SUNY UPSTATE MEDICAL
CLARK BURN CENTER
CLINICAL PRACTICE
GUIDELINES FOR BURNS

KEY POINTS:

- Patients that meet low risk criteria can be evaluated and treated in the Emergency Department and do not warrant definitive referral or consultation with the Burn Service.
- Patients that meet moderate risk criteria can be evaluated, treated and released by an Emergency Department Physician; however, communication with a Burn Service provider is required to determine management options and/or need for Burn Specialty evaluation and follow-up.
- Patients that meet High Risk Criteria should be referred for definitive burn specialty evaluation and management.
- Emergency Department communication options regarding burn patients A*ttachment A.*
- Operating hours of the Regional Outpatient Burn Center are found in A*ttachment B.*
- The patient's tetanus immunization status should be evaluated and updated if appropriate
- AMERICAN BURN ASSOCIATION BURN CENTER REFERRAL CRITERIA
  - All third degree burns (full-thickness) of any size, in any age group
  - Burns that involve the face, hands, feet, genitalia, perineum or major joints
  - Second degree burns (partial-thickness) ≥ 10% of the body surface area
  - Electrical burns, including lightning injuries
  - Chemical burns
  - Inhalation injury (with or without accompanying cutaneous burn injury)
  - Burns accompanied by pre-existing medical conditions that can complicate management, prolong recovery or affect mortality
  - Burns accompanied by trauma, where burn injury poses the greatest risk of morbidity and mortality
  - Burns to children in hospitals without pediatric burn specialty services
  - Patients with special social, emotional or rehabilitative needs

I. INTRODUCTION/PURPOSE:

The initial evaluation, management and timely referral of burn injuries are critical components of modern burn injury management. The historical watch and wait approach to wound care that included twice daily dressing changes with mechanical debridement methods has been replaced with a more aggressive and individualized approach that includes early excision of devitalized tissue with application of less caustic antibiotic ointments, enzymatic debriding agents, and the use of biological skin replacements. The goals of modern methods of treatment include minimizing physical pain to the patients, decreasing the psychological and psychosocial trauma associated with frequent painful dressing changes, and ensuring a rapid return to pre-injury function and aesthetics.

A minor burn injury is defined by the American Burn Association (ABA) as a partial-thickness burn involving less than 10% Total Body Surface Area (TBSA). The recognition of the severity of a burn injury can be adversely affected by several other injury related factors. Additionally, other things that need to be considered are the physiological factors that include mechanism of injury, depth of burn, presence of inhalation injury, age, and the presence of comorbidities. For this reason, the determination of minor burn designation should be individualized and more clearly defined.

The American Burn Association (ABA) & American College of Surgeons Committee on Trauma developed Formal Referral Criteria to assist in the identification of patients that present the greatest risk/ challenge in management *(Attachment C)*. It is important to note that the formal criteria were developed to assist Non-Burn Center Hospitals in the triage of burns and therefore should not be primarily used for triage within the health network of a Burn Center Hospital. Although the ABA criteria identify 10% TBSA as the threshold for partial-thickness burn referral, many smaller partial thickness burn injuries involve areas of critical function or cosmetic, and therefore require burn center referral. Any patients that has burns to the hands, feet, face, or genitalia need to be referred to a burn center.

The purpose of this guideline is to provide a standard approach to the initial evaluation, management, and referral of minor burn injuries based on the guidelines and recommendations set forth by the ABA as well as the established standards of care defined by Suny Upstate Medical Hospital.

The Clark Burn Center at Suny Upstate Medical Hospital is a comprehensive program that includes inpatient and outpatient services that include emergent management of minor and major burn injuries in all age groups, state-of-the-art surgical management options, ongoing follow-up and specialized scar management options.

II. DEFINITIONS:

A. Minor Burn Injury

1. Burn Injury that includes ≤ 10% TBSA partial-thickness burns, in the absence of defined severity factors and in the presence of airway and hemodynamic stability. (A third degree burn of any size is considered significant and requires burn center referral.)
2. Location may influence the decision to refer a burn injury to the burn center. (ie. face, hands, feet, major joints, genitalia, and perineum.)

B. Severity Factors
    1. Factors that significantly increase potential severity of injury, morbidity and mortality, regardless of burn size or depth:
        a) Mechanism of injury:
            a. Electrical
            b. Chemical
            c. Presence of/ suspicion of Inhalation Injury

        b) Physiological Factors:
            a. Age (extremes of age are more likely to present with deeper burns)
            b. Comorbid disease history including but not limited to:
                Diabetes Mellitus, Cardiac Disease, Chronic Obstructive Pulmonary Disease, Peripheral Vascular Disease.

C. Depth of Burn Injury
    1. Defined by the level of anatomic destruction of the functioning layers of the skin
    2. Burn depth alone can guide transfer & referral decisions
    3. Deeper burns of moderate size that meet minor burn definition (<10% TBSA) may require fluid replacement

D. Extent of Burn Injury
    1. Defined in Total Body Surface Area (TBSA) involvement
    2. Specific methods for Pediatric and Adult estimation of TBSA *(Attachment D)*
        a. Rule of Nine
        b. Palmar Method
        c. Lund & Browder Method
    3. Guides transfer & referral decisions

III. SCOPE:

The following Emergency Department Guidelines and the subsequent management and Triage Criteria (*Attachment F*) have been established for use by the emergency department of Suny Upstate Medical Hospital to guide the initial evaluation, management and referral of pediatric and adult patients with minor burn injuries.

IV. DISPOSITION CRITERIA:

A. **Low Risk:**

Patients that meet Low Risk criteria can be evaluated and treated in the Emergency Department and do not warrant definitive referral or consultation with the Burn Service.

1. Superficial 2nd Degree Burns less than 1% that do not require ongoing burn wound re-evaluation or ongoing wound management and present minimal to no risk of complication or scarring.

2. 1st Degree burns that do not require pain control or intravenous re-hydration.

B. **Moderate Risk:**

Patients that meet Moderate Risk Criteria can be evaluated, treated and released by an Emergency Department Physician; however, communication with a Burn Service provider is recommended to determine management options and/or need for Burn Specialty evaluation and follow-up. If a patient meets Moderate Risk criteria and you would like to discuss with a burn provider, please see appendix A for communication options.

1. Any patient with a 2nd Degree Burn that requires wound re-evaluation or ongoing management of burn wounds that do not meet High Risk Criteria

2. Superficial 2nd Degree burns <5% TBSA that are not on the Face, Hands, Feet, Genitalia, Perineum or Involve Major Joints

    a) Take caution in Deep 2nd degree and indeterminate depth burn wounds due to the risk for wound conversion to full-thickness and infection.

C. **High Risk:**

Patients that meet High Risk Criteria should be referred for definitive Burn specialty evaluation and management. If a patient meets High Risk criteria and you would like to discuss with a burn provider, please see appendix A for communication options.

1. 3rd Degree burn of any size in any age

2. ≥ 5% TBSA 2nd degree burns in any age

3. 2nd Degree Burns to Face, Hands, Feet, Genitalia, Perineum or crossing major joint(s)

4. Circumferential or near circumferential burns of any extremity (regardless of depth)

5. High risk Mechanisms of Burn Injury
    a) Inhalation Injury
    b) Caustic Chemical Agents
    c) Electrical (Low voltage, High Voltage including Lightning Injury)

V. BURN MANAGEMENT GUIDELINES:

A. Cool the Burn

1. Remove the source of burning or additional source(s) of burning
    a. Jewelry or any metal objects that can retain heat

    b. Decontaminate for suspected chemical exposure (Follow institutional Decon/ Haz-Mat policy)
        - If powder chemical – Brush, then flush
        - If liquid, then flush with copious amounts of water
            - Flush for at least 15 min with luke-warm water

2. Avoid the use of ice to cool any burn
    - Cooling of burns is only effective when performed within the initial 2 minutes of injury or if the burning agent is present. Use luke warm water to cool the affected area.
    - Avoid secondary injury and minimize potential for wound conversion

3. Avoid use of cold saline or cold water soaked dressings on burns, however room temperature water is not contraindicated in cooling a minor burn (Venter, Karpelowsky, Rode, 2006)

4. **If history of fire in an enclosed space, suspect smoke inhalation – Upgrade to Trauma Alert

B. **Partial Thickness Burn Wounds (2nd Degree):**
   1. Definition:
      a. Destruction of epidermis and varying layers/ depth of the dermis

   2. Characteristics:
      a. Historically described as blistered or moist if blisters are removed
         a. Extremes of age may present with blistered wound that has deeper areas below the blister, therefore the presence of blister does not guarantee partial-thickness depth.

      b. Wound Coloration/Appearance:
         a. Wound bed coloration and appearance will vary according to the depth of dermis that is injured:
            i. Superficial partial-thickness burns typically present with varying stages of bullous blister. Once the blister is removed, the wound bed may be red or variations of pink
            ii. Deep partial-thickness burns may be pale pink, white, yellow or deep red and may present with or without blister

      c. Vascularity:
         a. Blanches with pressure
         b. May range from brisk to sluggish or absent depending on depth and coloration of the wound

      d. Pain:
         a. Superficial partial-thickness are very painful when exposed to air as well as to palpation
         b. Deep partial-thickness may be painful but pain is typically dull to minimal

      e. Prognosis:
         a. Blister removal is highly recommended to complete accurate wound assessment and to facilitate more rapid healing.
         b. Partial-thickness burn wounds that heal within 14 days typically have minimal risk for hypertrophic scarring, although mechanisms of injury such as grease have a higher probability for discoloration scarring.
         c. Deep partial-thickness burn wounds have a higher probability to result in scarring due to the depth of structural involvement and can

result in contracture and hypertrophic scarring if healing is delayed or if the wound becomes infected.

3. Recommended Treatment:
    a. Gently cleanse wound with Chlorhexadine soap and rinse thoroughly with tap water. If the wound is on the face or ears use a mild soft soap as the chlorhexidine can cause Ototoxicity leading to hearing loss that can be permanent.

    b. Apply Bacitracin Ointment and cover with non-adherent Xeroform or adaptic.
        a. Antibiotic Ointment is preferred on hands, feet and areas that may have increased exposure to bacteria/ increased risk of infection
        b. Wrap loosely with absorbent gauze dressing (Kerlix)

    c. The patient's tetanus immunization status should be evaluated and updated if appropriate. Should be within the past 5 years.

    d. Avoid use of Silver Sulfadiazene Cream 1% (Silvadene) in 2nd Degree burn wounds (Wasiak et al, 2010).
        a. The high concentration of silver delays wound healing and is likely to be ineffective or harmful in the treatment of partial-thickness burns.
        b. Wounds treated with Silvadene also develop a thick layer of pseudoeschar that obscures future wound bed evaluation.

    e. Routine administration of prophylactic antibiotics does not protect against cellulitis and their use is not recommended (ABA chapter 2, 2001).

C. **Full Thickness Burn Wounds (3rd Degree):**

1. Definition:
    a. Complete destruction of epidermis, dermis and may extend though subcutaneous tissue into fat and muscle.
    b. Full-thickness burn wounds may present with accompanying blister, specifically, in the extremes of age.

2. Characteristics:
    a. Wound Coloration/ Appearance:
        a. Charred, white to tan or black
        b. Dry, leathery or waxy texture/ feel

    b. Vascularity:
        a. Since vascular bed is destroyed, Full-thickness burn wounds do not blanch due to complete destruction of cutaneous vascular supply.

    c. Pain:
        a. Insensate, however may have deep pressure sensation
        b. Minimal to no pain, unless infection/ cellulitis is present

d. Prognosis:
    a. Full thickness burn wounds require surgical management with excision and skin grafting. Full-thickness burn wounds present multiple complications that result in the potential for extensive scarring, especially when located in areas of high tension and movement such as fingers, joints, axilla and neck.

3. Recommended Treatment:

a. Referral to Burn Center for further evaluation and treatment
b. The patient's tetanus immunization status should be evaluated and updated if appropriate
c. Full-thickness/ 3rd degree burns require excision and skin grafting to heal
d. Routine administration of prophylactic antibiotics does not protect against cellulitis and their use is not recommended

VI. EVALUATION:

Due to the individualized response to burn injury, individual outcomes will be defined by the clinician treating the patient and should be determined by the individual patient response to therapy.

VII. ATTACHMENTS:

A. Attachment A: Emergency Department Communication Options for Burn Patients
B. Attachment B: Operating Hours of the Outpatient Burn Center
C. Attachment C: ABA/ACS Burn Center Referral Criteria
D. Attachment D: Burn Wound Extent Diagrams
E. Attachment E: Burn Center Triage Criteria for Minor Burn Injuries
F. Attachment F: Fluid Resuscitation for Burn Patients in the Emergency Department with 20% or greater TBSA (Adult/Pediatric)
G. DVT/VTE Scoring & Risk Level
H. Guidelines for Management and Prevention of Delirium in Geriatric Burn Patients
I. Operational Guidelines: Universal Precautions (personal protective equipment (PPE) Guidelines

VIII. ADDITIONAL RESOURCES:

- Upstate Burn/Trauma Code Alert Criteria
- Guidelines for Management and Prevention of Delirium in Geriatric Burn Patients
- Operational Guidelines: Universal Precautions (personal protective equipment (ppe) guideline

Attachment A: Emergency Department communication options regarding burn patients

If a patient meets Moderate Risk criteria and you would like to discuss with a burn provider, options for communication are: Call the Upstate Burn Transfer Center (24-hr Burn Attending availability): 866 464-5449

Attachment B: Operating Hours Outpatient Burn Recovery Center

Outpatient Burn Recovery Center

750 East Adams Street

Syracuse, New York
13201
Phone: 315-464-1800
Fax:

Hours:

All Patients MUST Call for an Appointment

Helpful Information when calling the Outpatient Burn Center:

- Demographics: Name, Age, DOB, MR#
- HPI: Date of Injury, circumstances & mechanism of injury, burn size, location & depth
- Pt. Contact information (Home / Cell #)
- What was done to treat burn in ED

Attachment C: Burn Center Referral Criteria

1. Partial thickness burns greater than 10% TBSA.

2. Burns involving the face, hands, feet, genitalia, perineum, or major joints.

3. Third degree burns in any age group.

4. Electrical burns, including lightning injury.

5. Chemical burns.

6. Inhalation injury.

7. Burn injury in patients with preexisting medical disorders that could complicate management, prolong recovery, or affect mortality.

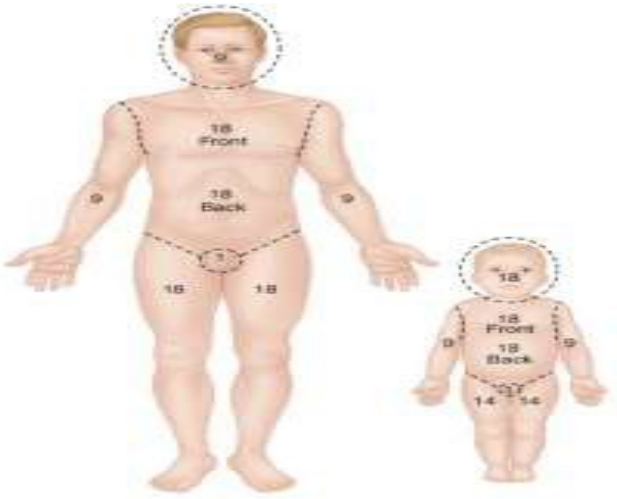
8. Any patient with burns and concomitant trauma (such as fractures) in which the burn injury poses the greatest risk of morbidity or mortality. In such cases, if the trauma poses the greater immediate risk, the patient may be initially stabilized in a trauma center before being transferred to a burn unit. Physician judgment will be necessary in such situations and should be in concert with the regional medical control plan and triage protocols.

9. Burned children in hospitals without qualified personnel or equipment for the care of children.

10. Burn injury in patients who will require special social, emotional, or rehabilitative intervention.

Attachment D: Evaluation of Extent of Burn Injury:

1. **Rule of Nine: Adult/ Pediatric:**



2. **Palmar Method**
   a. The palmar surface of a patient's hand, including fingers = 1% TBSA

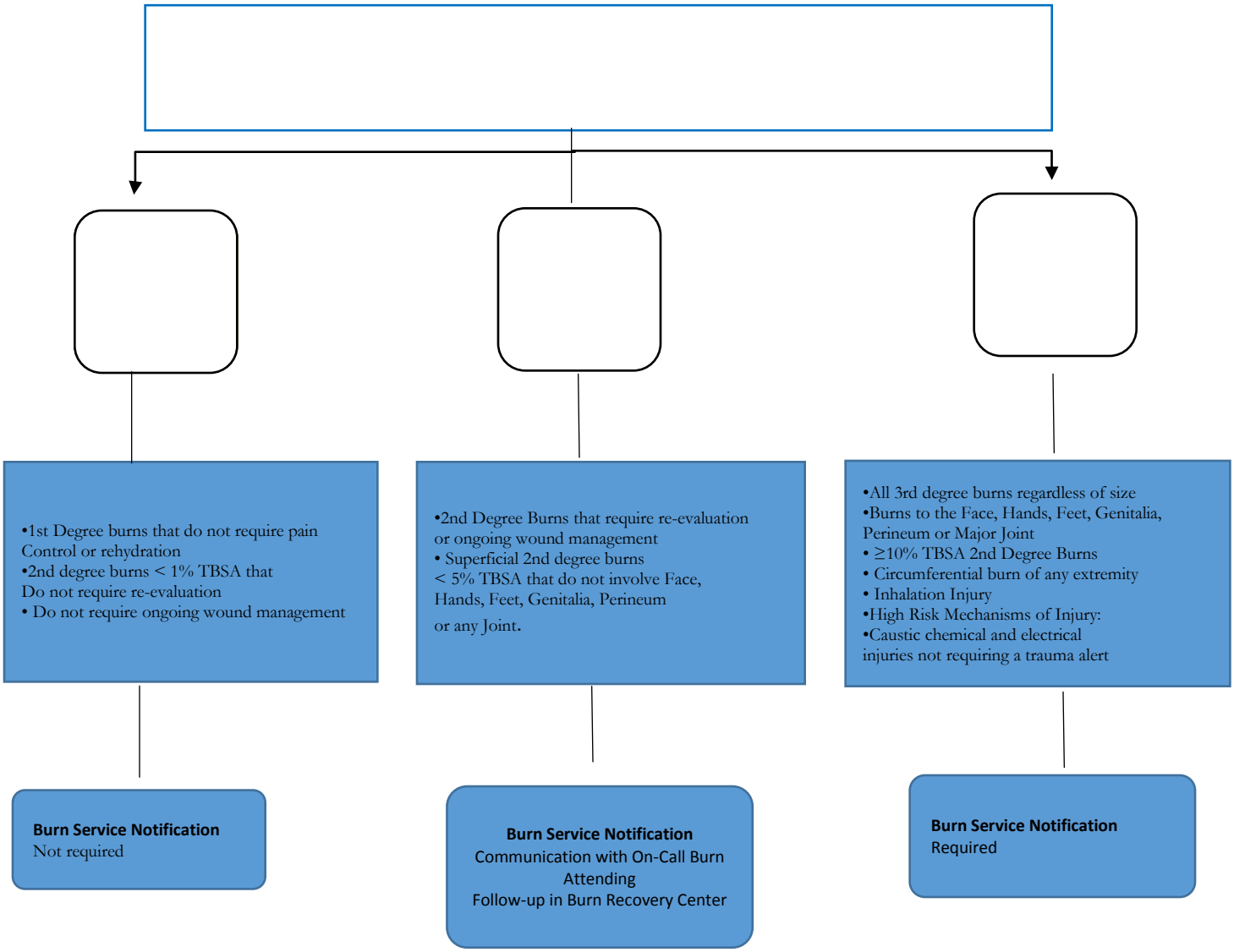
3. **Lund & Browder Method:**

Lund and Browder

Area	Age – Years					% 2°	% 3°	% Total
	0–1	1–4	5–9	10–15	Adult			
Head	19	17	13	10	7			
Neck	2	2	2	2	2			
Ant. Trunk	13	13	13	13	13			
Pos. Trunk	13	13	13	13	13			
Right Buttock	2 ½	2 ½	2 ½	2 ½	2 ½			
Left Buttock	2 ½	2 ½	2 ½	2 ½	2 ½			
Genitalia	1	1	1	1	1			
Right Upper Arm	4	4	4	4	4			
Left Upper Arm	4	4	4	4	4			
Right Lower Arm	3	3	3	3	3			
Left Lower Arm	3	3	3	3	3			
Right Hand	2 ½	2 ½	2 ½	2 ½	2 ½			
Left Hand	2 ½	2 ½	2 ½	2 ½	2 ½			
Right Thigh	5 ½	6 ½	8 ½	8 ½	9			
Left Thigh	5 ½	6 ½	8 ½	8 ½	9			
Right Leg	5	5	5 ½	6	7			
Left Leg	5	5	5 ½	6	7			
Right Foot	3 ½	3 ½	3 ½	3 ½	3 ½			
Left Foot	3 ½	3 ½	3 ½	3 ½	3 ½			
				TOTAL				

Attachment E: Regional Burn Center Criteria for Minor Burn Injuries

Regional Burn Center Criteria for Minor Burn Injuries



Attachment F: OPERATIONAL GUIDELINES: Fluid Resuscitation for Burn Patients in Emergency Department Adults/Pediatrics

OBJECTIVE:

Provide guidelines describing the appropriate fluid resuscitation for the adult and pediatric burn patients in the Emergency Department.

GUIDELINES:

All trauma cases – including patients with burn injuries – should be treated by initially following the guidelines for Advanced Trauma Life Support (ATLS) to ensure that life-threatening injuries are addressed immediately. ABCDs first! After addressing the ABCDs of life support, focus turns to burn injuries. Fluid replacement is crucial in the first 24 hours.

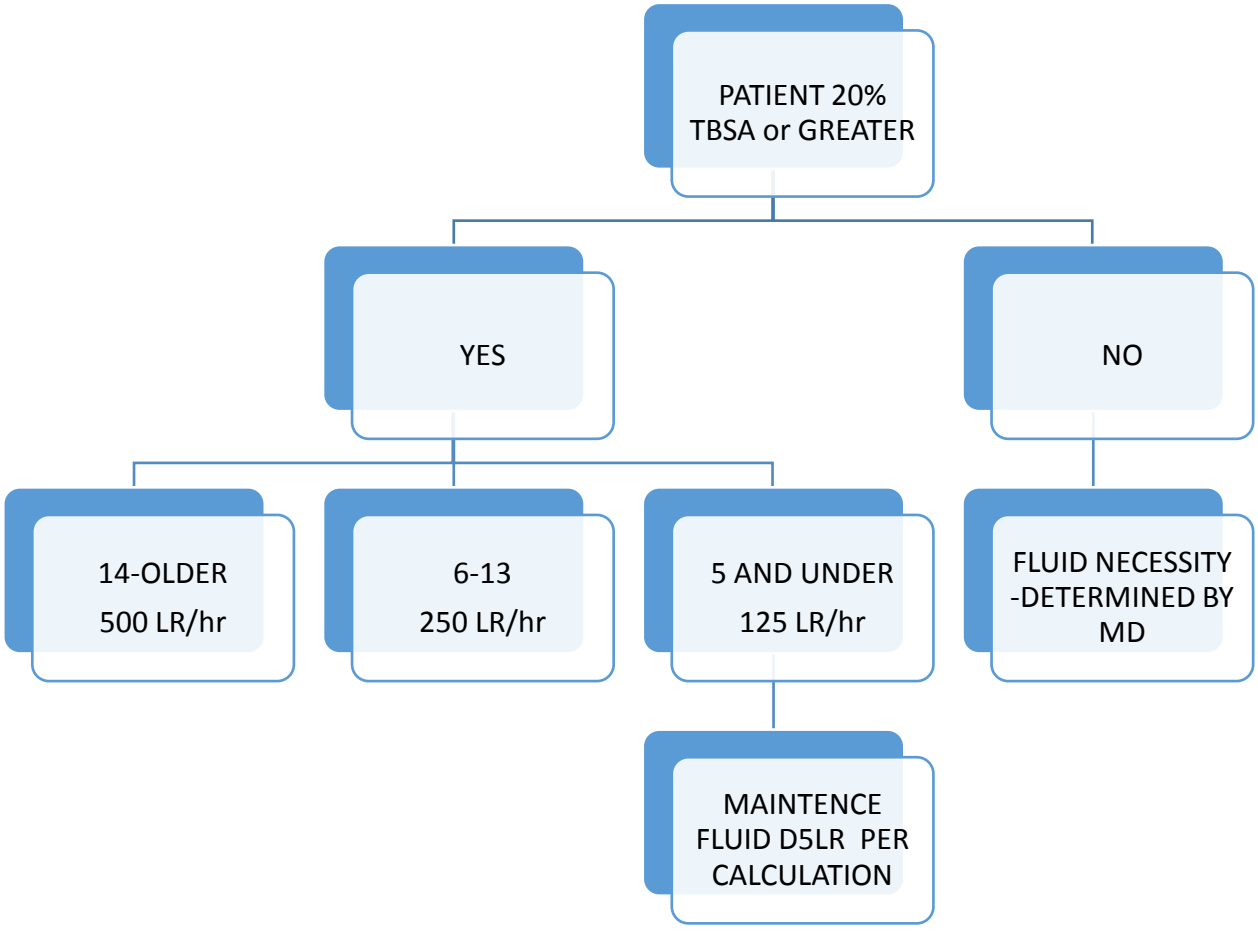
Patients who will need fluid resuscitation are those who have greater than 20% TBSA. First degree burns DO NOT count as part of the burn calculation.
DO NOT bolus patient unless suspected trauma. Instead increase fluids by 1/3.
Do not administer Diprivan during resuscitation phase.

Procedure:

1. Patients who arrive to the ED will be assessed rapidly for an accurate TBSA.
2. Adult patients 14-older with 20% or greater TBSA will receive **500 LR/hr**
3. Children age 6-13 with 20% or greater will receive **250 LR/hr**
4. 5 years old and younger with 20% or greater will receive **125 LR/hr**
5. Children under the age of 5 will also receive D5LR maintenance fluid
    a. **4ml/hour for each kg up to 10 kg**
    b. **2ml/hour for each kg from 11-20 kg**
    c. **1 ml/hour for each kg > 20kg**

6. Fluids should be adjusted to UOP.
    a. Adults and older children (≥ 14 years old) 0.5 ml / kg / hour (30-50 ml / hour)
    b. Children (<14 years old) 1 ml / kg / hour
    c. Electrical injuries regardless of age 75-100 ml/hr

Patient with Greater Than 20% TBSA Fluid Resuscitation Algorithm for Emergency Department



Attachment G: DVT/VTE Scoring & Risk Level

FAST FACTS About….
DVT/VTE Scoring & Risk Level

Why is education being requested? In providing outstanding care to our patients at an increased risk for DVT, it is important to ensure that RNs caring for these patients have an understanding of the physicians screening assessment. Quality patient education is essential in meeting the educational needs of patients and their caregivers. Opportunities to confirm that education given to the patient/caregiver was understood with verbal understanding and return demonstration.
Policy: CM D-07 Venous Thromboembolism (VTE) Prevention
Education Dates: August 1-August 30, 2016
Education Time: 10 minutes
Date Changes will go into effect: June 30, 2016
Intended Audience: All Downtown and Community campus adult inpatient RNs who provide patient and caregiver education related to DVT/VTE patient risk, treatment and prophylactic measures. Excluded OR/PACU, Emergency Department, Family Birth Center???, Pediatric Units, Psychiatric Units??
Contact Information: Kelly Czarnecki, Trauma Service; Mary O'Leary, Clinical Educator
Oracle Tracker Code: TBA

Fast Facts

DVT/VTE Screening
Assessment
Completed by physicians during admission of all adult patients (> 18 years) Risk factors for DVT/VTE include
Reassessments can occur throughout patient's hospital stay

Risk Factors & Scoring
Categories of risk factors
Current, recent, past diagnosis (examples)
- MI
- Abnormal pulmonary function tests
- Varicose veins
- Stroke
- Hip/pelvic fracture
- Multiple trauma

Surgical risk factors (examples)
- Major surgery
- Minor surgery (planned)

Age
- 41- 60 years
- 60-74 years
- **>** 75 years

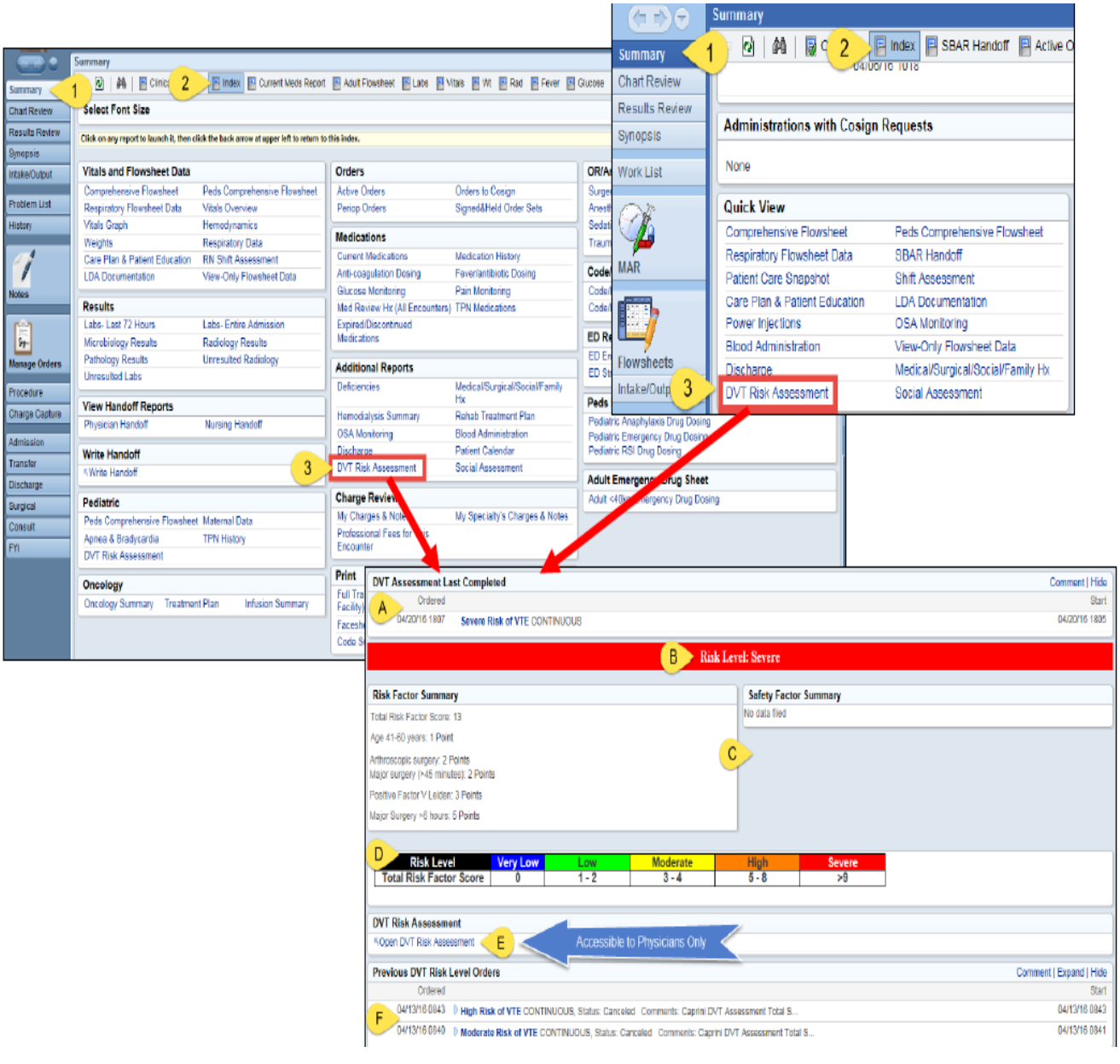
BMI
Female (examples)
- Oral contraceptives/hormones therapy
- History unexplained stillborn infant, recurrent spontaneous abortion

Other factors (examples)
- Medical patient currently on bedrest
- Central venous access

Accessing Summary
1. Open patient chart & go to Summary activity.

2. Select Index at top.
3. In Quick View or Additional Reports section, select DVT Risk Assessment
4. DVT Risk Assessment report opens

A. Date/Time of Last DVT Assessment
B. Current Risk Level
C. Summary of Pertinent Risk & Safety Factors
D. Risk Factor Score Scale for Reference
E. Hyperlink to DVT Assessment form (accessible only to physicians)
F. Previous DVT Risk Level Orders



Inpatient Clinicians

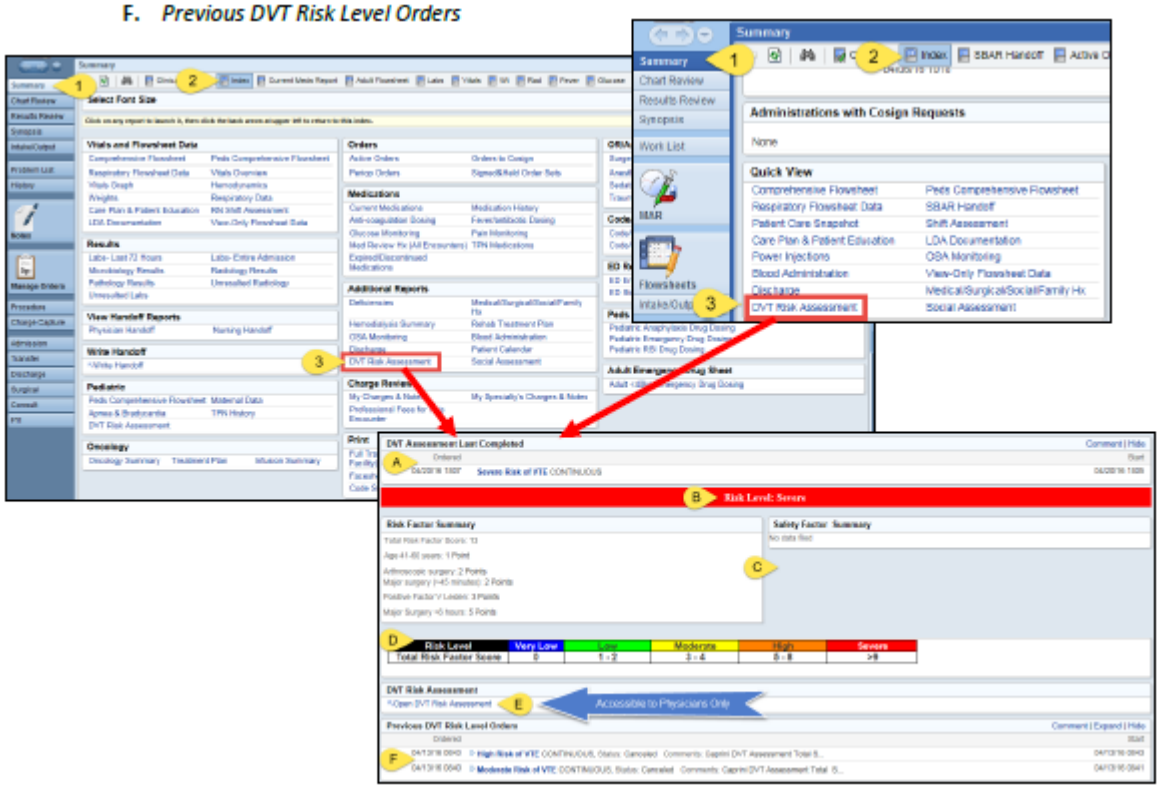
DVT Risk Assessment Report

Overview of Feature/Changes

The DVT/VTE Screening Assessment is completed by physicians during admission. Additionally, reassessments can occur throughout the patient's hospital stay. As an inpatient clinician, you may want to review the results of the DVT/VTE Screening. To do so, use the Index Report available via the Summary activity within the patient chart.

Index Report via Summary

1. Open the patient chart and go to the Summary activity.
2. Select Index at the top.
3. Next, in the Quick View -or- Additional Reports section, select DVT Risk Assessment.
4. The DVT Risk Assessment report opens.
   - A. *Date/Time of Last DVT Assessment*
   - B. *Current Risk Level*
   - C. *Summary of Pertinent Risk and Safety Factors*
   - D. *Risk Factor Score Scale for Reference*
   - E. *Hyperlink to the DVT Assessment form (Note: accessible to physicians only)*
   - F. *Previous DVT Risk Level Orders*



DVT Risk Assessment Report Upstate System Update Bulletin / Created: 04/21/2016 JAC / Revised: 04/21/2016 JAC

ADDITIONAL RESOURCES:

Trauma/Burn Code Activation Criteria
http://www.upstate.edu/surgery/pdf/healthcare/trauma/cm_t-28-trauma_code_criteria_final.pdf

Guidelines for Management and Prevention of Delirium in Geriatric Burn Patients:
http://www.upstate.edu/surgery/pdf/healthcare/trauma/geriatric-guidelines-for-management-and-prevention-of-deli.pdf

Operational Guidelines: Universal Precautions (personal protective equipment (ppe) guideline

http://www.upstate.edu/policies/documents/intra/EHS_P-02.pdf

1. ALL PATIENTS ARE ASSUMED TO HAVE BLOOD AND BODILY FLUID INFECTIONS THAT ARE TRANSMISSIBLE.

2. PPEs consist of: a. Impervious gown covering the exposed clothing and arms of the health care provider.
b. Gloves.
c. Goggles to provide eye protection. Corrective eyeglasses may be used if they have “lateral shields” to prevent exposure from splashes.
d. Booties to cover footwear.

3. Masks are to be worn when working on open wounds.

4. PPE will be used during every Level 1 & 2 Trauma Codes. PPE will be utilized by all members of the trauma team that is inside the box. All providers who are not wearing PPE should stay outside of the box.

5. If a needle stick or exposure to the patient’s bodily fluid occurs, see Management of Employee Exposure to Communicable Diseases

http://www.upstate.edu/policies/documents/intra/IC_E-01.pdf

It is key to remember that protective isolation is worn to protect the burn patient.

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