Physical therapy after thoracic surgery Mgr. Alena Sedláková

Surgical procedurs in the thoracic region

- Pulmonary indications lung tumors or lung tissue reductions
- Cardiac indications bypass or transplations

Thoracic surgery

- Posterolateral thoracotomy
- Anterolateral thoracotomy
- Sternotomy

Pulmonary surgery

- Lung segmentectomy
- Lobectomy
- Pneumonectomy
- Transplantations

The goals of physical therapy

- Clearance of respiratory tract
- Decreasing of bronchial obstruction
- Improvement of ventilator parametres
- Prevention of post-operative pulmonary complications such as pneumonia
- Prevention of decubitus
- Prevention of cardiovascular complications such as tromboembolism
- Prevention of muscle contractions, weakness and joint stiffness

Pre-operative phase

- Preconditioning is important and involves increasing endurance fitness and minimizing functional deficits of the movement system prior to surgery
- Having already increased the patinnet's fitness during the pre-operative phase is an important benefit during the post-operative rocovery period
- Any strenghtening prior to surgery increases and accelerates the period of post-surgical recovery

Pre-operative phase

 The practice of pulmonary physical therapy practical skills prior to surgery gives patients the needed peace and certainty during the post-surgical stay in Intensive Care Unit

Physical therapy in the presurgical period

- Includes the explanation of physical therapy before and after surgery
- Training of pulmonary physical therapy practical skills
- Breathing techniques emphasizing respiratory thoracic excursion
- Breathing practise with inspiratory and experatory breathing simulators

Physical therapy in the presurgical period

- Relaxation
- Expectoration
- Corrective work of the postural system
- Lower extermity movements
- Movements of the arms
- Trunk muscle stretching

Physical therapy in the postoperative period

- We continue with the pre-surgical physical therapy
- As soon as possible and following a consultation with the doctor, we initiate the intensive exercises that should be repeated 2-4 times per day

Exercise methods after surgery

- Active expiratory techniques
- Standard respiratory tract hygiene
- Training of expectoration
- Restoration of spontaneous breathing through breathing exursions of thorax
- Manual compression of the thorax

Exercise methods after surgery

- Cardiovascular exercises ankle pumping exercices to prevent deep vein thrombosis
- Lower extermity movements
- Movements of arms, movements in shoulder especially on the operated side
- Splinting chest incisions during coughing or sneezing

Exercise methods after surgery

- Training of verticalization process (sitting, standing, walking)
- Scare care (incision mobilization) after stiches extraction

Respiratory Physical Therapy

 Modern methods and techniques of respiratory pathway hygiene, also known as Airway Clearence Techniques (ACT)

ACT include:

- Active cycle of breathing techniques ACBT
- Autogenic drainage AD
- Breathing simulators
- Inhalation treatment
- Physical exercise PE

Active Cycle of Breathing Techniques ACBT

- Contains three indenpendant breathing techniques
- ACBT is perfomed in sitting or while laying down, wherever and wheneverit is needen and necessary for the patients, in the hospital, health resort, at home, at the office, at a table, in standing, in bed or in an armchair

ACBT

Thoracic expansion exercises are inspiratory techniques emphasizing maximum volume of slowly (through the nose or the mouth) ispired air and a short and without force passively blown out expiration through the mouth

ACBT

- Forced expiration and huffing techniques are active, muscle supported expirations with modified speed competed by huffing with an expectorate ,which occures instead of coughing
- Controlled breathing is relaxed, resting and movement-centered in the abdominal region but without activation of the abdominal muscles

Autogenic Drainage

- In the last 20 years, AD gradually replaced classic percussion postural drainage
- High effective and gentle
- Performed in sitting or laying down
- The basic principles of AD include the following: release, collect and evacuate the released mucus from the respiratory tract
- AD is consciously controlled and patientmodified breathing

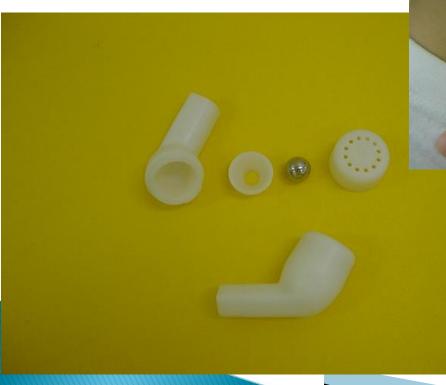
AD

- Breathing in the form of a slow, smooth inspiration mainly through the nose with a inspiratory pause at the end of inspiration
- Followed by consciously controlled, slow and long, but mainly muscle supported active expiration through pursed lips via the relaxed upper respiratory pathways
- Is not time limited
- In sitting or supine position

Breathing simulators

- As soon as possible, we instruct the patients how to independently exercise while using breathing simulators
- Flutter
- Accapella
- Triflow

Flutter





Acapella





Tri-flow



Breathing Gymnastics

- Also known as breathing exercices, form the practical content of respiratory rehabilitation
- Static breathing gymnastics is designed to renew the basic breathing pattern and it is based on respiratory training. SBG is independent breathing without any accompanied co-movement of other body parts, including the upper or the lower extremities

Breathing gymnastics

- Dynamic breathing gymnastics when breathing movements of the thorax the abdomnal wall are accompanied by extremity movements
- Mobilization breathing gymnastics is i higher form of breathing and movement exercices. It is combination of breathing and movement sets during which large muscle groups are activated

Verticalization process

- Bed mobility movement toward either side of the bed or up and down in the bed
- Rolling to the side toward the operated or healthy side
- Sitting at the edge of the bed, legs in contact with the floor
- Balance training in sitting
- Training of getting out of bed over the operated side
- Training walking and stair training

During verticalizition process take notice

- Orthostatic disorders
- Such as pale in face, sweat, bad balance, nauzea, feeling dizzy
- Hart rate, blood presure when the patients are monitoring in the Intensive care unit
- Post-operative patients may have inserted multiple lines, tubes and drains (such as peripheral line, central line, chest tube, wound drains, urinary catheter etc.). Before mobilization, ask the nurses about discconnection of lines

Rehabilitation process day by day

- Ist.day respiratory physical therapy, cardiovascular gymnastics, conditioning training in laying position, bed mobility, training verticalization – sitting?, standing?, walking around the bed?
- 2nd.day respiratory physical therapy, cardiovascular gymnastics, conditioning training in laying position, in sitting position, walking around the bed, walking in the room...

Rehabilitation process day by day

- 3rd.day respiratory physical therapy, cardiovascular gymnastics, conditioning training in laying position, in sitting position, walking around the bed, walking in the room, in the corridor, with our assistance or without
- Approximately after 2 or 3 days the patients are moved from Intensive care unit to standard wards and we continue with higher level of physical therapy

 Of course the patients continue with rehabilitation at home following physiotherapist instructions