

Developed in collaboration with the Wound Care Clinicians from:



<b>TITLE</b>	<b>Guideline: Treating Minor Uncomplicated Lacerations in Adults</b>
<b>Practice Level</b>	<ul style="list-style-type: none"> <li>Section 6 of the Nurse's (Registered) and Nurse Practitioner Regulation authorizes Registered Nurses (RNs) to suture lacerations for the purposes of wound care. The College of Registered Nurses of BC (CRNBC) places the following limits and conditions on this restricted activity: "Registered nurses may only suture uncomplicated skin lacerations as outlined in the British Columbia Provincial Nursing Skin and Wound Care Committee's decision support tool". The CRNBC also states that nurses must successfully complete additional education before suturing an uncomplicated skin laceration.</li> <li>The health authority/agency must have a policy and standards in place to support this activity and RNs must act in accordance with these when suturing lacerations.</li> <li>RNs can suture uncomplicated laceration in adults if they demonstrate (1) competent wound assessment, (2) accurate identification of lacerations that must be referred to a physician, (3) accurate identification of the need for suturing, and (4) proficient demonstration and application of suturing as determined by a qualified mentor.</li> </ul>
<b>Background</b>	<ul style="list-style-type: none"> <li>Most lacerations are minor and repairable by primary closure.</li> <li>Primary closure techniques attempt to bring wound edges together neatly and evenly, stop any bleeding, preserve function of the tissue, prevent infection, restore cosmetic appearance and promote rapid healing.</li> <li>Techniques to obtain primary closure include steri-strip dressings, skin adhesive and sutures.</li> <li>Lacerations may be caused by:             <ul style="list-style-type: none"> <li>Blunt trauma – split or crush type injuries that tend to have increased edema, significant inflammatory response and have more devitalized tissue; may require revision of wound edges prior to closure; have a higher risk of infection.</li> <li>Sharp trauma – tend to have clean edges, low cellular injury and a low risk of infection.</li> <li>Animal or human bites – are heavily contaminated.</li> <li>Puncture wounds – can injure blood vessels and nerves and contaminate several tissue planes; best left open due to increased risk of infection.</li> </ul> </li> <li>Uncomplicated lacerations do not include lacerations that are (1) caused by a human or animal bite, (2) associated with a fractured bone or over a joint (3) grossly contaminated, (4) more than 12 hours old, (5) involve tendons, nerves or large blood vessels or (6) have severe surrounding soft tissue damage and maceration</li> <li>After 3 hours without treatment the bacterial count in a wound is significantly increased and wounds exposed for ≥ 8 hours are at a significant risk for infection.</li> <li>Most wounds can be closed with sutures up to 8 - 12 hours following injury if they are not contaminated and are in a well vascularized area; wounds on the face can be closed up to 24 hours following injury.</li> <li>Wounds that are infected or inflamed, dirty, human or animal bites, puncture wounds or severe crush wounds should not be sutured.</li> <li>Lidocaine 1% without epinephrine is the recommended choice for topical anaesthesia when suturing a wound. <i>Solutions containing epinephrine should not be used by nurses.</i></li> <li>Adults who have sustained a laceration and have not previously received a primary tetanus toxoid series require 3 doses of combined tetanus, diphtheria, pertussis immunization. To maintain immunity to tetanus after completion of the primary immunization, booster doses of combined tetanus and diphtheria toxoids should be given at 10 year intervals.</li> </ul>
<b>Indications / Precautions / Contraindications</b>	<p><b>Indications</b></p> <ul style="list-style-type: none"> <li>Nurses can only suture uncomplicated lacerations in adults.</li> </ul> <p><b>Precautions</b></p> <ul style="list-style-type: none"> <li>The following must be referred to a physician / NP prior to suturing:</li> </ul>

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	<ul style="list-style-type: none"> <li>○ Laceration on the lower extremity in clients with diabetes</li> <li>○ Lacerations on the lower extremity in clients with arterial compromise, venous insufficiency and S &amp; S of PVD.</li> </ul> <p><b>Contraindications</b></p> <ul style="list-style-type: none"> <li>● Nurses cannot suture a laceration if the wound is:             <ul style="list-style-type: none"> <li>○ As a result of a skin tear</li> <li>○ Infected, inflamed or contaminated.</li> <li>○ Animal or human bite.</li> <li>○ Deep puncture wound.</li> <li>○ Severe crush wound.</li> <li>○ On or around the genitalia.</li> <li>○ Over 12 hours old.</li> <li>○ On the face</li> <li>○ Over a joint.</li> <li>○ Associated with a fracture or joint</li> <li>○ Involves damage to nerves, blood vessels, tendons and/or muscle.</li> </ul> </li> </ul>
<p><b>Definitions</b></p>	<p><b>2-point Discrimination</b> – The ability to discriminate one stimulus from two stimuli; may be compromised in hand injuries.</p> <p><b>Aseptic Technique</b> - the purposeful prevention of the transfer of microorganisms from one person to another by keeping the microbe count to a minimum and for assuring that cross-contamination does not occur. The technique chosen is based on dressing procedure, client setting and agency policy:</p> <ul style="list-style-type: none"> <li>○ Sterile Technique – the use of sterile gloves, field, tray, instruments solutions and dressings</li> <li>○ No Touch Technique – the use of clean gloves and sterile field, tray, instruments, solutions; sterile instruments are used for direct contact with the wound; dressings are to be sterile</li> <li>○ Clean Technique – the use of sterile solutions, clean gloves and clean dressings</li> </ul> <p><b>Clean laceration</b> – Wounds that appear clean with no evidence of contamination, have healthy tissue present and show good apposition of wound edges.</p> <p><b>Closure by primary intention</b> – Closure immediately following tissue injury and prior to formulation of granulation tissue; wound edges can be approximated and closed with strips, adhesive or sutures.</p> <p><b>Closure by secondary intention</b> – Wounds healing by granulation without the benefit of surgical closure.</p> <p><b>Contaminated laceration</b> – Evidence of contamination and debris in the wound; devitalized wound edges.</p> <p><b>Restricted Activity</b> – An activity deemed by the government to present a significant risk of harm to the public and therefore is reserved for health professionals with specialized education; the activity may not require an order but does require an RN to adhere to standards, limits and conditions set by CRNBC.</p> <p><b>Uncomplicated / simple laceration</b> – Lacerations not caused by a human or animal bite; not communicating with a fractured bone or joint; not involving tendons, nerves or large vessels; not having severe surrounding soft tissue damage and maceration and requiring closure.</p>
<p><b>Related Documents</b></p>	

## Assessment and Determination of Treatment

### Assessment

To develop a comprehensive plan of care and to determine the most appropriate treatment for treating minor, uncomplicated lacerations, assess the following:

1. Client Concerns
  - a. Client / family level of understanding about the injury, healability and risk factors.

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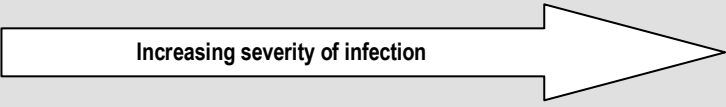
- b. Impact of client's current environment on client care.
  - c. Client / family preferences for treatment of the wound / risk factors and the goals of care.
  - d. Client / family ability and motivation to comprehend and adhere to the treatment plan.
  - e. Date of last tetanus injection
  - f. Allergy to tetanus immunization.
2. Risk Factors for Wound Healability
- a. Impaired nutritional status:
    - i. Low body weight, obesity, unplanned weight loss, appetite changes, cachexia and dehydration, edema.
    - ii. Adequacy of nutritional intake including % of intake at meals, protein / calorie intake <sup>1</sup> and fluid intake. Possible causes of poor intake, e.g. difficulty swallowing or poor dentition.
    - iii. Assess renal function if increased protein intake is indicated for the client.
  - b. Medical conditions that interfere with healing, e.g. diabetes, PVD, autoimmune diseases, cancer with chemotherapy, endocarditis.
  - c. Medications that interfere with healing, e.g. NSAIDS, antineoplastics, systemic corticosteroids, anticoagulants.
  - d. Smoking history / substance use.
  - e. Advanced age.
  - f. Oxygenation status of skin and underlying tissues, e.g. COPD, CHF, anemia.
  - g. Ability to mobilize and transfer.
3. Physical Assessment
- a. Heart rate, blood pressure, temperature, level of consciousness and respirations especially if there is significant blood loss.
4. Pain Assessment
- a. Type, location, frequency and quality of pain occurring in the laceration or as a result of treatment.
  - b. Pain severity using client self report, observation of non verbal cues and/or a pain scale, e.g. Wong Baker FACES Scale, Visual Analog Scale.
  - c. Impact of pain on function.
  - d. Differentiate between pain in the wound and in other areas.
5. Assess integrity of underlying structures prior to administering anaesthesia
- a. Check capillary refill distal to the wound for vascular injury.
  - b. Check muscle strength and movement proximal and distal to the wound.
  - c. Check for loss of function in proximal and distal tendons and ligaments
  - d. Check for sensation in surrounding areas; changes may indicate nerve damage; for hand / finger lacerations check 2-point and sharp / soft discrimination on the area distal to the wound and distal extremities.
  - e. Check for boney involvement, including open or associated fractures.
  - f. Inspect the surrounding area for foreign bodies.
6. The Laceration
- a. If the client has a laceration on the lower extremity or has a diagnosis of diabetes, arterial compromise, venous insufficiency or S & S of PVD, refer to a physician / NP for further assessment prior to suturing (Link to Lower Limb DST); if the laceration is due to a skin tear see Skin Tear Management DST
  - b. History of the Wound

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<sup>1</sup> Wound healing is impaired in clients with an albumin of less than 35 g/l or a pre-albumin of less than 180 mg / L (female) or <less than 215 mg / L (male).

- i. Client's experience of injury.
- ii. Mechanism of injury.<sup>2</sup>
- iii. Wound contact with contaminants, e.g. manure<sup>3</sup>, rust, dirt.
- iv. Time elapsed since injury.
- v. Amount of blood loss.
- c. Wound Assessment
  - i. Type of wound, e.g. puncture, laceration, bite, crush.
  - ii. Length, width and shape of the wound.
  - iii. Location, including proximity to major blood vessels, organs and joints.
  - iv. Wound(s) depth: superficial (epidermis / dermis) or penetrating (subcutaneous tissue, muscle, fascia, bone)
  - v. Exposed bone, ligament, and tendon.
  - vi. Appearance of wound bed, noting presence of necrotic tissue.
  - vii. Amount & type of exudate.
  - viii. Presence of odour, after cleansing.
  - ix. Description of wound edge and peri-wound skin.
  - x. Presence of foreign bodies in the wound or surrounding tissues

## 7. Wound Infection

<b>Clinical Signs and Symptoms of Wound Infection</b>		
		
<b>Increased Bacterial Bioburden</b>	<b>Localized Infection</b>	<b>Systemic Infection</b>
Non-healing (minimal change in wound measurements after 3 weeks of care)	Onset of wound pain or increasing pain	General malaise (predominantly in clients who are elderly, immunocompromised & children)
Non-granulation tissue (pink to bright red non-pebbly tissue)	Peri wound induration greater than/equal to 2cm	Fever (may be muted in clients who are elderly or immunocompromised)
Friable or hypergranulation tissue	Peri wound erythema greater than/equal to 2cm	Rigor / chills
New areas of necrotic slough	Increased peri wound warmth	Change in behaviour or cognition (especially in elderly clients)
Increased amount of exudate	Increased wound size and / or the development of sinus tracts and / or satellite wounds	Unexplained high blood sugar (in clients who are diabetic)
Change in characteristics of exudate from watery and serous to purulent	Purulent exudate	Septic shock potentially leading to multi organ failure
Odour after wound cleansing	Increased dysreflexia / spasticity in clients with spinal cord injury	
	Wound that probes to bone	
<b>3 or more of the following S &amp; S are sufficient for a clinical diagnosis of potential or actual wound infection.</b>		

<sup>2</sup> Provides information on the potential injury to adjacent tissues and structures, the likelihood of contamination and the preferred method of repair.

<sup>3</sup> Wounds sustained in barnyards or stables are considered contaminated; *Clostridium tetani* is considered indigenous in manure.

Adapted from: Sibbald, G., et al. (2006). Increased bacterial burden and infection: The story of NERDS and STONES. *Advances in Skin and Wound Care*, 19(8): 158.

- a. Determine if wound is contaminated or dirty.
  - b. Determine status of tetanus vaccination.
  - c. Determine ARO, HIV and Hepatitis A/B status.
  - d. If there are 3 or more signs and symptoms of an infection, do not suture the wound; take a swab for culture and sensitivity (Link to Infection DST) and refer to the physician / NP.
8. Refer to a physician / NP if:
- a. There is suspicion of injury to blood vessels, muscles, tendons or nerves.
  - b. There is suspicion of bony involvement or an open fracture.
  - c. The laceration is on the face.
  - d. The laceration is extensive or of unknown depth, e.g. deep puncture wounds.
  - e. The laceration is severely contaminated or appears infected.
  - f. There is a possibility that the laceration transects the joint capsule.
  - g. Significant tissue deficit is present.
  - h. It has been more than 12 hours since the injury.
  - i. There is strong clinical suspicion of a foreign body in the wound or surrounding tissue.
  - j. There is concern about the cosmetic outcome.

### **Determination of Treatment**

1. The treatment is based on:
  - a. The client / family's willingness and ability to participate in the treatment plan.
  - b. Overall assessment findings.
  - c. The client's potential for healing.
  - d. Time since injury.
  - e. Extent and location of the wound.
  - f. Available resources and supplies.
  - g. Repair injured tissue with a minimum of deformity.
2. Determine the need for:
  - a. Suturing vs steri-strips or skin adhesive.
  - b. Tetanus prophylaxis.
  - c. Antibiotics.

### **Interventions**

#### **Client Care Management**

1. Client Concerns:
  - a. The plan of care should take into account client / family abilities, concerns, preferences and motivation for treatment.
2. Risk Factors for Wound Healability
  - a. Nutritional Care:

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- i. Encourage client to take an adequate calorie intake and high protein supplements <sup>4</sup> if compatible with goals of care.
    - ii. Encourage 1500 – 2000 mL of fluid daily, unless contraindicated.
    - iii. Refer to a dietitian, if available to determine the need for nutritional supplements and vitamin / mineral preparations if:
      - Nutritional risk factors exist (weight loss or poor intake) or albumin / pre albumin values are abnormal.
      - The client is obese, has a low body weight and/or is dehydrated.
    - iv. Reassess the need for protein supplements and additional fluids as the client's condition changes.
    - v. Refer to the appropriate professional if client has difficulty swallowing or poor dentition.
  - b. Support clients to stop smoking and discuss referral to a smoking cessation program; refer for harm reduction / substance use management if client consents.
3. Pain Relief
  - a. Prior to suturing
    - i. Use Lidocaine 1% without epinephrine; this is the anaesthetic of choice for nurses (please review indications/contraindications prior to administering)
    - ii. Use a small gauge needle (# 25, # 27 or # 30) to decrease pain at the site
    - iii. Dribble a small amount of anaesthetic onto the wound prior to the first injection to provide some initial anaesthesia.
    - iv. Slowly inject the body temperature anaesthetic into the open wound edge avoiding the intact skin as this will decrease the burning sensation
    - v. Always draw back on the plunger with each injection to ensure that the needle is not in the blood vessel.
    - vi. Administer subsequent injections into an area that has already been anaesthetized.
    - vii. Onset of effect is 2 - 5 minutes; duration of effect is 60 minutes.
    - viii. Maximum dose: 3 – 4.5 mg / kg; maximum dose is 30 mL.
  - b. After suturing
    - i. If client has pain, recommend acetaminophen if needed for mild to moderate pain (discuss contraindications with client prior to first dose)
    - ii. Refer to a physician / NP if the acetaminophen is not adequate to control pain.

## Wound Care Management

1. Use appropriate aseptic technique (based on treatment procedure, care setting and agency policy) during the dressing change to prevent infection.
2. Debridement
  - a. Debride devitalized tissue down to but not including healthy tissue.
  - b. Debride jagged, non viable wound edges, if necessary.
3. Cleansing
  - a. Wash the wound and surrounding skin with a broad spectrum non cytotoxic antimicrobial agent, e.g. povidone-iodine.

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<sup>4</sup> Clients with a laceration can receive 1.5 - 1.8 g of protein / kg of body weight per day based on client's assessed needs unless the client requires a protein restriction for an unrelated health concern.

- b. Irrigate the wound with body temperature normal saline using a 30-35 ml syringe with either a wound irrigation tip catheter **or** an 18 - 19 gauge device; use 50 – 100 mL / cm of wound to clean and remove debris.
  - c. When irrigating the wound, use personal protective equipment to protect from back-splash.
  - d. Cleanse the peri wound skin with normal saline to remove the antimicrobial agent.
  - e. Hair can be clipped from the surrounding area if necessary but avoid shaving hair.
  - f. Remove visible foreign matter with forceps.
4. Control Bleeding - Ensure hemostasis in the wound before suturing.
- a. Apply direct pressure over the area with a sterile dressing.
  - b. If unable to control bleeding, notify the physician / NP regarding the need for possible cauterization.
5. Determine appropriate primary intention closure method
- a. Steri-strips
    - i. If the wound is small, shallow and closes together naturally along lines of tension, reinforce with steri-strips and dress with dry sterile dressing.
    - ii. Use only on areas of low tension; should not be used if there is movement or tension across the wound.
    - iii. Instruct the client to keep the wound clean and dry for 48 - 72 hours and apply only minimal tension on the wound.
  - b. Skin Adhesives
    - i. May be used in small ( $\leq 3 - 5$  cm), clean lacerations with edges that can be easily approximated.
    - ii. Should not be placed on areas of high tension or repetitive movement such as over joints.
    - iii. Do not use on mucosal surfaces.
    - iv. Contraindicated in wounds with poor chance of healing, contaminated or complex wounds or jagged lacerations.
    - v. Do not apply too thickly as it may create heat and be uncomfortable for the client.
    - vi. Instruct the client to keep the wound clean and dry for 48 hours; after 48 hours the adhesive will withstand some moisture but not prolonged moisture, e.g. swimming and bathing.
    - vii. Can be dressed after the adhesive is dry if desired by the client.
    - viii. Do not use antibiotic or white petrolatum ointments with skin adhesive as they will remove the adhesive.
    - ix. Adhesive will slough off in 5 – 10 days.
  - c. Suturing (see Practice Level page 1)
    - i. See Precaution / Contraindications (page 1) for a list of lacerations that a nurse cannot suture.
    - ii. Choose appropriate suture material (See Appendix A).
    - iii. Choose appropriate wound closure technique.
      1. Simple interrupted sutures – most effective in closing wounds.
      2. Vertical mattress sutures – for wound edges that stretch such as posterior neck or concave skin folds.
  - d. Cover Dressing
    - i. Apply a dry, sterile, non-adherent dressing for 24 – 48 hours that will absorb any exudate or blood, keep the incision free of contamination and irritation.
    - ii. Some wounds may need a dressing to:
      1. Immobilize the wound if it is adjacent to a joint.
      2. Provide pain relief.
      3. Apply pressure if necessary.
    - iii. Beyond 48 – 72 hours a dressing may be unnecessary, depending on wound healing, the comfort of the client with an exposed laceration and agency policy.

6. If unable to approximate wound edges and secure closure with steri-strips, skin adhesives or suturing then support wound healing by secondary intention
  - a. Goal of Treatment – Moist wound healing.
  - b. Dressings should:
    - i. Loosely fill any dead space without putting pressure on healing wound tissue
    - ii. Keep the peri wound skin dry; use skin sealants, protectants or moisture barriers as needed.
    - iii. Maintain moisture balance within the wound
    - iv. Protect the wound, especially in the final stages of healing.
  - c. Avoid using plain dry gauze for these wounds as it does not support moist wound healing
  - d. Determine the dressing change frequency based upon the wound assessment including the client's risk for infection, the dressing product used to control the bacterial load, the effectiveness of the cover dressing to manage the amount of drainage anticipated and balanced with the need to minimize wound disturbance to allow for healing.
  - e. Reassess the wound at every dressing change and do a full wound reassessment as per the client's care plan.
  
7. Wound Infection
  - a. Implement strategies to prevent infection, e.g. hand washing and aseptic technique.
  - b. Use non sensitizing broad spectrum antimicrobial dressings for infected wounds healing by secondary intention.
  - c. Identify need for tetanus vaccine immunization and administer tetanus / diphtheria toxoid if required. (See Appendix C)
  - d. Refer to a physician / NP for consideration of prophylactic antibiotics if the client has:
    - i. Signs and symptoms of infection.
    - ii. A history of endocarditis or cardiac valve replacements.
    - iii. A hip or knee prosthesis or lymphedema.
    - iv. Diabetes and presents with a contaminated foot wound.
    - v. Peripheral vascular disease.

## Client Education

1. Instruct the client / family with a clean wound which is healing by primary intention to :
  - a. Keep the dressing dry and intact for at least 48 hours unless the dressing becomes excessively dirty or wet and then change it immediately.
  - b. Check the wound for infection after 48 hours and change the dressing.
  - c. Return to the clinic, ER , or physician / NP office:
    - i. If fever, redness swelling or increased pain develops.
    - ii. If the area distal to the wound becomes numb, painful or tingling.
    - iii. For suture removal (see Appendix B).
  
2. After 48 hours the client can shower unless instructed not to; client can bathe if shower not available but the wound can only be immersed in water for a brief period for time.
  
3. If swelling is present, elevate the affected area.
  
4. Instruct the client with a wound which is healing by secondary intention to notify a physician / NP if:
  - a. The wound does not show signs of healing after 2-4 weeks of appropriate treatment or the wound deteriorates.
  - b. The wound probes to bone if this is a new finding.
  - c. There is an acute onset of pain or increasing pain.



## Discharge Planning

1. Discharge planning, if discharge is anticipated, should be initiated during the initial client encounter and should support timely discharge and optimal client independence.
2. If the client's care is being transferred across sectors (acute care, community care or residential care), ensure that the receiving site / facility is provided with a care plan that outlines the current client care and wound management strategies.

## Client / Family Outcomes

1. Intended
  - a. Wound is clean and free from infection.
  - b. There is no excessive bleeding from the wound.
  - c. The wound heals if healing is the goal.
  - d. Function is restored to involved tissues.
  - e. There is no cosmetic deformity.
2. Unintended
  - a. Wound develops an infection.
  - b. There is excessive bleeding from the wound
  - c. The wound does not heal if healing is the goal.
  - d. Function is not restored to involved tissues.
  - e. There is avoidable cosmetic deformity.

## Documentation

1. Document initial assessment and treatment as per agency guidelines.
2. Document follow-up treatment as per agency guidelines.

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## **Document Development/Review**

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<b>Original Publication Date:</b> June 2011	
<b>Revision Date(s):</b>	
<b>Review Date (s):</b> June 2014	

### **Appendix A Types of Suture Material for Specific Body Areas**

Type of Suture	Size of Suture	Body Area.
Nylon-Dermalon, Ethilon (Nonabsorbable)	# 3-0, 4-0	Scalp
Nylon-Dermalon, Ethilon (Nonabsorbable)	# 3-0, 4-0, 5-0	Back
Nylon-Dermalon, Ethilon (Nonabsorbable)	# 3-0, 4-0, 5-0	Torso
Nylon-Dermalon, Ethilon (Nonabsorbable)	# 3-0, 4-0, 5-0	Limbs
Polygalactin (Vicryl, Dexon) (Absorbable)	# 4-0, 5-0	Subcutaneous tissue

### **Appendix B Timing of Suture Removal**

Site of Laceration	Timing of Suture Removal
Scalp	7 – 10 days
Trunk	7 – 10 days
Arms	7 – 10 days
Legs	10 – 14 days

### **Appendix C Tetanus Prophylaxis <sup>5</sup> in Wound Management**

History of Tetanus Immunization	Clean Minor Wounds		All Other Wounds	
	Td <sup>6</sup> or Tdap <sup>7</sup>	Tlg <sup>8</sup>	Td or Tdap	Tlg
Uncertain or < 3 doses of immunization series	Yes	No	Yes	Yes
≥ 3 doses received in an immunization series less than 10 years ago	No	No	No	No
≥ 3 doses received in an immunization series more than 10 years ago	Yes	No	Yes ( if ≥ 5 years since last booster)	No

<sup>5</sup> Tetanus toxoid should not be given if a severe systemic reaction followed a previous dose; tetanus immune globulin should be given instead.

<sup>6</sup> Td - Tetanus and diphtheria toxoid combined

<sup>7</sup> Tdap – Tetanus, diphtheria and acellular pertussis toxoids combined.

<sup>8</sup> Tlg – Tetanus immune globulin