PHYSIOTHERAPY MANAGEMENT IN ICU PATIENTS

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Objectives

- Assessment of patient
- Goals
- Treatment techniques used in ICU by physiotherapist
- Chest physiotherapy for pediatrics

ASSESSMENT OF PATIENT

- See the patient is well conscious or not
- Read the case papers and daily orders. Note the temperature
- Type of mode of ventilators

Examination of the chest in mechanically ventilated patients

1) INSPECTION

- Chest movement
- Clubbing
- Cyanosis
- AP & Lateral chest diameter
- Kyphoscoliosis

2) PALPATION

- Confirm all inspectory findings
- Tenderness
- Rib fracture
- Crepitus
- Tracheal deviation

3)PERCUSSION

Dullness/ Normal/ Hyperesonant

4)AUSCULTATION

Breath sounds-Vesicular
Bronchial
Added breath sounds-Rhonchi
Wheeze
Crackles

GOALS

- Pain relief
- To prevent accumulation of secretions
- To mobilize and remove secretions
- To teach proper method of breathing pattern and effective coughing or huffing
- To mobilize the thorax and shoulder girdle and to teach the postural awareness
- To teach relaxation
- To improve functional capacity by exercise training programme
- To advice the home programme

OBJECTIVES OF CHEST PHYSIOTHERAPY

- Clearance of secretions from large and small airways and re-expansion of nonventilated lung
- Improve ventilation to areas of local lung obstruction
- To reduce incidence of post operative respiratory infection, morbidity and hospital stay

Treatment techniques used in ICU by physiotherapist

- Positioning
- Mobilization
- Manual Hyperinflation
- Percussion, Vibration, Shaking
- Cough/huff
- Suction
- Breathing exercises

POSITIONING

AIMS

- Optimizing O2 transport through its effect of improving ventilation/perfusion matching (V/Q)
- Increase lung volumes
- Reduce work of breathing
- Minimize the work of heart
- Enhance mucociliary clearance

HANDLING A CONSCIOUS PATIENT

- 2-3 people are needed to turn a patient
- Ensure sufficient slack in lines and tubes
- Inform the patient
- If possible disconnect the patient from ventilator/tracheal manualy
- Turn the patient smoothly & check the lines, patient comfort and observe monitors

TURNING PATIENT WITH CRANIOTOMY

- Position require
- To minimize pressure on the operated side especially in bone flap is removed
- 500ml IV infusion bags above &below this area support the head & prevent undue pressure

2] MOBILISATION

- This technique help to maintain or restore normal fluid distribution in the body
- It reduces the effect of immobility & bed rest

It includes-

- Limb exercises, Neck exercise
- Moving/Turning in bed
- Sitting in the edge of the bed
- Standing
- Standing transfer from chair, bed
- Walking

3]MANUAL HYPERINFLATION

- It is one of the technique where there is involvement in disconnecting the patient from ventilator &inflating the lungs with a large tidal volume via a manual resuscitator bag
- Bagging can be used as a technique to hand ventilate a patient or during physiotherapy
- MH can be given by using Ambu bag

4] POSTURAL DRAINGE POSITION

- Definition
- Goals
- To prevent accumulation of secretions in patient at high risk for pulmonary complication
- To remove secretions already accumulated in the lungs

Contraindications

- Haemoptysis
- Severe pulmonary edema
- CCF
- Large pleural effusion
- Pulmonary embolism
- Pneumothorax
- Cardiac arrhythmias
- Recent MI
- Recent neurosurgery

5] PERCUSSION & VIBRATIONS

- Are manual technique used to increase clearance of airway secretions

- PERCUSSION
- Medications to reduce pain is given prior to treatment
- In pediatrics percussion is given by using hand, fingers or facemask
- Force-58 & 65N on chest wall
- 100-480time/min

CONTRINDICATIONS

- Lung abcess
- Bronchopleural fistula
- Haemoptysis
- Rib Fractures
- Osteoporotic bone
- Tumour area
- Pulmonary embolism
- Low platelet count/ anticoagulation therapy
- Unstable angina
- Chest wall pain eg Thoracic surgery

VIBRATIONS

- Are performed manually by vibrating/compressing the chest wall
- Pressure is applied in the same direction in which chest is moving
- The vibrating action is achieved by therapist isometrically contracting the muscle of upper extremity from shoulder to hands

SHAKING

- More vigorous form of vibrations
- Applied during exhalation using an intermittent bouncing maneuver coupled with wide movement of therapist hands

6]SUCTION

- In unconscious patient & in patients with depressed cough
- Should not done routinely but only on demand
- Every 2hrly suctioning
- Ideally catheter diameter should be half of the size of the tracheal tube/ETT
- Adults- 10,12,14,16 FG & Pediatrics - 6,8 FG
- Monitor vacuum pressure 150-200mmHg for adults & <100mmHg for children
- Kink one end of catheter while inserting into the tube ,move in a circular manner in downward direction &release the kink when you feel resistance to pass the catheter further
- Never prolong the procedures
- Duration

COMLICATIONS

- Infection
- Bronchospasm
- Tracheaobroncheal trauma
- Hypoxia
- Atelectasis
- Cardiac arrest/arrhythmia

7] COUGH/HUFF

- COUGHING

- To keep the lungs clear

Procedure

- Evaluate the patient Place the patient in relaxed forward bending neck slightly flexed
- Teach controlled diaphragmatic breathing
- Demonstrate sharp double cough
- Ask the patient to repeat

Precautions

- Never allow the patient to suck air in by gasping

- HUFFING
- Huff is a rapid forced exhalation without maximum effort
- Glottis remains open
- Required less effort than coughing

9] BREATHING EXERCISES

- Goals
- Assist removal of secretions
- Improve respiratory muscle strength & endurance
- Increase thoracic mobility and tidal volume
- Promote relaxation
- Teach the patient how to deal with shortness of breath attack
- Improve patients overall functional capacity

- TYPES

1] Diaphragmatic Breathing

2] Ventilatory Muscle Training

i] Diaphragmatic breathing using weight

ii] Inspiratory resistance training

iii] Incentive respiratory spirometry

3] Segmental breathing

i] Lateral costal

ii] Posterior Basal Expansion

iii] Apical Expansion

iv] Rt middle/Lingula expansion

4] Glossopharyngeal Breathing

- Indications-Severe inspiratory muscle weakness
  postpolio
  Spinal cord injury
- Contraindication-COPD

5] Pursed lip Breathing

It increases tidal volume, improve exercise tolerance

Decrease respiratory rates

Breathing Exercises In Obstructive Airway Disease

1] Breathing Control

- Treatment should start with breathing control
- It is a normal tidal breathing to promote relaxation & prevent hyperventilation
- While teaching BC avoid full expiration should be controlled but not forceful
- Position- Side lying, head elevated, leaning forward
- EFFECT- Relief of dysponea, improve vital capacity, improve V/Q

2] Diaphragmatic Breathing

- For relaxation & coordinated breathing pattern
- It is often used with pursed lip breathing
- Greater tidal volume is achieved with Diaphragmatic breathing improve overall ventilation

3] Pursed Lip Breathing

- Benefits- increase tidal volume, decrease RR, decrease $PaCO_2$ level, increase PaO_2
- PLB may improve patients confidence and decrease anxiety by providing some temporary control over oxygenation

4] Ventilatory Muscle Training

i] Diaphragmatic training with weights

ii] Inspiratory resistance training

iii] Incentive respiratory training

- **BE After Surgery**

i] Diaphragmatic breathing

ii] Lateral costal breathing

iii] Incentive spirometry

9] PASSIVE EXERCISES AND ACTIVE EXERCISES

- Limb exercise like PROM, AAROM/ARROM are performed in ICU patients
- It helps to improve joint ROM, function, muscle strength, soft tissue length
- It decreases the risk of thromboembolism
- IRR, TENS can be given for relief of pain

10] IMPROVEMENT IN FUNCTIONAL CAPACITY

- Based on walk test the dyspnoea is noted & also performance of the patient is noted
- According to this the goals are set

CHEST PHYSIOTHERAPY FOR PAEDIATRIC PATIENTS

Indications

- Neurological impairment
- Asthma
- Cystic fibrosis
- Secretion retention after surgery
- Immobility
- Decrease collateral ventilation

CPT should not performed more frequently more than 3 hr & includes 3min chest percussion in 5 PD position followed by assisted coughing/suctioning

Handling/ positioning

- Excessive handling of low birth weight infant causes hypoxemia
- Supine - compromise lung functional
- Side lying-Releases diaphragm from pressure of abdominal viscera allowing more effective basal expansion
- Facilitate drainage of secretions from the uppermost part of lung

Prone-Better compared to supine position

-Improve gas exchange

-Reduce gastro-esophageal reflux

-It increases tidal volume, minute ventilation & decreases period of apnea &25% increase in PaO_2

- Placing preterm baby in prone position may significantly reduce morbidity & mortality

- It may stabilize the compliant chest wall of the infant & improve co-ordination between rib cage, diaphragm & abdominal movement

Summary

- Assessment of patient
- Goals
- Treatment techniques used in ICU by physiotherapist
- Chest physiotherapy for pediatrics

QUESTIONS

1. WRITE THE AIMS OF POSITIONING. 3MARKS
2. WRITE ABOUT POSTURAL DRAINAGE. 3MARKS

THANK YOU