

Cyanosis

BY

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Definition of cyanosis:

- Cyanosis defined as bluish discoloration of skin & mucus membranes due to elevated level of reduced hemoglobin more than **5gm** percent.
- Normal level of Reduced hemoglobin **(1-2)gm** percent of total hemoglobin.

Types of cyanosis:

Cyanosis classified to three types according to the cause:

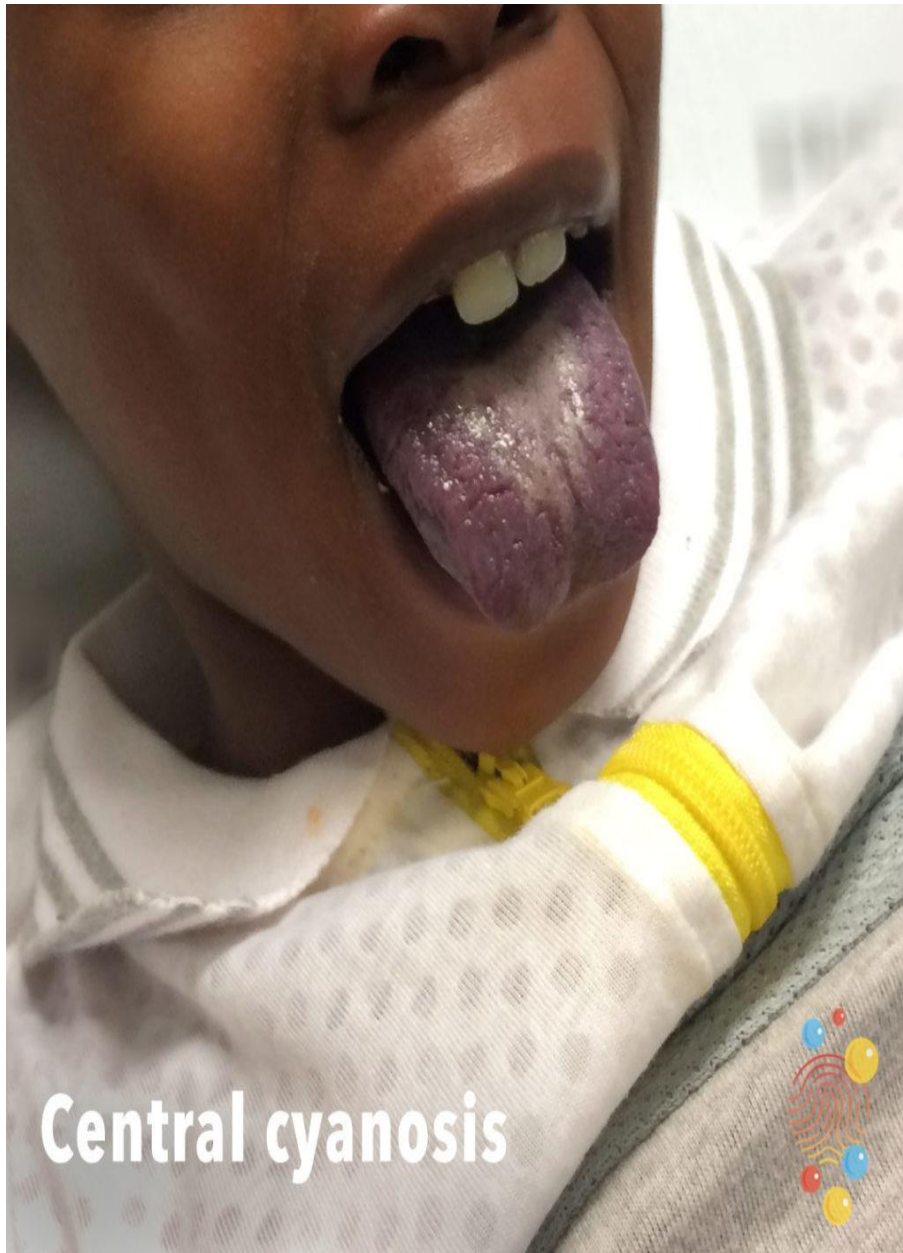
- True cyanosis: (central , peripheral).
- Differential cyanosis.
- False cyanosis: (chemical).

Central cyanosis:

- Is bluish discoloration of skin ,mucus membranes & tongue due to increase level of reduced HB more than 5gm percent as a result of cardiac or chest & central causes.

Central cyanosis





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Causes of central cyanosis:

- **Cardiac causes:** fallot triology,fallot tetralogy,cyanotic heart diseases(with right to left shunt).
- **Lung causes:** lung fibrosis,COPD.
- **Pulmonary A-V shunt** (liver cirrhosis).

- Prolonged central cyanosis associated with development of (hypoxic) blue clubbing.

Central cyanosis & cyanotic clubbing





By admission

5 weeks after palliation

10 months after palliation

Peripheral cyanosis:

Is **bluish discoloration** of nail beds, finger tips, ear lobule, tip of nose, **tongue spared**.

Peripheral cyanosis



Causes of peripheral cyanosis:

1. **Sluggish circulation** (congestive heart failure).
2. **Raynaunds** (peripheral artery disease).
3. **Cold exposure.**
4. **Shock.**

Central cyanosis vs peripheral cyanosis

	central cyanosis	Peripheral cyanosis
Area	generalize	localize
Tongue	involve	Not involve
Hand shake	Feel warm	Feel cold
clubbing	Usually present	Not present
On O2 application	Pulmonary cause improved	Not improved
Application of warming	Not improved	improved
Mechanism	Diminution of oxygen saturation	Diminution of blood flow
Capillary refill time	<2 sec	>2 sec

ETIOLOGY

Peripheral cyanosis

C

- Cold

O

- Obstruction

L

- LVF and shock

D

- Decreased cardiac output

Central cyanosis

P

- Polycythemia

A

- Altitude

L

- Lung disease

M

- Met - sulfhemoglobinemia

S

- Shunt

Mnemonic: "COLD PALMS"



(a) Peripheral cyanosis (©iStockPhoto)



(b) Central cyanosis (source:[9])

Differential cyanosis:

- Cyanosis of both lower limbs without involvement of upper limbs due to :

1-PDA with preductal aortic coarctation.

2-PDA with pulmonary HTN
(eisenmenger effect).

Chemical cyanosis:

- Not true cyanosis as discoloration of skin & mucus membranes due to exposure to (nitrite) methemoglobin formation ,exposure to (sulfonamide) sulfhemoglobin formation.

Work up for diagnosis:

- Pulse oximeter to confirm hypoxia.
- ABG{arterial blood sample} oxygen saturation.
- Provide warmth to correct vasoconstriction to cold.

- CT chest to diagnose lung lesions
- Echocardiography to assess cardiac condition & exclude or confirm congenital disease.

It is important to say:

- Patient with severe anemia never develop cyanosis as there is no enough hemoglobin for 5gm to be deoxygenated (incompatible with life).

- On the other hand patients with polycythemia more prone to cyanosis as there is excess available hemoglobin to be reduced in addition to sluggish circulation.