

Local Guideline and Procedure



CLINICAL APPLICATION OF BILATERAL LOWER LIMB TRACTION (ALSO KNOWN AS GALLOWS TRACTION)

Sites where Local Guideline and Procedure applies John Hunter Children's Hospital

This Local Guideline and Procedure applies to:

- | | |
|---------------------------------|-----|
| 1. Adults | No |
| 2. Children up to 16 years | Yes |
| 3. Neonates – less than 29 days | Yes |

Target audience Clinical staff applying and providing care to paediatric patients in lower leg traction

Description Provides information to clinicians for care of a child/infant requiring bilateral lower leg traction

[Go to Procedure](#)

National Standards	NS 1, 2, 3, 6.
Keywords	Traction, straight leg, Gallows', lower limb, paediatric orthopaedics, fractured femur
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Registration number and dates of superseded documents	JHCH 10.2- 2017

Related Legislation, Australian Standard, NSW Ministry of Health Policy Directive or Guideline, National Safety and Quality Health Service Standard (NSQHSS) and/or other, HNE Health Document, Professional Guideline, Code of Practice or Ethics:

- [NSW Health Directive PD2017_032_PCP_2_Clinical_Procedure_Safety.pdf](#)
- [NSW Health Directive PD2017_013_Infection_Prevention_and_Control_Policy_.pdf](#)
- [HNELHD PD2019_020_PCP_1_Clinical_Handover_-_ISBAR.pdf](#)
- [HNELHD PD2018_18_03_Aseptic_Technique.pdf](#)
- [NSW Health Policy IB2020_010 Consent to Medical and Health Care Treatment Manual .pdf](#)

Local Guideline and Procedure note This document reflects what is currently regarded as safe and appropriate practice. The guideline section does not replace the need for the application of clinical judgment in respect to each individual patient but the procedure/s **require mandatory compliance**. If staff believe that the procedure/s should not apply in a particular clinical situation they must seek advice from their unit manager/delegate and document the variance in the patients' health record.

Position responsible for and document authorised by	JHCH Clinical Quality & Patient Care Committee
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Note: Over time links in this document may cease working. Where this occurs please source the document in the PPG Directory at: <http://ppg.hne.health.nsw.gov.au/>

PURPOSE AND RISKS

This local clinical procedure has been developed to provide instruction to the health clinician and to ensure that the risks of harm to the child associated with application of traction are prevented, identified and managed.

The risks are:

- Ineffective traction
- Neurovascular damage
- Skin damage
-

The risks are minimised by:

- Clinicians having knowledge of fractured femur management and traction management
- Clinicians seeking assistance if the therapy is outside their scope of practice
- Following the instructions set out in the clinical procedure
- Recognition of the common clinical signs of the risks with neurovascular assessment
- Rectification of the causes of the risks to the patient

Please refer to the table for resolving clinical problems PAGE 19

Risk Category: Clinical Care & Patient Safety

ABBREVIATIONS AND GLOSSARY

Acronym or Term	Definition
Footplate	The square plastic spreader that sits below the bottom of the child's foot when in skin traction
Fracture	A complete or incomplete break in a bone resulting from force
Hydrocolloid	A malleable adhesive skin dressing applied with the intention of protecting the skin under the skin traction
Ischaemia	Insufficient blood supply to a part of a body due to a mechanical obstruction
Plagiocephaly	Distortion of the shape of the skull resulting from premature closure of the cranial sutures.
Pulley	A device that is designed to allow rope to move freely through it in a desired direction
Skin shearing	A separation between layers of skin resulting from opposing forces
Skin traction	Traction that is applied via adhesive tape applied on the skin
Torticollis	A condition causing asymmetrical head or neck position due to a problem in the neck muscles.
Traction	A pulling force on an extremity designed to achieve a desired therapeutic outcome
Traction frame	A frame that supports pulleys and rope for traction
Weight bag	A weighted bag that provides a specified amount of pull on the skin traction device

PROCEDURE

This procedure does not replace the need for the application of clinical judgment in respect to each individual patient. More comprehensive information is available in the learning resource available on the JHCH ward share drives. You can also contact the Orthopaedic CNC and request further resources and information.

INDICATIONS AND BENEFITS OF BILATERAL LOWER LIMB TRACTION

- Achieve and maintain femoral fracture alignment in children under 2 years who weigh less than or equal to 12kg
- Reduction and treatment of hip dislocation
- Decrease and prevent muscle spasm
- Analgesia

PREPARATION

It is mandatory to ensure that the parents / carers have received appropriate information to provide informed consent. Patient identification, correct procedure and correct site process must be completed prior to any procedure.

PRIOR TO APPLICATION

- Prepare the child for the procedure in a developmentally appropriate manner. Plans should be individualised to suit the child in consultation with parents/carers
- It is strongly advised that a child life therapist is called if the procedure occurs during regular business hours
- Assess the child's skin integrity and skin history, i.e., eczema
- Perform and document a neurovascular assessment
- Ensure all the equipment is available BEFORE administration of analgesia
- Observe hand hygiene – 5 moments of care

ANALGESIA MANAGEMENT

- The child should be calm, relaxed and free of pain prior to the procedure
- A definitive analgesia plan must be in place before any physical contact affecting the fracture site is initiated
- A femoral nerve block and Nurse Controlled Analgesia, containing opioid, are recommended
- It is recommended the Acute Pain Service is contacted

NOTE:

Where a nerve block and / or opioid analgesia are contra-indicated, the reason must be clearly documented in the child's notes with an alternate analgesia plan

PARENT PREPARATION

- Parents/carers should have an initial treatment plan explained to them.
- Parents/carers should be given a copy of the Gallows traction parent resource booklet. This is available on the JHCH ward share drives.
- It is recommended the parents/carers stay with their child and are included in the procedure. They should be given a role, such as distraction and comfort. This should be clearly defined prior to the procedure.

PRESCRIBING TRACTION

Traction must be prescribed in the child's notes by a medical officer.

The traction and management plan must be written in a clear and unambiguous manner.

Use metric weights and not imperial, i.e., kg not lb.

APPLYING THE TRACTION

Traction is a medical therapy. It must be applied by knowledgeable and competent clinical staff. A minimum of two clinicians are required for traction application.

Ensure the procedure is followed. The accuracy with which the traction is applied will determine its effectiveness.

Determine clinician competence. Locate an experienced staff member if necessary. It is recommended traction is applied by clinicians who are experienced with traction application or at least under instruction from an experienced clinician.

The procedure will take approximately 45 minutes.

EQUIPMENT

- Alcohol based hand rub for staff
- Personal Protective Equipment for staff
- 2 x skin traction kits marked 'child'
- Non-sterile scissors
- Brown Tape
- 2 x water weight bags – do not use sand bags or IV bags
- Hydrocolloid – recommend thin version and enough to place under the skin traction
- Electronic scales (baby scales)
- A jug full of tap water
- A cot set up with a Gallows traction frame – found in corridor outside J1 – purple or orange cot



Figure 1. Equipment x 2 sets (i.e., 1 x for each leg) required for application of Gallows traction.

CLINICAL PROCEDURE

BE AWARE OF POTENTIAL RISK FACTORS

The arrows highlight areas at risk of damage from traction therapy. Constant force and pressure can damage nerves, expose tendons, cause pressure areas over bone and restrict blood flow to the limb.

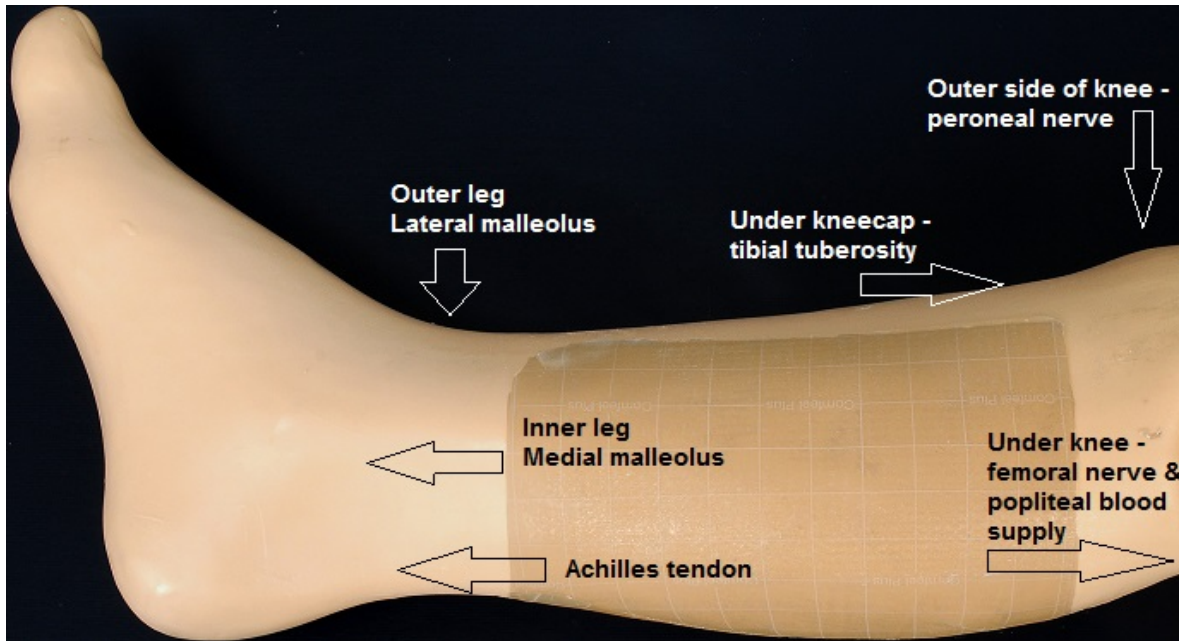


Figure 2. Arrows identify the areas that are at risk of damage from pressure and force.

PROTECTIVE DRESSINGS

Cut and place a hydrocolloid dressing on either side of the child's lower legs. This will protect the skin from the adhesive tape in the traction kit. It also distributes the force over the skin surface.



Figure 3. Hydrocolloid dressings are placed on either side of both legs to protect the skin.

MEASURING THE TRACTION TAPE

- Take the traction kit out of the box and open it. Spread it out.
- Hold the foot plate away from the child's foot. Feel where the ankles are and hold the edge of each end of the foam on the malleoli (ankles).
- Place the tape along the length of the leg before removing the backing paper. Cut the tape to its correct length. The tape should be 1cm below the kneecap and 1cm above the lateral and medial malleoli (ankles).
- Do not place the skin traction above the knee or below the ankle on either leg.

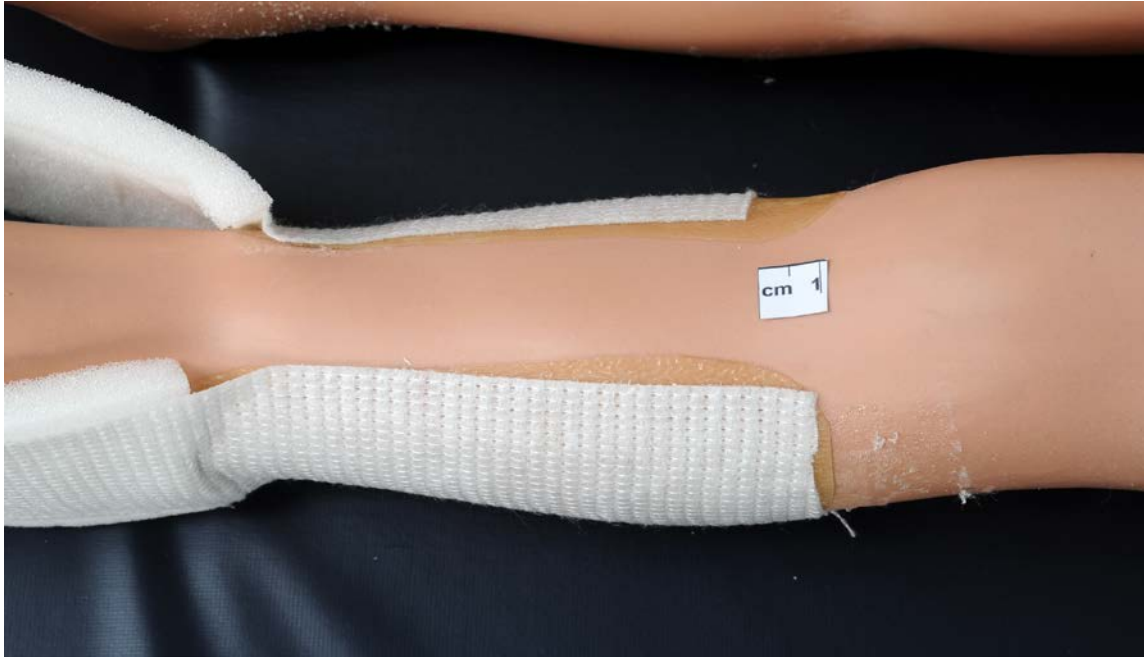


Figure 4. Measuring and placing the traction tape on the legs.



Figure 5. Measuring and placing the traction tape on the legs.

- Ensure there is a gap between the foot plate of the traction kit and the end of the child's foot. The child should not be able to touch the kit with their toes when their foot is extended.
- If the foot plate is placed too close to the child's foot, the child is able to manipulate the foam with their toes and can loosen and detach the skin traction.
- Avoid wrinkles in the tape.



Figure 6. Ensure there is a gap between the foot and the traction foot plate.

- Wrap the bandage around the leg – avoiding the potential areas of risk. There is no evidence that one wrapping style is more effective than another.
- If the child is very small, i.e., newborn, use a finger bandage. The bandage should be firm and not tight.
- The bandage should be secured with tape. Do not use the metal fasteners in the skin traction kit. Do not place adhesive tape circumferentially around the child's leg.



Figure 7. Bandage over the tape once it is placed on the child's leg.

- Pull one end of the rope through the footplate so that there is a shorter piece of rope approximately 10-15 cm in length. Tie the two parts of the rope in a firm knot at the end of the footplate. This should leave you with a single, long piece of rope.



Figure 8. Pull the rope through with one end 10-15cm.

- Thread the ends of the ropes up through pulley 1 and pulley 2 on each side. The frame set up is recommended by the traction frame company in the picture below. The weights must be **outside** the frame of the cot.



Figure 9. The recommended frame arrangement for a Gallow's traction frame on a cot.

WEIGHT AND WEIGHT BAGS

While an assistant is holding the ropes in position, add the water to the weight bags. Use electronic scales to measure the weight in kilograms to ensure you do not go over 10% of the child's weight, until ***the child's buttocks are just touching the mattress – you should be able to slide your hand under the buttocks. The buttocks should not be off the mattress.***

The weight required will be between 5-10% of the child's weight, i.e., if child weighs 10kg then the child will require between 0.5-1kg of weight on each leg.

GETTING THE WEIGHT RIGHT IS IMPORTANT!

If the weight required to have the buttocks just touching the mattress exceeds 10% of the child's weight, the child is too large for Gallows traction and should be changed over to Hamilton-Russell traction.



Figure 10. Ensure the buttocks are just touching the bed. You should just be able to easily slide your fingers under the buttocks.

The weight bags on each leg must be the same weight. You can cause damage to a child's hips if you have two different weights.

THIS IS VERY IMPORTANT!

There are no exceptions to the 10% weight rule. If more than 10% weight is ordered, it must be under the instruction of the Orthopaedic Consultant and the reason should be documented in the notes.

Weight over 10% of the child's weight will cause:

- over-distraction of the fracture (separation of bone ends)
- stretching of soft tissues (including vessels and nerves – causes pins and needles (paresthesia), swelling, ischaemia)
 - skin shearing

SKIN SHEARING

The bonds between the layers of skin break, causing the top layer to slide off.

Skin breakdown is a problem for children requiring traction therapy because after shearing has occurred:

- The weight must be reduced to prevent further skin breakdown

- The surface area of the skin traction should be increased (by adding a larger piece of thin hydrocolloid under the skin traction)
- The child will not be able to be placed in a plaster
- It could prevent a child from having surgery



Figure 11. Skin shearing caused by excessive weight on the skin.

WEIGHT BAGS

- The weight markings on the water bags are not accurate. The weight bags must be measured with electronic scales at the bedside and the weight documented in the child notes and on the weight bags.
- The weight is often changed throughout the course of the treatment.
- Any request for a change to the weight must be documented in the child's notes by a member of the treating team, explaining the reason for the change.
- IV fluid bags are not appropriate substitutes for traction weight bags under typical circumstances. IV bags are not designed to hang from rope. The weight cannot be easily changed. Under some circumstances, for neonates, small IV bags may be useful.

No counter traction is required for Gallows traction. The child's body weight provides the counter traction.

AFTER THE TRACTION IS APPLIED

Once the weight is placed on the child, the child may feel some initial discomfort; however, this should be minimal and transient. If the child is still unsettled after 10 minutes, assess the child and check the traction. If no corrective intervention can be identified - request a clinical review within 30 minutes.

The child's legs should be the same width apart as the child's shoulders.



Figure 12. The child's legs should be apart the same distance as their shoulders.

SAFETY

Children in gallows traction must never be left alone when consuming food or drink. The head of the cot can be increased to 30° during meals to prevent Oesophageal Reflux and assist swallowing. Always put the bed rails up if leaving the immediate area.



Figure 13. The cot head can be inclined for meals. Keep cot sides up when a child is unattended.

MAINTENANCE OF TRACTION

COMMENCEMENT OF SHIFT

- At the beginning of every shift, the nurse allocated to the child must check the traction is correctly set up. It is not acceptable to assume the traction was correct on the previous shift.
- Neurovascular assessment is to be attended according to the recommendations in the [Paediatric Orthopaedic Neurovascular Assessment](#) Guideline.
- Traction is designed to maintain a constant pull. Traction must be continuously maintained for the duration of treatment and may not be removed unless instructed to do so from a member of the treating team.
- If the child's skin integrity or circulation begins to deteriorate, clinical review is required within 4 hours.
- Do not place oil, talc or cream on the child's legs.

MOVING THE COT

It is not recommended a child in Gallows traction is moved around for non-medical purposes during the first week after a femoral fracture because of the discomfort it may cause to the child. After a week, the fracture will have started to heal and discomfort is less likely.

Parents are not to push a child in Gallows traction around the hospital in the cot.

REMOVAL OF TRACTION

Care must be taken when removing adhesive products from skin. Adhesive removal products may be used.

It is recommended the adhesive be removed with the grain of the hair, supporting the skin with the palm of the hand to reduce the potential of tearing the skin.

Baby oil or a warm bath may be used to remove skin traction when the therapy is completed.

Do not use commercial adhesive removal products on broken skin.

SUMMARY

1. The child's neurovascular status has been checked and is satisfactory
 - There are no signs and symptoms of neurovascular compromise, or a clinical review has been initiated and the cause has been rectified
 - The skin under the tapes is intact
2. The weight has been checked with electronic scales
 - The weight is equal to or less than 10% of the child's weight
3. The child's buttocks are just resting on the mattress
4. The child is lying in bed in correct alignment with the traction
 - The traction is set-up correctly
5. The parents are rotating around the cot daily to reduce the risk of torticollis and plagiocephaly
6. The child has a pain score less than or equal to 3/10 using an appropriate paediatric pain scoring tool
 - The child is interactive and is moving without distress
 - The child is interactive and does not become easily distressed when staff approach
 - The child is having simple regular analgesia and PRN opioid analgesia prior to personal care or painful procedures
7. The child is eating and drinking
8. The child has had their bowels open within 2 days
 - The child has laxatives charted
 - The child and family have had appropriate referrals to allied health staff, which may include:
 - Occupational therapy
 - Physiotherapy
 - Social work
 - Psychology
 - Child life therapy
 - Dietician

RESOLVING CLINICAL PROBLEMS

PROBLEM	WHAT IS THE GOAL FOR THE CHILD?	WHAT ARE YOU GOING TO DO ABOUT THE PROBLEM?	HOW ARE YOU GOING TO ASSESS IF YOUR INTERVENTION HAS BEEN SUCCESSFUL?
The extremity is swollen	<ul style="list-style-type: none"> Maintain neurovascular circulation Reduce or prevent swelling <p><i>*IV therapy should not be running through an affected limb unless there is no alternative option – where this occurs, staff need to be aware of the extra risks of neurovascular compromise and not assume the IV therapy is the cause of neurovascular changes</i></p>	<ul style="list-style-type: none"> Encourage movement of the distal joint (where appropriate) Check for and release restrictive materials down to the level of the skin Check the traction weight of each bag is less than or equal to 10% of the child's body weight Instigate a clinical review within 30 minutes Increase the frequency of neurovascular assessment according to the recommendation in the procedure Ensure <u>both weight bags are of equal weight</u> (use baby scales to obtain an accurate weight – not the bag markers) 	<ul style="list-style-type: none"> Corrective intervention has been initiated The swelling has been reduced
Skin integrity is impaired	<ul style="list-style-type: none"> Reduce the risk of further damage to the skin Provide the skin with an environment that will optimise skin healing Remove the cause of the damage to the skin (see next column) Maintain effective traction 	<ul style="list-style-type: none"> Request a clinical review within 4 hours Increase the surface area of the skin traction Reduce the weight of the traction (after consultation with CNC or MO) Apply an appropriate dressing (a thin hydrocolloid is usually appropriate) Take care not to cause further damage when removing adhesive from broken skin 	<ul style="list-style-type: none"> Further damage to skin is prevented Skin is healing or has healed Traction has been maintained
Constipation	<ul style="list-style-type: none"> Constipation is prevented and/or treated <p><i>*please note the effects of slowed bowel motility if patient is having opioid analgesia</i></p>	<ul style="list-style-type: none"> Document bowel activity daily Ensure laxatives are charted Encourage fluid intake 	<ul style="list-style-type: none"> Bowel activity is usual for the child

<p>Gastro-oesophageal reflux</p>	<ul style="list-style-type: none"> Gastro-oesophageal reflux is reduced 	<ul style="list-style-type: none"> Elevating the head of the cot by 30° during meals & for 30 minutes after eating Anti-reflux medication Check for constipation 	<ul style="list-style-type: none"> Gastro-oesophageal reflux is reduced
<p>Ineffective and/or inadequate analgesia</p>	<ul style="list-style-type: none"> The child is assessed for pain using an appropriate paediatric pain assessment tool and is treated according to the paediatric pain procedure 	<ul style="list-style-type: none"> Use a paediatric pain scoring tool to assess the child's pain and document the assessment Administer appropriate and effective analgesia Check for occult sources of pain Re-assess regularly Request clinical review within 30 minutes Complete IMS+ report (if appropriate) 	<ul style="list-style-type: none"> The child has an appropriate and definitive pain management plan and the pain is effectively controlled The child's pain score is <3 Staff and family are able to perform care
<p>Increased pain after traction application / re-application</p>	<ul style="list-style-type: none"> The source of the pain is discovered and clinical intervention initiated 	<ul style="list-style-type: none"> Check the amount of weight is appropriate (less than or equal to 10% of the child's body weight) Check that the traction is correctly applied Check the rope is not caught in a pulley Pain assessment Request a clinical review within 30 minutes 	<ul style="list-style-type: none"> The source of the pain is discovered and clinical intervention has been successful
<p>Traction is applied incorrectly</p>	<ul style="list-style-type: none"> The traction is re-applied correctly 	<ul style="list-style-type: none"> Refer to the Gallows procedure Request a clinical review if not able to re-apply the traction correctly Complete IMS+ documentation 	<ul style="list-style-type: none"> The traction has been correctly applied and is effective
<p>The traction is falling off or not adhering to the leg</p>	<ul style="list-style-type: none"> The skin is free of substances, ie, oils, talc, creams, that prevent the traction from adhering to the skin 	<ul style="list-style-type: none"> Ensure the skin is dry, free of oils, talc and creams and free of shedding or flaky skin Do not put cream or talc on the leg Reduce the weight. Increase the traction surface area 	<ul style="list-style-type: none"> The traction is adhering to the skin and is effective
<p>The child is moving and spinning around in the traction (this can be a sign of healing)</p>	<ul style="list-style-type: none"> Maintain the traction and keep the child safe 	<ul style="list-style-type: none"> Do not prevent the child from moving unless it is unsafe If it is no longer practical or safe for the child to be in Gallows traction, the child can be placed into straight leg traction for the last week of therapy – the Consultant must be aware of this 	<ul style="list-style-type: none"> The traction is effective and the child is safe

COMPLIANCE, IMPLEMENTATION AND MONITORING

The clinical areas using the procedure will be given a fact sheet and Orthopaedic CNC will liaise with relevant NUM / Educator regarding the most appropriate roll-out for the specific area. The relevant learning package is available on the JHCH ward share drives.

The Guideline will be placed on the HNE PPG website
Communicated with staff at ward meetings
Compliance will be monitored with annual audits

The results of audit will be addressed with the Acute Services Manager.

APPENDICES

Appendix One- Flow Chart - Application of Gallow's Traction
Appendix Two- Clinical Audit tool

REFERENCES

- Byrne Thomas (1999) The Setup and Care of a Patient in Buck's Traction *Orthopaedic Nursing* 18(2):79-83.
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FEEDBACK

Any feedback on this document should be sent to the Contact Officer listed on the front page.

CONSULTATION

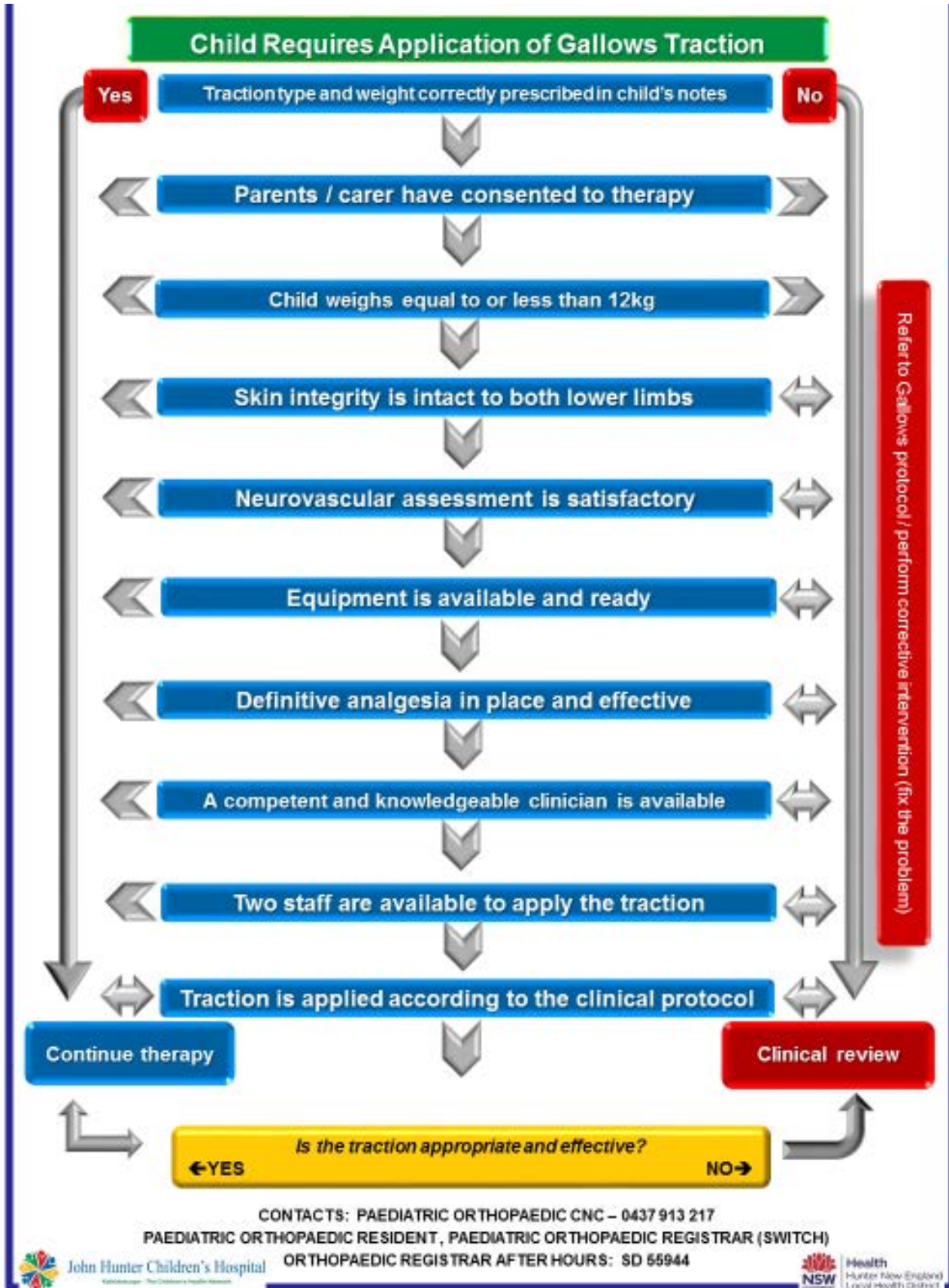
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APPROVAL

CYPFS CPGAG - March 2020
JHCH CQ&PCC - May 2020

APPENDIX ONE- FLOW CHART APPLICATION OF GALLOWS TRACTION

This procedure is a clinical therapy and requires mandatory compliance.



APPENDIX TWO - CLINICAL AUDIT TOOL

(National Standard 1: 1.7.2 The use of agreed clinical guidelines by the clinical workforce is monitored)

Criterion no.	Criterion	Exceptions	Definition of terms and/or general guidance	Data source	Frequency	Position Responsible
1	Percentage of children in Gallows traction who have not had the therapy applied as recommended by the procedure. All children in Gallows traction will be audited, inclusive of consumer feedback.	None.	The aim is that all children undergoing Gallows traction therapy receive the recommended standard treatment. (Standard = 100%)	Patient health record and consumer feedback.	Constant	CNC Paediatric Orthopaedics
2	Quantity of IMS+ reporting		The aim is that the percentage of IMS+ will be reduced	IMS+	Constant	
3	Competency of clinicians who are able to apply, care for and provide information to others regarding care of the child in Gallows traction	None	The aim is that all staff who apply, care for and provide information to others, have the minimum described standard of skill and knowledge.	Audit staff	12 monthly	CNC Paediatric Orthopaedics

Reference: *Electronic audit tool - National Institute for Health and Clinical Excellence (NICE): www.nice.org.uk/nicemedia/live/10996/56372/56372.xls*