Introduction

This guideline is designed to facilitate best practice in the identification and treatment of Toxic Epidermal Necrolysis / Stevens-Johnson Syndrome, including, but not limited to, those precipitated by an idiosyncratic reaction to medication. This guideline will cover initial assessment through to definitive management.

Scope

This guideline applies to clinical staff who may be involved in the diagnosis and treatment of Toxic Epidermal Necrolysis / Stevens-Johnson Syndrome. This may include, but is not limited to, Dermatology, Plastic Surgery, Medicine, Emergency Medicine, Intensive Care, Paediatrics, Paediatric Intensive Care, and Microbiology.

Guideline Standards and Procedures

A treatment algorithm is included at the beginning of the document.

Background

a. Definition

Stevens-Johnson Syndrome or Toxic Epidermal Necrolysis are a spectrum of severe and life-threatening hypersensitivity disorders affecting skin and mucous membranes, most commonly precipitated by an idiosyncratic reaction to medication.

Stevens-Johnson syndrome (SJS) always involves mucosal surfaces but the skin involvement is limited by definition to <10% body surface area (BSA).

Toxic epidermal necrolysis (TEN) may sometimes spare mucous membranes but skin involvement is by definition >30% BSA.

An intermediate form is recognised in which mucosal involvement is accompanied by skin involvement of 10-30% BSA (TEN / SJS overlap syndrome).

All forms result in extensive erosion and epidermal loss, leading to exposed dermis, and carry a significant risk of fatal outcome. (World Health Organization, 2018)

TEN / SJS can be fatal.
Toxic Epidermal Necrolysis / Stevens-Johnson Syndrome

Treatment Algorithm

Unwell patient + Cutaneous rash

Consider TEN/SJS

Assess observations

Unstable Stable

Resuscitate

Adult/Paediatric Advance Life Support (ALS/PALS) Senior doctor review

Stabilised

History & Examination

Review symptoms
Assess rash – erythema v. blistering, mucosal involvement
%TBSA (Total Body Surface Area) affected,
Review past medical history
Review medications & recent changes

Consider alternative diagnoses

SJS/TEN Suspected?

No Yes

Toxic Epidermal Necrolysis / Stevens-Johnson Syndrome Management

Name: __________________________ Hospital Number: __________________________ DOB: ____________ Done

1. Resuscitate as appropriate, including:
   - O₂
   - IV access
   - Fluid resuscitation
   - Urinary catheterisation

2. Obtain bloods:
   - FBC, U+E, LFT, Glucose, Magnesium, Phosphate, Bicarbonate

3. Analgesia as required

4. Review medications & hold any suspected causative agents

5. Contact Dermatology urgently & liaise with appropriate/related specialities

6. Monitor observations & escalate as appropriate

7. Wound care for any denuded skin:
   - Gentle cleanse with NaCl-soaked gauze
   - Wound swab for MC&S
   - Dressings: Jelonet to body, soft paraffin to head & neck, Emollin Spray
b. **Epidemiology**

In the UK, there is an incidence rate of 5.76 per million persons per year.

TEN / SJS can occur in patients of all ages, but incidence rates appear highest in ages 1-10 years & over 80 years.

Asian ethnicities & those with a higher Fitzpatrick skin type appear to have to 2-fold risk compared to lower Fitzpatrick skin type. Fitzpatrick skin typing refers to skin pigmentation & reaction to exposure to sunlight.

Anti-epileptics & allopurinol have a stronger association with TEN / SJS.

Pre-existing comorbidities, including pre-existing depression, lupus erythematosus, recent pneumonia, chronic kidney disease, and active cancer, have statistically significant associations with TEN / SJS. (Frey, et al., 2017)

Symptoms typically begin 4-28 days after contact with causative agent.

c. **Pathogenesis**

The mechanism of TEN / SJS is most often an unpredictable response to medication in adults. In children, infections appear to be a more common cause. It is a complex & not completely understood pathology.

It is believed that CD8+ cytotoxic lymphocytes specific to certain medications, found in early blister fluid, cause cell death of keratinocytes

Other cytokines, including perforin/granzyme B, Fas-L & TNFα can result in cytotoxicity & apoptosis. (Ngan, Dyall-Smith, & Oakley, 2016) (McPherson, et al., 2019) (Creamer, et al., 2016)

d. **Differential Diagnoses**

A number of conditions may present in similar ways to TEN / SJS. The important differentials to consider include:

- Other Severe Cutaneous Adverse Reactions (SCARs) to medications
- Staphylococcal Scalded Skin Syndrome
- Toxic Shock Syndrome
- Erythema multiforme
- Mycoplasma infection
- Bullous systemic lupus erythematosus
- Pemphigus
  - Vulgaris
  - Paraneoplastic
Clinical Assessment

a. Take a detailed history

- Timing & onset of:
  - Any prodromal symptoms
  - Rash
  - Blistering

- Past medical history, in particular pertaining to:
  - HIV or other immunocompromise
  - History of malignancy

- Drug history
  - Determine a timeline for any and all medications, prescribed or otherwise, and compare this to onset of symptoms
    - This may facilitate identification of causative agent
  - Ensure to discuss with the patient, and/or carers/family/etc.:
    - Over the counter medicines
    - Herbal or complementary therapies
    - Recreational drugs
    - Health supplements
    - Contraception
    - Changes in brand/manufacturer of any medications
  - Document & review any drug allergies or adverse drug reactions

b. Perform a full physical examination, including:

- Baseline body weight
- Observations & oxygen saturations
- Assess Percentage of Total Body Surface Area (% TBSA) affected
  1. Erythema
  2. Blistering or epidermal loss
    - This may be true, detached epidermis
    - Or incipient skin loss (loose epidermis on traction = Nikolski sign positive)
  - Adjuncts to facilitate this assessment may be used, including:
    - Lund & Browder Charts (separate Appendix A)
    - Rule of Nines (for adults – see Appendix B)
    - Patients Palm = 1% TBSA (for adults and children)
    - Mersey Burns App (for adults and children)
  - Ensure the assessment is documented in writing
  - Clinical photography is also ideal, and must follow trust policy
    - Trust policy is found in Appendix A of “Consent to Examination or Treatment UHL Policy” A16/2002

- Assess involvement of mucosal surfaces
  - Airway/Oral
  - Ocular
  - Urogenital
c. **Laboratory Investigations**

- **Blood tests**
  - FBC
  - U+E
  - LFT
  - Glucose
  - Magnesium
  - Phosphate
  - Bicarbonate
  - Blood culture

- **Conjunctival PCR swabs** – these should be taken from the mucosal surface of the conjunctiva for the following organisms
  - Bacterial
  - Chlamydia
  - HSV
  - Adenovirus

- **Atypical pneumonia PCR Panel (Covers Mycoplasma PCR)** – would need discussion with microbiology

- **CXR**

- **Skin biopsy**
  - Undertaken by on-call Dermatologist
  - The on-call Biomedical Scientist for histology should be made aware via switchboard to expect the specimen for immediate processing
  - Dermatologist to liaise with Pathology to facilitate urgent report
  - Incisional ellipse biopsy from lesional site to include the blister edge
    - Can be sent for a frozen section in a dry container (NOT in formalin) if required for assessment within a few hours. Otherwise, standard H&E histology in formalin is more reliable for diagnosis but will take ~24 hours.
  - Another 4mm punch biopsy should be taken from unaffected skin, adjacent to a lesion
    - Send in normal saline for immunofluorescence. Ask to be snap frozen if OOH.

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**Figure 1. Suggested biopsy technique**
d. **Initiate primary management**
   - Establish peripheral IV access
   - If patient cannot maintain adequate nutrition orally, insert a nasogastric tube and institute nasogastric feeding
   - Insert a urinary catheter if urogenital involvement is causing significant dysuria/retention

e. **Determine drug causality**
   - Identify causative agent and withdraw immediately
   - Determine a timeline for any suspects (including initiation & discontinuation)
   - Routine drug hypersensitivity testing is not recommended
   - Advice from hypersensitivity specialist should be sought if:
     - The causative drug cannot be determined
     - The causative agent cannot be discontinued
     - Accidental exposure to the causative agent could occur

f. **Prognostic scoring**
   - Calculate SCORTEN within the first 24 hours
     - The SCORRe of Toxic Epidermal Necrosis, is a prognostic indicator used to predict mortality in TEN / SJS
     - This was originally devised for adults; however, it has been found to be valid in predicting morbidity & mortality in children (Beck, Quirke, Gamelli, & Mosier, 2015) (Gleghorn, Voigt, & Kelly, 2021) (Sorrell, et al., 2017)
     - One point is scored for each of the following (at time of admission/presentation)
       - Age > 40 years
       - Presence of malignancy (cancer)
       - Heart rate > 120 beats/minute
       - Initial percentage of epidermal detachment > 10% TBSA
       - Serum urea level > 10 mmol/L
       - Serum glucose level > 14 mmol/L
       - Serum bicarbonate level < 20 mmol/L.
     - The score above indicates risk of mortality:
       - SCORTEN 0-1 = 3.2%
       - SCORTEN 2 = 12.1%
       - SCORTEN 3 = 35.3%
       - SCORTEN 4 = 58.3%
       - SCORTEN 5 or more = 90%
Definitive Management

a. Care setting

- Care of the skin failure/epidermal loss will be led by Dermatology, with support from the following specialities. Dermatology should be the first point of contact with regards to the skin failure. Patients should be reviewed by Dermatology within 12-24 hours of admission.
- Care should be delivered by a multi-disciplinary team, including:
  - Acute Medics
  - Dermatology
  - Plastic Surgery
  - Ophthalmology
  - Specialist Nurses
  - Intensive Care
  - Paediatrics (if child)

- ICU referral criteria
  - SCORTEN ≥ 3
  - Epidermal loss >10%

- Intubation Criteria
  - Oral involvement plus ONE of the following
    - 1. initial TBSA>70%
    - 2. progression of TBSA sloughed while in hospital >15% from days 1 to 3
    - 3. extensive airway involvement e.g. haemorrhage erosions of upper airway
    - 4. inadequate airway protection due to underlying neurologic disease
      (Williams, Hodge, & Ingram, 2016)
  - Intubation and mechanical ventilation may be needed in the absence of respiratory involvement for e.g.; to facilitate effective management of pain, to enable safe transfer of patients, to enable airway protection from extensive epithelial necrosis.

- Skin failure of 10% TBSA or greater may necessitate Level 2 or 3 nursing care and discussion with the Acute Medical and Intensive Care Teams for consideration of transfer to HDU/ITU setting as appropriate, e.g. the Acute Medical Unit Acute Care Bays (ACB)

- **Actual or predicted epidermal loss of >30% TBSA** in histologically confirmed TEN / SJS should be referred urgently to Queen Elizabeth Hospital, Birmingham, or the Birmingham Children's Hospital, for care of extensive skin loss
  - Dermatology at UHL should refer to Dermatology at Birmingham. Once accepted, Plastics at UHL can support and refer to Burns in Birmingham
  - Verbal referral to the on-call Dermatology & Burns Consultants via QEHB / BCH switchboard
  - Referrals then should be made via the Network of On-call Referral Services (NORSe) System, via this link: https://nww.norse.uhb.nhs.uk/login.aspx. The referral should go to the TEN / SJS & Burns Team.
  - Inform QEHB / BCH Dermatology Registrar on-call via switchboard prior to transfer and document discussion on NORSe
  - Once NORSe referral complete, contact on-call Burns registrar to confirm referral is received and they will confirm when a bed is available
  - Once patient has been transferred, please ensure outstanding investigation results (e.g. direct immunofluorescence) are communicated to QEHB / BCH team
- If same day transfer to QEHB / BCH not possible, transfer to HDU/ITU setting as appropriate, e.g. ACB
- If no suitable bed is available at QEHB / BCH, the Plastic Surgery team at LRI, in conjunction with the Burns Centre, should escalate to the National Burns Bed Bureau, in order to find a suitable alternative.
• **Nursing**
  - Patient should be nursed in Protective Isolation in line with the Trust’s Isolation Precautions Policy B62/2011
    - This reduces nosocomial infections
  - Patient should be moved to a side room, ideally with ambient temperature between 25°C and 28°C
  - Teaching packs should be available to guide registered nurses with wound management
• **When Level 3 nursing is appropriate, transfer to a medical ward can be considered. A drug cupboard is allocated to Dermatology on Ward 38 which can provide access to topical treatments & teaching packs out of hours.**

**b. Skin management**

• **Strict barrier nursing to reduce nosocomial infections**
• **Avoid the following as far as possible:**
  - Adhesive tapes when securing lines, tubes etc.
  - Sphygmomanometer cuffs and tight ID bands
  - Flamazine and Polyfax if sulphonamide-induced reaction suspected
• **Regularly cleanse wounds & intact skin**
  - Warmed sterile water
  - Warmed saline
  - Consider an antimicrobial solution such as chlorhexidine (1/5000)
• **Blisters should be decompressed & fluid removed via aspiration.**
• **Any necrotic skin or de-roofed blisters should be debrided**
• **Dressings**
  - Greasy emollient such as 50% white soft paraffin (WSP) with 50% liquid paraffin (LP) (50/50 WSP/LP) over the whole epidermis including denuded areas
  - Apply topical antimicrobial agents to sloughy areas
    - Consider silver-containing therapies and dressings
  - Non-adherent dressings should be used to cover the lesions
    - E.g. Jelonet, Mepitel
  - Secondary foam or absorbent dressings, such as gauze, should be applied over non-adherent dressings to collect exudate
  - Consider Emollin Spray to any undressed epidermis
c. Monitoring for infection

- The most common pathogens causing bloodstream infection in SJS/TEN are *P. aeruginosa*, *S. aureus* and *Enterobacterales*.
- All patients with SJS/TEN should be screened for MRSA and CRO on admission
- In addition, any exposed dermis should be swabbed for bacterial & fungal cultures
  - At least 3 areas
  - Focus on sloughy/crusted areas
  - Swabs should be taken on alternate days in the acute phase
- Isolation of *P. aeruginosa* and *S. aureus* from skin swabs increases the risk of bloodstream infection with these organisms. Isolating Enterobacterales from skin cultures is not associated with an increased risk of blood stream infection, as these organisms mainly cause infection via damaged gut mucosa.
- Clinicians should be aware that skin or wound swabs may yield commensal or colonising organisms which would not necessarily require antibiotic treatment. Significant growth, or risk of invasive infection is generally regarded as when one organism begins to predominate on cultures. Discuss with Microbiology if there is uncertainty around swab results.
- Consider HSV reactivation in eroded or vesicular areas which are slow to heal, particularly in genital and oral sites. Send viral swab from these lesions for HSV and VZV PCR.
- Routine antibiotic prophylaxis is not recommended. Administer systemic antibiotics only if there are clinical signs of infection
  - The MDT should seek advice from Microbiology for this
  - Clinicians should be aware of potential cross-reactivity of penicillin-allergic patients to meropenem & cephalosporins.
  - Skin loss conditions can be accompanied by pyrexia, even in the absence of infection.

 d. Fluid Management

- IV access should be sited through intact skin wherever possible
- Urine output & fluid balance should be closely monitored
  - Consider urinary catheterisation
- Fluid replacement should be guided by urine output with regular monitoring
  - Titrate to maintain an adequate urine output
  - For children, please refer to the Trusts Children’s Fluids Guidelines
- As the patient improves, oral fluids should be progressively administered

 e. Nutrition Regimen

- Enteral nutrition should be provided throughout, wherever possible
  - If successful enteral nutrition is not attainable, a proton pump inhibitor should be prescribed to reduce the risk of stress-related gastro-intestinal ulcer formation
- Input should be sought from the Nutrition and Dietetics Service
- Calorific requirements vary throughout the course of TEN / SJS progression
- For adults, the national guidance is:
  - In the early, catabolic phase – 20-25 kcal/kg/day should be delivered
  - In the late, anabolic phase – 25-30 kcal/kg/day should be delivered
- For children, input from a paediatric dietician should be sought to advise on nutritional requirements.
f. **Analgesia**
   - Ensure patients receive regular analgesia adequate enough to provide comfort at rest
   - Breakthrough pain relief should also be prescribed as required
     - This can be used as an adjunct for re-positioning, dressing changes, etc. which may cause an increase in pain

g. **VTE Prophylaxis**
   - Patients should be prescribed appropriate Venous Thromboembolism Prophylaxis
     - Low molecular weight heparin should be utilised in immobile patients
     - For children, please refer to the Trust’s Children’s VTE Guidelines
   - If the lower legs are spared, Anti-embolism Stockings can be applied

h. **Airway management**
   - Any concern of airway involvement, such as respiratory symptoms or hypoxaemia, should be discussed urgently with Intensive Care
   - Fibre-optic bronchoscopy may be required, which should take place in an appropriate Intensive Care Unit or Burns Centre

i. **Ophthalmological treatment**
   - In the acute phase:
     - Ophthalmology should review daily
       - This review should also attend to ocular hygiene
     - Ocular lubricants should be applied every 2 hours
       - E.g. Hylo-Forte, Carmellose, VitA-POS
     - Topical corticosteroid drops may be utilised to ameliorate ocular injury
       - E.g. nonpreserved dexamethasone 0.1%
     - A topical antimicrobial agent is indicated in the presence of corneal ulceration
       - E.g. a quinolone (moxifloxacin or levofloxacin)
     - Maintenance of corneal protection is vital, and this should be addressed in an unconscious patient

j. **Management of oral/mucosal involvement**
   - Daily review of oral involvement, with attention to oral hygiene, is required
   - Oral hygiene may utilise a combination of the following:
     - Warm saline mouthwash
     - Oral sponge
     - Oral Lubricants
       - E.g. gelclair®/bioXtra gel®
     - Anti-inflammatory oral rinse 3 hourly, especially prior to eating
       - E.g. benzydamine hydrochloride
     - Anti-septic mouthwash twice a day
       - E.g. Corsodyl
     - Corticosteroid mouthwash four times a day
       - E.G. Betamethasone sodium phosphate 0.5 mg in 10 mL water
   - White soft paraffin ointment may be applied as required to lips/nose (not within cavities) (no less than every 2 hours)
k. **Urogenital**
   - Urogenital involvement should be reviewed daily
   - White soft paraffin ointment may be applied to any urogenital skin or lesions four hourly
   - A non-adherent, silicone dressing, such as mepitel, should be applied to denuded areas
   - The use of potent topical corticosteroid ointments may be considered for involved, but non-eroded areas

l. **Immunomodulatory therapy**
   - The mainstay of TEN / SJS management remains supportive care in an appropriate care setting as outlined above
   - Various systemic therapies are used worldwide (see Table 1), in addition to supportive care. Given the rarity of this spectrum of disease, evidence for efficacy of these treatments is limited, and most has been derived from retrospective, uncontrolled studies comprising few participants.
   - In line with British Association of Dermatologists UK TEN / SJS guidelines (McPherson, et al., 2019) (Creamer, et al., 2016), we do not support the use of a particular systemic immunomodulatory agent but the therapies in Table 1 may be considered at the discretion of the consultant dermatologist based on the individual circumstances of the patient.

<table>
<thead>
<tr>
<th>Systemic immunomodulatory therapy</th>
<th>Points to note</th>
</tr>
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<tbody>
<tr>
<td>Intravenous methylprednisolone</td>
<td>Higher rates of infection including candida sepsis and overall complications including higher rates of mortality with prolonged corticosteroids – limit to short term (pulsed) therapy</td>
</tr>
<tr>
<td>IVIG*</td>
<td>Risk to older patients, those with renal, thrombotic or cardiovascular disease</td>
</tr>
<tr>
<td>Ciclosporin</td>
<td>Can be given oral or IV, weak evidence base</td>
</tr>
</tbody>
</table>
| TNF alpha inhibitors (infliximab, etanercept) | Expensive, weak evidence base
| Plasmapheresis                     | Used in conjunction with ciclosporin in some studies |

**Procedure for IVIG infusion and administration:**

1. Refer to the InSite webpage on Immunoglobulins by clicking on this hyperlink or by searching “Immunoglobulins” on InSite
2. Look at the “UHL Flow Chart for Requesting Immunoglobulins”
   - TEN / SJS is in the “Red” category and can be given urgently without panel approval
3. Complete the “New Patient Request Form” and send to the email listed
4. Once form submitted, contact on-call pharmacy who will arrange supply of IVIG
5. Complete the “Immunoglobulin request form” on the Immunoglobulins webpage
   - Pharmacy can help to complete this form
   - Administration information for IVIG is available via Medusa

If out-of-hours, please refer to the “Procedure for out of hours Ig” document and review the criteria for administration.

**Dose** is 2mg/kg Ideal Body Weight (IBW calculator here) of IVIG in Stevens-Johnson Syndrome / Toxic Epidermal Necrolysis. Preferably given as a single dose, or divided over 3 days. Current preferred brand of IVIG is Privigen, but may depend on supply – discuss with on-call pharmacist.
m. Discharge & Follow-up

- The causative agent should be documented as an allergy in the patient’s notes, electronic prescribing system & discharge letter, with the result being the appropriate diagnosis (SJS, or TEN, or TEN/SJS Overlap Syndrome)
- The patient should be provided with written information on TEN / SJS, as well as the suspected causative agent(s), so they can avoid it(Them)
- The patient should be encouraged to carry or wear an alert card or bracelet with details on the reaction & causative agent
- Any episode of TEN / SJS should be reported to the national pharmacovigilance authority
- The patient should be reviewed in an appropriate outpatient clinic with dermatology within 1 month of discharge
- Other specialities involved in the patient’s care should arrange outpatient review as appropriate (e.g. Ophthalmology) (McPherson, et al., 2019) (Creamer, et al., 2016)

Education and Training

Training and awareness amongst the relevant specialty departments is required to implement this guideline.

Monitoring and Audit Criteria

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<th>Key Performance Indicator</th>
<th>Method of Assessment</th>
<th>Frequency</th>
<th>Lead</th>
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<tbody>
<tr>
<td>Identification and management</td>
<td>Audit &amp; review of case notes</td>
<td>2-3 years</td>
<td>R Agarwal &amp; M Scorer</td>
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SUPPORTING REFERENCES


Key Words
Toxic Epidermal Necrolysis, Stevens-Johnson syndrome, Skin Failure, Cutaneous Drug Reaction

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<td><strong>Date Approved:</strong> 3.8.23</td>
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V1 approved by Policy and Guideline Committee on 3 August 2023

Trust Ref: 819/2023

Date of Next Review: August 2025

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Appendix A: Lund & Browder Chart

'Lund & Browder Chart'
An aid for documenting the extent & calculating the %TBSA of the affected areas

The surface area of the patient’s palm plus fingers equates to around 1% of their TBSA. Making a paper cutout of similar dimensions can help to estimate the size of larger injuries.

The above chart can be adjusted for all ages by applying the below adjustments.

<table>
<thead>
<tr>
<th>Age</th>
<th>0 yrs</th>
<th>1 yr</th>
<th>5 yrs</th>
<th>10 yrs</th>
<th>15 yrs</th>
<th>Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
</tr>
<tr>
<td>Back</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
</tr>
<tr>
<td>R arm</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
</tr>
<tr>
<td>L arm</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
</tr>
<tr>
<td>Buttocks</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
</tr>
<tr>
<td>Genitalia</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
</tr>
<tr>
<td>R leg</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
</tr>
<tr>
<td>L leg</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
</tr>
</tbody>
</table>

Total TBSA

- Head
- Neck
- Front
- Back
- R arm
- L arm
- Buttocks
- Genitalia
- R leg
- L leg

Chart completed by

Print name
Signature
Role
Date
Time

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Appendix B: Rule of Nines

The Rule of Nines provides an alternative to the Lund & Browder Chart, dividing anatomical areas into a multiple of 9% (excluding the perineum).

This method is only accurate for adults.

<table>
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<th>Total</th>
<th>Subdivision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td>9%</td>
<td>Anterior Head = 4.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Posterior Head = 4.5%</td>
</tr>
<tr>
<td>Torso</td>
<td>18%</td>
<td>Chest = 9%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Abdomen = 9%</td>
</tr>
<tr>
<td>Back</td>
<td>18%</td>
<td></td>
</tr>
<tr>
<td>Each Arm</td>
<td>9%</td>
<td>Anterior Arm = 4.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Posterior Arm = 4.5%</td>
</tr>
<tr>
<td>Each Leg</td>
<td>18%</td>
<td>Anterior Leg = 9%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Posterior Leg = 9%</td>
</tr>
<tr>
<td>Perineum</td>
<td>1%</td>
<td></td>
</tr>
</tbody>
</table>