

Complications of Peripheral IV Access

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Phlebitis

Inflammation of the intimal lining of the vein.

Phlebitis is a progressive complication.

Early recognition and management is key to limiting progression.

Types and Causes of Phlebitis

Chemical Phlebitis

- Hypertonic solutions >375 mOsm/L
- Medications and solutions with pH <5 or >9
- Drugs classified as irritants or vesicants
- Solutions with large amounts of particulate

Mechanical Phlebitis

- Trauma from the IV catheter during insertion or while indwelling
- Rigid catheter material (i.e., FEP Polymer)
- Larger gauge and/or longer length catheters
- Lower skill level of inserting clinician
- Inadequate stabilization of the catheter
- Insertion across a joint

Bacterial Phlebitis

- Compromised skin integrity (i.e., shaving)
- Palpating site after applying skin prep
- Other breaks in aseptic technique
- Contamination of the IV system
- Non-sterile dressing

Management of Phlebitis

- Remove the catheter
- Culture cannula if infection is suspected
- Apply warm moist compress
- Provide comfort measures

Clinical Criteria

Grade 0

No symptoms

Grade 1

Erythema at access site with or without pain

Grade 2

Pain at access site with erythema and/or edema

Grade 3

Pain at access site with erythema

Streak formation

Palpable venous cord

Grade 4

Pain at access site with erythema

Streak formation

Palpable venous cord >1 inch in length

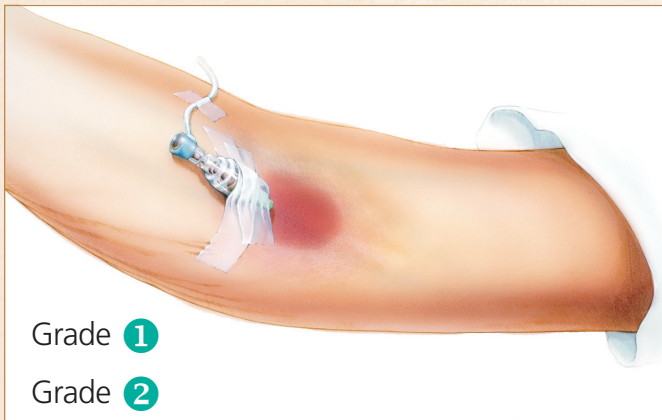
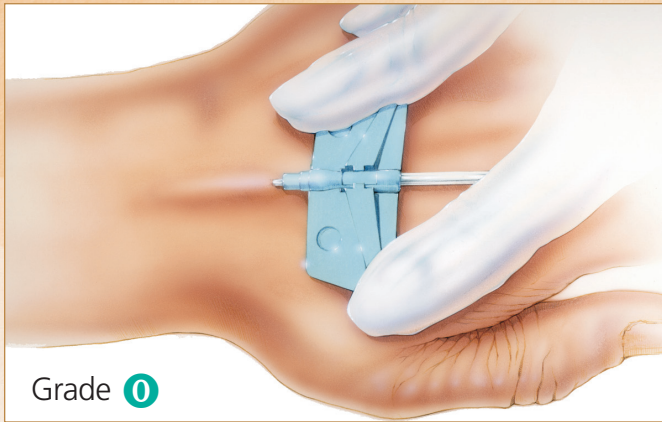
Purulent drainage

From Infusion Nursing Standards of Practice

Phlebitis Rate Calculation

$$\frac{\text{Number of Phlebitis Incidents}}{\text{Total Number of Peripheral Lines}} \times 100 = \% \text{ of Phlebitis}$$

Phlebitis Presentation



Hematoma

A localized mass of blood outside of the vessel, usually creating a hard, painful lump.



Causes

- Nicking the vein during an unsuccessful insertion
- Incomplete insertion of the needle into the lumen of the vessel
- Tourniquet above a previous attempt site
- Unskilled clinician
- Lack of pressure over site of discontinued catheter
- Large cannula

Management

- With unsuccessful attempts, apply direct pressure and elevate extremity until bleeding stops

Infiltration

The inadvertent administration of nonvesicant medication or solution into the surrounding tissues.

Extravasation

The inadvertent administration of vesicant medication or solution into the surrounding tissues.

Clinical Criteria

Grade 0

No symptoms

Grade 1

Skin blanched

Edema <1 inch in any direction

Cool to touch

With or without pain

Grade 2

Skin blanched

Edema 1-6 inches in any direction

Cool to touch

With or without pain

Grade 3

Skin blanched, translucent

Gross edema >6 inches in any direction

Cool to touch

Mild to moderate pain

Possible numbness

Grade 4

Skin blanched, translucent

Skin tight, leaking

Skin discolored, bruised, swollen

Gross edema >6 inches in any direction

Deep pitting tissue edema

Circulatory impairment

Moderate to severe pain

Infiltration of any amount of blood product, irritant or vesicant

Infiltration Presentation



References

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