





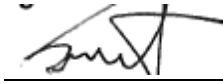
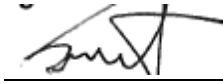
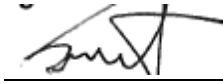


CLINICAL GUIDELINES ON THE MANAGEMENT OF CHILDREN WITH BURNS EMERGENCY DEPARTMENT SECTION ONLY							
Version Number	1						
Date of Issue	29 th August 2014						
Reference Number	CGMCB-08-2014-MS						
Review Interval	3 yearly						
Approved By	<table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: left;"><i>Signature</i></th> <th style="text-align: right;"><i>Date</i></th> </tr> </thead> <tbody> <tr> <td> <i>Mr. David Orr</i> <i>Consultant in Plastic Surgery</i>  </td> <td style="text-align: right; vertical-align: bottom;"><u>12/06/14</u></td> </tr> <tr> <td> <i>Dr. Carol Blackburn</i> <i>Consultant in Emergency Medicine</i>  </td> <td style="text-align: right; vertical-align: bottom;"><u>10/06/14</u></td> </tr> </tbody> </table>	<i>Signature</i>	<i>Date</i>	<i>Mr. David Orr</i> <i>Consultant in Plastic Surgery</i> 	<u>12/06/14</u>	<i>Dr. Carol Blackburn</i> <i>Consultant in Emergency Medicine</i> 	<u>10/06/14</u>
<i>Signature</i>	<i>Date</i>						
<i>Mr. David Orr</i> <i>Consultant in Plastic Surgery</i> 	<u>12/06/14</u>						
<i>Dr. Carol Blackburn</i> <i>Consultant in Emergency Medicine</i> 	<u>10/06/14</u>						
Authorised By	<table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: left;"><i>Signature</i></th> <th style="text-align: right;"><i>Date</i></th> </tr> </thead> <tbody> <tr> <td> <i>Dr. Cormac Breatnach</i> <i>Consultant Intensivist</i>  </td> <td style="text-align: right; vertical-align: bottom;"><u>20/08/14</u></td> </tr> </tbody> </table> <p style="text-align: right;">Chair of Clinical Guidelines Committee</p>	<i>Signature</i>	<i>Date</i>	<i>Dr. Cormac Breatnach</i> <i>Consultant Intensivist</i> 	<u>20/08/14</u>		
<i>Signature</i>	<i>Date</i>						
<i>Dr. Cormac Breatnach</i> <i>Consultant Intensivist</i> 	<u>20/08/14</u>						

Part B		MANAGEMENT IN THE EMERGENCY DEPARTMENT	
B1.0	<u>Pre Admission Procedure:</u>		
	9.1 Medical Advice to be Given Over the Phone		3
	9.2 Guidelines for Accepting a Transfer to OLCHC		3
B2.0	<u>Assessment:</u>		
	B2.1 Primary Assessment		3
	B2.2 Secondary Assessment		5
	B2.3 Burn Assessment – Lund & Browder		7
B3.0	<u>Fluid Resuscitation</u>		7
B4.0	<u>Pain Management in the Emergency Department</u>		
	B4.1 General Principles of Pain Management		8
	B4.2 Pain Assessment		9
	B4.3 Analgesia for Burns injured Children		9
B5.0	<u>Wound Management in the Emergency Department</u>		10
	Appendix 11 revised fluid resuscitation guidance		12

PART B: MANAGEMENT IN THE EMERGENCY DEPARTMENT

B1.0 Pre admission Procedure

B9.1 Medical advice over the phone to other centres on the management of a child with a burn

Advice and information on the management of a child with a burn should be given by a member of the plastics team or senior medical staff in the Emergency Department.

Determine by phone:

- Who is making the call
- Full name & age of the injured child.
- History of the burn to include the time of the injury.
- Extent, depth and distribution of the injury
- Risk of inhalation injury
- General condition of the patient – including other injuries

Advice to be given over the phone:

- Advice re fluid resuscitation if burn estimated >10% TBSA
(Refer to B3.0 – Fluid Resuscitation)
- Stress importance of adequate analgesia
- Ensure anaesthetic review prior to transfer, if there is any risk of airway injury.
- Tetanus toxoid to be given if child is not covered with appropriate vaccination (see Appendix 1)
- Dress the burn with cling film ONLY and a blanket for transfer. No topical cover to be used as it can affect assessment of the burn at a later stage)
- Advice on urgency of transfer depending on information obtained.

B9.2 Guidelines for accepting a transfer to OLCHC

Direct transfer to St Anne's Burns unit is possible under the following circumstances:

- Transfer from Children's University Hospital Temple Street, where the child has been reviewed by the plastics team there and resuscitation has commenced.
- A patient who has remained in any hospital nationwide overnight, is deemed stable and is transferred the following day, can be directly transferred to the burns unit.

Transfer to the Emergency Department

- Transfers of children from any other Emergency Department in the country are to be transferred to the Emergency Department in OLCHC for full assessment.
- Any child who remained in any hospital nationwide overnight but is deemed to be unstable is to be assessed in the Emergency Department upon arrival to the hospital.

Transfer to PICU

- Any child who remained in any hospital nationwide overnight but is critically unwell is transferred to the PICU (this should be discussed with Consultant Intensivist prior to transfer).

Plastics Registrar will notify the following people / departments prior to the child arriving in OLCHC:

- Bed Manager
- Emergency Department
- The burns unit – St Anne's Ward
- Consultant Intensivist if PICU admission is likely
- PICU department if transfer there is likely
- Anaesthetic consultant if it is anticipated that the child will need to go to the Operating Theatre

B2.0 Assessment Error! Bookmark not defined.

This assessment is to be completed by a member of the plastics team or senior medical staff in ED using the OLCHC ED standardised trauma assessment chart in addition to the Lund and Browder chart.

B2.1 Primary Assessment:

H - History of the injury

- Full name & age of the injured child.
- History of the burn to include the time of the injury.
- Extent, depth and distribution of the injury
- Is there any risk of inhalation injury?
- General condition of the patient – Any other injuries?
- Also: First aid carried out.
- Life threatening conditions determined and emergency management begun.

Conduct a brief review of the burn to determine the severity of the injury

A - Airway (To include cervical spine control if necessary)

- Ensure the airway is open – C-spine protection as appropriate.
C-spine injury from concomitant trauma (e.g.: fall or jump from a height, car accident etc...).
Unconsciousness and/or injuries above the level of the clavicle, e.g. facial injuries, are often associated with cervical fractures.
- Presence of facial or neck burns
- Risk of hot gas inhalation or upper airway burn – evident by singeing of nasal hair, red/swollen tongue or throat

B – Breathing

- Expose the chest – observing for adequate expansion on both sides of the chest
- Inhalation injury – did the burn occur indoors, in a closed space or was there an explosion? Is there evidence of soot around the nose and mouth?
- Presence of circumferential thoracic burns present – consider the need for an escharotomy
- Chest injury from concomitant injury
- Pneumothorax – increased risk with electrical injury.
- Blood gases & blood for carboxyhaemoglobin are required in any child with a suspected inhalation injury.

C – Circulation

- Monitor rate, rhythm and strength of the child's pulse.
- Assess the child's central capillary refill – this should be less than 2 seconds.
- Adequate IV access necessary
- Bloods required –FBC + U&E. (Group & hold / crossmatch only required if patient requires theatre within the first 24 hours or depending on child's clinical condition)
- Circumferential burns – Is an escharotomy necessary?
- Fluid resuscitation for a burn > 10%, calculated from the time of injury.
(Refer to Section B3.0 – Fluid Resuscitation)
- Signs of hypovolaemic shock are rarely due to the burn in the first 4 hours - therefore if signs are present, it is **essential** that another concomitant injury is ruled out
- Urinary catheter required for strict output monitoring in any burn > 10% who will require fluid resuscitation or a child with burns to the perineum.

D – Disability (Neurological status)

- Establish level of consciousness using the AVPU scale –
 - A** – Alert – Fully awake, eyes open and alert although not necessarily orientated
 - V** – Voice responsive –child makes some response when spoken to. E.g. grunt/moan
 - P** – Painful stimuli- child responds to painful stimuli only e.g. sternal rub

U – Unresponsive

- Assess the child's Glasgow Coma Scale (GCS) if AVPU scale abnormal.
- Examine pupillary response
- Observe for signs of hypovolaemia and shock as these can cause restlessness and unresponsiveness.

E – Exposure with environmental control

- Remove all clothing and jewellery (if clothing is adhered to the skin – to be removed in theatre)
- Keep the child warm at all times.

F – Fluid resuscitation

- **(Refer to Section B3.0)**

P – Pain:

- Burns are very painful
- Assess pain using locally used validated pain scales.
- Appropriate analgesia is administered based on the child's pain score **(Refer to Section B4.0)**

X – X-ray:

- Investigate suspected fractures (Spine, skull, chest etc)

B2.2 Secondary Assessment:

This is a comprehensive head to toe examination which commences after all life threatening conditions have been treated or excluded.

H – History

A – Allergies

M – Medications

P – Past illness

L – Last meal

E – Events related to injury

Mechanism of injury:

Burn:

- Duration of exposure
- What type of clothing was worn?
- If a scald – the temperature and nature of the fluid
- First aid measures received.
- Is the injury consistent with the description given – any child protection concerns?

Penetrating injury:

- Type and length of implement used.
- Distance and direction inserted.

Blunt:

- Height of fall
- Type of explosion and distance thrown
- What was the angle of impact?

Examination:

- Head to toe examination
- Search for concomitant injuries
- Evaluate risk of electrocution
- Recheck burn area and depth and plot on Lund & Browder chart.
- Further assess circumferential burns and determine need for escharotomy.
- Is there any suspicion of non-accidental injury
- Re – evaluate condition and investigations required throughout.

Head:

- Check eyes for thermal or penetrating injuries. This examination can be completed by the plastics team or a member of the ophthalmology team. Consider the need for an ophthalmology consult.
- Check the scalp for lacerations or boggy areas which may indicate a skull fracture.

Face:

- Are there any teeth missing?
- Is there evidence of CSF leaking from nose or ears?
- Is there evidence of soot around the mouth or nose?
- Any blisters or oedema of the tongue / pharynx?
- Eye examination ideally before swelling otherwise it is impossible until swelling decreases.

Chest:

- Examine from front to back.
- Assess for circumferential burns and the need for an escharotomy.
- Is the child's voice altered or does the child have a brassy cough- which may indicate an inhalation injury.
- Is there evidence of soot in the sputum?

Abdomen:

- Assess for evidence of swelling or tenderness and frequently re-evaluate.
- If there are severe burns to the abdomen and a risk of other injuries a CT scan may be necessary to assess fully.

Perineum:

- Any evidence of bruising or meatal bleeding – if present, do not insert urethral catheter. Suprapubic catheterisation is advisable.

Rectum:

- A rectal examination should only be carried out if specifically indicated in children presenting with evidence of bleeding, bruising, lacerations or loss of sphincter tone and should only be carried out by a senior paediatric surgeon to avoid repetition.

B2.3 Burn Assessment – Lund & Browderⁱ

Depth and extent of the burn injury is assessed and recorded on the Lund & Browder chart. The total body surface area (TBSA) is to be determined by the doctor assessing the child (Preferably at the initial assessment).

Do not include areas of erythema in the assessment of the extent of the burn as this will overestimate the TBSA.

A Lund & Browder Chart must be completed on **EVERY** patient

Note: Conclusive assessment of depth is difficult within the first 48 hours



Our Lady's Children's Hospital, Crumlin.
Lund & Browder Burns Classification

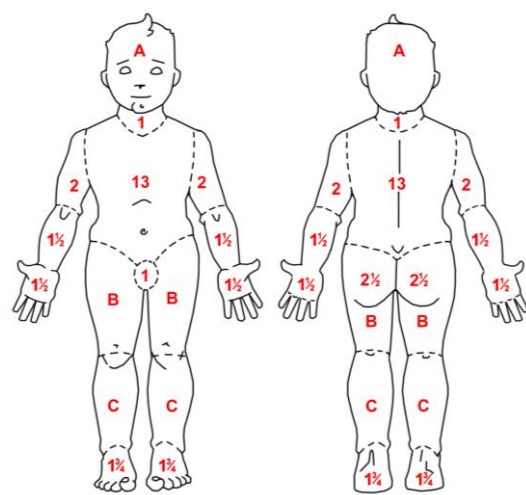


Name: Unit Number: Age:
 Ward: Date: DOB:

Simple erythema not included

Superficial **Deep**



Region	%
Head	
Neck	
Ant. trunk	
Post. trunk	
Right arm	
Left arm	
Buttocks	
Genitalia	
Right leg	
Left leg	
TOTAL BURN	

Area	Age:0	1	5	10	15	Adult
A = 1/2 of head	9 1/2	8 1/2	6 1/2	5 1/2	4 1/2	3 1/2
B = 1/2 of one thigh	2 1/4	3 1/2	4	4 1/2	4 1/2	4 3/4
C = 1/2 of one leg	2 1/2	2 1/2	2 1/2	3	3 1/4	3 1/2

OLCHC 2007

B3.0 Fluid Resuscitation^{ii,iii,iv,v}

Fluid resuscitation protocol updated February 2018.

Please disregard this page and refer to Appendix 11 for updated Fluid Resuscitation Protocol

Fluids:

Hartmans fluid is used for both the resuscitation & maintenance fluids and therefore only one infusion and one cannula is required.

(Unless large volumes are being infused in which case a second line may be required)

The amount of resuscitation fluid required is calculated using the following formula:

$$\text{Modified Parkland Formula: } 3 \times \text{weight (kg)} \times \% \text{ burn}$$

100% maintenance fluids are also required and are calculated using the following formula:

$$\begin{aligned} &100 \text{ ml / kg} \times \text{First } 10\text{kg} \\ &50 \text{ ml / kg} \times \text{Second } 10\text{kg} \\ &20 \text{ ml / kg for each kg in excess of } 20\text{kg.} \end{aligned}$$

Both totals are added together to give the total amount of fluids the child requires for the first 24hours following the burn injury.

This total is divided in 2 with the first half given over the first 8 hours and the remaining half given over the following 16 hours.

NB: The first 8 hours starts from the time the injury occurs.

Example

A 2year old child is admitted with 12% scalds. The burn occurred at 14.00 hrs. The child weighs 15kgs. The time is now 15.00 hrs

■ **Resuscitation fluids =**

$$4 \times 15 \text{ (weight)} \times 12\% \text{ (burn)} = 720\text{ml}$$

Total Resuscitation Fluids: 720mls

■ **Maintenance fluids =**

$$100 \text{ ml} \times 10 \text{ (kg)} = 1000\text{mls}$$

$$50 \text{ ml} \times 5 \text{ (kg)} = 250\text{mls}$$

Total Maintenance Fluids: 1,250mls

■ **Total fluids = 720mls (resus) + 1,250mls (maintenance) = 1,970mls over 24hours**

(Then divide by 2: $1,970\text{mls} / 2 = 985\text{mls per period}$)

■ **First 8hour Period:** 985mls. As only 7 hours remaining until the 8 hour period has elapsed, the hourly rate $985\text{mls} / 7\text{hrs} = 140.7\text{mls/hr}$

■ **Second 16 hours Period:** 985mls also. $985\text{mls} / 16\text{hrs} = 61.5\text{mls/hr}$

Note: The fluids should be adjusted accordingly to ensure a urinary output of

1-2mls/kg/hr in children < 8years of age &

0.5-1.5 mls/kg/hr in children > 8 years of age

B4.0 Pain Management in the Emergency Department

(See also Section C4 for further information on the management of burn related pain)

Burn injuries result in significant pain and anxiety at the time of the burn and during subsequent treatment and rehabilitation^{vi,vii}. Developmentally appropriate pain assessment and pain management is essential in the management of burned children^{vi,vii,viii}. Burn pain may be constant or related to activity or procedures and is further compounded by anxiety and post-traumatic stress symptoms^{vi,ix}.

A number of factors, including the extent and severity of the wound, mechanism of injury, surgical procedures, physical and occupational therapy, will affect the amount of pain experienced by a child with a burn injury^{vi,x,xi}. Because of the multifactorial nature of pain in burned children, a multidisciplinary approach to pain management must include non-pharmacological and pharmacological approaches to relieving pain and anxiety.

B4.1 General Principles of Pain Management

The general principles of pain management can be summarised as follows:

- **Evaluation and assessment:** A comprehensive assessment and physical assessment is important. Pain must be assessed using developmentally appropriate pain assessment tools and the results of this assessment must be documented in the child's Health Care Record^{vi,vii,x}.

- **Non-pharmacological pain management strategies** should be used in addition to pharmacological methods whenever available and appropriate^{vi,viii,ix}. In addition, it may be appropriate to consider psychological support for individual patients.
- **Explanation and reassurance:** Explanation and reassurance about the child's condition is important in alleviating anxiety^{ix}. Other disciplines have a role in the management of children's burn pain: Refer child to play specialist, psychology, occupational therapy, physiotherapy, and music therapy for support in managing burn pain.
- **Prior to procedure** review infant/child's analgesia and sedation. Ensure intervention such as dressing change is timed to coincide with peak analgesic effect of both current regular agents and any supplementary agents given.
- **Note:** Paracetamol PO/PR/IV, NSAIDs, Oramorph, Midazolam (oral) and Clonidine if used should be given at least 30-45minutes pre-procedure. The peak effect of these agents ranges generally between 1-3 hours

Analgesics are most effective when given on a scheduled regular basis (not as required)^{vii}. Supervision necessitates review of analgesic medication regularly. Ensure patient is tolerating medicine, dose is sufficient and side effects are being treated. Pain Service referral should be made to the Acute Pain Team within 24 hours of admission for children requiring intravenous opiates or where pain is difficult to control.

B4.2 Pain Assessment

Assess and record pain scores on a regular basis using developmentally appropriate pain scoring tools following consultation with the child and parents (**See Appendix 2 – Pain Assessment Tools**), e.g.

- Wong and Baker Faces^{xii}.
- FLACC^{xiii} and FLACC-Revised for children with intellectual disabilities
- Numeric or Visual Analogue Scale for pain intensity^{vii}.
- Manchester Pain Ladder (ED)

(A range of pain assessment tools are available in the nursing practice guidelines on the hospital intranet, including multilingual pain assessment tools.)

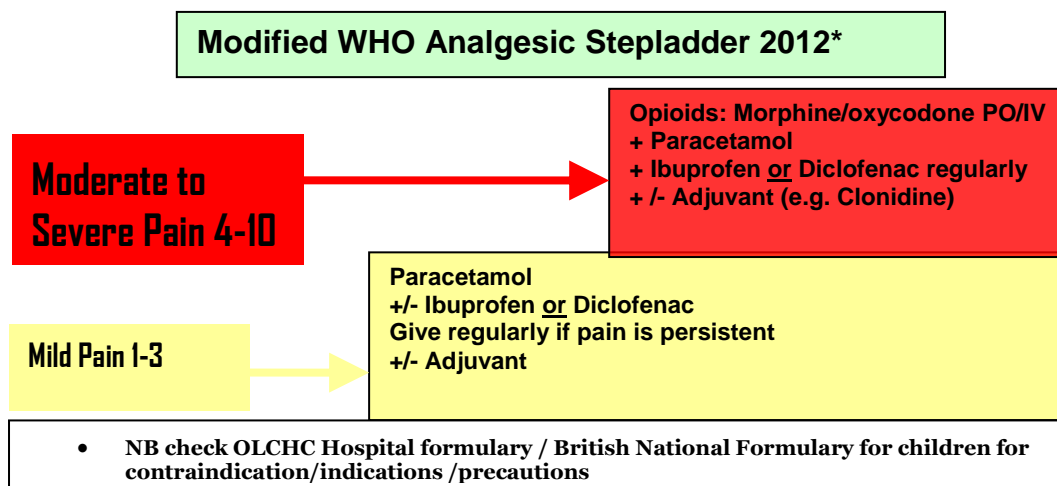
Based on the score obtained, offer appropriate analgesia as outlined below.

Assess and record pain scores before, during and after all potentially painful procedures. This will help to guide provision of optimal analgesia for individual patients and assess efficacy of the various analgesic regimens used by individual service providers.

B4.3 Analgesia for Burn Injured Children

Multimodal analgesia is important i.e. analgesic drugs are used in combination to maximize their impact^{ix}.

The World Health Organisation have redefined their pain ladder into a 2-step approach. Analgesia therapy regimens should be based on a '**step-down**' ladder rather than a '**step-up**' ladder until analgesia is achieved.



Consider starting with intravenous opiate until adequate analgesia provided. Addition of regular, simple analgesics (paracetamol, NSAIDs) may give useful additional analgesia and allow change from parenteral to enteral opiate. Reduction and cessation of opiate analgesia should occur before reduction and cessation of paracetamol and/or NSAIDs.

B5.0 Wound Management in the Emergency Department

(See also Section C5.0 for further information on Burn Wound Management)

Note: Children being admitted to St Anne's Ward should have their dressings applied on the ward. If, for whatever reason, the dressing needs to be applied in the ED (this would be the exception rather than the norm), liaise with the ward re availability of support to the ED. If staffing unavailable, seek advice re a temporary non-adherent dressing prior to transfer (Refer to Sections C5).

Procedure

- Give a full explanation to the child and parents prior to attending to the wounds.
- The child must receive adequate analgesia as per Sections B4.0 & C4.0 prior to any dressing change / wound assessment.
- The burn extent and depth is to be determined by the plastics team / senior medical staff in ED and documented using the Lund and Browder chart. (Refer to Section B2.3)
- Deroof blisters where possible, especially those over joints.
- Debride dead skin.
- Take photographs where possible (Contact St. Anne's to see if nurse available to take photos).
- Perform wound swabs after burn is cleaned.
- Dressing choice is determined by the burn depth and location of the wound and the child's clinical condition

ⁱ Lund C and Browder N (1944), The estimation of areas of burns. *Surgical Gynecology and Obstetrics* **79** 352-358

ⁱⁱ Josier MJ, Cancio LC, Amani H, Blayney C, Cullinane J, Haith L, Jeng JC, Kardos P, Kramer G, Lawless MB, Serio-Melvin ML, Miller S, Moran K, Novakovic R, Potenza B, Rinewalt A, Schultz J and Smith H (2013) American Burn Association Consensus Statements: Burn Resuscitation. *Journal of Burn Care & Research* **34**(4), 368-371.

ⁱⁱⁱ Pham TN, Cancio LC and Gibran NS (2008) American Burn Association Practice Guidelines: Burn Shock Resuscitation. *Journal of Burn Care & Research* **29**(1), 257-266.

^{iv} European Burns Association (2013) European Practice Guidelines for Burn Care: Minimum level of Burn Care Provision in Europe, 2nd edn. EBA, Vienna.

^v Jeschke MG and Herndon DN (2014) Burns in children: standard and new treatments. *The Lancet* **383**, 1168-1178.

^{vi} Stoddard FJ, Sheridan RL, Saxe GN, King BS, King BH, Chedekel DS, Schnitzer JJ and Martyn JAJ (2002) Treatment of pain in acutely burned children. *Journal of Burn care and Rehabilitation* **23**(2)135-156

^{vii} Macintyre PE, Schug SA, Scott DA, Visser EJ, Walker SM (Eds) (2010) *Australian and New Zealand College of Anaesthetists and Faculty of Pain Medicine: Acute Pain Management: Scientific Evidence* (3rd edition), ANZCA & FPM, Melbourne.

^{viii} Henry DB & Foster RL (2000) Burn pain management in children. *Pediatric Clinics of North America* **47**(3) 681-698

^{ix} Ratcliffe SL, Brown A, Rosenberg L, Rosenberg M, Robert RS, Cuervo LJ, Villarreal C, Thomas CR and Meyer WJ 3rd (2006). The effectiveness of a pain and anxiety protocol to treat the acute pediatric burn patient. *Burns* **32**, 554-562

-
- ^x Bonham A (2000) Managing Procedural Pain in Children with Burns. Part 1: Assessment of pain in children. *International Journal of Trauma Nursing* **2**(3), 68-77.
- ^{xi} Kahana MD (2003) Burn Pain Management. In *Pain in Infants, Children and Adolescents*, 2nd edn (Schechter N, Berde C and Yaster M Eds.) Lippincott Williams and Wilkins, Philadelphia.
- ^{xii} Wong D. and Baker C. (1988) Pain in children: comparison of assessment scales. *Pediatric Nursing* **14** (1), 9-17.
- ^{xiii} Merkel S, Voepel-Lewis T, Shayevitz JR & Malviya S (1997) The FLACC: a behavioural scale for scoring post- operative pain in young children. *Pediatric Nursing* **23**(3):293-7
- ^{xiv} WHO (2012) Persisting pain in children package: WHO guidelines on the pharmacological treatment of persisting pain in children with medical illnesses. WHO, Geneva.

Appendix 11: Fluid Resuscitation

To replace B3:Fluid Resuscitation in ED (page 16) and C3:Fluid Resuscitation for Inpatients (page 20)

Fluid resuscitation: Fluid resuscitation is required for any child with a burn over 10% TBSA. Calculate the TBSA using the Lund & Browder Chart (refer to page 14).

Note: use caution when determining the need for additional fluid boluses and consider whether fluid boluses need to be included within the overall fluid resuscitation.

Bloods: Check FBC and U&E on admission and repeat thereafter depending upon child's condition.

Fluids: Two fluid calculations are required, the burn ration and the maintenance fluids

Burn ration (Hartman's solution):

The amount of resuscitation fluid (the burn ration) required is calculated using the following formula:

$$\text{Modified Parkland Formula: } 3\text{mls} \times \text{weight (kg)} \times \% \text{ burn}$$

Half of the burn ration should be given in the first 8 hours and half in the following 16 hours. The time of fluid administration is calculated from the time of the burn (not the start of resuscitation).

NB: The first 8 hours starts from the time the injury occurs.

Maintenance fluids (0.9% saline in 5% dextrose): 100% maintenance fluids are also required and are calculated using the following formula:

$$\begin{aligned} &100 \text{ ml / kg} \times \text{First } 10\text{kg} \\ &50 \text{ ml / kg} \times \text{Second } 10\text{kg} \\ &20 \text{ ml / kg for each kg in excess of } 20\text{kg.} \end{aligned}$$

The maintenance fluids are given at a constant rate and ideally through a separate cannula.

Example

A 2year old child is admitted with 12% scalds. The burn occurred at 14.00 hrs. The child weighs 15kgs. The time is now 15.00 hrs

■ Burn ration =

$3 \times 15 \text{ (weight)} \times 12\% \text{ (burn)} = 540 \text{ ml of Hartman's solution, of which } 270 \text{ ml should be given in the first } 8 \text{ hours (from time of injury) and } 270 \text{ ml in the following } 16 \text{ hours}$

■ Maintenance fluids =

$$100 \text{ ml} \times 10 \text{ (kg)} = 1000\text{mls}$$

$$50 \text{ ml} \times 5 \text{ (kg)} = 250\text{mls}$$

Total Maintenance Fluids: 1,250mls or 52 ml per hour of 0.9% saline in 5% dextrose through a separate cannula

Note: The fluids should be adjusted accordingly to ensure a urinary output of

1-2mls/kg/hr in children < 8years of age &

0.5-1.5 mls/kg/hr in children > 8 years of age

Amendment approved by: Mr David Orr

Signature:



Date: 12th February 2018