University Hospitals of Leicester NHS NHS Trust | Nottingham University Hospitals NHS NHS Trust

CoMET Burn Transfer Guideline

This guideline is for use by healthcare staff, at CoMET undertaking critical care retrieval, transport and stabilization of children, and young adults.

CoMET is a Paediatric Critical Care Transport service and is hosted by the University Hospitals of Leicester NHS trust working in partnership with the Nottingham University Hospitals NHS Trust.

The guidance supports decision making by individual healthcare professionals and to make decisions in the best interest of the individual patient.

This guideline represents the view of CoMET, and is produced to be used mainly by healthcare staff working for CoMET, although, professionals, working in similar field will find it useful for easy reference at the bedside.

We are grateful to the many existing paediatric critical care transport services, whose advice and current guidelines have been referred to for preparing this document. Thank You.

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Approved By:	**Policy & Guideline Committee (UHL)**
Date of Latest Approval:	**19 May 2023 – UHL Trust ref: B10/2023**
Version:	**1**
Next Review Date:	**May 2025**

Education and Training

1. Annual Transport team update training days
2. Workshops delivered in Regional Transport Study days/ Outreach

Monitoring Compliance

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements
Incident reporting	Review related Datix	Abi Hill – Lead Transport Nurse abi.hill@uhl-tr.nhs.uk	Monthly	CoMET Lead Governance Meeting
Documentation Compliance	Documentation Audit	Abi Hill – Lead Transport Nurse abi.hill@uhl-tr.nhs.uk	3 Monthly	CoMET Lead Governance Meeting

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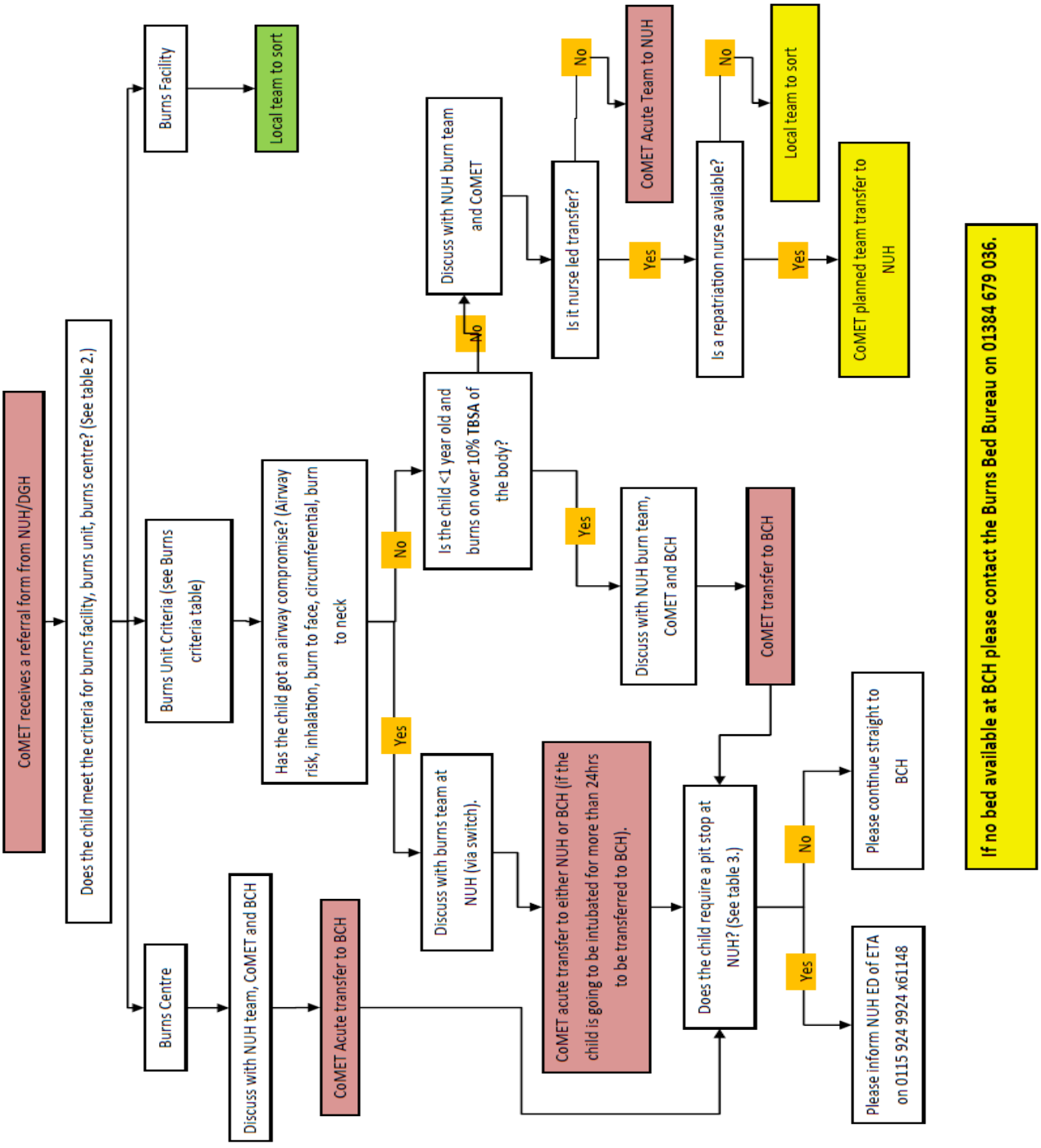
Burns Transfer Pathway

DGH referral Flow Chart



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Initial Management or a Burns Patient

Please refer to Nottingham University Hospitals Burn Guidelines and Comet Burn Guidance

Initial management of acute paediatric major burn (>10% TBSA), electrical & inhalation injuries

TBSA = Total burn surface area

Circumferential burns restricting ventilation or causing neurovascular compromise of a limb may require an escharotomy warranting time critical transfer if they cannot be performed locally. Elevate limb and continue neurovascular observations. Compartment syndrome in electrical burns also requires time critical transfer in order that a fasciotomy can be performed.

Airway
- Maintain airway (with C-spine immobilisation if possibility of trauma)
- Intubate early with facial burns, airway burns or inhalation injuries
- Use rocuronium (not suxamethonium)
- Use cuffed ETT and do not cut it
- Record ETT length at fixed landmark eg. specific tooth

Breathing
- High flow oxygen via non rebreathe mask if risk of carbon monoxide poisoning/inhalation injury
- 100% oxygen if ventilated

Circulation
- 2 wide bore peripheral cannula or IO access (preferably unburned areas)
- If shocked consider other causes (eg. trauma) & treat as per APLS/ATLS
- FBC,U&E,Coag,amylase,ABG,Cross match,carboxyhaemoglobin,CK

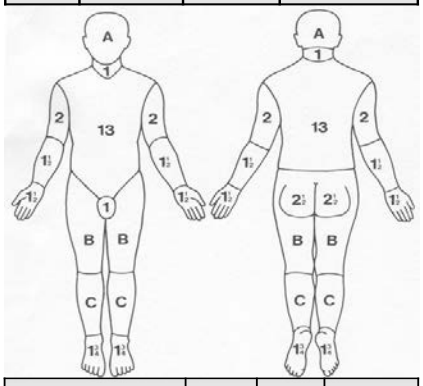
Disability
- Assess GCS and pupils
- Monitor glucose
- Give appropriate analgesia

Exposure
- Cool burn with cool tap water for 20 minutes if not yet performed (up to 3hrs post burn)
- Remove clothing & jewelry
- Estimate percentage & depth of burns
- Cover burns with cling film (longitudinally not circumferentially)
- Keep patient warm

Fluids (for burns >10% TBSA)
- Give Hartmann's 2ml x %TBSA x weight(kg) over 8hrs from burn time
- Give maintenance fluid in addition
- Ongoing fluid as per burn service
- Maintain urine output >1ml/kg/hr (increase to >2 if urine discoloured)

Lund and Browder Burn Assessment[1]
Ignore areas of simple erythema

Age	A ½ of head	B ½ of 1 thigh	C ½ of 1 lower leg
0	9 ½	2 ¾	2 ½
1	8 ½	3 ¼	2 ½
5	6 ½	4	2 ¾
10	5 ½	4 ½	3
15	4 ½	4 ½	3 ¼
Adult	3 ½	4 ¾	3 ½



Region	% PTB	% FTB	% TBSA
Head			
Neck			
Anterior trunk			
Posterior trunk			
Right arm			
Left arm			
Buttocks			
Genitalia			
Right leg			
Left leg			
Total			

Secondary survey
- Top to toe survey for other injuries
- Urinary catheter & nasogastric tube
- Consider tetanus prophylaxis

Inhalation injuries
- Stridor/change in voice/brassy cough
- Exposure to smoke in a confined space
- Deposits around the mouth and nose
- Carbonaceous sputum

Carbon monoxide
- Suspect if any altered consciousness
- Check carboxyhaemoglobin (COHb)
- Give 100% oxygen until COHb <3%
- SpO_2 monitoring is ineffective

Cyanide
- Suspect in persistent severe metabolic acidosis of unclear cause
- Released as materials burn
- Discuss with National Poisons Information Service 08448 920111

Chemical burns
- Remove contaminated clothing
- Wash with copious amounts of water
- Continuous irrigation if eyes burned
- Contact National Poisons Information Service 08448 920111/ use Toxbase

Burn depth
- Partial thickness burn (PTB); +/- pain, +/- blisters, pink/blotchy red, CRT normal/sluggish/absent, +/- sensation
- Full thickness burn (FTB); no blisters, no CRT, no sensation, white/charred

Electrical injuries
- 12 lead ECG
- Risk of rhabdomyolysis due to current
- Assess peripheral circulation hourly

Social
- Consider the mechanism of injury; refer to social care if injury history is inconsistent or may be due to neglect

Discuss the patient with the appropriate burns service

Burns Facility	Burns Unit	Burns Centre
Leicester Children's Hospital	Nottingham Children's Hospital	Birmingham Children's Hospital
• >6 months old • <5% TBSA ➢ <1 year, <1% TBSA FTB ➢ 1-10 years, <2% TBSA FTB ➢ >10 years, <5% TBSA FTB	• >6 months-1 year, <10% TBSA • >1year, <30% TBSA burn ➢ >1 year, FTB <20% TBSA • Inhalation injuries • Significant burn to face, hand, feet or genital area • Circumferential burns to a limb	• All % TBSA • From birth • Predicted to require respiratory support/PICU for >24 hours solely due to their burn or inhalation • Severe chemical burns • High voltage electrical burns
Burns and Plastics Registrar via switchboard 0300 303 1573	Burns and Plastics Registrar via switchboard 01159 249924	Burns and Plastics Registrar via switchboard 0121 333 9999

References 1) Adapted from: Lund C.C., Browder N.C. (1944) The estimation of areas of burns, Surgery, Gynaecology, Obstetrics 79:352-358 2) Midland Burn Operational Delivery Network (2016) Midland Burn ODN Referral Guidelines: Guidelines for the Admission and Transfer of Burn Patients in the Midlands 3) British Burn Association (2016) Emergency Management of Severe Burns

Introduction and Who Guideline Applies To

This is a guideline for Clinicians, Burns Clinicians and Comet Clinicians to establish the correct pathway for burns patients to be transported to either a Burns Unit or Burns Centre.

Burn care is organised using a tiered model of care, whereby the most severely injured are cared for in services designated as centres and patients requiring less intensive clinical support are cared for in services designated as either burns units or facilities.

Table 1. Midlands Burns Network

Hospital	Level of Service	Description of Service
University Hospitals Birmingham NHS Foundation Trust.	Burns Centre (BC).	Adults with minor, moderate, severe and complex severe burns.
Birmingham Children's Hospital NHS Foundation Trust.	Burns Centre (BC).	Children with minor, moderate, severe and complex severe burns.
Nottingham University Hospitals NHS Trust.	Burns Unit (BU).	City Hospital Campus: Adults with minor, moderate and severe burns. Queens Medical Centre: Children with minor and moderate burns.
University Hospitals of Leicester NHS Trust.	Burns Facility (BF).	Adults and Children with minor burns.
Royal Stoke University Hospital	Burns Facility (BF).	Adults and Children with minor burns.

Burns Referral Guidelines

All burn services in the Midlands manage burns patients at the lower end of the referral threshold. Patients with more complex or severe injuries will be referred to a Burn Unit or a Burn Centre. Nottingham University Hospitals will assist any referrer in ensuring that patients from the Midlands are admitted to the right service. Alignment with major trauma referral pathways is facilitated by having the Burn Unit and Centre Level Services (Nottingham and Birmingham) collocated with major trauma centres.

Initial indication for referral to a specialised burns service

- A child with a partial thickness burn greater than 2% TBSA

In addition to the % TBSA thresholds described for children, any child with a burn injury regardless of age and %TBSA who presents with any of the following should be discussed with the local burn service and consideration given for the need for referral:

- Inhalation injury (defined as either visual evidence of suspected upper airway smoke inhalation, laryngoscopic +/ - bronchoscopic evidence of tracheal/bronchial contamination/injury or suspicion of inhalation of products of incomplete combustion).
- A full thickness burn greater than 1% TBSA
- Burns to special areas (hands, face, neck, feet, perineum)
- Burns to an area involving a joint which may adversely affect mobility and function
- Electrical burns
- Chemical burns
- Suspected non-accidental injury (NAI). Any burn with suspicion of non-accidental injury should be referred to a specialised burn service for an expert assessment within 24 hours.
- A burn associated with major trauma
- A burn associated with significant co-morbidities
- Circumferential burns to the trunk or limbs
- Any burn not healed in 2 weeks

Table 2. Initial indication for referral to a specialised burns service

Burns Facility	Burns Unit	Burns Centre
Leicester Children's Hospital	Nottingham Children's Hospital	Birmingham Children's Hospital
• >6 months old • <5% TBSA • <1 years old, <1% TBSA Full thickness burn (FTB) • 1-10 years old, <2 % TBSA FTB • >10 years old, <5% TBSA	• >6 months-1 year old, <10% TBSA • >1year old, <30% TBSA burn ➢ >1 year old, FTB <20% TBSA • Inhalation injuries • Significant burn to face, hand, feet or genital area • Circumferential burns to a limb	• All % TBSA • From birth • Predicted to require respiratory support/PICU for >24 hours solely due to their burn or inhalation • Severe chemical burns • High voltage electrical burns
Burns and Plastics Registrar via switchboard 0300 303 1573	Burns and Plastics Registrar via switchboard 0115 9249924	Burns and Plastics Registrar via switchboard 0121 333 9999

Burns Referrals to Nottingham University Hospitals

Nottingham University Hospitals burns service receives referrals from all over the East Midlands. Depending on the injury and severity of burn, the patient may be required to be admitted to Nottingham University Hospitals or Birmingham Children's Hospital.

Depending on where the patient has been referred from, will depend on whether the patient will require a **'Pit Stop'** at Nottingham University Hospitals Emergency Department for a burns assessment to deem whether patient can stay at Nottingham University

Hospitals or be transferred to Birmingham Children's Hospital. Please refer to table 3 to review if a patient requires a pit stop at Nottingham University Hospital.

Table 3. Does the child require a PIT STOP for review at NUH?

Referral Hospital	Does the child require a Pit Stop at Nottingham before proceeding to BCH
Derby Children's Hospital Uttoxeter Road, Derby DE22 3NE	NO
Grantham & District Hospital 101 Manthorpe Road, Grantham NG31 8DG	**YES**
Kettering General Hospital Rothwell Road, Kettering NN16 8UZ	NO
Kings Mill Hospital Mansfield Road, Sutton in Ashfield NG17 4JL	**YES**
Lincoln County Hospital Greetwell Road, Lincoln LN2 5QY	**YES**
Leicester Royal Infirmary Infirmary Square, Leicester LE1 5WW	NO
Northampton General Hospital Cliftonville, NN1 5BD	NO
Pilgrim Hospital Sibsey Road, Boston PE21 9QS	**YES**
Peterborough District Hospital Thorpe Road, Peterborough, PE3 6DA	NO

Pit Stop Expectations

When a patient is expected to have a PIT at QMC ED from one of the four hospitals the following expectations are:

- Burns registrar / consultant to be present in ED for patient assessment.
- Patient to be brought out of ambulance to be reviewed in ED by ED team and burns team.

- To be assessed to see if patient is in Nottingham Burns threshold. If in Nottingham Burns threshold to stabilise patient and admit to Nottingham Children's Hospital.
- If patient out of Nottingham Burns threshold to stabilise patient and transfer to Birmingham Children's Hospital.
- To contact Birmingham Children's Hospital to inform patient will need to be transferred to them.

National Burns Bed Bureau

The National Burns Bed Bureau is a nationally available resource to aid and support specialised burns services and professionals to identify burns bed capacity and capability in England and Wales.

The bed bureau is to be contacted if no burns bed are available within the Midlands. The bed bureau is open 24 hours a day.

Telephone Number: 01384 649036

Mersey Burns App

Mersey Burns is a free clinical tool for calculating burn area percentages, prescribing fluids using Parkland, background fluids and recording patients' details. It is designed for physicians and runs on the iPad™, iPhone®, iPod touch®, Android™, BlackBerry® PlayBook™ and HTML5 compatible browsers.

www.merseyburns.com

Midlands Burns Operational Delivery Network

The Midlands Burns Operational delivery Network website hosts guidelines and information on burn care which has been ratified by the burns network.

www.mcctn.org.uk

Flow Chart

Please follow the flow chart on page 2 with guidance to transferring burns patients to Nottingham University Hospitals or Birmingham Children's Hospital.

References

Walsh. D (2017) **Initial Management of Acute Paediatric Major Burn (>10% TBSA), Electrical and Inhalation Injury.** CoMET Guideline

Cronshaw. A., Kennedy. M (2021) **Admission and Discharge of Children and Young People with Burns Injuries**. NUH Guideline

British Burns Association (2018) **National standards for Provision and Outcomes in Adult and Paediatric Burn Care.** www.britishburnsassociation.org

O'Boyle. C. (2021) **Fluid Resuscitation in Paediatric Burn Injuries.** NUH Guideline

Document Control

Document Amendment Record

Version	Issue Date	Author(s)	Description
1	June 2019	Andrea Cronshaw, Abigail Hill	
2	October 2021	Andrea Cronshaw, Nicole Justice	Updated references
3	January 2023	Nicole Justice	CoMET Template and Front Glenfield Hospital removed Flow chart and burns map moved to the start of the document