

# **Comprehensive Classification System for Visible Intentional and Unintentional Acute Injuries**

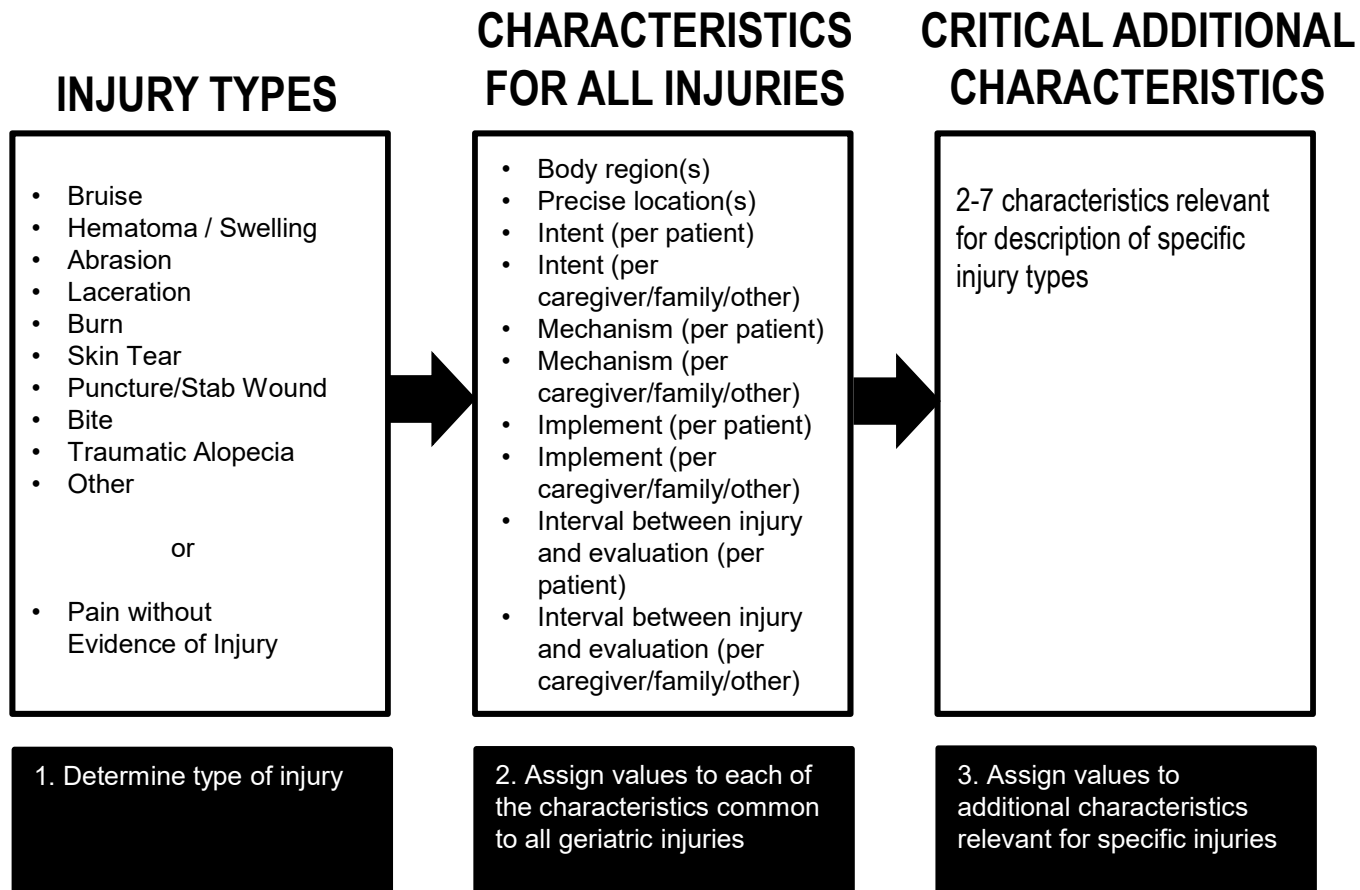
**Taxonomy for Research and Practice**

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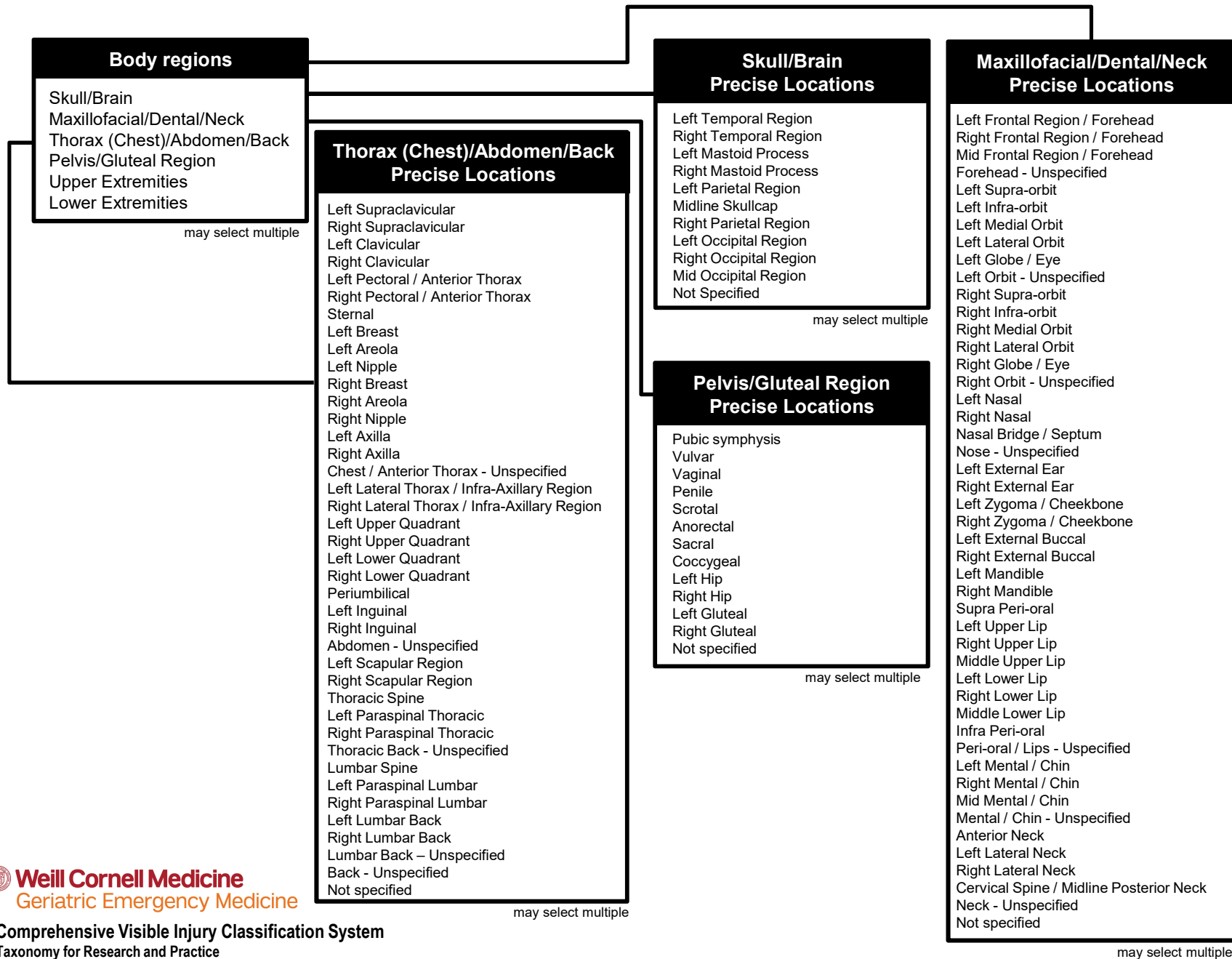
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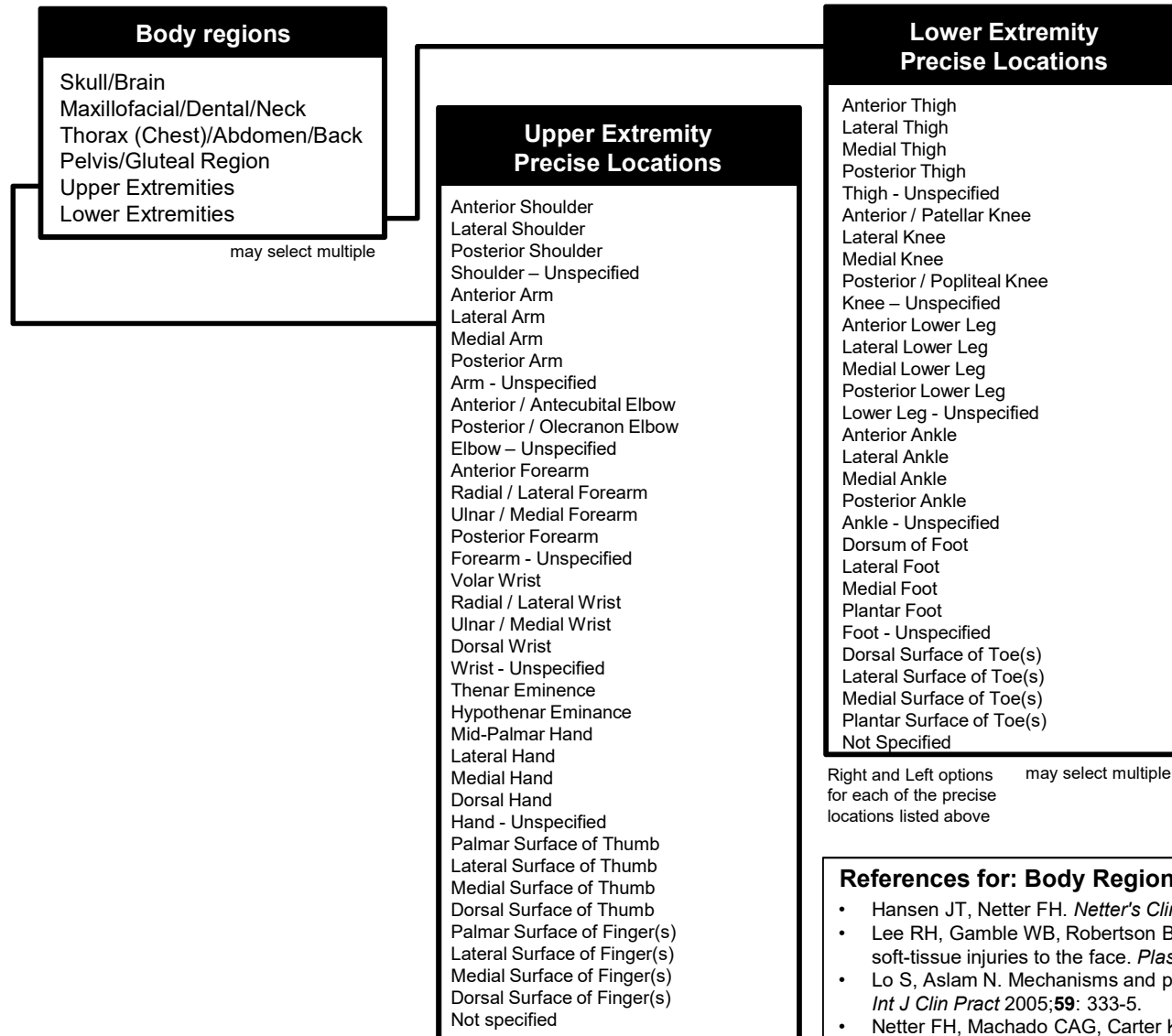
# OVERVIEW OF 3-STEP CLASSIFICATION PROCESS



# CHARACTERISTICS FOR ALL INJURIES (details for Body Regions and Precise Locations)



# CHARACTERISTICS FOR ALL INJURIES (details for Body Regions and Precise Locations, ctd)



**Body regions**

- Skull/Brain
- Maxillofacial/Dental/Neck
- Thorax (Chest)/Abdomen/Back
- Pelvis/Gluteal Region
- Upper Extremities
- Lower Extremities

may select multiple

**Upper Extremity Precise Locations**

- Anterior Shoulder
- Lateral Shoulder
- Posterior Shoulder
- Shoulder – Unspecified
- Anterior Arm
- Lateral Arm
- Medial Arm
- Posterior Arm
- Arm - Unspecified
- Anterior / Antecubital Elbow
- Posterior / Olecranon Elbow
- Elbow – Unspecified
- Anterior Forearm
- Radial / Lateral Forearm
- Ulnar / Medial Forearm
- Posterior Forearm
- Forearm - Unspecified
- Volar Wrist
- Radial / Lateral Wrist
- Ulnar / Medial Wrist
- Dorsal Wrist
- Wrist - Unspecified
- Thenar Eminence
- Hypothenar Eminence
- Mid-Palmar Hand
- Lateral Hand
- Medial Hand
- Dorsal Hand
- Hand - Unspecified
- Palmar Surface of Thumb
- Lateral Surface of Thumb
- Medial Surface of Thumb
- Dorsal Surface of Thumb
- Palmar Surface of Finger(s)
- Lateral Surface of Finger(s)
- Medial Surface of Finger(s)
- Dorsal Surface of Finger(s)
- Not specified

Right and Left options may select multiple for each of the precise locations listed above

**Lower Extremity Precise Locations**

- Anterior Thigh
- Lateral Thigh
- Medial Thigh
- Posterior Thigh
- Thigh - Unspecified
- Anterior / Patellar Knee
- Lateral Knee
- Medial Knee
- Posterior / Popliteal Knee
- Knee – Unspecified
- Anterior Lower Leg
- Lateral Lower Leg
- Medial Lower Leg
- Posterior Lower Leg
- Lower Leg - Unspecified
- Anterior Ankle
- Lateral Ankle
- Medial Ankle
- Posterior Ankle
- Ankle - Unspecified
- Dorsum of Foot
- Lateral Foot
- Medial Foot
- Plantar Foot
- Foot - Unspecified
- Dorsal Surface of Toe(s)
- Lateral Surface of Toe(s)
- Medial Surface of Toe(s)
- Plantar Surface of Toe(s)
- Not Specified

Right and Left options may select multiple for each of the precise locations listed above

**References for: Body Regions, Precise Locations**

- Hansen JT, Netter FH. *Netter's Clinical Anatomy*. Philadelphia: Saunders/Elsevier; 2010.
- Lee RH, Gamble WB, Robertson B, Manson PN. The MCFONTZL classification system for soft-tissue injuries to the face. *Plast Reconstr Surg* 1999;**103**: 1150-7.
- Lo S, Aslam N. Mechanisms and pattern of facial lacerations in the Accident Department. *Int J Clin Pract* 2005;**59**: 333-5.
- Netter FH, Machado CAG, Carter K. *Netter's Atlas of the Human Body*. Hauppauge, NY: Barron's Educational Series, Incorporated; 2005.
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- Shepherd JP, Al-Kotany MY, Subadan C, Scully C. Assault and facial soft tissue injuries. *Br J Plast Surg* 1987;**40**: 614-9.

# CHARACTERISTICS FOR ALL INJURIES (details for Intents, Mechanisms, Implements, Time Interval)

Intents
Intentional injury / assault
Unintentional Injury
Intentional self-harm
Legal intervention
Unknown

may select multiple

Mechanisms
Blunt assault with hand/fist
Blunt assault with foot/knee
Blunt assault with other body part
Blunt assault with object
Push/shove, fall during altercation
Strangulation/suffocation
Grab/twist/pinch
Bite (human)
Penetrating assault with object
Using body weight / sitting on victim
Pulling hair
Rape / sexual assault
Fall from standing / sitting
Fall from height
Motor vehicle collision - occupant
Pedestrian struck by motor vehicle
Bicyclist struck by motor vehicle
Poisoning
Fire/Burn
Suffocation
Drowning
Bite / sting by animal
Jump from height
Other
Unknown

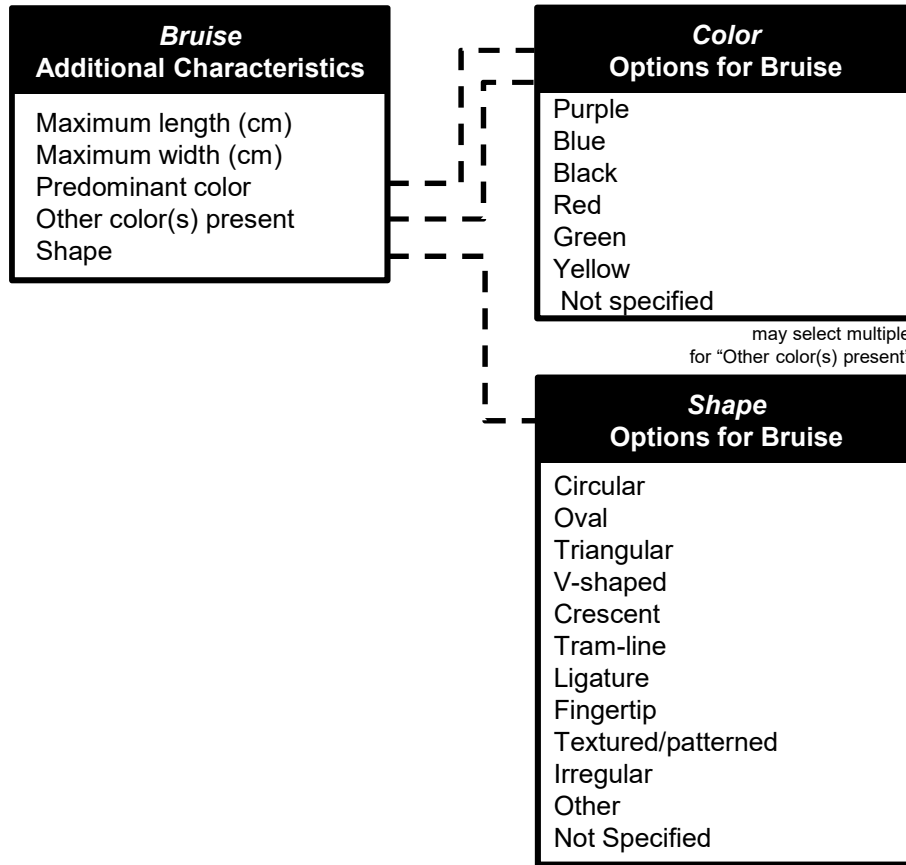
may select multiple

Implements
Closed fist
Open hand
Feet
Knees
Other body part
Body weight
Handgun
Rifle
Knife
Piece of furniture
Cane
Baseball bat
Bottle
Telephone
Kitchen utensils
Broomstick
Rope
Other household object
Other object
Unknown

may select multiple

Time Interval between Injury and Evaluation
<1 Day
1 Day
2 Days
3 Days
4 Days
5 Days
6 Days
7-14 Days
15-29 Days
1-2 Months
3-6 Months
7-12 Months
>1 Year
Unknown

# CRITICAL ADDITIONAL CHARACTERISTICS FOR SPECIFIC INJURY TYPES



**References for: Bruises**

- Carpenter RF. The prevalence and distribution of bruising in babies. *Arch Dis Child* 1999;**80**: 363-6.
- Dunstan FD, Guildea ZE, Kontos K, Kemp AM, Sibert JR. A scoring system for bruise patterns: a tool for identifying abuse. *Arch Dis Child* 2002;**86**: 330-3.
- Kaczor K, Pierce MC, Makoroff K, Corey TS. Bruising and physical child abuse. *Clin Pediatr Emerg Med.* 2006;**7**(3):153-60.
- Lecomte MM, Holmes T, Kay DP, Simons JL, Vintiner SK. The use of photographs to record variation in bruising response in humans. *Forensic Sci Int* 2013;**231**: 213-8.
- Madea B. *Handbook of Forensic Medicine.* 1st ed. Chichester: Wiley Blackwell; 2014.
- Maguire S, Mann M. Systematic reviews of bruising in relation to child abuse-what have we learnt: an overview of review updates. *Evid Based Child Health* 2013;**8**: 255-63.
- Maguire S, Mann MK, Sibert J, Kemp A. Are there patterns of bruising in childhood which are diagnostic or suggestive of abuse? A systematic review. *Arch Dis Child* 2005;**90**: 182-6.
- Payne-James J, McGover C, Jones R, Karch SB, Manlove J. *Simpson's Forensic Medicine.* 13th ed. London: Hodder Arnold; 2011.
- Mosqueda L, Burnight K, Liao S. The life cycle of bruises in older adults. *J Am Geriatr Soc* 2005;**53**: 1339-43.
- Wiglesworth A, Austin R, Corona M, et al. Bruising as a marker of physical elder abuse. *J Am Geriatr Soc* 2009;**57**: 1191-6.

**Definitions for selected Bruise: Shapes**

- **Tram-line:** pattern characterized by parallel linear bruises with regions of sparing between them -- created when a relatively light object impacts the skin surface rapidly
- **Ligature:** mark usually encircling the neck in a horizontal plane often overlying the larynx or upper trachea – may also appear surrounding wrists or ankles
- **Fingertip:** bruises from a continually or forcefully applied grip are often relatively round and may coincide with 2 to 4 fingertips -- thumb bruise may also be noted on the opposite side

# CRITICAL ADDITIONAL CHARACTERISTICS FOR SPECIFIC INJURY TYPES

## **Soft Tissue Swelling** **Additional Characteristics**

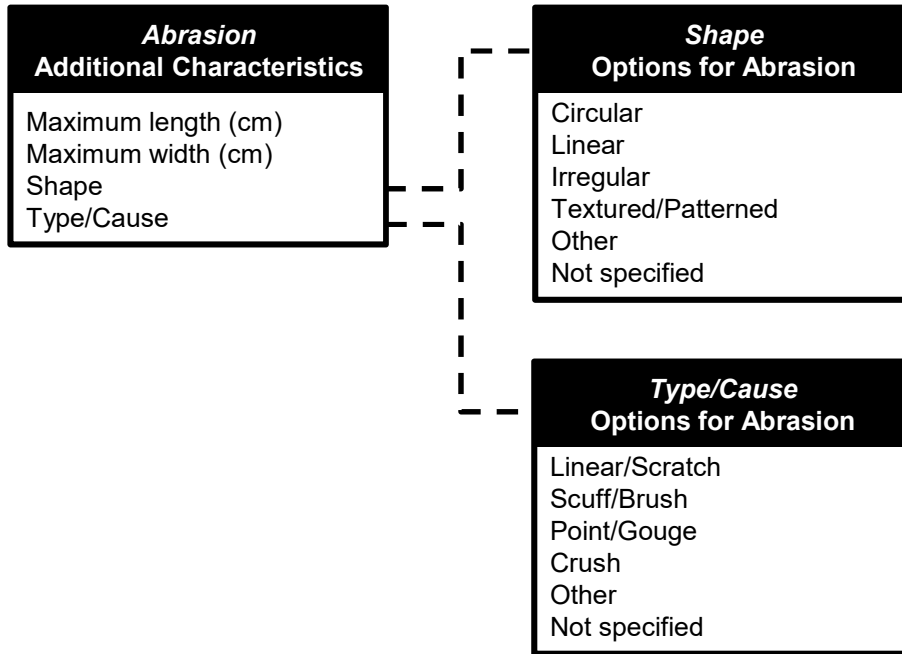
Maximum length (cm)  
Maximum width (cm)

### **References for: Soft Tissue Swelling**

- Kellogg ND, American Academy of Pediatrics Committee on Child Abuse and Neglect. Evaluation of suspected child physical abuse. *Pediatrics* 2007;119: 1232-41.
- Payne-James J, McGover C, Jones R, Karch SB, Manlove J. *Simpson's Forensic Medicine*. 13th ed. London: Hodder Arnold; 2011.
- Sheridan DJ, Nash KR. Acute injury patterns of intimate partner violence victims. *Trauma Violence Abuse* 2007;8: 281-9.



# CRITICAL ADDITIONAL CHARACTERISTICS FOR SPECIFIC INJURY TYPES



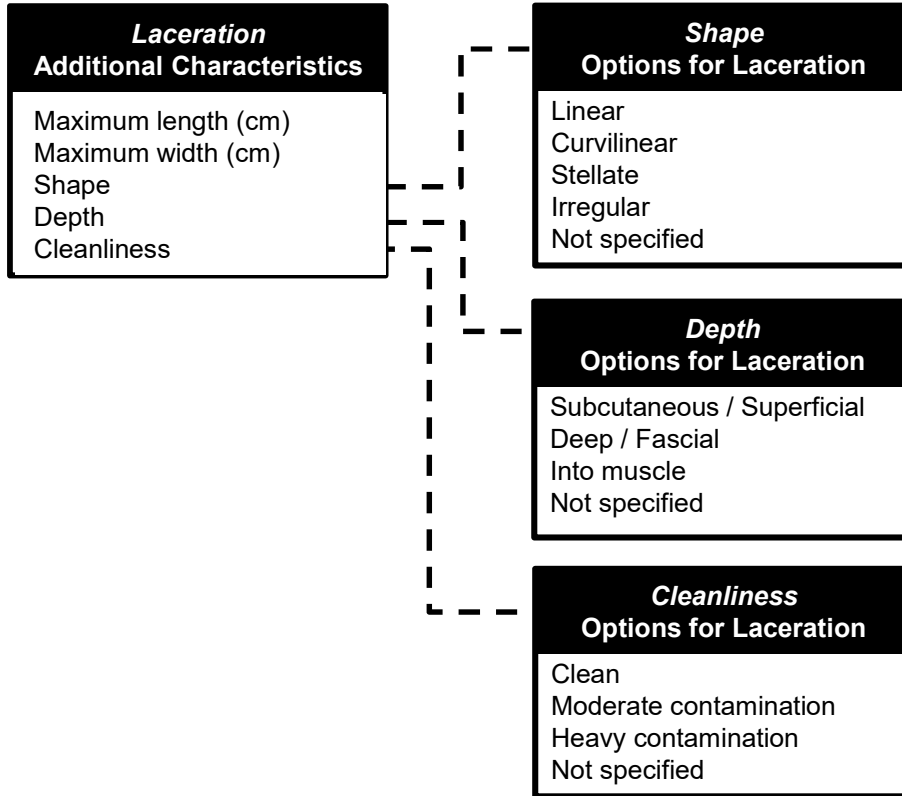
**References for: Abrasions**

- DiMaio VJM, DiMaio DJ. *Forensic Pathology*. 2nd ed. Boca Raton, FL: CRC Press; 2001.
- Madea B. *Handbook of Forensic Medicine*. 1st ed. Chichester: Wiley Blackwell; 2014.
- Payne-James J, McGover C, Jones R, Karch SB, Manlove J. *Simpson's Forensic Medicine*. 13th ed. London: Hodder Arnold; 2011.
- Reddy K, Lowenstein EJ. Forensics in dermatology: part I. *J Am Acad Dermatol* 2011;**64**: 801-8.
- Saukko PJ, Knight B. *Knight's Forensic Pathology*. 4th ed. Boca Raton, FL: CRC Press; 2015.

**Definitions for selected Abrasion: Types/Causes**

- **Scuff/Brush**: lateral rubbing action scrapes off the superficial layers of the skin
- **Crush**: injuring object may be reflected by the shape of the skin injury, so that the patterned abrasion can be regarded as an imprint of the causative object, often depicting edges or protruding parts

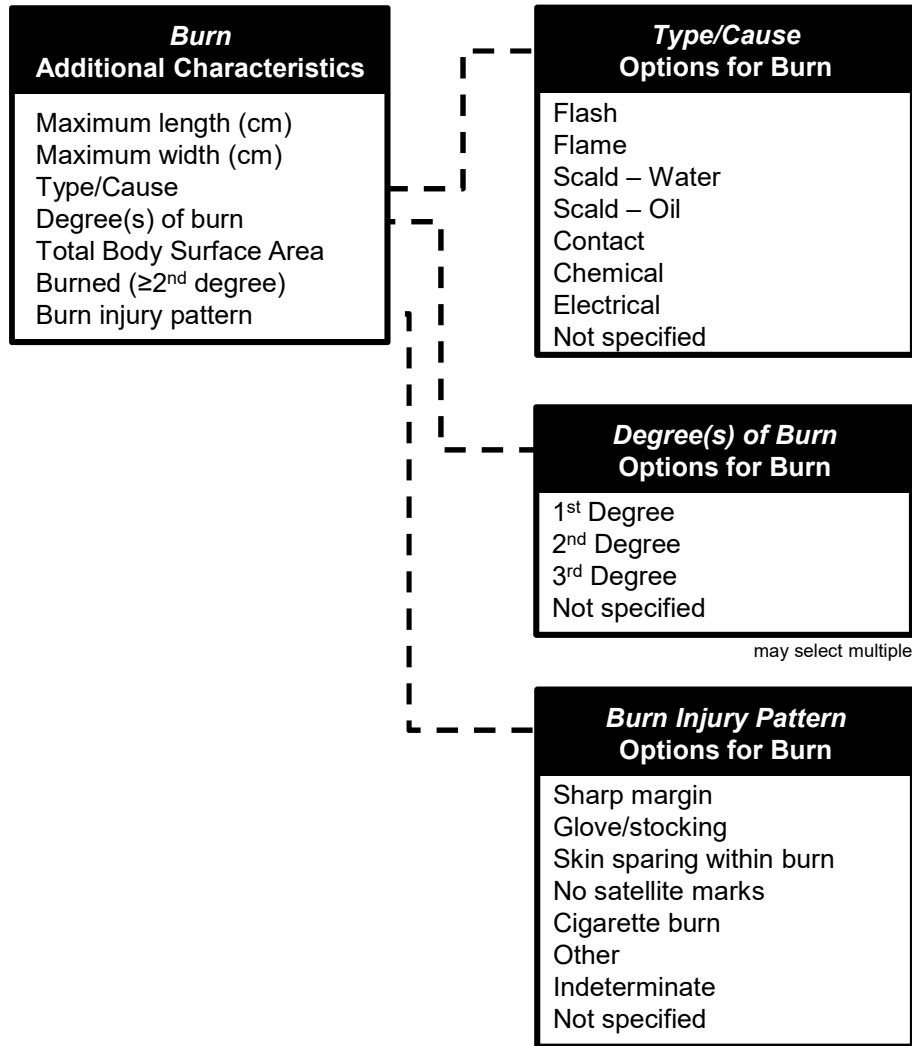
# CRITICAL ADDITIONAL CHARACTERISTICS FOR SPECIFIC INJURY TYPES



**References for: Lacerations**

- DiMaio VJM, DiMaio DJ. *Forensic Pathology*. 2nd ed. Boca Raton, FL: CRC Press; 2001.
- Lee RH, Gamble WB, Robertson B, Manson PN. The MCFONTZL classification system for soft-tissue injuries to the face. *Plast Reconstr Surg* 1999;**103**: 1150-7.
- Lo S, Aslam N. Mechanisms and pattern of facial lacerations in the Accident Department. *Int J Clin Pract* 2005;**59**: 333-5.
- Madea B. *Handbook of Forensic Medicine*. 1st ed. Chichester: Wiley Blackwell; 2014.
- Payne-James J, McGover C, Jones R, Karch SB, Manlove J. *Simpson's Forensic Medicine*. 13th ed. London: Hodder Arnold; 2011.
- Saukko PJ, Knight B. *Knight's Forensic Pathology*. 4th ed. Boca Raton, FL: CRC Press; 2015.

# CRITICAL ADDITIONAL CHARACTERISTICS FOR SPECIFIC INJURY TYPES



**References for: Burns**

- DiMaio VJM, DiMaio DJ. *Forensic Pathology*. 2nd ed. Boca Raton, FL: CRC Press; 2001.
- Greenbaum AR, Donne J, Wilson D, Dunn KW. Intentional burn injury: an evidence-based, clinical and forensic review. *Burns* 2004;**30**: 628-42.
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- Madea B. *Handbook of Forensic Medicine*. 1st ed. Chichester: Wiley Blackwell; 2014.
- Payne-James J, McGover C, Jones R, Karch SB, Manlove J. *Simpson's Forensic Medicine*. 13th ed. London: Hodder Arnold; 2011
- Reddy K, Lowenstein EJ. Forensics in dermatology: part II. *J Am Acad Dermatol*. 2011;**64**(5):811-24.
- Saukko PJ, Knight B. *Knight's Forensic Pathology*. 4th ed. Boca Raton, FL: CRC Press; 2015.

**Definitions for selected Burn: Types/Causes**

- **Flash:** caused by the sudden ignition or explosion of gases, petrochemicals or fine particulate material
- **Flame:** actual contact of body and flame, with scorching of the skin progressing to charring
- **Contact:** physical contact between the body and a hot object

**Definitions for selected Burn: Injury Patterns**

- **Glove/stocking:** burn on hands and/or feet with sharp line of demarcation giving the appearance of gloves or stockings occurring when feet or hands are held in the water
- **Skin sparing within burn:** presence of spared areas within areas of burn and sharp demarcations between burned and un-burned skin (such as in joint flexion surfaces)
- **Cigarette burn:** characteristically appear as circular lesions 8mm to 10mm in diameter with a central crater surrounded by a rolled margin

# CRITICAL ADDITIONAL CHARACTERISTICS FOR SPECIFIC INJURY TYPES

**Skin Tear  
Additional Characteristics**

Maximum length (cm)  
Maximum width (cm)  
Flap tissue loss  
Flap color

**Flap Tissue Loss  
Options for Skin Tear**

No skin loss  
Partial flap loss  
Total flap loss  
Not specified

This is the ISTAP Skin Tear Classification System from:  
LeBlanc K, Baranoski S, Christensen D, et al. International Skin Tear Advisory Panel: a tool kit to aid in the prevention, assessment, and treatment of skin tears using a Simplified Classification System. *Adv Skin Wound Care* 2013;26:459-76.

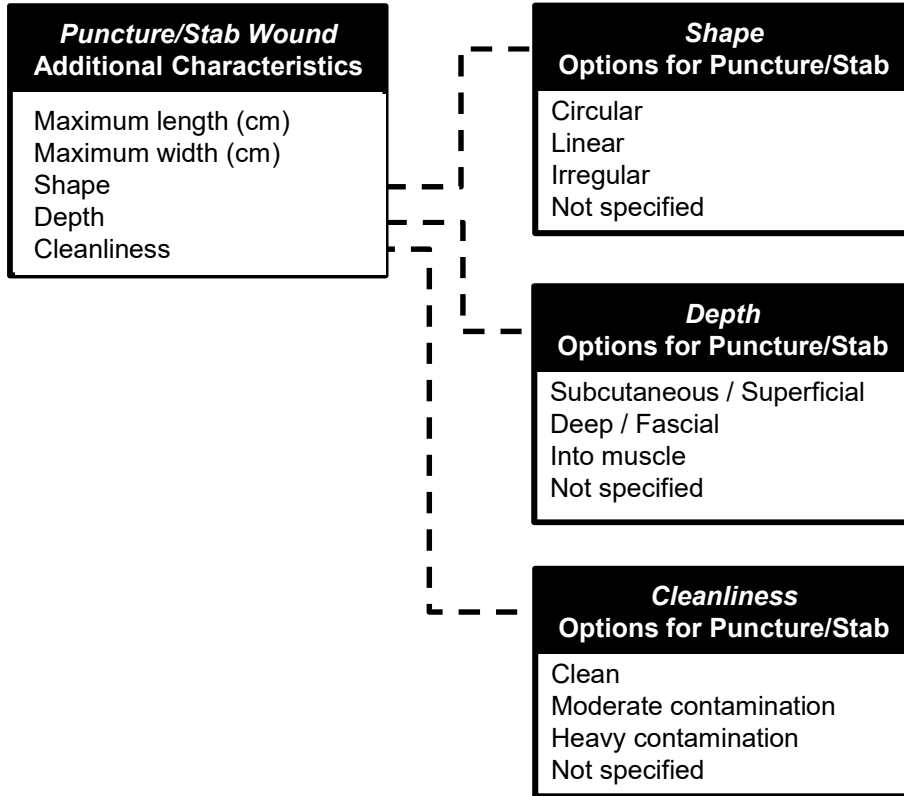
**Flap Color  
Options for Skin Tear**

Pale, dusky, or darkened  
Not pale, dusky, or darkened  
Not specified

**References for: Skin Tears**

- Carville K LG, Newall N, Haslehurst P, Michael R, Santamaria N, Roberts P. STAR: A consensus for skin tear classification. *Prim Intent* 2007;15: 18-28.
- LeBlanc K, Baranoski S, Christensen D, Langemo D, Sammon MA, Edwards K, et al. International Skin Tear Advisory Panel: a tool kit to aid in the prevention, assessment, and treatment of skin tears using a Simplified Classification System. *Adv Skin Wound Care* 2013;26: 459-76.
- LeBlanc K, Baranoski S, Holloway S, Langemo D. Validation of a new classification system for skin tears. *Adv Skin Wound Care* 2013;26: 263-5.
- Payne RL, Martin ML. The epidemiology and management of skin tears in older adults. *Ostomy Wound Manage* 1990;26: 26-37.
- Payne RL, Martin ML. Defining and classifying skin tears: need for a common language. *Ostomy Wound Manage* 1993;39: 16-20, 2-4, 6.

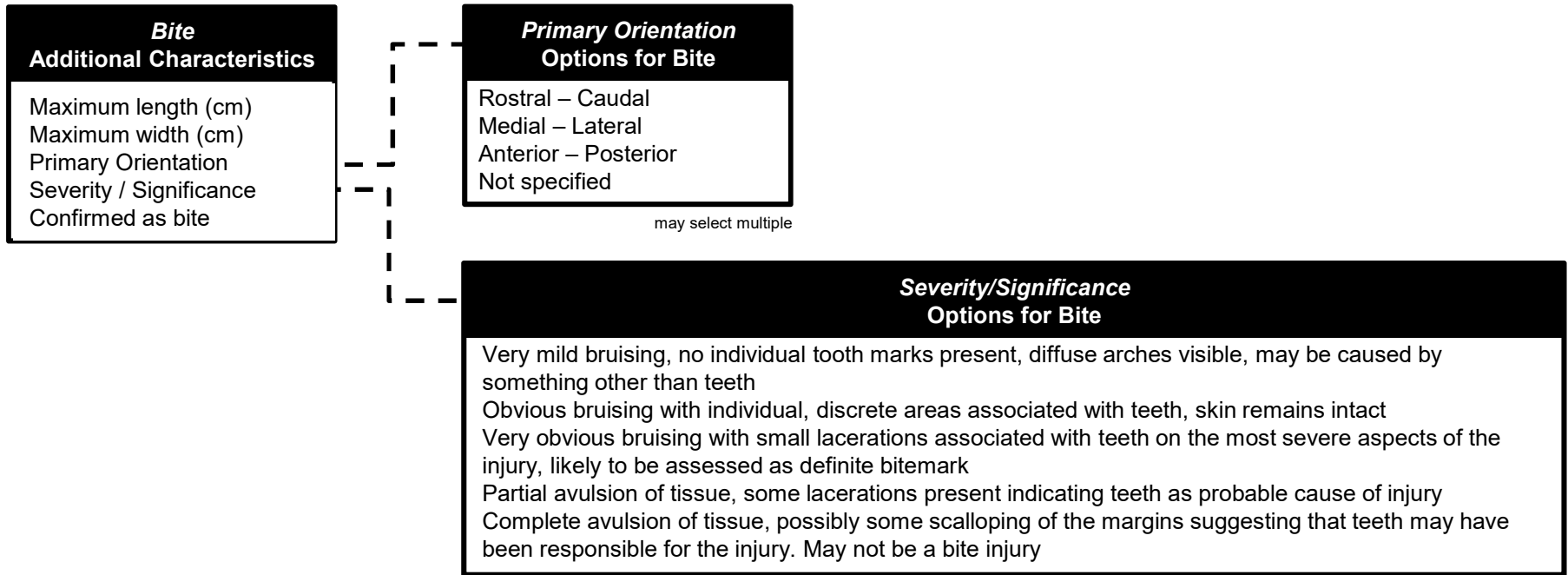
# CRITICAL ADDITIONAL CHARACTERISTICS FOR SPECIFIC INJURY TYPES



**References for: Puncture/Stab Wounds**

- DiMaio VJM, DiMaio DJ. *Forensic Pathology*. 2nd ed. Boca Raton, FL: CRC Press; 2001.
- Madea B. *Handbook of Forensic Medicine*. 1st ed. Chichester: Wiley Blackwell; 2014.
- Payne-James J, McGover C, Jones R, Karch SB, Manlove J. *Simpson's Forensic Medicine*. 13th ed. London: Hodder Arnold; 2011.
- Saukko PJ, Knight B. *Knight's Forensic Pathology*. 4th ed. Boca Raton, FL: CRC Press; 2015.

# CRITICAL ADDITIONAL CHARACTERISTICS FOR SPECIFIC INJURY TYPES



This is the Bitemark Severity and Significance Scale from:  
 Pretty IA. Development and validation of a human bitemark severity and significance scale. *J Forensic Sci* 2007;52:687-91.

**References for: Bites**

- Pretty IA. Development and validation of a human bitemark severity and significance scale. *J Forensic Sci* 2007;52: 687-91.
- Pretty IA, Sweet D. A paradigm shift in the analysis of bitemarks. *Forensic Sci Int* 2010;201: 38-44.
- Sweet D, Pretty IA. A look at forensic dentistry--Part 2: teeth as weapons of violence--identification of bitemark perpetrators. *Br Dent J* 2001;190: 415-8.

## CRITICAL ADDITIONAL CHARACTERISTICS FOR SPECIFIC INJURY TYPES

### **Traumatic Alopecia** Additional Characteristics

Maximum length (cm)  
Maximum width (cm)  
Sharp delineation between  
injury patch and hair  
Hair breakage  
Associated with  
hemorrhage or  
hematoma

### **References for: Traumatic Alopecia**

- Collins KA. Elder maltreatment: a review. *Arch Pathol Lab Med* 2006;**130**: 1290-6.
- Palmer M, Brodell RT, Mostow EN. Elder abuse: dermatologic clues and critical solutions. *J Am Acad Dermatol* 2013;**68**: e37-42
- Sheridan DJ, Nash KR. Acute injury patterns of intimate partner violence victims. *Trauma Violence Abuse* 2007;**8**: 281-9.
- Whiting DA. Traumatic alopecia. *Int J Dermatol* 1999;**38 Suppl 1**: 34-44.

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- Carpenter RF. The prevalence and distribution of bruising in babies. *Arch Dis Child* 1999;**80**: 363-6.
- Carville K LG, Newall N, Haslehurst P, Michael R, Santamaria N, Roberts P. STAR: A consensus for skin tear classification. *Prim Intent* 2007;**15**: 18-28.
- Collins KA. Elder maltreatment: a review. *Arch Pathol Lab Med* 2006;**130**: 1290-6.
- DiMaio VJM, DiMaio DJ. *Forensic Pathology*. 2nd ed. Boca Raton, FL: CRC Press; 2001.
- Dunstan FD, Guildea ZE, Kontos K, Kemp AM, Sibert JR. A scoring system for bruise patterns: a tool for identifying abuse. *Arch Dis Child* 2002;**86**: 330-3.
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- Kaczor K, Pierce MC, Makoroff K, Corey TS. Bruising and physical child abuse. *Clin Pediatr Emerg Med*. 2006;**7**(3):153-60.
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- Payne-James J, McGover C, Jones R, Karch SB, Manlove J. *Simpson's Forensic Medicine*. 13th ed. London: Hodder Arnold; 2011
- Pretty IA, Sweet D. A paradigm shift in the analysis of bite marks. *Forensic Sci Int* 2010;**201**: 38-44.
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