



# **NEANN Vacuum Splint Set**

# **User Manual**



**Please read before use**

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This manual is a guide to using the  
NEANN Vacuum Splints.

If this manual conflicts with your service's  
CPGs, you should follow those protocols  
in preference to the  
guidelines stated in this manual.



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# INTRODUCTION

# **INTRODUCTION**

The management of the trauma patient requires a range of skills including scene management, safe work practices, hazard control, patient assessment and treatment.

## **TERMINOLOGY**

Prehospital personnel including First-Aiders, CERTs, ACO's QAP's, Paramedics, Advanced & MICA Paramedics, Rescue Officers and other persons performing activities in the prehospital setting, will for standardisation, all be referred to as '**Officers**' in this manual.

## **TRAINING**

Officers should realise that there is no substitute for training and experience in trauma management. Each person must be thoroughly trained in all areas of prehospital trauma care.

The ideal situation is to have all members of the team qualified to manage all the steps presented in this manual. If unqualified members are present at a scene, they must perform under strict supervision of a qualified team member.

Frequent applications need to be undertaken to ensure that skill levels are maintained. Practice will lead to high levels of competence and safety.

It is strongly recommended that initial training of Officers in the use of the Vacuum Splints is to include:

1. Reading this manual is to be under taken with direct supervision from an appropriately trained supervisor.
2. Practical hands-on applications of all five procedures presented in this manual in a training environment under direct supervision from an appropriately trained supervisor before use on actual patients.

It is also recommended that ongoing training of Officers is to include:

1. Three monthly practical review in the use of the Vacuum Splints in the five procedures presented in this manual.
2. Twelve monthly theoretical & practical review.

Officers using the Vacuum Splints without proper initial & ongoing training may place the patient and other Officers at risk of injury.

## **EQUIPMENT**

Officers must be familiar with the Vacuum Splints, the way they operate, and their limitations. Every Officer should be competent to check and maintain the Vacuum Splints in the field.



# **FIELD USE OF THE VACUUM SPLINTS**

**VACUUM SPLINTS** provide a specialised device for the immobilisation of extremity injuries in any position without placing inward pressure on the injury, whilst still allowing access to the injured limb, performance of neurovascular observations below the level of injury, and the ability to apply ice to help reduce swelling and pain.

## **INDICATIONS FOR THE USE OF VACUUM SPLINTS**

In keeping with the standard guidelines of immobilisation - *'immobilising the joint above and below the fracture and/or dislocation'* - the Vacuum Splint is indicated for use in:

1. Knee dislocations
2. Patella fractures
3. Tibia and/or fibula fractures
4. Ankle and/or foot dislocations
5. Ankle and/or foot fractures
6. Humeral fractures (in conjunction with anatomical splinting)
7. Elbow dislocations
8. Elbow fractures
9. Ulna and/or radius fractures
10. Wrist or hand dislocations
11. Wrist or hand fractures

Femoral fractures require the use of traction splints, whilst NOF and spinal fractures benefit from the use of a padded Long Board or Vacuum Mattress. Pelvic fractures require devices such as the SAM Pelvic Splint in conjunction with the padded Long Board or Vacuum Mattress.

## **CONTRA-INDICATIONS**

Nil in the above indications.

## **PRECAUTIONS**

Most Vacuum Splints are made of nylon or PVC, giving only limited durability against glass, metal and other sharp objects found in the prehospital environment. The Neann Vacuum Splint's have been selected due to the use of a heavy duty specialised Silik Elastomer™ material that provides greatly increased durability over nylon or PVC. However if punctured, the Vacuum Splints will not maintain their immobilisation ability. Therefore, if possible either place a towel under the Vacuum Splint, or remove glass and other sharp objects from the area around the patient where the Vacuum Splint will be placed to extend the life of the splint and help reduce any potential damage.



## **APPLICATION**

**Before applying the Vacuum Splint, Officers should consider the following steps of patient assessment (as appropriate / qualified).**

1. The **First Officer** undertakes a full assessment of the patient before application of the Vacuum Splints This includes:
  - Check safety, scene, and situation.
2. A **Second Officer** brings the patient's c-spine into neutral in-line position and performs manual head stabilisation (if patient meets the guidelines for spinal precaution).
3. The **First Officer** continues the assessment as per the Officers qualification:
  - Perform Primary Survey:
    - i. **Response**
    - ii. **Airway**
    - iii. **Breathing**
    - iv. **Compressions**
    - v. **Defibrillation**
    - vi. **Major Bleeds**
  - Perform Basic Care:
    - i. **Rest,**
    - ii. **Reassure**
    - iii. **Oxygen**
    - iv. **Position**
    - v. **Pulse Oximeter**
    - vi. **ECG Monitor**
    - vii. **End Tidal CO2 Monitor**
  - Perform Vital Signs Survey:
    - i. **Conscious Status Assessment**
    - ii. **Perfusion Status Assessment**
    - iii. **Respiratory Status Assessment**
  - Perform Secondary Survey:
    - i. **Motor/Sensory x 4 (neurological exam)**
    - ii. **Head**
    - iii. **Spine**
    - iv. **Chest**
    - v. **Abdomen**
    - vi. **Pelvis**
    - vii. **Legs**
    - viii. **Arms**

- Check AMPLE:
  - i. **A**llergies
  - ii **M**edications
  - iii. **P**ast medical history
  - iv. **L**ast oral intake
  - v. **E**vents leading up to injury
- Apply Vacuum Splint:
  - i. Evaluate neurovascular function below fracture or dislocation
  - ii. Provide pain relief and muscle relaxant (as per your organisational protocols)
  - iii. Irrigate open fractures with sterile isotonic solution and cover with a sterile dressing
  - iv. Re-align limb if possible unless:
    - Excessive pain on moving.
    - Resistance on attempting to re-align.
    - Fracture or dislocation to a joint.
    - Loss of sensation, colour, warmth or pulse occurs on moving the limb
  - v. Apply Vacuum Splint
  - i. Reassess neurovascular function below the injury site following application of Vacuum Splint

# **VACUUM SPLINT COMPONENTS**

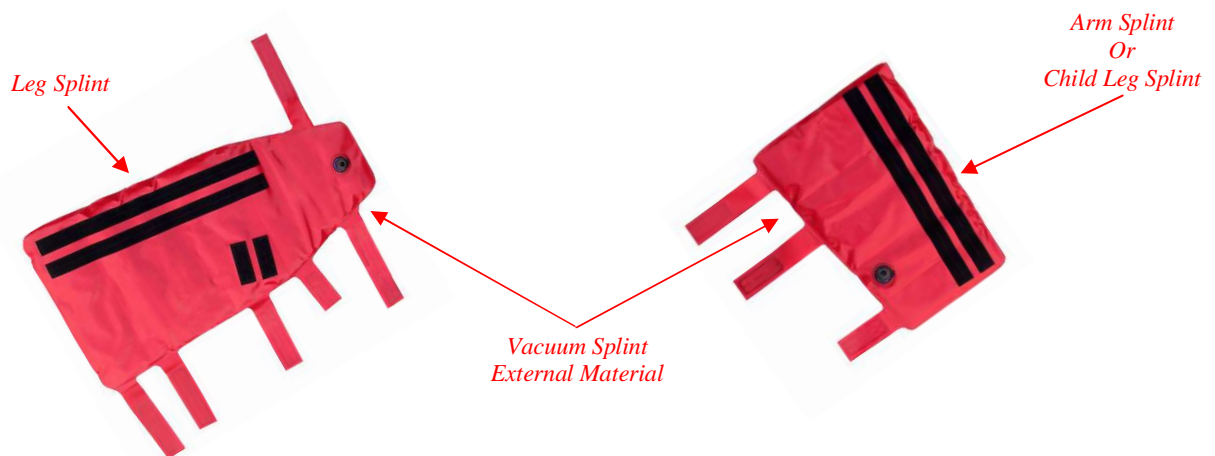
## VACUUM SPLINTS

**The NEANN Vacuum Splints utilise the latest materials, technology and manufacturing processes to provide improved durability and immobilisation.**

### EXTERNAL MATERIALS

The external cover of the NEANN Vacuum Splints are made of a heavy duty, specialised and uniquely manufactured pure reinforced double coated Silik Elastomer™. This material provides a significant improvement over nylon or PVC, the standard material used by other Vacuum Splints. Improvements of Silik Elastomer™ include:

- *10-15 times more expansive*
- *Significantly improved abrasion, puncture and tear resistance*
- *100% airtight in comparison to the slow leaking nylon or PVC materials*



### INTERNAL BEADS

The internal beads are of a newly developed material, offering significant improvements over the standard Styrofoam used in other Vacuum Splints including:

- *Higher density material preventing collapsing of beads*
- *Significantly improved X-ray translucency*



## **CHAMBER DESIGN**

The new patented inner lining system provides a configuration of overlapping multi-chambers preventing the beads from moving around and clumping together in comparison to other Vacuum splints on the market. By being placed across the width of the splint rather than the length like all other splints, beads remain better placed, require little spreading before application, and provide vastly improved rigidity.

*Unique Multi Chamber Design*



## **AIR VALVE**

The Air Valve on the NEANN Vacuum Splints is the highest quality valve available. Turn clockwise to close, extract the air with a hand pump or automated Suction Unit and the splint will remain rigid for up to 24 hours. To allow air to re-enter the splint, turn anticlockwise.

**Always leave the air valve open during storage to protect the Vacuum Splint from stressing the welded seams.**



## **HAND POWERED VACUUM SPLINT PUMPS**

The Vacuum Splint set is supplied with a lightweight and easy to operate hand powered suction pump.

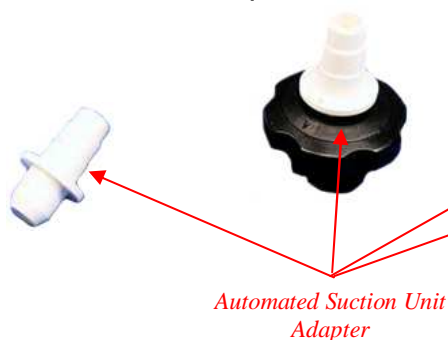


*Hand Pump*

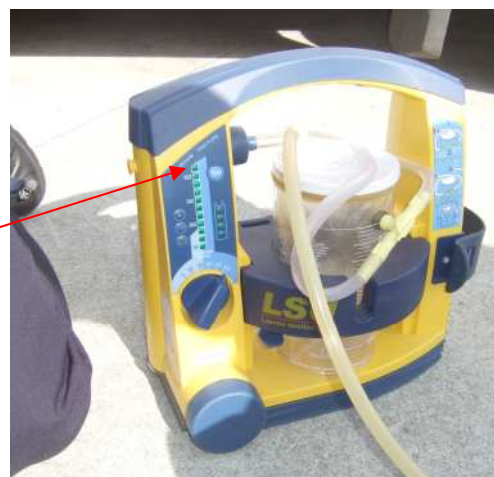


## **AUTOMATED SUCTION UNIT ADAPTER**

An adapter is supplied with the Vacuum Splint Set to allow for an automatic powered suction unit such as an LSU or a hospital wall suction outlet to be attached to the Vacuum Splint in place of the hand pump to extract the air. This allows Officers to place all hands on the Vacuum Splint to hold the beads against the limb for improved immobilisation.



*Turn suction off when  
green light shows full  
vacuum is achieved (500)*



## **CLOSURE OF SPLINT**

NEANN Vacuum Splints use velcro for the of closure of the Vacuum Splints as it is the most versatile, causes least movement during application, can be adjusted and positioned in multiple places for when the limb is deformed or angulated, thus allowing greater limb support.



*Velcro Closure*



## **VACUUM SPLINT CARRY BAG**

The Vacuum Splints now come with a simple carry bag that allows for proper OH&S storage in the current Mercedes Ambulance vehicle (places previous carry pouch).

Equipment stored in the carry bag includes:

- *Vacuum Splint - Leg*
- *Vacuum Splint - Arm*
- *Hand Powered Vacuum Pump*
- *Automated Suction Unit Adapter*



# **VACUUM SPLINT APPLICATIONS**



# **LEG SPLINT APPLICATION**

## **(STRAIGHT LEG)**

*The following section is a detailed photographic guide to applying the Vacuum Splint - Leg to a re-aligned anatomical straight leg,*

### **Training Requirements:**

**2 x Officers**  
**1 x Patient**  
**1 x Vacuum Splint - Leg**  
**1 x Vacuum Splint Pump**  
**or**  
**1 x Automated Suction Unit with**  
**1 x Suction Unit Adapter**

### **Procedure**



*Assess patient*

### **Step 1**

**Officer 1** assesses patient as per the section 'Field Use Of The Vacuum Splint' on page 8 of this manual.



*Provide appropriate pain relief*

### **Step 2**

**Officer 1** provides pain relief and a muscular relaxant as required, in-line with CPGs.

Irrigate any open fractures with sterile isotonic solution and cover wound with a sterile dressing before moving the limb.

**Officer 2** re-aligns the limb into the normal anatomical position, unless unable or contra-indicated due to:

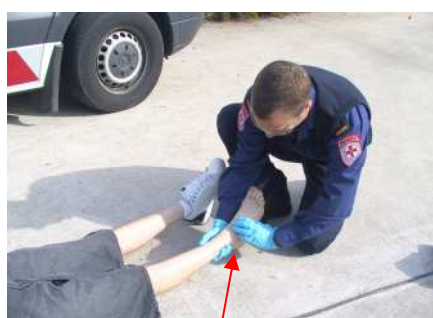
- Excessive pain on moving
- Resistance on attempting to re-align
- Fracture or dislocation to a joint
- Loss of sensation, colour, warmth or pulse occurs on moving the limb



*Remove footwear and leg clothing*

### **Step 3**

**Officer 2** takes support of the limb and removes footwear and leg clothing to properly perform a neurovascular assessment below the level of injury, and to allow proper visual examination of the injury sight.



*Assess neurovascular function*

### **Step 4**

**Officer 2** assesses neurovascular function below the level of injury including:

- Pulse
- Warmth
- Colour
- Sensation
- Movement

**Officer 2** continues to maintain support of the limb.



*Place splint next to patient and ensure beads are evenly spread*

### **Step 5**

**Officer 1** opens the Vacuum Splint Carry Bag and selects the correct splint for the limb injury.

Place splint next to patient with blue surface facing upwards and ensure beads are evenly spread throughout splint.

**Officer 2** continues to maintain support of the limb.



*Centre splint under leg*

### **Step 6**

**Officer 1** carefully slides Vacuum Splint under the injured leg and centrally aligns the splint with the limb. If possible, the splint should be positioned so that the patients foot is fully supported by the splint once applied.

**Officer 2** continues to maintain support of the limb.



*Apply the velcro straps from the pelvis to the foot*

### Step 7

**Officer 1** begins to apply the velcro straps starting at the strap nearest the pelvis and progressively moving down towards the foot.

**Officer 2** continues to maintain support of the limb.



*Apply figure of eight to support foot*

### Step 8

**Officer 1** finishes applying the velcro strapping by applying the figure of eight foot straps to prevent foot movement.



*Evacuate air with hand pump*

### Step 9

If three Officers are available, **Officer 1** closes the air valve, attaches the hand powered suction pump to the air valve, and evacuates the air by pumping the hand powered suction pump until it is difficult to withdraw the handle, then disconnects the hand pump.

Whilst **Officer 1** evacuates the air, **Officers 2 and 3** hold the beads firmly against the patient's limb to ensure that as the air is evacuated, the beads stay firmly against the patient's limb.



*Evacuate air with battery powered suction unit*

If only two Officers are available, it is best to utilise an automatic powered suction unit such as the LSU so both Officers can hold the beads against the limb. Close the air valve, attach the automated suction unit adapter to the air valve and suction unit. Turn the powered suction unit on to evacuate the air from the splint until the splint is rigid, then disconnect the suction pump.

**Failure to hold the beads against the limb will result in inadequate support and immobilisation of the splint.**



*Retighten the straps until the splint is comfortable and supportive*

### **Step 10**

Once the air is fully evacuated from the splint, the splint may loosen reducing immobilisation.

**Officer 1** re-secures the velcro straps to ensure the splint is comfortable and supportive on the limb.



*Recheck neurovascular observations post splint application*

### **Step 11**

Finally, recheck the neurovascular observations of the distal limb reviewing:

- Pulse
- Warmth
- Colour
- Sensation
- Movement

to ensure the splint has not compromised the limb.

Consider applying an ice pack the injury sight and raising the limb to further reduce swelling and pain.

## **LEG SPLINT APPLICATION**

### **(BENT KNEE)**

*The following section is a detailed photographic guide to applying the Vacuum Splint - Leg to a dislocated knee.*

#### **Training Requirements:**

2 x Officers  
1 x Patient  
1 x Vacuum Splint - Leg  
1 x Vacuum Splint Pump  
or  
1 x Automated Suction Unit with  
1 x Suction Unit Adapter

#### **Procedure**



*Assess patient*

#### **Step 1**

**Officer 1** assesses patient as per the section 'Field Use Of The Vacuum Splint' on page 8 of this manual.



*Provide appropriate pain relief whilst the limb is supported*

#### **Step 2**

**Officer 1** provides pain relief and a muscular relaxant as required, in-line with CPGs.

Irrigate any open wounds with sterile isotonic solution and cover wound with a sterile dressing before moving the limb.

As it cannot be re-aligned, **Officer 2** supports the limb in it's current angulated position.





*Remove footwear and leg clothing*

### **Step 3**

**Officer 2** takes support of the limb and removes footwear and leg clothing to properly perform a neurovascular assessment below the level of injury, and to allow proper visual examination of the injury.



*Assess neurovascular function*

### **Step 4**

**Officer 2** assesses neurovascular function below the level of injury including:

- Pulse
- Warmth
- Colour
- Sensation
- Movement

**Officer 2** continues to maintain support of the limb.



*Place splint next to patient and ensure beads are evenly spread*

### **Step 5**

**Officer 1** opens the Vacuum Splint Carry Bag and selects the correct splint for the knee injury.

Place the splint next to patient with blue surface facing upwards and ensure beads are evenly spread throughout splint.

**Officer 2** continues to maintain support of the limb.



*Centre splint under leg*

### **Step 6**

**Officer 1** carefully slides Vacuum Splint under the injured knee and centrally aligns the splint with the limb. If possible, the splint should be positioned so that the patient's foot is fully supported by the splint once applied.

**Officer 2** continues to maintain support of the limb.



*Apply the velcro straps from the pelvis to the foot*

### Step 7

**Officer 1** begins to apply velcro straps starting at the strap nearest the pelvis and progressively moving down towards the foot.

**Officer 2** continues to maintain support of the limb.



*Apply figure of eight to support foot*

### Step 8

**Officer 1** finishes applying the velcro strapping by applying the figure of eight foot straps to prevent foot movement.



*Evacuate air with battery powered suction unit*

### Step 9

If three Officers are available, **Officer 1** closes the air valve, attaches the hand powered suction pump to the air valve, and evacuates the air by pumping the hand powered suction pump until it is difficult to withdraw the handle, then disconnects the pump.

Whilst **Officer 1** evacuates the air, **Officers 2 and 3** hold the beads firmly against the patient's limb to ensure that as the air is evacuated, the beads stay firmly against the patient's limb.

If only two Officers are available, it is best to utilise an automatic powered suction unit such as the LSU (as shown) so both Officers can hold the beads against the limb. Close the air valve, attach the automated suction unit adapter to the air valve and suction unit. Turn the suction unit on to evacuate the air from the splint until the splint is rigid, then disconnect the suction pump.

**Failure to hold the beads against the limb will result in inadequate support and immobilisation of the splint.**



*Retighten velcro straps until the splint is comfortable and supportive*

### **Step 10**

Once the air is fully evacuated from the splint, the splint may loosen reducing immobilisation.

**Officer 1** re-secures the velcro straps to ensure the splint is comfortable and supportive on the limb.



*Recheck neurovascular observations post splint application*

### **Step 11**

Finally, recheck the neurovascular observation of the distal limb reviewing:

- Pulse
- Warmth
- Colour
- Sensation
- Movement

to ensure the splint has not compromised the limb.

Consider applying an ice pack to the injury to help reduce swelling and pain.



## **LEG SPLINT APPLICATION** **(ANGULATED LEG)**

*The following section is a detailed photographic guide to applying the Vacuum Splint - Leg to a lower leg injury that is unable to be re-aligned into the normal anatomical position.*

### **Training Requirements:**

**2 x Officers**  
**1 x Patient**  
**1 x Vacuum Splint - Leg**  
**1 x Vacuum Splint Pump**  
**or**  
**1 x Automated Suction Unit with**  
**1 x Suction Unit Adapter**

### **Procedure**



*Assess patient*

### **Step 1**

**Officer 1** assesses patient as per the section 'Field Use Of The Vacuum Splint' on page 8 of this manual.



*Provide appropriate pain relief  
& attempt to re-align limb*

*If contra-indicated or unable,  
splint as found*

### **Step 2**

**Officer 1** provides pain relief and a muscular relaxant as required, in-line with CPGs.

Irrigate any open fractures with sterile isotonic solution and cover wound with a sterile dressing before moving the limb.

**Officer 2** attempts to re-align the limb into the normal anatomical position, but is contra-indicated or unable to due to one of the following reasons:

- Excessive pain on moving
- Resistance on attempting to re-align
- Fracture or dislocation to a joint
- Loss of sensation, colour, warmth or pulse occurs on moving the limb



*Remove footwear and leg clothing*

### **Step 3**

**Officer 2** takes support of the limb and removes footwear and leg clothing to properly perform a neurovascular assessment below the level of injury, and to allow proper visual examination of the injury sight.



*Assess neurovascular function*

### **Step 4**

**Officer 2** assesses neurovascular function below the level of injury including:

- Pulse
- Warmth
- Colour
- Sensation
- Movement

**Officer 2** continues to maintain support of the limb.



*Place splint next to patient and ensure beads are evenly spread*

### **Step 5**

**Officer 1** opens the Vacuum Splint Carry Bag and selects the correct splint for the limb injury.

Place the splint next to patient with blue surface facing upwards and ensure beads are evenly spread throughout splint.

**Officer 2** continues to maintain support of the limb.



*Centre splint under upper leg*

### **Step 6**

**Officer 1** carefully slides Vacuum Splint under the limb and initially centrally aligns the splint with the upper limb. If possible, the splint should be positioned so that the patients foot will be fully supported by the splint once applied.

**Officer 2** continues to maintain support of the limb.



*Apply the velcro straps from the pelvis to foot*

### Step 7

**Officer 1** begins to apply velcro straps starting at the strap nearest the pelvis and progressively moving down towards the foot.

**Officer 2** continues to maintain support of the limb.



*Bend splint around the knee and centralise under the lower leg*

### Step 8

**Officer 1** bends the splint around the knee to centralise the splint under the lower limb and continues applying velcro straps to the lower limb finishing with a figure of eight around the foot.

**Officer 2** continues to maintain support of the limb.



*Evacuate air with battery powered suction unit*

### Step 9

If three Officers are available, **Officer 1** closes the air valve, attaches the hand powered suction pump to the air valve, and evacuates the air by pumping the hand powered suction pump until it is difficult to withdraw the handle, then disconnects the hand pump.

Whilst **Officer 1** evacuates the air, **Officers 2 and 3** hold the beads firmly against the patient's limb to ensure that as the air is evacuated, the beads stay firmly against the patient's limb.

If only two Officers are available, it is best to utilise an automatic powered suction unit such as the LSU so both Officers can hold the beads against the limb. Close the air valve, attach the automated suction unit adapter to the air valve and suction unit. Turn the suction unit on to evacuate the air from the splint until the splint is rigid, then disconnect the suction pump.

**Failure to hold the beads against the limb will result in inadequate support and immobilisation of the splint.**



*Retighten velcro straps until the splint is comfortable and supportive*

### **Step 10**

Once the air is fully evacuated from the splint, the splint may loosen reducing immobilisation.

**Officer 1** re-secures the velcro straps to ensure the splint is comfortable and supportive on the limb.



*Recheck neurovascular observations post splint application*

### **Step 11**

Finally, recheck the neurovascular observation of the distal limb reviewing:

- Pulse
- Warmth
- Colour
- Sensation
- Movement

to ensure the splint has not compromised the limb.

Consider applying an ice pack to the injury sight and raising the limb to further reduce swelling and pain.

## **ARM SPLINT APPLICATION** **(STRAIGHT ARM)**

*The following section is a detailed photographic guide to applying the Vacuum Splint - Arm to a re-aligned anatomical straight arm.*

### **Training Requirements:**

**2 x Officers**  
**1 x Patient**  
**1 x Vacuum Splint - Arm**  
**1 x Vacuum Splint Pump**  
**or**  
**1 x Automated Suction Unit with**  
**1 x Suction Unit Adapter**

### **Procedure**



*Assess patient*

### **Step 1**

**Officer 1** assesses patient as per the section 'Field Use Of The Vacuum Splint' on page 8 of this manual.



*Provide appropriate pain relief*

### **Step 2**

**Officer 1** provides pain relief and a muscular relaxant as required, in-line with CPGs.

Irrigate any open fractures with sterile isotonic solution and cover wound with a sterile dressing before moving the limb.

**Officer 2** re-aligns the limb into the normal anatomical position, unless unable or contra-indicated due to:

- Excessive pain on moving
- Resistance on attempting to re-align
- Fracture or dislocation to a joint
- Loss of sensation, colour, warmth or pulse occurs on moving the limb





*Assess neurovascular function*

### Step 3

**Officer 2** takes support of the limb and removes any clothing on the arm to properly perform a neurovascular assessment below the level of injury, and to allow proper visual examination of the injured limb.

**Officer 2** assesses neurovascular function below the level of injury including:

- Pulse
- Warmth
- Colour
- Sensation
- Movement



*Place splint next to patient and ensure beads are evenly spread*

### Step 4

**Officer 2** opens the Vacuum Splint Carry Bag and selects the correct splint for the limb injury.

Place splint next to patient with blue surface facing upwards and ensure beads are evenly spread throughout splint.



*Centre splint under arm*

### Step 5

**Officer 1** carefully slides Vacuum splint under the injured arm and centrally aligns the splint with the upper arm. If possible, the splint should be positioned so that the patient's hand will be fully supported by the splint following application.

**Officer 2** maintains support of the limb.



*Apply the velcro straps from the shoulder to hand*

### Step 6

**Officer 1** begins to apply velcro straps starting at the strap nearest the shoulder and progressively moving down towards the hand.

**Officer 2** continues to maintain support of the limb.



*Apply middle velcro strap*

### Step 7

**Officer 1** applies the middle velcro strap.

**Officer 2** continues to maintain support of the limb.



*Apply velcro strap over hand*

### Step 8

**Officer 1** finishes applying the velcro strapping by applying the velcro strap over the hand.



*Connect the LSU Suction Pump*

### Step 9

If three Officers are available, **Officer 1** closes the air valve, attaches the hand powered suction pump to the air valve, and evacuate the air by pumping the hand powered suction pump until it is difficult to withdraw the handle, then disconnects the pump.

Whilst **Officer 1** evacuates the air, **Officers 2 and 3** hold the beads firmly against the patient's limb to ensure that as the air is evacuated, the beads stay firmly against the patient's limb.



*Evacuate air with  
battery powered suction unit*

If only two Officers are available, it is best to utilise an automatic powered suction unit such as the LSU so both Officers can hold the beads against the limb. Close the air valve, attach the automated suction unit adapter to the air valve and suction unit. Turn the suction unit on to evacuate the air from the splint until the splint is rigid, then disconnect the suction pump.

**Failure to hold the beads against the limb will result in inadequate support and immobilisation of the splint.**



*Retighten velcro straps until the splint is comfortable and supportive*

### **Step 10**

Once the air is fully evacuated from the splint, the splint may loosen reducing immobilisation.

**Officer 1** re-secures the velcro straps to ensure the splint is comfortable and supportive on the limb.



*Recheck neurovascular observations post splint application*

### **Step 11**

Finally, recheck the neurovascular observation of the distal limb reviewing:

- Pulse
- Warmth
- Colour
- Sensation
- Movement

to ensure the splint has not compromised the limb.

Consider applying an ice pack to the injured sight and raising the limb to further reduce swelling and pain.



## **ARM SPLINT APPLICATION** **(ANGULATED ARM)**

*The following section is a detailed photographic guide to applying the Vacuum Splint - Arm to a dislocated elbow or lower arm injury.*

### **Training Requirements:**

**2 x Officers**  
**1 x Patient**  
**1 x Vacuum Splint - Arm**  
**1 x Vacuum Splint Pump**  
**or**  
**1 x Automated Suction Unit with**  
**1 x Suction Unit Adapter**

### **Procedure**



*Assess patient and provide pain relief*

### **Step 1**

**Officer 1** assesses patient as per the section 'Field Use Of The Vacuum Splint' on page 8 of this manual.

**Officer 1** provides pain relief and a muscular relaxant as required, in-line with CPGs.

Irrigate open fractures with sterile isotonic solution and cover wound with a sterile dressing before moving the limb.



*Assess neurovascular function below the injury*

### **Step 2**

**Officer 1** removes any clothing on the arm to properly perform a neurovascular assessment below the level of injury, and to allow proper visual examination of the injury sight.

**Officer 1** assesses neurovascular function below the level of injury including:

- Pulse
- Warmth
- Colour
- Sensation
- Movement



*Place splint next to patient and ensure beads are evenly spread*



*Centre splint under upper arm*



*Apply the velcro straps from the shoulders to hand*



*Bend splint around the elbow and centralise under the lower limb*

### **Step 3**

**Officer 2** takes support of the limb.

**Officer 1** opens the Vacuum Splint Carry Bag and selects the correct splint for the limb injury.

Place splint next to patient with blue surface facing upwards and ensure beads are evenly spread throughout splint.

### **Step 4**

**Officer 1** carefully slides Vacuum splint under the upper arm and centrally aligns the splint with the limb. If possible, the splint should be positioned so that the patients hand is fully supported by the splint following application.

**Officer 2** continues to maintain support of the limb.

### **Step 5**

**Officer 1** begins to apply velcro straps starting at the strap nearest the shoulder and progressively moving down towards the hand.

**Officer 2** continues to maintain support of the limb.

### **Step 6**

**Officer 1** bends the splint around the elbow and centralises the splint under the lower arm.

**Officer 2** continues to maintain support of the limb



*Continue to apply velcro straps to the lower arm*

### Step 7

**Officer 1** continues applying the velcro strapping to the lower arm.

**Officer 2** continues to maintain support of the limb.



*Apply final velcro ensuring hand is within the splint*

### Step 8

**Officer 1** finishes applying the velcro strapping to the lower arm ensuring the hand is secured in the splint.

**Officer 2** continues to maintain support of the limb.



*Connect the battery powered suction unit*

### Step 9

If three Officers are available, **Officer 1** closes the air valve, attaches the hand powered suction pump to the air valve, and evacuate the air by pumping the hand powered suction pump until it is difficult to withdraw the handle, then disconnects the pump.

Whilst **Officer 1** evacuates the air, **Officers 2 and 3** hold the beads firmly against the patient's limb to ensure that as the air is evacuated, the beads stay firmly against the patient's limb.



*Evacuate air with battery powered suction unit*

If only two Officers are available, it is best to utilise an automatic powered suction unit such as the LSU, so both Officers can hold the beads against the limb. Close the air valve, attach the automated suction unit adapter to the air valve and suction unit. Turn the suction unit on to evacuate the air from the splint until the splint is rigid, then disconnect the suction pump.

**Failure to hold the beads against the limb will result in inadequate support and immobilisation of the splint.**



*Retighten velcro straps until the splint is comfortable and supportive*

### **Step 10**

Once the air is fully evacuated from the splint, the splint may loosen reducing immobilisation.

**Officer 1** re-secures the velcro straps to ensure the splint is comfortable and supportive on the limb.



*Recheck neurovascular observations post splint application*

### **Step 11**

Finally, recheck the neurovascular observation of the distal limb reviewing:

- Pulse
- Warmth
- Colour
- Sensation
- Movement

to ensure the splint has not compromised the limb.

Consider applying an ice pack to the injury sight and raising the limb to further reduce swelling and pain.

# **STORAGE OF THE VACUUM SPLINT**



# **VACUUM SPLINT SET** **AND** **STORAGE**

The Vacuum Splint Set consists of all the items required to use the Vacuum Splints and can be stored in the Mercedes Ambulance to comply with OH&S guidelines:

## **Vacuum Splint Set**

The Vacuum Split set now contains the following items:

- \* Vacuum Splint - Carry Bag (replaces carry pouch)
- \* Vacuum Splint - Arm
- \* Vacuum Splint - Hand Powered Suction Pump
- \* Vacuum Splint - Automatic Suction Unit Adapter



*Carry Bag*



# **CLEANING OF THE VACUUM SPLINTS**

## **CLEANING THE VACUUM SPLINTS**

**Ensure Air Valve is always closed before cleaning to prevent water entering the internal compartment of the Vacuum Splint.**

All fabrics used in the NEANN Vacuum Splints are designed to comply with the **Australian Standards on Laundry Practice (AS 4146-1994)** for the removal and killing of HIV, Hepatitis B and Vegetative Organisms.

A cleaning program that complies with the Australian Standards for cleaning blood, vomit and other substances off the Vacuum Splints are provided below.

- *The cleaner in keeping with normal practices should put on personal protection barrier equipment such as gloves, safety glasses, face masks, etc.*
- *Ensure Air Valve is closed to prevent water entering the splint's internal compartment.*
- **Small areas of contamination:**

Blood - Soak by placing a wet sponge on stain immediately after contact. If available, an antibacterial solution (Virkon™ or similar) should be added to the water. Repeat as necessary, then gently clean off residual stains with light spray of Nifty™. Allow to dry thoroughly before re-use.

Vomit - Gently sponge with hot water immediately after contact. If available, an antibacterial solution (Virkon™ or similar) should be added to the water. Repeat as necessary, then gently clean off residual stains with light spray of Nifty™. Allow to dry thoroughly before re-use.

- **Larger areas of contamination:**

Blood - Soak by placing effected panels in cold water. An antibacterial solution (Virkon™ or similar) should be added to the water. Let effected part soak for 20 minutes. Using Nifty™, gently sponge of residual stains. Allow to dry thoroughly before re-use .

Vomit - Soak by placing in hot water. An antibacterial solution (Virkon™ or similar) should be added to the water. Using Nifty™, gently sponge of residual stains. Allow to dry thoroughly before re-use.

*In very heavy saturation, soak the Splint in cold water with an antibacterial solution (Virkon™ or similar) for 2 hours, rinse and then emerse again and bring up to a temperature of 90 degrees Celsius and maintain for 10 minutes. Using Nifty™ or an equivalent, gently sponge of residual stains. Dry thoroughly before re-use.*



# **VACUUM SPLINT SPECIFICATIONS**

## **SPECIFICATIONS**

### **DIMENSIONS & Weight**

Dimension of the Vacuum Splint Full Set In Carry Bag:

Length	49 cm
Depth	16 cm
Height	34 cm
Weight	2.8 kg



Dimension of the Vacuum Splint - Arm:

Length	69 cm
Width	48 cm
Thickness	1 cm
Weight	0.7 kg



Dimension of the Vacuum Splint - Leg:

Length	100 cm
Width	48 cm
Thickness	1 cm
Weight	1.1 kg



### **PARTS SUPPLIED**

Part	..... Vacuum Splint Full Set
Part	..... Vacuum Splint - Leg
Part	..... Vacuum Splint - Arm
Part	..... Vacuum Splint Hand Powered Pump
Part	..... Automated Suction Unit Adapter

Spare and replacement parts are available on request by contacting RAPP Australia Pty Ltd

### **WARRANTY**

NEANN Vacuum Splints are warranted against defects in material and workmanship for a period of 2 years from the date of purchase by the original user. During this period, RAPP Australia Pty Ltd will upon receipt of the product found to be defective due to materials or workmanship from the purchaser and notification in writing of the defect at its option repair or replace any parts found to be defective.

# **TRAINING EVALUATION FORM**

## **VACUUM SPLINT**

# **TRAINING EVALUATION FORM**

Organisation: .....

Officer's Name Undertaking Training: .....

### **INITIAL TRAINING**

Instruction Manual Reviewed

5 x Splint Training Applications

Date Completed	Supervisor

### **THREE MONTHLY REVIEW**

2 x Splint Training Applications

Date Completed	Supervisor

### **TWELVE MONTHLY REVIEW**

Instruction Manual reviewed

5 x Splint Training Applications

Date Completed	Supervisor