smith&nephew

RENASYS®-F/AB

Abdominal Dressing Kit

Abdominal Dressing Clinical Guidelines

Contents

Introduction

In the past decade there has been increasing evidence to suggest that using temporary abdominal closure techniques can help to reduce mortality in patients with Intra-Abdominal Hypertension and to prevent development of Abdominal Compartment Syndrome.[1] Negative pressure dressings have been used for a number of years to help facilitate temporary abdominal closure and have proven to be a reliable treatment due to excellent clinical benefits.[2]

The primary aim of Temporary Abdominal Closure (TAC) is to reduce pressure within the abdominal cavity. Reducing the intra-abdominal pressure or IAP, can prevent or reduce the risk of the patient developing abdominal compartment syndrome or ACS.

Reducing the pressure in the abdominal cavity also reduces the likelihood of respiratory, renal and cardiac complications.

The Smith & Nephew Abdominal Dressing Kit and the RENASYS® EZ PLUS device have been designed to help facilitate temporary abdominal closure using Negative Pressure Wound Therapy. This clinical guideline describes the clinical indications for use, precautions and contraindications for the use of this product.

Clinical Indications for Negative Pressure Wound Therapy in Open Abdominal Wounds

The key clinical indications for using temporary abdominal closure include:

Sepsis and peritonitis: When the patient has ongoing sepsis, possibly due to abscess formation or ruptured bowel, within the abdomen and the risk of ACS is high, it is preferable to use TAC techniques to relieve the pressure. This will also allow a secondary laparotomy to be carried out.

Pancreatitis: The presence of an abscess in patients with pancreatitis places extra pressure on the diaphragm leading to respiratory failure and may lead to raised IAP.

Performing a laparotomy and TAC can help to relieve the pressure within the abdomen and allow a second look procedure.

Blunt or penetrating abdominal or pelvic trauma: The risk of the patient developing IAH due to uncontrolled internal bleeding in the abdomen or pelvis is high in trauma situations. TAC may be used in the first instance to allow the patient to be stabilised following which definitive surgery may be carried out.

Suspicion of raised intra-abdominal pressure following extensive abdominal surgery: Following abdominal surgery where bowel has been swollen as a result of the disease process, TAC may be used to prevent raised intra-abdominal pressure and allow primary closure at a later time.

Following Damage Control Surgery: Damage control laparotomy will allow immediate life saving measure to be carried out and patients to return to critical care where resuscitation can be completed. Following this, the patient can be returned for more definitive surgery and primary closure of the abdomen.

Following massive fluid resuscitation:[3] During resuscitation patients may be given large volumes of fluid to improve circulating fluid volumes. This fluid may be more than is required by the patient and may end up in the digestive tract causing swollen bowel and intra-abdominal hypertension.

The patient with primary, secondary or tertiary Abdominal Compartment Syndrome who requires a life saving decompressive laparotomy.

Management of the open abdomen

The main aim of management of the open abdomen is to reduce the intra-abdominal pressure thus preventing organ damage and the potential consequences of abdominal compartment syndrome. This may be achieved by a number of methods which aim primarily to leave the abdominal cavity open and allow management of the abdominal contents. This is known as temporary abdominal closure or TAC. This technique not only reduces the intra-abdominal pressure but also allows re-exploration of the abdomen and when possible facilitates primary closure.[2]

Some of the methods available which allow the abdomen to remain open are unable to manage the fluid within the cavity and may have to be used in conjunction with abdominal drainage systems.

The patients who require temporary abdominal closure (TAC) are often in an acute phase of illness or following major surgery. A major reason for TAC is to allow the patient to be resuscitated and then stabilised in critical care before having more definitive surgery carried out.

For this patient group the three main causes of death are acidosis, coagulopathy and hypothermia, and unless these can be brought under control, the patient is at significant risk. During this critical phase the patient will be ventilated in the ICU to correct the acidosis, re-warming will take place and coagulopathy should be corrected.

By providing TAC, the patient can be stabilised, bleeding can be controlled and the abdomen can be irrigated to reduce the risk of contamination.

Once patient has been stabilised, the surgeon may re-explore the abdomen and carry out more definitive procedures. TAC may again be used until the intra-abdominal pressure has been reduced and the surgeon is able to use primary closure techniques.

Intra-abdominal hypertension or IAH

Intra-abdominal hypertension is defined as a sustained rise in Intra-abdominal pressure (IAP) above 12mmHg. By taking action to normalise the IAP, the risk of organ failure can be reduced.[2]

In the following table IAH is described in grades of severity and potential recommendations are given which can affect patient outcomes.

Pressure (mm Hg)[4]	Interpretation[4]
0-5	Normal
5-10	Common in ICU patients
> 12-15 (Grade I)	Intra-abdominal hypertension consider non invasive measures
16-20 (Grade II)	Dangerous IAH - begin non-invasive interventions
>21-25 (Grade III)	Impending abdominal compartment syndrome - strongly consider decompressive laparotomy
>25 (Grade IV)	Perform/revise abdominal decompression with temporary abdominal closure to reduce IAP

The IAH grades have been revised downward as the detrimental impact of elevated IAP on end-organ function has been recognized (WSACS.org).

When a patient is at risk of raised intra-abdominal pressure, there are some, non surgical measures which can be employed to help reduce the IAP.

Non Surgical initial management of the patient with raised intra-abdominal pressure:[4]

- Sedation and analgesia, neuromuscular block, reduce bed head elevation
- Evacuate intra-luminal contents, nasogastric tube, rectal decompression, prokinetic agents for GI tract
- Evacuate abdominal fluid collections, paracentesis, drainage
- Correct positive fluid balance, avoid excessive fluid resuscitation, diuretics, haemodialysis
- Organ support, maintain abdominal perfusion pressure>50-60mmHg
- Optimize ventilation

Mechanisms of raised intra-abdominal pressure

The following are clinical examples of how intra-abdominal pressure may be elevated.

Peritonitis: Peritonitis can be described as primary, secondary or tertiary. Primary peritonitis is infection in the absence of a break in the GI tract, this may occur in liver failure or in tumour related ascites.

Secondary peritonitis occurs when there is a GI inflammatory process ongoing such as cholecystitis, diverticulitis, appendicitis, visceral perforation or ischaemic gut.

Tertiary peritonitis is a persistent or recurrent infection after treatment of secondary peritonitis, possibly from pancreatitis or intra-abdominal abscesses.

In each case there is potential for fluid and pus to collect within the abdominal cavity creating an inflammatory response which results in further fluid being produced.

This raises the IAP and if not corrected can lead to abdominal compartment syndrome and subsequent organ failure.

Surgical decompression should be carried out in order to reduce the IAP and allow exploration of the abdomen in order to correct the problem.

Pancreatitis: Inflammation of the pancreas can be an extreme inflammatory state, which can become septic in part due to auto digestion of the pancreas by amylase, an extremely potent enzyme. Symptoms can be classed as moderate, severe or necrotising, with mortality increasing as the disease progresses.

Many of the deaths caused by pancreatitis are related to infection, organ failure and necrosis.

Patients with infected pancreatitis may develop an abscess around the pancreas which not only fuels the infection but in addition takes up space within the abdominal cavity. This reduction in space leads to a rise in intra-abdominal pressure.

The patient will deteriorate without appropriate medical management, such as fluid resuscitation (haemostatic), the use of inotropes to maintain cardiac output, antibiotics, mechanical ventilation and catheterisation.

Surgical management to decompress the abdomen is also recommended in order to lower the IAP and reduce the risk of organ failure.

Damage Control Surgery

Patients who suffer from extreme trauma, directly or indirectly to the abdomen have the potential for internal injuries. Trauma may be blunt, such as in motor vehicle accidents, or penetrating, such as bullet wounds, stabbing or blast injuries.

Initial management of these patients involves ABC: airway, breathing and circulation. Control of haemorrhage is key to survivial.

Haemostatic resuscitation with warmed fluids is important to reduce the risk of compartment syndrome. This is done by careful replacement of fluid volume, and no longer relies on large volumes of fluids being forced in to the venous system. A much more controlled approach is now recommended.[3]

These patients often become acidotic due to reduced lung compliance and loss of blood. The patients are also often hypothermic which hampers progress and may impact on survival. In addition the large volume of blood loss and subsequent transfusions lead to coagulopathy.

Packing the abdomen especially around bleeding points is essential, other aspects of damage control include vascular shunts and arterial ligation. Peritoneal irrigation may also be carried out at this time.

Surgery is necessary to stop the bleeding, remove the haematoma and pack the abdomen. Temporary abdominal closure is necessary and this may be best achieved with a negative pressure dressing.

This allows the patient to be stabilised in ICU prior to being re-explored and further surgery carried out.

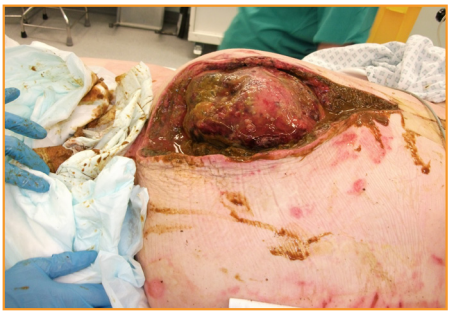
Colorectal Surgery and the open abdomen

Patients presenting with colorectal complaints may also be at risk of raised IAP.

Potential causes include sepsis (primary, secondary or tertiary), leaking anastamoses, tight closure, inadequate primary surgery.

The patient in the image which follows has a ruptured diverticulum. The abdomen is extremely swollen and the risk of abdominal compartment syndrome is high.

Surgery is required not only to resect the colon but also to decompress the abdomen.



Abdominal Compartment Syndrome (ACS)

Compartment syndrome occurs when any fixed body compartment defined by muscle, fascia or bone is subjected to increased pressure which then leads to ischaemia and ultimately organ dysfunction.

Abdominal compartment syndrome (ACS) is the result of a sustained raise IAP >20mmHg (with or without an APP<60mmHg) that is associated with new organ dysfunction/failure.[4] This increase in pressure occurs within the abdominal wall, pelvis, diaphragm and retroperitoneum and adversely affects the functioning of not only the entire GI tract but also the organs within and outwith the abdominal cavity.

A number of clinical conditions are associated with ACS including intra-abdominal or retroperitoneal haemorrhage, severe oedema, intestinal obstruction and ascites.

- **Primary or acute Abdominal Compartment Syndrome (ACS):** This occurs when intra-abdominal pathology is directly and proximally responsible for the compartment syndrome.
  - Penetrating trauma
  - Intraperitoneal haemorrhage
  - Pancreatitis
  - External compressing forces, such as debris from a motor vehicle collision or after a large structure explosion
  - Pelvic fracture
  - Rupture of abdominal aortic aneurysm
  - Perforated peptic ulcer

- **Secondary Abdominal Compartment Syndrome:** This occurs when no visible intra-abdominal injury is present but injuries outside the abdomen cause fluid accumulation.

  - Large-volume resuscitation: The literature shows significantly increased risk when more than 3 L are infused.
  - Large areas of full-thickness burns
  - Penetrating or blunt trauma without identifiable injury
  - Post surgery
  - Packing and primary fascial closure, which increases incidence
  - Sepsis
- Recurrent ACS is the redevelopment of symptoms following an earlier episode of compartment syndrome either primary or secondary examples of which may include recurrent abscess formation or chronic ascites.[8]

Clinical features of ACS

The key clinical features of Abdominal Compartment Syndrome often begin with pulmonary complications and respiratory insufficiency. Due the increase in abdominal pressure, the lungs cannot fully expand, the diaphragm is tense and the inspiratory volumes decrease significantly.

As the pressure on the circulation increases, the renal arteries are affected so the glomerular filtration rate is reduced which then reduces the renal output, this results in low urine volumes. Renal failure may follow if left untreated. A decrease in venous return to the heart results from the increase in abdominal pressure, this may reduce the circulating blood volume and generally reduce cardiac efficiency.[5]

The liver and spleen are also affected by raised IAP, resulting in decreased liver metabolism. This can be detected by measuring blood liver function tests (LFTs).

Over time there may also be an increase in intracranial pressure caused by the increasing venous pressure.

The small and large intestine will not be able to function when there is raised IAP and there may be areas of ischaemia which develop as a result.

Classification and grading of the open abdomen

In order to facilitate assessment and outcome measures Swan and Banwell (2005)[6], set out to establish a grading scale for patients with open abdominal wounds.

The initial classification has been adapted by the World Society of the Abdominal Compartment Syndrome (WSACS).[7]

The table below illustrates the grading system adopted by the WSACS.

Grade	Description
1A	Clean OA without adherence
1B	Contaminated OA without adherence
2A	Clean OA developing adherence
2B	Contaminated OA developing adherence
3	OA complicated by fistula formation
4	Frozen OA unable to close surgically

Grade 1A: A clean open abdomen without adherence between the bowel and the abdominal wall or fixity. This may occur following uncomplicated decompressive laparotomy to prevent or treat ACS. This patient group has a relatively favourable prognosis, with the aims of treatment being to prevent infection, prevent adherence and fistula formation, and to achieve primary delayed fascial closure.[7]

Grade 1B: Contaminated open abdomen without adherence or fixity. This includes patients with perforated bowel, such as appendix, breakdown of bowel anastamoses or trauma. Treatment involves peritoneal lavage and redirection of the faecal flow via stoma to reduce the risk of infection and to prevent adhesions, fixity or fistula formation.

Grade 2A: Clean open abdominal wound with developing adherence/fixity. The patient may have developed adhesions to the abdominal wall and possibly has lateral fascial fixation. This patient poses a number of management problems and the main effort should be to convert the abdomen to a grade 1 problem. This may be achieved by division of adhesions and potentially to perform partial fascial closure to prevent complete lateral fixation of the fascia. This may involve skin grafting, split thickness skin grafting combined with mesh closure. As with the other patient groups the overarching aim is to prevent fistula formation, minimise the risk of infection and achieve full primary closure of the wound.[7]

Grade 2B: Contaminated open abdomen with developing adherence or fixity. This patient group is likely to have a septic abdomen, which may not have been treated optimally. This patient is likely to have adhesions and some lateralisation of the fascia to the abdominal wall, both of which prevent acceptable fascial closure.

The main treatment aims are to control contamination in order to return the wound status to 2A, provide temporary closure as detailed above, and to prevent worsening of the adherence/fixity where frozen abdomen may result. As with all cases the need to prevent fistulisation is key.[7]

Grade 3: Open abdomen complicated by fistula formation. Development of a fistula in patients with open abdominal wounds has a significant impact on the patients' morbidity. The fistula will normally be an outlet for faecal matter which will further complicate wound healing. Techniques may be employed which allow closure of the fistula or which control the flow of faecal matter while effecting wound closure at the same time.

The aims of treatment should also include the prevention of adhesions, adherence or fixity and prevention of fascial retraction must also be considered.[7]

Grade 4: Frozen open abdomen with adherence/fixed bowel, unable to close surgically with or without fistula. This is the worst possible scenario for the patient and as such, should be prevented where possible. Early intervention with appropriate treatments when the patients have lower grade open abdominal wounds is paramount. Patients should be stabilised physiologically and nutritionally, and prevention of sepsis is key. The patient will require complex reconstructive surgery after 6-12 months.[7]

What are the properties of the ideal abdominal dressing for Temporary Abdominal Closure?

According to Barker *et al.*,[2] the properties of ideal dressing for temporary abdominal closure are:

- Contain and protect the abdominal viscera
- Prevent bowel desiccation
- Prevent development of abdominal compartment syndrome
- Maintenance of abdominal domain
- Prevent adherence of the viscera to the closure materials or abdominal wall
- Prevent external contamination of the peritoneal cavity
- Control egress of peritoneal fluid and keep surrounding skin dry
- Be rapidly applied and durable

The key clinical benefits of Negative Pressure Wound Therapy in open abdominal wounds

Negative pressure dressings have been used to provide temporary abdominal closure for the past decade.[2] The benefits of negative pressure in treating patients with open abdominal wounds include:[2,9]

- Provides a bridge to closure of the fascia and abdominal wall
- Removes, collects, and quantifies abdominal fluids
- Removes pro-inflammatory cytokines which can hinder the healing process
- Removes infectious materials
- Helps protect the wound environment
- Helps promote wound healing and assists in granulation tissue formation
- Helps approximate wound margins

Once *in situ*, the negative pressure dressing will remove fluid from the abdominal cavity which will allow quantification and examination of fluid in the negative pressure system canister. Negative pressure systems can dynamically manage the abdominal cavity and allow easy access for re-exploration of the abdominal cavity.

Primarily, the key to successful treatment involves reducing the intra-abdominal pressure to sub-pathological levels.

In addition, negative pressure dressings can help in preventing fascial contraction, by reducing pressure and fluid build up within the abdominal cavity therefore reducing the pressure on the fascia, and also by providing a non adherent interface between the viscera and the abdominal wall.

Closing the open abdominal wound

The timing of definitive closure of the open abdominal wound will depend on a number of co-dependent variables. The patient must be in a stable condition, and abnormalities such as hypothermia, acidosis and coagulopathy should be corrected prior to primary closure being attempted. Similarly the intra-abdominal pressure should continue to be monitored to ensure that the pressure in the abdomen is normal.

Barker *et al.*,[2] reported on a group of 258 patients with open abdominal wounds over a 7 year period 68% of patients achieved fascial wound closure within 1-19 days. The fistula rate in this group of patients (n=258) was 5%. However, delays in primary closure, were associated with increased complications such as fistulae, fascial retraction and adherence of the viscera to the abdominal wall.

Stopping therapy

The decision to stop or continue with abdominal negative pressure therapy will be based on the overall goals of care for the patient. In some patients there may be a need for longer periods of therapy due to other co-morbidities which may prevent primary closure.

A study by Miller *et al.,* reported significantly higher complication rates among patients who had delayed primary closure beyond 8 days, these complications included enteroatmospheric fistulae.[10]

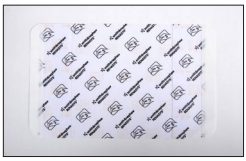
Application of the Smith & Nephew Foam Abdominal Dressing Kit

RENASYS®-F/AB Abdominal Dressing Kit is intended for use with the RENASYS EZ/ RENASYS EZ PLUS device as a complete Negative Pressure Wound Therapy system for managing open abdominal wounds.

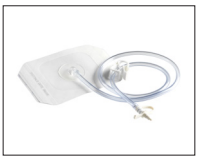
The RENASYS-F/AB dressing kit is made up of the following components:

Organ Protection Layer (OPL) x 1

Perforated Foam x 2



Transparent adhesive film x 6



Port dressing x 1

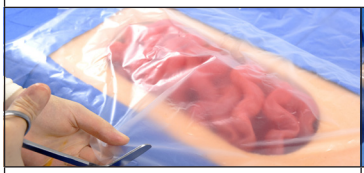
Open Abdominal Wound Preparation

Warning: Review all RENASYS NPWT system safety information before beginning wound preparation. Ensure adequate haemostasis has been achieved prior to dressing placement

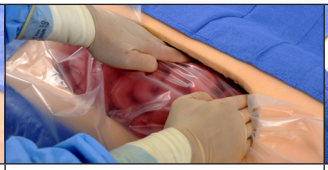
1. Sharp edges or bone fragments must be eliminated from wound area or covered
2. Ensure any areas of necrosis are appropriately debrided
3. Irrigate abdominal wound as needed
4. Clean and dry the peri-wound area

Organ Protection Layer (OPL) Application

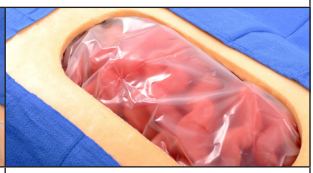
Warning: Protect vital structures such as bowel and abdominal organs with the OPL at all times during therapy. Never place exposed foam material directly in contact with exposed bowels, organs, blood vessels or nerves. The OPL is designed to allow application directly over exposed internal organs and can be cut or folded as desired. Either side of the OPL may be placed against the viscera.



1. Remove contents from pouch and prepare the OPL on a sterile field. If cutting the OPL to a different size, ensure that each piece removed has been properly disposed of, away from the open wound.



2. Ensure gloves are wet before applying the OPL. Gently position the OPL evenly into the abdominal cavity, distributing the sides into both of the lateral paracolic gutters. Any excess material on the sides of the OPL may be folded back onto itself.

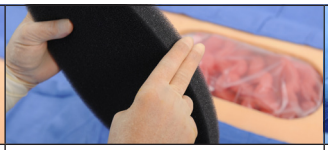


3. Ensure complete coverage of all viscera in the abdominal compartment with the OPL, prior to filling the wound defect with foam.

Perforated foam Application

1. Size the foam to the desired proportions by tearing along the pre-scored perforations. The foam should fit directly over the OPL whilst still being in contact with all the wound edges.

Foam may be cut if required. Do not cut the foam directly over the wound bed. Always rub the edges of any cut foam to remove loose fragments.

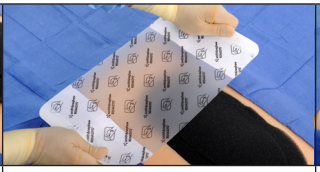


2. Do not allow foam to contact intact skin without use of an appropriate barrier such as transparent film or a hydrocolloid. It may be necessary to stack multiple pieces of foam depending on the wound profile. If multiple pieces of foam are required, count and record how many pieces are used.

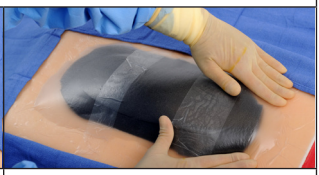
3. Gently place the perforated foam into the wound cavity over the OPL. Ensure the foam is sized to fit loosely in the wound defect and does not go below the level of the abdominal wall.

Transparent film Application

1. Holding the transparent film, expose one side of the adhesive backing by removing a single panel and apply it to the foam.



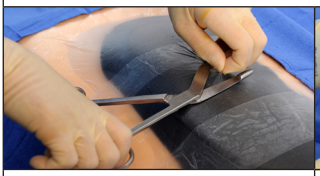
2. Apply film to the foam removing adhesive panels as well as the carrier film to seal.



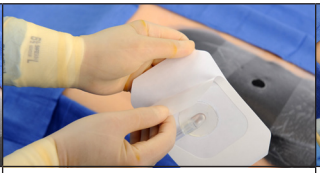
3. Cover the foam with transparent film. The film should extend at least 5cm beyond the wound margin to facilitate a good seal.

N.B When using multiple pieces of film ensure the edges overlap by a minimum of 7.5cm. Avoid stretching or pulling the film to minimise tension or trauma to the peri-wound skin.

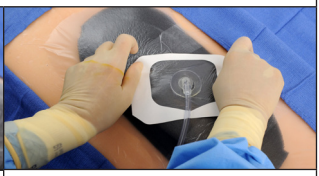
Port Application



1. Cut a small hole (no less than 0.6cm) in the centre of the film. Remove any excess trimmed film and dispose of away from the wound.

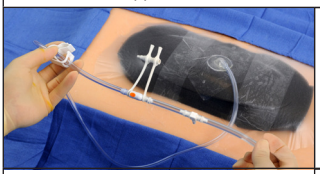


2. Remove the backing liner from the Port dressing, and align the centre opening over the hole to deliver negative pressure. Use gentle pressure to anchor the Port dressing to the transparent film.



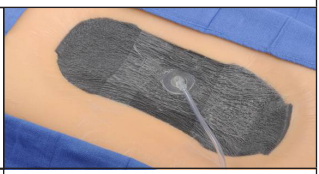
3. Smooth the dressing down while removing the frame from the Port dressing.

Initiation of Therapy



1. Ensure the canister is installed correctly. Connect the Port tubing to the canister tubing by pushing the quick-click connectors together. Ensure the Port dressing clamp is open and there are no kinks in the tubing.

2. Activate the RENASYS® EZ or RENASYS EZ PLUS device on continuous mode, beginning with -80mmHg and check the dressing has a good seal



3. The finished dressing should collapse and be firm to the touch. If required, adjust the pressure setting to desired level.

N.B. The recommended pressure range is -80 to -120mmHg.

Open Abdominal Wound Preparation

Warning: Review all RENASYS® NPWT system safety information before beginning wound preparation. Ensure adequate haemostasis has been achieved prior to dressing placement.

1. Sharp edges or bone fragments must be eliminated from wound area or covered
2. Ensure any areas of necrosis are appropriately debrided
3. Irrigate abdominal wound as needed
4. Clean and dry the peri-wound area

Organ Protection Layer (OPL) Application

Warning: Protect vital structures such as bowel and abdominal organs with the OPL at all times during therapy. Never place exposed foam material directly in contact with exposed bowels, organs, blood vessels or nerves. The OPL is designed to allow application directly over exposed internal organs and can be cut or folded as desired. Either side of the OPL may be placed against the viscera.

1. Remove contents from pouch and prepare the OPL on a sterile field. If cutting the OPL to a different size, ensure that each piece removed has been properly disposed of, away from the open wound.

2. Ensure gloves are wet before applying the OPL. Gently position the OPL evenly into the abdominal cavity, distributing the sides into both of the lateral paracolic gutters. Any excess material on the sides of the OPL may be folded back onto itself.

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Perforated foam Application

1. Size the foam to the desired proportions by tearing along the pre-scored perforations. The foam should fit directly over the OPL whilst still being in contact with all the wound edges.

Foam may be cut if required. Do not cut the foam directly over the wound bed. Always rub the edges of any cut foam to remove loose fragments.

2. Do not allow foam to contact intact skin without use of an appropriate barrier such as transparent film or a hydrocolloid. It may be necessary to stack multiple pieces of foam depending on the wound profile. If multiple pieces of foam are required, count and record how many pieces are used.

3. Gently place the perforated foam into the wound cavity over the OPL. Ensure the foam is sized to fit loosely in the wound defect and does not go below the level of the abdominal wall.

Transparent film Application

1. Holding the transparent film, expose one side of the adhesive backing by removing a single panel and apply it to the foam.

2. Apply film to the foam removing adhesive panels as well as the carrier film to seal.

3. Cover the foam with transparent film. The film should extend at least 5cm beyond the wound margin to facilitate a good seal.

N.B When using multiple pieces of film ensure the edges overlap by a minimum of 7.5cm. Avoid stretching or pulling the film to minimise tension or trauma to the peri-wound skin.

Port Application

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3. The finished dressing should collapse and be firm to the touch. If required, adjust the pressure setting to desired level.

N.B. The recommended pressure range is -80 to -120mmHg.

Hints and Tips for Application of the Abdominal Dressing

When applying the organ protective layer (OPL), wet gloves to avoid the product sticking.

Centre the OPL by placing hand in the centre of the layer while placing into the abdominal cavity and around the viscera.

Avoid extensive overlapping of the drape onto the surface of the abdomen, this will avoid restriction of abdominal swelling.

Prepare the skin beforehand and shave if necessary.

Monitor the exudate in the canister for signs of fresh bleeding.

Safety Information relating to the RENASYS°-F/AB Dressing Kit

The Smith & Nephew Abdominal Dressing is designed to be used with the RENASYS EZ PLUS Negative Pressure Wound Therapy device. This device is designed to cope with the high volumes of fluid from the acute open abdomen.

All dressings are packaged sterile and designed for single use only.
Sterile or aseptic technique should be used when changing the dressings.

It is important to be familiar with all the safety information before using this dressing and the device. Improper use may lead to product malfunction which may have serious consequences.

The Smith & Nephew Abdominal Dressing is designed for use only as an abdominal dressing where temporary abdominal closure is necessary, and where there is a need for re-exploration of the abdominal cavity. This dressing is designed to manage abdominal contents and the fluid from the abdomen during this time.

Contraindications

The dressing contains an organ protective layer or OPL, this is the only part of the kit which can come into contact with the viscera.

It is essential that the foam component of the dressing does not come into direct contact with exposed organs, blood vessels, viscera, fistulae or nerves.

Negative Pressure Wound Therapy is contraindicated for patients with:

Excessive bleeding (see additional notes on next page)
Untreated osteomyelitis
Unexplored fistulae
Malignancy in the wound
Necrotic tissue with hard eschar present

Precautions

The following recommendations should be adhered to in order to provide safe therapy when using the abdominal dressing kit:

- Always apply the dressing in a sterile setting using aseptic technique
- Ensure the patients are in a suitable clinical area where appropriate monitoring is available
- Standard infection control guidelines should be followed to minimise the risk of cross infection
- Continuous therapy is preferred to intermittent when using therapy over unstable structures
- Fluid loss should be monitored and corrected under the guidance of the clinicians
- Avoid placing the dressing close to vessels and/or nerve plexus
- Protect the surrounding skin prior to drape application
- The drape should not be stretched over the skin
- Avoid circumferential use of the drape to allow for increases in abdominal girth

Bleeding

A number of patients will suffer from bleeding in the abdominal cavity due to surgery, trauma and as a complication of shock and resultant fluid resuscitation. There is also a risk of coagulopathy in some patient groups which can lead to coagulation problems.

Patients who have an increased risk of bleeding should be monitored and cared for in the appropriate clinical setting.

If bleeding persists or develops and fresh blood is seen in the tubing or canister, Negative Pressure Wound Therapy should be stopped and the surgeon should be informed.

Take care when applying the dressing to ensure that no blood vessels come into direct contact with the foam part of the dressing.

If the patient has been treated with haemostats such as sponges care must be taken not to dislodge them when applying the abdominal dressing.

Be aware that bone fragments in the abdomen could be moved under negative pressure this may lead to bleeding if in contact with blood vessels.

Use the smaller 250ml canister for patients who are at risk of bleeding. If bleeding increases, the “canister full” alarm will alert the clinician of the problem. If using the 800ml canister the blood loss will be greater.

Evisceration

This may occur when using the Smith & Nephew abdominal dressing following laparotomy. This may be related to the patient's general condition and/or obesity. Care should be taken when moving and handling the patient. Nursing the patient in the recumbent position may also help to reduce the pressure on the abdomen.

Fistula Formation

There is a risk that fistulae can form when using Negative Pressure Wound Therapy or when using any other method of temporary abdominal closure. To reduce the risk of fistula formation, the OPL should completely cover the bowel and separate the viscera from the abdominal wall. Care should be taken during application of the dressing.

Primary closure should also be carried out as soon as the patient's condition allows as this is associated with a reduction in complications such as fistula formation, retraction and infection.

Notes

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