Ontology Specification Document

Domain: Wounds and Medical Treatment

Purpose:
The purpose of this ontology is to formally represent knowledge about the wounds, their causes, and treatments as described in the given document. It enables classification, reasoning, and querying to support decision-making and domain-specific knowledge retrieval...
It includes:

- Categories of wounds and their subtypes.
- Factors leading to different wound types
- Observable symptoms and the associated risks
- Treatments and possible complications
- Healing timeframes and indicators for medical attention

Competency questions:

Q1. What causes are associated with different wound types?

Q2. Which wound types show risk of infection or other complications?

Q3. Which body parts can be involved in various wound types?

Q4. What healing stages are linked with different wound types?

Q5. Which treatments are recommended for wounds based on their severity level?

Classes and their Taxonomy:

1) Wound:
    a) OpenWound:
        - Abrasion
        - Avulsion
        - Laceration
        - Puncture
    b) ClosedWound:
        - Contusion
        - Hematoma
    c) SurgicalWound:
        - CleanContaminatedWound
        - CleanWound
        - ContaminatedWound
        - DirtyContaminatedWound

2) Cause:
   a) Accident
   b) Bite
   c) Fall
   d) Gunshot
   e) SharpObject
   f) Twisting

3) BodyPart:
   a) Bone
   b) InternalOrgan
   c) Joint
   d) Muscle
   e) Skin
   f) Tissue

4) Complication:
   a) Hemorrhage
   b) Infection:
      - Cellulitis
      - Gangrene
      - Tetanus
   c) LossOfFunction
   d) NectrotizingFascities
   e) NerveDamage
   f) OrganDamage
   g) Sepsis

5) HealingStage:
   a) ClotFormation
   b) ScabFormation
   c) ScarFormation
   d) GranulationTissue

6) Symptom:
   a) Bleeding
   b) Pain
   c) Fever
   d) PusDischarge
   e) FoulOdor

f) Redness
g) swelling
7) Treatment:
   a) HomeTreatment:
      ● Cleaning
      ● Bandage
      ● IceApplication
      ● Rest
   b) MedicalTreatment:
      ● TetanusShot
      ● Sutures
      ● Staples
      ● Surgery
      ● SkinGlue
      ● Antibiotics

8) SurgicalClass

Object Properties:

Property	Domain	Range	Meaning
classifiedAs	SurgicalWound	SurgicalClass	How is the surgical wound classified?
hasCause	Wound	Cause	What caused the wound?
hasHealingStage	Wound	HealingStage	Wound healing phases
hasSymptom	Wound	Symptom	What symptoms appear?
involvesBodyPart	Wound	BodyPart	Part of body damaged?
mayLeadTo	Wound	Complication	This wound may lead to what complications?
requiresMedicalAttention	Wound	Treatment	Identities wound needing doctor?
treatedWith	Wound	Treatment	What treatment used?

Data Properties:

Property	Domain	Range
bleedingAmount	Wound	string
hasDepth	Wound	float
hasLength	Wound	float
riskLevel	Wound	string
severityLevel	Wound	string
treatmentDuration	Wound	integer

Non-Trivial Axioms:
1) Class Disjointness:
   A wound cannot be both opened and closed.
   OpenWound ⊥ ClosedWound

2) Cardinality Restriction
   Every wound must have atleast one cause.
   hasCause min 1 cause

3) Property Restriction
   Puncture wounds requires tetanus shot.
   Puncture ⊑ ∃ requiresMedicalAttention.TetanusShot