)**
- **Chronic Bronchitis**
- **Pneumonia**
- **Bronchiectasis**
- **Chronic Obstructive Pulmonary Disease (COPD)**

RATIONALE BEHIND THE AUTOGENIC DRAINAGE TECHNIQUE

The generation of shearing forces induced by airflow. The speed of the expiratory flow may mobilize secretions by shearing them from the bronchial walls and transporting them from the peripheral to the central airways.

EQUIPMENTS

- ✓ No equipment is needed
- ✓ Self-technique
- ✓ Patient and therapist possess good proprioceptive, tactile and auditory perception of the mucus moving.

HOW WILL THE TECHNIQUE HELP

The three phases of autogenic drainage include:

1 Loosening secretions from peripheral airways: Low lung-volume level

2 Collecting secretions from middle airways: Mid lung-volume level

3 Evacuating secretions from central airways: High lung-volume level

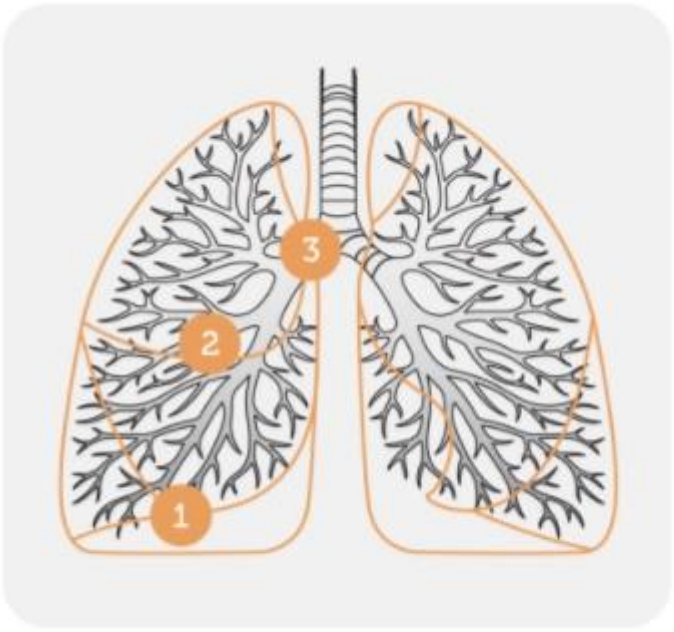

Fig 1. 1 – small peripheral airways 2 – medium airways 3 – large central airways

AUTOGENIC DRAINAGE CYCLE

Before you start:

Ensure you clear your nose by blowing your nose slowly, gently and for as long as possible.

Position:

Sit in a well-supported position with a neutral lumbar spine and the neck and shoulders relaxed.

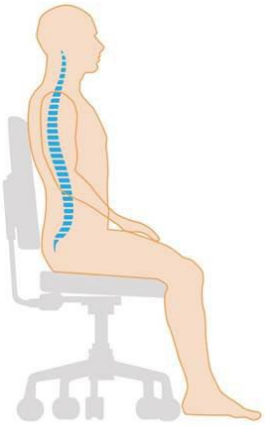

Fig. 2 Sitting posture

Autogenic Drainage consists of three stages:
1. A mobilising phase
2. A collecting phase
3. A evacuating phase

Preliminary instruction :
- ❖ Check physician ‘s order and the identification details of the child.
- ❖ Explain the procedure to the parents and child.
- ❖ Check the vital parameters like temperature, pulse rate, respiratory rate etc.
- ❖ Instruct the child to sit in a well supported position with the neck and shoulders relaxed.
- ❖ Instruct the child to breathe gently feeling the stomach rise and fall as they breathe in and out.
- ❖ Teach the child to Sigh out gently through the mouth.
- ❖ Instruct the child to gradually increase the depth of breathing while staying relaxed.

A ‘test’ breath
- ✓ Teach the child to take a very slow breath in through the nose or mouth.
- ✓ Inform the child to Pause at the end of the full breath with mouth slightly open and count for 2-3 seconds.
- ✓ Teach the child to exhale gently through the mouth by contracting the abdominal (tummy) muscle to tighten.
- ✓ Insist the child to listen and feel for secretions crackling as they breathe out.

1. LOW LUNG VOLUME BREATHING (A mobilising phase)
- ➢ This helps to loosen the secretions

1. Teach the child to taken in a small breath slowly through the nose by keeping the upper airways open and you feel the breath at the bottom of your chest.
2. Inform the child to hold the breath with mouth slightly open for about 2- 3 seconds.
3. Teach the child to exhale all of the air out of the lungs by contracting the abdominal (tummy) muscle to tighten.
4. Instruct the child to repeat 3 breaths until the child can hear or feel the sputum moving up into the middle airways.
5. Inform the child not to cough until after the third breath

2. MIDDLE LUNG VOLUME BREATHING (A collecting phase)
- ➢ This helps to move the secretions up the chest into your main airways

1. Teach the child to take in a normal sized breath slowly through the nose by keeping the upper airways open and you Feel the breaths more in the middle of the chest
2. Inform the child to hold the breath with mouth slightly open for about 2- 3 seconds.
3. Teach the child with gentle force to exhale all of the air out of the lungs by contracting the abdominal (tummy) muscle to tighten.
4. Instruct the child to repeat 3 breaths until the child can hear or feel the sputum collecting in the upper airways.
5. Inform the child not to cough until after the third breath.

3. HIGH LUNG VOLUME BREATHING (A evacuating phase)

- This will help to get rid of the secretions

1. Teach the child to take in a deep breath slowly through the nose by keeping the upper airways open.
2. Inform the child to hold the breath for about 2-3 seconds.
3. Teach the child with gentle force to exhale all of the air out of the lungs by contracting the abdominal (tummy) muscle to tighten.
4. Instruct the child to repeat 3 breaths until the child can hear or feel the sputum is ready to be cleared.
5. Inform the child not to cough until after the third breath.
6. Teach the child to do 1 or 2 huffs followed by a cough to clear the secretions.

LENGTH AND FREQUENCY OF AD TREATMENT

- ✓ Depends on the disease severity, knowledge of the technique, quantity of secretions etc.
- ✓ The more secretions, the more times and/or sessions per day.
- ✓ Each phase should take two to three minutes to complete. completing all three phases (one cycle) should take about six to nine minutes to complete. Repeat the cycle until the lungs are cleared as much as possible, which should take between 20 and 45 minutes.

TIPS

- Do not force it so much that may cause wheezing or tightness in your chest. If you hear wheezing on your out breath, slow your breath out to reduce the flow of air.
- The aim is to squeeze air quickly from your lungs, out through your open mouth and throat, as if you were trying to mist up a mirror or your glasses. The huff should move the sputum in the chest by making it 'rumble' or 'rattle'. If huffing clears the sputum there is no need to cough. Cough only if the sputum can be cleared easily.
- Try to stop from coughing until the last part of Autogenic Drainage when the secretions are high up in the larger central airways as a premature cough will lead to impaired clearance and ready to be cleared
- Use breathing control (diaphragmatic breathing) for 1-2 minutes between each cycle to assist with shortness of breath.

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