Purpose of the Manual

This Operation Manual is designed to enable the user to safely setup, use, clean and store the Spinal Traction Bed (the “bed”) during a two-centre clinical evaluation.

This manual is for use only with the bed as part of the evaluation by the Canterbury and Waikato District Health Board’s, and should not be used by any party not thoroughly trained in its use by Mr Singhal (or a party delegated by Mr Singhal), and should not be used separately or without the use of best clinical practice by the operator.

All maintenance and inspection of the bed must be carried out by Spinal Traction Ltd.

Spinal Traction Limited’s Policy

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1. Before You Begin

1.1. Brief Description

This Operation Manual is designed to enable the user to safely setup, use, clean and store the Spinal Traction Bed (the “bed”) during a two-centre clinical evaluation. It also outlines the technique for rapid reduction of cervical spine dislocations.

All maintenance and inspection of the bed must be carried out by Spinal Traction Ltd.

1.2. Indications of Use

The bed has been designed for a single purpose - to apply traction to and flexion of a patient’s neck to realign the vertebrae and spinal cord, preventing permanent damage from occurring.

The bed is only to be operated by suitably trained clinicians and is not to be used for any other purpose.

1.3. Contraindications

- This Traction Bed is not to be used for any purpose other than to assist the reduction of acute cervical spine dislocations.

- The bed is not designed to be used with any other mattresses or without its custom supplied mattresses and foam foot rests.

- The bed is not to be used if patient has severe fractures of the skull.

- The bed is not to be used when patient also has shoulder/ collar bone injuries in the area of the strap restraints.

- Discontinue use of the bed if the patient is in distress or excessive discomfort.
1.4. Symbols and Notational Conventions

The following special typefaces are used throughout this manual.

**Typeface** | **Type of Information**
--- | ---
**Bold type** | The names of parts on the Bed.

**Symbol** | **Meaning**
--- | ---
Note: | A Note provides additional or vital information to the topic being discussed.
Caution: | A Caution provides information on prevention of potential equipment damage, malfunction, inaccurate operation or damage to other property.
Warning: | A Warning provides information on prevention of potential harmful situations to the patient or operator.

1.5. Safety and Effectiveness Considerations

**General**

Be sure to read, understand and follow the instructions in this Operation Manual. If any damage occurs halt use immediately if possible and seek service intervention.

**Cleaning**

Always unplug the bed from its electrical power source and apply the brakes when cleaning.

If any liquid is spilled on the mattress, frame or foam packers, sponge off excess, clean with an approved cleaning product at its correct concentration and dry thoroughly.

Refer to Section 4 “Cleaning and Storage” for more detailed information.
Environmental Conditions for Operation

The bed is to be used in a clean, spacious (if possible), clinical environment where the risk of body fluid or other liquid/contamination is minimal.

1.6. Warnings

The following warnings provide information on prevention of potential harmful situations to the patient and operator.

General

**Warning:** Visually inspect every part of the bed and its functions before commencing a procedure.

Specifically check for structural damage at attachment point for the traction unit (i.e. bent members, cut or frayed seat belts, bare/damaged electrical wires, seized/ damaged foot board rail adjuster or loose screws).

NEVER operate the bed if one or more of the above conditions exists.

**Warning:** The bed has been designed specifically as a complete preassembled unit. It is NOT to be removed from the Howard Wright M7 Trauma Stretcher.

**Warning:** DO NOT allow anyone to climb under the bed or put their limb/s under the mattress base as there is a danger moving parts could cause injury. Always check area is clear before lowering the foot of the bed.

**Warning:** Maximum safe patient weight is 300kg. DO NOT overload. Body weight should be evenly distributed over the entire surface of the bed. DO NOT lie, sit or lean in such a way that your entire body weight is placed on the foot or head end of the bed. This includes when assisting in the repositioning or transferring of a patient.

**Warning:** This bed is designed for patient transport for short distances only. When transporting a patient use an approved patient transport. Always lock castors...
when moving/transferring a patient onto/off traction bed.

**Warning:** Ensure no liquid is spilled on or near the electrical components of the bed. If a spill occurs, disconnect bed power cord, clean up the spill and dry area thoroughly before using controls again.

**Warning:** Ensure the belt buckles are positioned away from sensitive patient areas so as to avoid bruising, and always use the shoulder pads provided. For example collar bones, ribs, etc.

Also ensure restraint belts are never placed on the floor where they could become a slipping/ tripping hazard.

1.7. **Precautions**

The following precautions provide information on the prevention of potential equipment damage, malfunction, inaccurate operation or damage to other property.

**General**

**Caution:** Keep the bed a minimum of 300mm away from any direct heat source.

**Caution:** When bed is not in use for an extended period of time, unplug power cord from wall socket.

**Caution:** When routing oxygen hoses or patient monitoring (electrical) cables ensure they are secured and clear of moving parts that could sever or entangle them during normal operation of the bed.

**Caution:** If the bed is not working properly, contact Spinal Traction Limited.

**Contacts are:**

Raj Singhal  ph 027 213 6224 raj.singhal@cdhb.health.nz
Jonathan Prince  ph 021 582 199 jonathan.prince@motovated.co.nz
1.8. Symbols on Labelling

The following symbols are listed in the AS/NZS 3200.1.0:1998 and AS/NZS 2211.1:2004 standards and appear on the bed’s electrical components.

Where this symbol is located on any device, it means “TYPE B APPLIED PART”

Where this symbol is located on any device, it means “Attention, consult ACCOMPANYING DOCUMENTS”

1.9. Repair of Equipment

The bed has been manufactured Spinal Traction Limited. All repairs and maintenance are to be carried out by Spinal Traction Limited.

1.10. Product Support

If you have any questions regarding the correct use of the Spinal Traction Bed first refer to the relevant sections in this Operation Manual.

If you are still experiencing difficulties, or suspect that there is a fault, contact Spinal Traction Limited:

Raj Singhal  ph 027 213 6224  raj.singhal@cdhb.health.nz
Jonathan Prince  ph 021 582 199  jonathan.prince@motivated.co.nz
2. Overview

2.1. Overall Dimensions and Functional Positions

The Spinal Traction Bed is made up of:
2.2. Handle Operation

Mast Tensioner Handle:

- raising the mast will increase the traction force and increase the flexion angle
- lowering the mast will decrease the traction force and decrease the flexion angle

Load Cell Tensioner Handle:

- winding the handle in the positive direction will increase the traction force
- winding the handle in the negative direction will decrease the traction force
<table>
<thead>
<tr>
<th>Dimension (mm)</th>
<th>With handle folded up</th>
<th>820 x 2512 x 945 High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (kg)</td>
<td>With Mattresses</td>
<td>173kg</td>
</tr>
<tr>
<td>Patient Height</td>
<td>Maximum patient height</td>
<td>6’4” [1.94m]</td>
</tr>
<tr>
<td>Patient Weight (kg)</td>
<td>Maximum patient weight</td>
<td>300kg</td>
</tr>
<tr>
<td>Rated Traction Load</td>
<td>Maximum line pull</td>
<td>60kg</td>
</tr>
</tbody>
</table>

### Range of Motion

![Diagram of range of motion](image)

### Electrical Rating

<table>
<thead>
<tr>
<th>Power Input</th>
<th>220-240 VAC, 50-60Hz, 3.0A maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Output</td>
<td>24V DC</td>
</tr>
</tbody>
</table>

For full operating instructions and functionality of the Howard Wright M7 Trauma Stretcher, refer to the accompanying M7 Trauma Stretcher Operators Manual (M799-03, Version 7, August 2012)
2.3. Mattress and Foam (Packer) Supports

The Traction Bed is supplied with a custom length PREMA Stretcher Mattress, which is **NOT** to be exchanged, replaced or removed from the bed.

The mattress must be positioned against the footrest of the bed, as shown below. Foam packers or pillows are required to support the feet, to accommodate varying patient heights.
2.4. Adjustable Strap and Shoulder Pads

Shoulder strap mounts are attached at the foot end of the bed, and at the head end of the bed, and should be attached in a diagonal arrangement across the patients’ shoulders. The patient needs to be correctly positioned on the bed before the straps are secured over the shoulders.

The patient should feel no discomfort from the strap mounts yet must be secure, otherwise they will be pulled up on the bed during the procedure.
### 3. Rapid Reduction Procedure

The reduction procedure described in this Section 3 has been designed by Raj Singhal and is for use only with the Spinal Traction Bed as part of their evaluation by the Canterbury and Waikato District Health Board's. Neither the Spinal Traction Bed nor the reduction procedure should be used by any party not thoroughly trained in their use by Mr Singhal (or a party delegated by Mr Singhal) and they should not be used separately or without the use of best clinical practice by the operator.

#### 3.1. Traction Bed and Patient Setup

<table>
<thead>
<tr>
<th>Step</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Plug in the bed power cord, and set to the lowest height setting using the controller  &lt;br&gt;   a. Ensure the side rails are down  &lt;br&gt;   b. Ensure the straps are tucked out of the way</td>
</tr>
<tr>
<td>2.</td>
<td>Position beds side by side, aligning the shoulders with the positioning strips on the bed  &lt;br&gt;   a. Ensure the bed castors are braked/locked</td>
</tr>
<tr>
<td>3.</td>
<td>Scoop the patient from ward bed to Spinal Traction Bed in accordance with clinical best practice</td>
</tr>
<tr>
<td>4.</td>
<td>Support the head with pillow or towels</td>
</tr>
<tr>
<td>Step</td>
<td>Instruction</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td>5.</td>
<td>Align shoulders to the positioning strips on the bed</td>
</tr>
<tr>
<td>6.</td>
<td>Pack the feet with foam wedges or pillows against the foot rest</td>
</tr>
<tr>
<td>7.</td>
<td>Apply Gardner-Wells Tongs (supplied by others) as per best practice/manufacturer/s instructions</td>
</tr>
<tr>
<td>8.</td>
<td>Position shoulder pads against shoulders and tighten the straps diagonally across the patient</td>
</tr>
<tr>
<td>9.</td>
<td>Administer midazolam and morphine for pain relief and muscle relaxation (or follow specific guidelines from the anaesthetist).</td>
</tr>
</tbody>
</table>
10. Ensure that the mast is in the neutral/horizontal position, in line with the Gardner-Wells hook (supplied by others).

11. Attach the wire to the hook

12. Wind on 2.5kg using the Load Cell Tensioner Handle

13. Lift the bed to full height, and tilt leg end down fully.

**NOTE:** Tilting the feet down will apply further weight (depending on the patient weight)

14. Position Image Intensifier as shown, and take first x-ray
### 3.2. Reduction Achieving Flexion and Traction

**NOTE:** The methodology below is a guideline only. Always use clinical best practise and take into account the specific circumstances of each case.

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Wind the Mast Tensioner Handle, increasing traction force in 5kg increments</td>
</tr>
<tr>
<td>2.</td>
<td>Take Image Intensifier films every 5kg of weight added to check current state of the facets, and also to identify over-distraction</td>
</tr>
<tr>
<td>3.</td>
<td>Neurological exam every 5kg of weight added by asking the patient to move upper and lower limbs, and check for any neurological deterioration</td>
</tr>
<tr>
<td>4.</td>
<td>As the neck flexes, keep putting in towels under the pillow to support the neck</td>
</tr>
</tbody>
</table>
5. On maximum flexion of the mast, check for reduction. If reduction is not achieved, wind the Load Cell Tensioner Handle till reduction is achieved.

**NOTE:** **DO NOT** exceed total traction force greater than 50% of the patient’s weight.

6. Once reduced, wind the Mast Tensioner Handle until the bed is in the neutral position. This will also decrease the traction force.

7. Recheck Image Intensifier film to ensure reduction has been maintained.

In the rare case in which reduction is not maintained, repeat the process above to achieve reduction.
8. Extend the neck by winding the Mast Tensioner Handle further down below the neutral position to keep the dislocation reduced.

9. Apply maintenance traction force (~1kg per level of vertebrae) using the Load Cell Tensioner Handle

10. Reverse the procedure above to transfer the patient off the bed

For patient comfort and practicality it is recommended that the patient does not stay on the bed for a long period of time.

### 3.3. General Procedure Notes

Bi-facet dislocations may be best reduced using the guidelines above. In the case of unifacet dislocations, when the facets are aligned tip to tip, rotate the neck 40deg to the opposite side of the dislocation. This may aid reduction.
4. Cleaning and Storage

The Cleaning and Storage section describes how the bed is maintained.

4.1. Storage

1. Once patient has been transferred, also wipe all surfaces in contact with the patient, including the mattress, traction wire and the handles.

2. Lower the mast fully so that it is retracted under the bed.

3. Wind the traction wire up into the unit.

4. Store the straps tidily.

5. Clean as required

6. Cover with a bed sheet.

4.2. During Cleaning

- Do not use abrasive cleaning products
- Do not use a water temperature of more than 50 degrees Celsius
- Do not use a steam cleaner, washing tunnel, high-pressure spray or hose
- Do not immerse any part of the unit in water
- Use only approved cleaning products as per standard hospital beds
- Keep sharp objects such as razors etc away from the mattress and foam packers
- Do not use oil based products
- Do not unplug the handset or actuators from the control box for cleaning
4.3. Surface Cleaning Procedure

- Wipe using a sponge or soft cloth wetted with warm water containing a mild detergent.
- Disinfect surfaces with products approved for cleaning hospital bed mattresses and adhere to recommended concentrations especially with bleach products as these can corrode the material surface. Care must also be taken to rinse and dry the item disinfected so as not to leave a corrosive residue.
- Wipe dry using a dry sponge or cloth and place the item in a dry environment for further drying.
- Do not dry clean the mattress or foam packers
5. Troubleshooting

This Troubleshooting section describes symptoms and recommended actions for problems that may occur with the bed.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause</th>
<th>Recommended Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bed controls unresponsive</td>
<td>The power cord isn’t plugged in, or the battery charge is low</td>
<td>Plug the power cord into the mains supply.</td>
</tr>
<tr>
<td></td>
<td>The lockout feature on the Stretcher is engaged</td>
<td>Use the key supplied with the bed to unlock all functions</td>
</tr>
<tr>
<td>The bed does not achieve the full range of motion</td>
<td>Overloading (SWL = 300kg including patient and accessories)</td>
<td>Remove the excess load</td>
</tr>
<tr>
<td>The Load Cell Tensioner Handle won’t wind any further</td>
<td>The maximum and minimum hardstop limits have been reached</td>
<td>This is the limit of operation</td>
</tr>
<tr>
<td>The Mast Tensioner Handle won’t wind any further</td>
<td>The maximum and minimum hardstop limits have been reached</td>
<td>This is the limit of operation</td>
</tr>
</tbody>
</table>

For any other troubleshooting enquiries or product support, contact Spinal Traction Limited.