Table 3.41 – ASSESSMENT and MANAGEMENT of:

Hypothermia *continued*

ASSESSMENT	MANAGEMENT
Oxygen	• If the patient is hypoxaemic, administer high levels of supplemental oxygen and aim for a target saturation within the range 94–98% – **refer to oxygen guideline**.
Fluid therapy	• If fluid therapy is indicated, refer to **intravascular fluid therapy guidelines**. NB The use of cold fluids should be avoided if possible. • **DO NOT** delay on scene for fluid replacement; administer en-route.
Blood glucose	• Measure blood glucose level if <4.0 mmol/L treat for hypoglycaemia (**refer to glycaemic emergencies guidelines**).
Vital signs	• Monitor ECG. • Respiratory rate may be very slow – measure for 10 seconds.
Transfer	• Transfer patients to nearest appropriate receiving hospital. • In severe hypothermia, the fastest way to re-warm patients is by extracorporeal warming: – this may not be available in every hospital so follow any local care pathways. • Continue management en-route. • Complete documentation.[49]
	Additional information for cardiac arrest in hypothermia: Follow the usual procedure (**refer to appropriate resuscitation guidelines**) with the following minor changes: • **Signs of life** – because the heart rate and respiratory rate may be slow and difficult to detect, look for signs of life (palpate central artery, ECG monitoring etc.) for up to 1 minute. • Hypothermia may cause chest wall stiffness and ventilations and compressions may be more difficult. • Drugs are less likely to be effective at low body temperatures: do not give drugs if the core temperature is below 30°C. • Defibrillation is less likely to be effective at low body temperatures: if VF persists after three shocks, delay further defibrillation until the core temperature is above 30°C. • **DO NOT STOP CARDIAC RESUSCITATION IN THE FIELD**, hypothermia is protective and good outcomes have resulted from prolonged resuscitation of hypothermic patients. **Trauma** (**refer to appropriate trauma guidelines**) – hypothermia worsens the prognosis of trauma patients, so it is important that patients who are initially normothermic, are not allowed to become hypothermic. This may occur e.g. during a prolonged extrication from a road traffic collision or from the cooling of burns.

KEY POINTS

Hypothermia

- **Hypothermia is defined as a core body temperature below 35°C.**
- **There are three main classifications depending on the speed at which a person loses heat: acute, subacute, and chronic hypothermia.**
- **Prevent further heat loss; wrap the patient appropriately, do not rub the skin or give alcohol.**
- **Patients with decreased level of consciousness may develop VF or pulseless VT and should be immobilised and managed horizontally.**
- **Cardiac arrest is treated in the usual way, bearing in mind that drugs/defibrillation are less likely to be effective at low body temperatures.**

Sickle Cell Crisis [276–279]

1. Introduction

- Sickle cell disease is a hereditary condition affecting the haemoglobin contained within red blood cells.
- A previous history of sickle cell disease and sickle cell crisis will be present in most cases, with the patient almost always being aware of their condition.
- The signs and symptoms include (**any of those listed below may apply**):
  - severe pain, most commonly in the long bones and/or joints of the arms and legs, but also in the back and abdomen
  - stroke
  - high temperature
  - difficulty in breathing, reduced oxygen (O_2) saturation, cough and chest pain may indicate Acute Chest Syndrome
  - pallor
  - tiredness/weakness
  - dehydration
  - headache
  - priapism.

2. Incidence

- There are different types of sickle cell disease found mainly in people of African or Afro-Caribbean origin, but can also affect people of Mediterranean, Middle Eastern and Asian origin. In the United Kingdom it is estimated that 15,000 adults and children suffer from sickle cell disease with 1 in every 2,000 babies born with the condition.

3. Severity and Outcome

- These painful crises can result in damage to the patient's lungs, kidneys, liver, bones and other organs and tissues. The recurrent nature of these acute episodes is the most disabling feature of sickle cell disease, and many chronic problems can result, including leg ulcers, blindness and stroke. Acute Chest Syndrome[a] is the leading cause of death amongst sickle cell patients.

4. Pathophysiology

- The red cells of patients with sickle cell disease are prone to assuming a permanently sickled shape when exposed to a variety of factors including hypoxia, cold or dehydration. These cells are prone to mechanical damage, hence the haemolytic anaemia in this group of patients, and to occluding the microvasculature leading to tissue hypoxia and pain and end organ damage.
- A crisis may follow as a result of an infection, during pregnancy, following surgery or a variety of other causes including mental stress.

5. Assessment and Management

For the assessment and management of patients with sickle cell crisis refer to Table 3.42 or Figure 3.4.

Methodology

For details of the methodology used in the development of this guideline refer to the guideline webpage.

KEY POINTS

Sickle Cell Crisis

- **Sickle cell disease is a hereditary condition affecting the haemoglobin contained within red blood cells; the cells are irregular in shape and occlude the microvasculature leading to tissue ischaemia.**
- **Sickle cell crises can result in damage to the lungs, kidneys, liver, bones and other organs and tissues.**
- **Sickle cell crises can be very painful and patients should be offered pain relief.**
- **Administer supplemental oxygen to all patients including those with chronic sickle lung disease.**
- **Patients with sickle cell disease can be dangerously ill but in no pain (e.g. aplastic crisis, stroke, hepatic sequestration, PE, etc.).**
- **Acute Chest Syndrome is a leading cause of death amongst sickle cell patients and is characterised by hypoxia and tachypnoea.**

[a] **Acute Chest Syndrome (also known as chest crisis)**. This is a common and potentially life-threatening complication of painful crises, and is often precipitated by a chest infection. The patient becomes breathless, hypoxic and tachypnoeic/tachycardic over a short period of time. Chest pain is often present, and the hypoxia responds poorly to inhaled oxygen. Crackles are often present in the lung bases and will ascend rapidly to involve the whole lung fields in severe cases. Radiological changes follow late and patients may be critically ill with near normal radiology. If a chest crisis is suspected, treatment should be initiated with inhaled oxygen and intravenous fluids. In hospital, intravenous antibiotics and urgent exchange transfusion are likely to be instituted after discussion with the haematology team. Intensive care and mechanical ventilation may be required in some cases. Pulmonary embolus is an important differential diagnosis.

Table 3.42 – ASSESSMENT and MANAGEMENT of:

Sickle Cell Crisis

ASSESSMENT	MANAGEMENT
• Assess ABCD	• If any of the following **TIME CRITICAL** features present: – major **ABCD** problems – [a]acute chest syndrome, then: • Start correcting **A** and **B** and undertake a **TIME CRITICAL** transfer to nearest receiving hospital. • Continue patient management en-route. • Provide an alert/information call.
• Ask the patient if they have an individualised treatment plan	• Follow the treatment plan if available. • The patient will often be able to guide their care. • Follow **medical emergencies guideline** in addition to the specific management detailed below.
• Oxygen	Administer supplemental oxygen to **ALL** patients including those with chronic sickle lung disease; oxygen helps to counter tissue hypoxia and reduce cell clumping. • **Adults** – administer supplemental oxygen via an appropriate mask/cannula until a reliable SpO_2 measurement is available; then adjust the oxygen flow to aim for target saturation within the range of 94–98%. • **Children** – administer high levels of supplemental oxygen. • Apply pulse oximeter. NB It is safer to over-oxygenate until a reliable SpO_2 measurement is available.
• ECG	• Undertake a 12-lead ECG in patients with chest pain to exclude obvious cardiac causes (**refer to acute coronary syndrome guideline**).
• Fluid	Patients with a sickle cell crisis will not have acute fluid loss, but may present with dehydration if they have been ill for an extended period of time. • If fluid resuscitation is indicated (**refer to intravascular fluid therapy guideline**).
• Pain management	• Offer **ALL** patients pain relief. • **Entonox** – administer initially but do not administer for extended periods (**refer to Entonox guideline**). • **Opiate analgesia** – administer orally or subcutaneously rather than intravenously if possible (**refer to morphine guidelines**). The dose should be guided by the patient's hand-held record if available, otherwise **refer to pain management guidelines**.
• Transfer to further care	• Transfer to specialist unit where the patient is usually treated. • Patients should not walk to the ambulance as this will exacerbate the effects of hypoxia in the tissues.

[a]**Acute Chest Syndrome (also known as chest crisis)**. This is a common and potentially life-threatening complication of painful crises, and is often precipitated by a chest infection. The patient becomes breathless, hypoxic and tachypnoeic/tachycardic over a short period of time. Chest pain is often present, and the hypoxia responds poorly to inhaled oxygen. Crackles are often present in the lung bases and will ascend rapidly to involve the whole lung fields in severe cases. Radiological changes follow late and patients may be critically ill with near normal radiology. If a chest crisis is suspected, treatment should be initiated with inhaled oxygen and intravenous fluids. In hospital, intravenous antibiotics and urgent exchange transfusion are likely to be instituted after discussion with the haematology team. Intensive care and mechanical ventilation may be required in some cases. Pulmonary embolus is an important differential diagnosis.

Sickle Cell Crisis

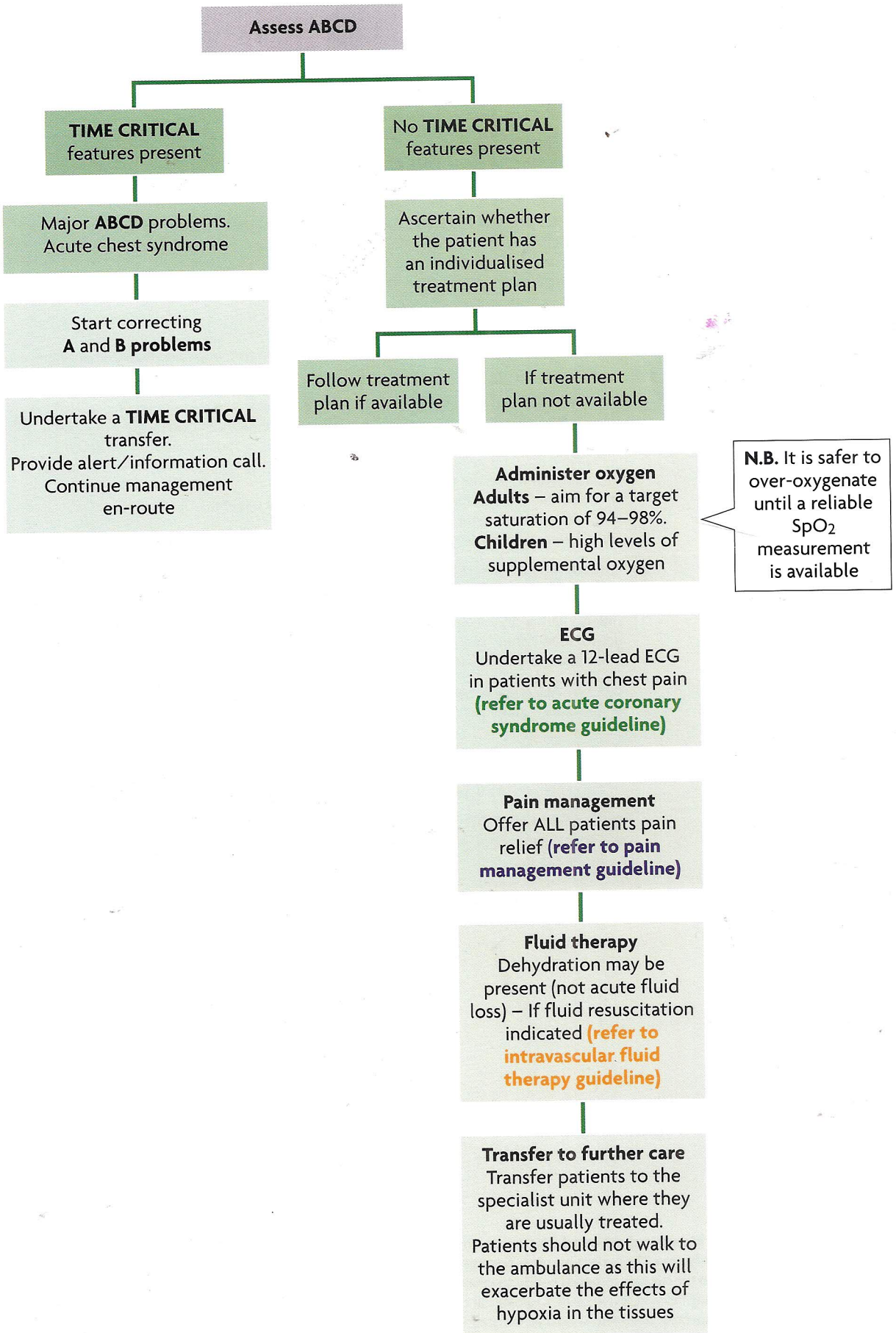

Figure 3.4 – Assessment and management algorithm for sickle cell crisis.