Emergency Insight - Jan12

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Welcome to our follow up on chest drain care. In this newsletter we explore some of the nursing considerations in chest drain placement and maintenance.

Chest Drain Placement - Nursing Care

Patients with chest drains must be monitored closely and treated with diligent care. Nursing of such patients is a critical factor in achieving the desired clinical outcome.

A completed chest drain should have a 3-way stop cock with the addition of a gate clamp for extra security to prevent any air passing into the thorax. The clamps should be regularly checked and must remain clamped or sealed unless manually drawing air or fluid from the chest.

Alternatively, a Heimlich valve may be used. This is a one-way valve attached to the end of the chest tube which evacuates air from the chest cavity as the patient breathes in. Note - these valves are only suitable in patients over 10kg and are inappropriate where an effusion is present.

It is a good idea to familiarise yourself with how a three way stopcock works before actually placing the drain. The flat side of the stopcock corresponds to the closed position, whilst the "arms" signify an open pathway through which fluid and/or air can be drained.

Care of the chest drain

The ports on the stopcock should be wiped with alcohol and protected with sterile caps when not in use. Sterile gloves should be worn any time that the chest drain is handled.

The chest drain insertion sites should be checked at least twice daily for signs of inflammation or infection.

Skin around the drain must be kept clean and dry and the entry site should be protected with soft, sterile bandage material. Melolin will prevent the bandages from sticking to the skin should there be any exudation from the entry site.

A light chest bandage should be applied to keep the area clean and prevent any self trauma. It is essential the bandage is not placed too tight as it can lead to compromised ventilation. The chest bandage should be checked for fit every 4-8 hours, with two fingers easily slipped beneath the bandage. A thorough bandage examination should occur every 12 hours, with a bandage change recommended every 24 hours. If at any time the bandage becomes soiled or strike-through occurs, the bandage should be changed immediately.

An Elizabethan collar may also be required if there is any indication the patient may cause trauma to the chest drain.

How to suction the drain

To drain the chest a 25ml syringe is placed onto the end of the 3-way stopcock. The stopcock is then turned to create an open pathway and the clamp released. Slowly pull back on the syringe to drain any air or fluid. In a normal animal the pressure difference between the pleural pressure and the intra-alveolar pressure is 4-8 mmHg. This is equal to a 5-10ml vacuum in the syringe. Syringes should not be pulled past this point.

Once negative pressure is reached or the syringe is full, the stopcock should be closed to the drain pathway and the syringe contents expelled through the right-angle stopcock port into an appropriate container.

The quantity of air and fluid removed from the drain as well as the appearance and any changes from previous aspirates should be noted. Before disconnecting the syringe from the stopcock the gate clamp should be clamped and the stopcock position confirmed to be closed.

Continued overleaf

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Chest Drain Nursing (continued)

Monitoring and problem solving
Regular recordings of respiratory rate, effort, pattern and quality, mucous membrane colour, CRT, heart rate, pulse strength, SPO2 and temperature are all important. The frequency of drainage is dependant on the volumes of air and fluid being produced, however the drain should be typically aspirated every 4-6 hours.

If the patient becomes dyspnoeic sooner than the scheduled time for the next drainage, the drain should be aspirated immediately. If negative pressure is obtained from the chest drain but the patient's respiratory effort and rate are unchanged, the chest should be auscultated to determine if breath sounds are decreased and the chest drain should be examined for any kinks.

If the chest drain does not yield negative pressure, the system should be examined for possible leaks or the development of a tension pneumothorax or other forms of unrelenting pneumothorax. In this instance a continuous suction drainage collection system may be indicated.

Other considerations could be worsening pain, or a progression of a pulmonary parenchymal disease.

Patient comfort
Patient comfort is always paramount. A warm and quiet environment is important, and an orthopedic mattress or similar should be used. Laterally recumbent patients should be turned every 2-4 hours to prevent atelectasis and hypostatic pneumonia.

Ideally the patient should be placed in sternal recumbency. In this instance, only the hindquarters will need turning every 2-4 hours. Gentle massaging of the hind limbs and gentle range of motion exercises can also be employed to assist in venous return and lymphatic drainage.

Removing the chest drain
Before the removal of the chest drain is considered no air should be retrieved from the drain for 24 hours. An indwelling drain will typically produce 2ml/kg/day of inflammatory fluid (as the tube alone may cause inflammation and irritation leading to some fluid production) and should not be removed if the volumes of fluid being aspirated are significantly greater than this. It is important to note that tube occlusion or displacement can lead to a negative aspiration despite continued pleural space disease.

A thoracic radiograph taken before removal will allow you to determine if the pleural space disease has in fact resolved.

The tube is gently, smoothly and rapidly removed and a non-adherent pad pressed firmly over the exit site. Antibiotic ointment is applied around the stoma, a light bandage is placed and the skin incision is allowed to heal by secondary intention.

At SARC we consider good nursing care to be every bit as important as any other clinical consideration in chest drain patients. If you would like further nursing information on chest drain management, please feel free to contact us at any time.

Emergency query? We are available 24/7 for enquiries on 9532 5261