1.0 Introduction

The cause of vaso-occlusive crisis (VOC) is believed to be ischemic tissue injury from the obstruction of blood flow by sickled erythrocytes. Reduced blood flow causes hypoxia and acidosis. This further increases the sickling process, leading to further hypoxia and acidosis—a cycle that eventually leads to ischemic tissue injury. Each VOC varies in intensity and duration. Infection, fever, acidosis, hypoxia, dehydration, sleep apnea, and exposure to extremes of heat and cold can precipitate crises. Often, no cause is identified.

Painful VOC is the most frequent complication of Sickle Cell Disease. Common sites of pain include bone (extremities, dactylitis or hand/foot syndrome, back) and abdominal pain. Bone pain, the most common type of VOC, may or may not be accompanied by swelling, low-grade fever, redness, and warmth. It may be symmetrical, asymmetrical, or migratory. Dactylitis is a common presentation in infants and toddlers; back and abdominal pain are more common in older children. Abdominal pain in children with sickle cell disease is usually a simple VOC, but other diagnoses may present similarly (splenic sequestration, liver sequestration, appendicitis, pancreatitis, biliary colic and cholecystitis, urinary tract infection, pelvic inflammatory disease, etc.) and should be ruled out. In addition, pneumonia and chest crisis may present as, or accompany abdominal pain. During a severe painful crisis, a patient may also develop an acute chest syndrome, or a CNS event.

Pain should be treated early and aggressively. No laboratory features are pathognomonic of VOC; diagnosis is based strictly on the history and physical examination. When treating a painful crisis, the Healthcare Provider needs to be aware that concurrent illnesses such as an acute sequestration, priapism, aplastic episode, or fever/sepsis (see other protocols) may also occur, which must be dealt with concurrently.

This clinical practice guideline has been developed for the management of sickle cell patients with an acute painful episode who present to the emergency department and/or inpatient units.
2.0 Clinical Practice Recommendations for Management of Vaso-occlusive Crisis

Child with Sickle Cell Disease (SCD) presents to ED with acute painful episodes (vaso-occlusive crisis)

ED Initial Assessment and Management:
- Place a child with suspected SCD in EB 02 or 03, and admit or transfer to inpatient management immediately if EB is full or if child has high risk criteria
- Ethanol gel is contraindicated
- Do not provide pain medications if not contraindicated
- For all degrees of pain, administer pain medications while clinical diagnosis is confirmed
- Identify is the child has evidence of anemia
- Initiate Sickle Cell Fever Order Set in Epic
- If child has moderate to severe pain:
  - Consider physical or psychological interventions such as heating pads, oral analgesics
  - Review and adjust pain management regimen
  - Consider psychological interventions such as medication management

ED Discharge Medication Management and Follow-up:
- For all degrees of pain, child should receive one of the following medication regimen:
  - Oral medication should be considered as first line of treatment if child is able to ingest
- For child with moderate to severe pain:
  - Refer to eFormulary for dosing Instructions
- Incentive spirometry to prevent acute pulmonary complications in children with SCD
- Consider psychological interventions such as medication management
- If child has moderate to severe pain:
  - Consider psychological interventions such as medication management
- If child has laboratory abnormalities:
  - Consider psychological interventions such as medication management

Child discharged home with appropriate follow-up and return to same instructions

3.0 References


### 4.0 Related documents
- [Acute Chest Syndrome or Pneumonia: Guidelines for Management in Children with Sickle Cell Disease](#)
- [Pain Assessment Policy](#)
- [Pain Management Clinical Practice Guideline](#)

**Attachments:**
- [Discharge Criteria 2021 FINAL.pdf](#)
- [ED medication management.pdf](#)
- [Inpatient Management 2021 FINAL.pdf](#)
- [Revision History.docx](#)
- [SC_Clinic Follow Up Revised 2021_FINAL.pdf](#)
- [SCD pain plan_july 2015.pdf](#)
- [VOC Care pathway 2021 FINAL.pdf](#)