

VACUUM IMMOBILISATION MATTRESS



User Manual



READ BEFORE USE

RAPP Australia Pty Ltd

This manual has been produced by RAPP Australia Pty Ltd for training purposes only and is not for sale.

First published 8th September 2006 in Australia

Revised 15th October 2020 by:

RAPP Australia Pty Ltd
160 McClelland Ave
Lara
Victoria
Australia 3212

Copyright © RAPP Australia Pty Ltd

This publication is copyright. Apart from reproduction permitted under the Copyright Act, no part of this publication may be produced by any means (whether electronic, micro copying, photocopying, mechanical or otherwise) without direct permission from RAPP Australia Pty Ltd.

This manual is a guide to using the NEANN Vacuum Immobilisation Mattress. (VIM)

If this manual conflicts with your organisations protocols, you should follow those protocols in preference to the guidelines stated in this manual.



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 Paramedics, First-Aiders, 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 exercises need to be held to ensure that training levels are maintained. Practice will lead to high levels of competence and safety.

RAPP Australia Pty Ltd recommends that initial training of Officers in the use of the VIM is to include:

1. Review of this manual (supplied with each VIM) under direct supervision of an appropriately trained supervisor.
2. Practical hands-on applications of procedures presented in this manual in a training environment under direct supervision of an appropriately trained supervisor before use on actual patients.

RAPP Australia Pty Ltd recommends that ongoing training of Officers is to include:

1. Three monthly practical review in the use of the VIM in its intended environment,.
2. Twelve monthly theoretical & practical review .

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

FULL BODY IMMOBILISATION

The following section is a detailed photographic guide to Full Body / Spine Immobilisation using the VIM. These techniques offered are based on current research and x-ray studies and offer the most up to date teaching.¹⁻⁵

There is increasing questioning by some of the need to immobilise the full spine, with suggestions that immobilisation does not prevent further cord injury, but may actually cause such injuries.⁶ Whilst a Medline literature search failed to find any studies supporting the theory that correctly applied immobilisation causes secondary cord injury, a number of studies have shown that failure to identify and immobilise patients with unstable fractures do acquire secondary cord deterioration.⁷ Recent studies looking at prehospital spinal cord injuries & field clearance failed to establish any secondary cord injury on any patients correctly immobilised during transport.⁸⁻⁹

A number of studies in the literature do present complications when **POOR STANDARDS** of immobilisation are performed. Issues include occipital, lumbar and sacral pain development when padding is inadequate or absent,¹⁰⁻¹⁴ increased respiratory compromise with incorrect chest strapping,¹⁵⁻¹⁶ pressure sore development due to inadequate padding²⁻⁴ and spinal miss-alignment again due to inappropriate padding.^{2, 14, 17} When proper consideration is given, such complications are significantly reduced or avoided.¹⁻⁵

Training Requirements:

2 x Staff
1 x Patient
1 x Cervical Collar
1 x Scoop Stretcher
1 x VIM and Pump
1 x Stretcher Canvas
1 x Towel
1 x Combine Pad
1 x Hand / Wrist Airsplint
1 x Head Strap

Procedure



Place VIM on Ambulance Stretcher

Step 1

Place the VIM on the Ambulance Stretcher.

Undo straps on VIM and lay all straps to the side.

Ensure no carry handles are caught under the VIM.

Ensure beads are spread evenly and appropriately.



Place Canvas Sheet on the VIM

Step 2

Place a sheet down the full length of the VIM.

This will ease removing the patient off the VIM, and helps prevent sweating and heat loss when lying on the VIM.



Position Hand/Wrist Airsplint

Step 3

A *Hand / Wrist Airsplint* fully opened should be placed under the lumbar spine of the patient to fill the gaps formed by the anatomical curvature of the spine, as the VIM does not always fill this gap.¹² It should be placed with the bottom of the airsplint level with the green pelvic strap.

The hand / wrist airsplint should only be inflated once the air has been evacuated from the VIM (Step 16).



Position patient's shoulders level with shoulder marking

Step 4

Place the patient onto the VIM using a Long Spine Board or Scoop Stretcher.

Position the patient ensuring that the top of the patient's shoulders are level with the shoulder line marking. Once the shoulders are correctly positioned, remove the Long Spine Board or Scoop Stretcher.



Step 5

In adults, place adequate padding under the head section of the VIM to maintain the head in the neutral in-line position. Firm padding using a *Folded Towel* or similar (**NOT A PILLOW**) is generally required under the head section of the VIM in an adult to prevent hyperextension of the cervical spine.^{14, 17} A small number of adults will however require no padding.

A 20 x 20 cm *Combine Pad* can be placed between the patient's head and the VIM to improve the long term comfort for the patient and to help prevent headaches developing.¹²

Manual Head Stabilisation

In a suspected spinal injury, one person should also continue holding the head to maintain head alignment until the head is immobilised to the VIM (Step 14). A Cervical Collar alone has been shown in numerous studies to be ineffective in maintaining adequate cervical spine immobilisation.²¹⁻²⁴

Tightening The Straps

Straps should be tightened with a *'feed and pull'* method to prevent twisting of the patient. If a bystander is available, pushing laterally inwards on the sides of the VIM will also greatly assist in tightening the straps.

Step 6



Place the *Green Pelvic Strap* across the pelvic bone or iliac crest and tighten. Ensure that the strap goes over the bone rather than the soft abdomen otherwise abdominal organ damage may occur.

This strap will help prevent lateral movement of the spine.



Apply Yellow Upper Leg Strap

Step 7

Place the *Yellow Upper Leg Strap* across the upper legs and tighten. If the legs are able to move laterally, spinal column movement, including the cervical spine can still occur.²⁵



Apply Yellow Lower Leg Strap

Step 8

Place the *Yellow Lower Leg Strap* across the lower legs and tighten. Again, if the legs are able to move laterally, spinal column movement, including the cervical spine can still occur.²⁵



Apply Red Foot Strap

Step 9

Using the *Red Foot Strap*, apply a 'Figure Of Eight' around the patient's ankles and tighten. This strap will prevent downward sliding of the patient on the VIM that may occur if the foot end of the VIM is tilted downwards, or when the Ambulance accelerates. This strap will also help prevent lateral movement of the legs.



Apply Blue Chest Straps

Step 10

Apply both *Blue Shoulder Straps* across the chest in a crossing application and tighten. Following application of the straps, there should be just enough slack to allow one hand to be placed between the chest and the strap. Over tightening may compromise respiratory effort.¹⁵⁻¹⁶

These two blue straps will prevent upward sliding of the patient's body when the VIM is tilted head down, or when the brakes of the vehicle are applied during transport. They will also help prevent lateral movement of the torso if the VIM needs to be tilted sideways (vomiting patient).²⁶



Step 11

Apply the *Black Arm Strap*, encompassing the arms to prevent the upper arms of the patient from moving around; to help prevent lateral movement;⁹ and to help prevent the upper arms from moving above shoulder height. Raising the arms above the shoulder level as required for such manoeuvres as the Canadian Log-Roll is in general CONTRA-INDICATED in spinal injuries, as studies have shown this to cause sagging of the thoracic and lumbar spine.²⁶⁻²⁷

Step 12

Recheck all the torso straps before immobilising the patient's head to the VIM.



Step 13

Once the patient's body is secured properly to the VIM, ONLY THEN is the patient's head secured to the VIM. Ensure the correct amount of firm padding remains is under the head section of the VIM (step 5) to maintain the patient's spine in the neutral in-line position (generally around 2 - 7 cm in most adults).

Wrap the head section of the VIM around the patient's temporal region. Continue to hold this section firmly against head until air is evacuated (Step 14).



Apply the 25mm *Forehead Strap*. Tighten strap ensuring foam pad is centered on the patient's forehead. Place thumbs on the center of forehead, and pull both ends with equal pressure. Velcro into place.



Evacuate air from VIM until solid

Step 14

Once all the strapping is applied, attach the hand pump, foot pump or battery powered suction pump, and evacuate all the air out of the VIM until it feels solid.

Ensure patient's upper arms are against the VIM during air evacuation to prevent build up of a beads under the armpits (as this may cause discomfort).

To ensure beads remain close to the body to improve immobilisation, three bystanders can be used to push the beads in against the patient's body down the full length of the VIM.

Step 15

Re-adjust straps following evacuation of the air out of the VIM as the straps will loosen off.



Inflate the Air Splint

Step 16

If a gap develops under the lumbar spine when the air is evacuated out of the VIM, inflate the *Hand / Wrist Airsplint* to fill this void so as to improve long term comfort.¹²



Apply Stretcher Harness

Step 17

Secure the VIM to the stretcher ready for Ambulance transport. The VIM allows for the current 20G stretcher restraints to be effectively used.

IMMOBILISATION ACCESSORIES

ACCESSORIES FOR THE VIM

To assist with Full Body Immobilisation, additional equipment to the VIM is required. It is also helpful if all this additional equipment is prepared and stored in a kit near the VIM, so that the accessory items can be easily carried to the patient and no time is wasted searching for the equipment. The following equipment & spinal immobilisation accessories listed below, should be considered:

VIM CARRY BAG

Containing the following items:

- * VIM
- * Forehead Strap
- * Foot Pump

SPINAL IMMOBILISATION CARRY BAG

Containing the following items:

- * 1 x Towel
- * 1 x Combine Pad (20 x 20 cm)
- * 1 x Stretcher Canvas or Sheet
- * 1 x Hand / Wrist Airsplint with Hand Pump

VIM Carry Bag



CLEANING

CLEANING THE VIM

Ensure Valve is always closed before cleaning to prevent water entering the VIM.

All fabrics used in the VIM 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. For those wishing to undertake in-house cleaning (at your own risk, including risk to warranty), some basic guidelines are listed below:

- *The cleaner in keeping with normal practices should put on personal protection barrier equipment such as gloves, safety glasses, face masks, etc..*

- **Small areas of contamination:**

Blood - Soak by placing a wet sponge on stain immediately after contact. If available, an antibacterial solution (Milton's 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 (Milton's 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 (Milton's 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 (Milton's 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 VIM in cold water with an antibacterial solution (Milton's 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.

SPECIFICATIONS

SPECIFICATIONS

DIMENSIONS

Dimension of the VIM opened:	<u>Adult 6 Ft</u>	<u>Adult 7 Ft</u>
Length	190 cm	214 cm
Thickness	5 cm	6 cm
Width	84 cm	92 cm
Weight	6 kg	8.5 kg

Dimension of the VIM stored:	<u>Adult 6 Ft</u>	<u>Adult 7 Ft</u>
- Length	-	-
Height	84 cm	92 cm
Width	40 cm	45 cm
Weight	6.3 kg	8.8 kg

SAFE WORKING LOAD

The safe working load of the Adult VIM is 160 kg

PARTS SUPPLIED

- Part Carry Bag
- Part VIM - Adult 6 ft
- Part VIM - Adult 7 ft

- Part Hand Pump
- Part Foot Pump
- Part Set Of Straps
- Part CD Powerpoint Training Presentation
- Part Printed Training Manual

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

WARRANTY

RAPP Australia Pty Ltd warrants to the purchaser that the VIM is free from 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 or the entire product. All postage, shipping and handling charges shall be the sole responsibility of the purchaser.

TRAINING EVALUATION FORM

TRAINING EVALUATION FORM

Organisation:

Officer's Name Undertaking Training:

INITIAL TRAINING

Powerpoint Presentation Reviewed

Instruction Manual Reviewed

5 x VIM Training Applications

Date Completed	Supervisor

THREE MONTHLY REVIEW

1 x VIM Training Application

Date Completed	Supervisor

TWELVE MONTHLY REVIEW

Powerpoint Presentation Reviewed

Instruction Manual reviewed

1 x VIM Training Application

Date Completed	Supervisor

THIS PAGE CAN BE PHOTOCOPIED WITHOUT BREACH OF COPYRIGHT

For further information, please contact

RAPP Australia Pty Ltd

160 McClelland Ave
Lara
Victoria 3212

Phone: (03) 5284 0925

sales@rappaustralia.com.au

www.neann.com.au