PULSE OXIMETRY FOR NEWBORN INFANTS

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Why do we need to recognize heart defects in the newborn period?

The baby might die if we miss the diagnosis.
DIAGNOSIS OF CONGENITAL HEART DEFECTS

Prenatal Ultrasound

Newborn Exam

Pulse Oximetry

Echocardiography
Most congenital heart defects can be repaired, allowing a normal life.

We have a narrow window of time to diagnosis critical congenital heart defects.
The ductus arteriosus in the immediate newborn period often protects the baby from death.

But, the ductus arteriosus closes within days after birth.
Hypoplastic Left Heart Syndrome
When the ductus closes, at several days of age, the baby presents with shock and progresses to death.

If early diagnosis: start prostaglandin infusion to keep the ductus arteriosus open
VITAL SIGNS

Temperature

Heart Rate

Blood Pressure: Right Arm, Leg

Respiratory Rate and Pattern
PULSE OXIMETRY

Yes, this is a vital sign as well as a “screening tool”.
Pulse oximetry supplements a careful exam.

It does not replace a careful exam.
Is visual inspection accurate?

NO

Cyanosis is not evident until the saturation is about 80%.

Single ventricle: oxygen saturation= 85%
Is auscultation adequate?

NO

Many critical heart defects do not present with a murmur.
Pulse Oximetry

Need accurate acquisition

Need to have a plan for abnormal results
Figure. The proposed pulse oximetry monitoring protocol based on results from the right hand (RH) and either foot (F).
Low Oxygen Saturation:

Cyanotic heart defect
Pulmonary disease
Sleeping baby
Crying baby
Cool extremities
Procedure for low oxygen saturation

Careful evaluation by physician or other provider

Call neonatologist and/or pediatric cardiologist

Possible echocardiogram: only if indicated
Will pulse oximetry diagnose all babies with critical heart defects?

NO

Some defects that are critical may have a normal oxygen saturation

e.g. Critical coarctation or the aorta
    Critical aortic stenosis
    Critical pulmonary stenosis
Detection of critical heart defects by oximetry:

- HLHS: 100%
- DORV: 100%
- d-TGA: 100%
- AV septal defect: 80%
- Aortic stenosis: 75%
- Coarctation: 53%
- Pulm stenosis: 33%
Remember:
Pulse oximetry is an adjunct to a thorough clinical evaluation, not a substitute.
Pulse Oximetry

Usefulness is not limited to the detection of critical heart disease

An abnormal result indicates the need for further evaluation
THANKS FOR LISTENING !!