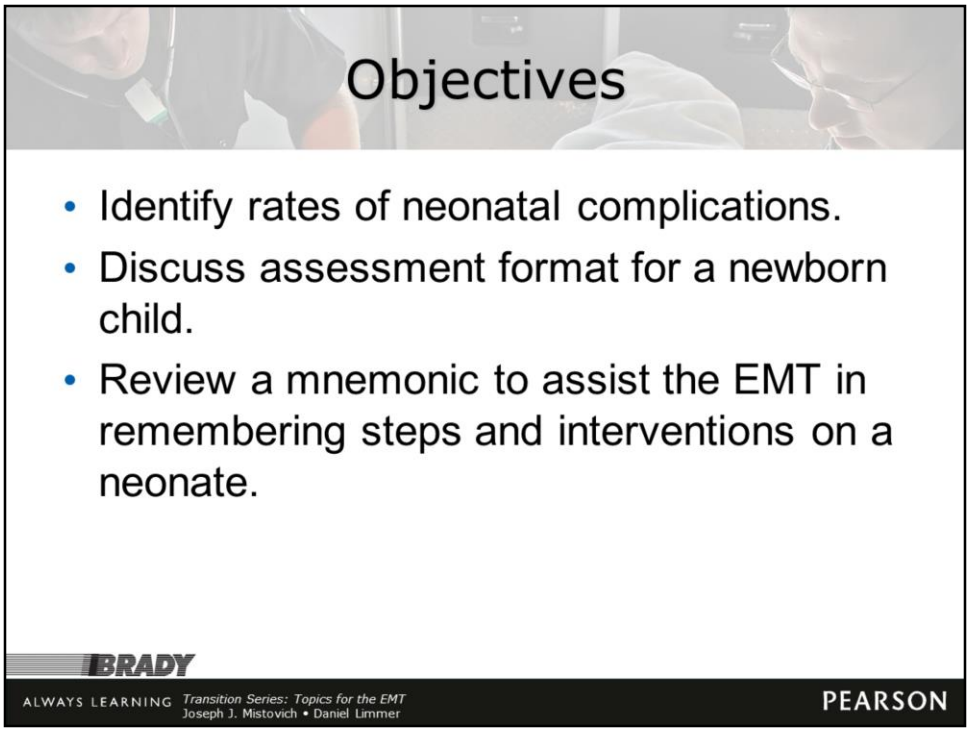
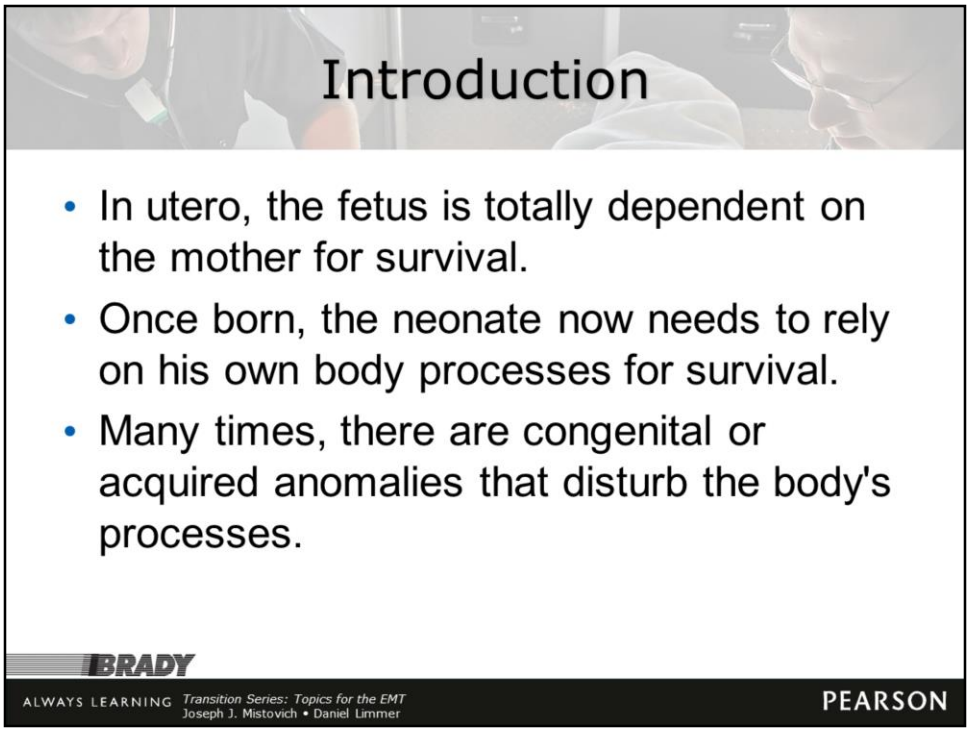

BRADY
TRANSITION SERIES
TOPICS FOR THE EMT
TOPIC 50
Neonatology
ALWAYS LEARNING
PEARSON



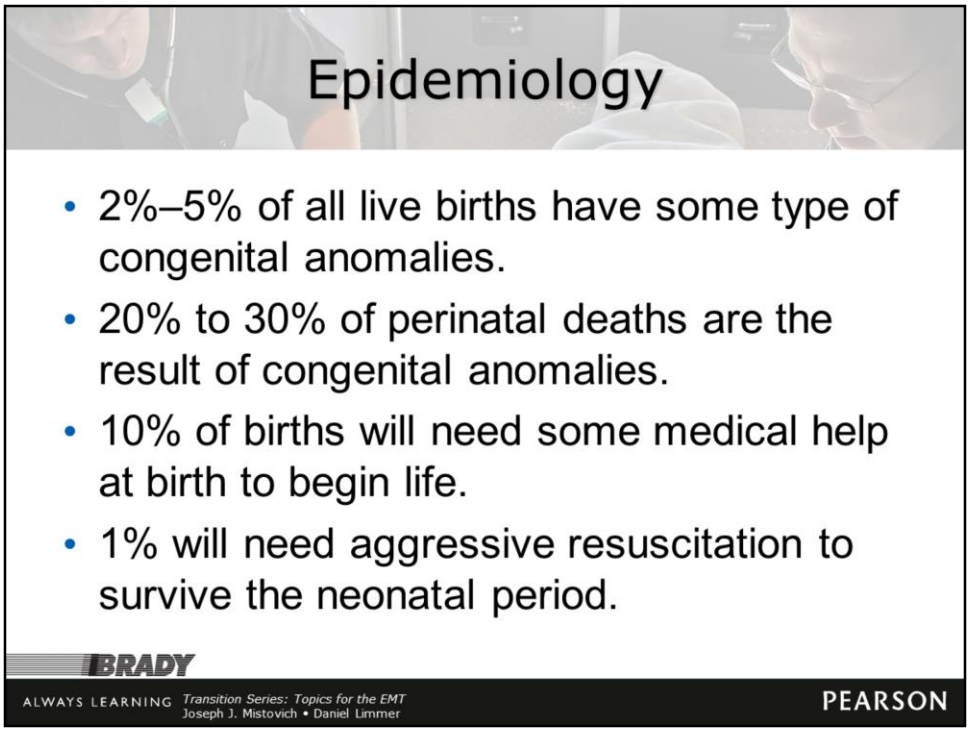
Review objectives.



In utero, the fetus can:
•See
•Feel
•Hear
•Breathe

Although simultaneously, the infant is totally dependent on the mother for:
•Protection
•Warmth
•Oxygen
•Nutrition
•Waste removal
•Immune function

After birth the infant must:
•Begin to fend for themselves by breathing air
•Depend on their own circulatory and respiratory systems for an adequate cardiac output and oxygen delivery
•Be capable of feeding effectively to allow for rapid growth
•Develop an immune system that can protect them from the many bacterial, viral, and fungal pathogens that they will encounter from the moment of birth



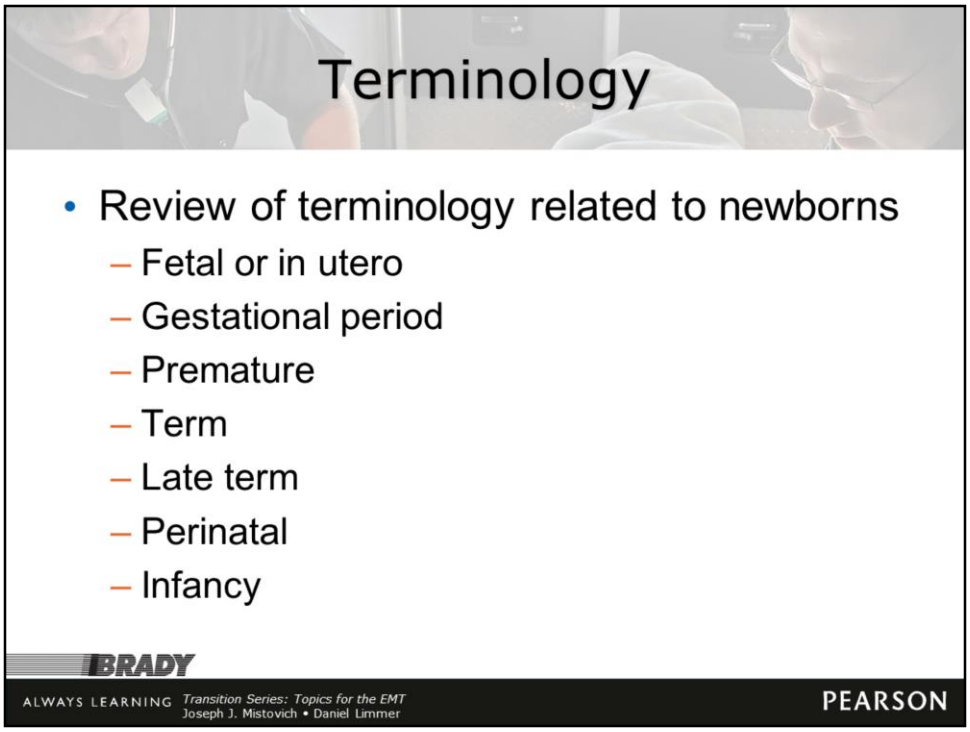
Review basic statistics.

Figure 50-1 Ten leading causes of death by age group. Courtesy of the Centers for Disease Control and Prevention. *Source:* Morbidity and Mortality Weekly Report, Vol. 58, No RR-1, (2009)

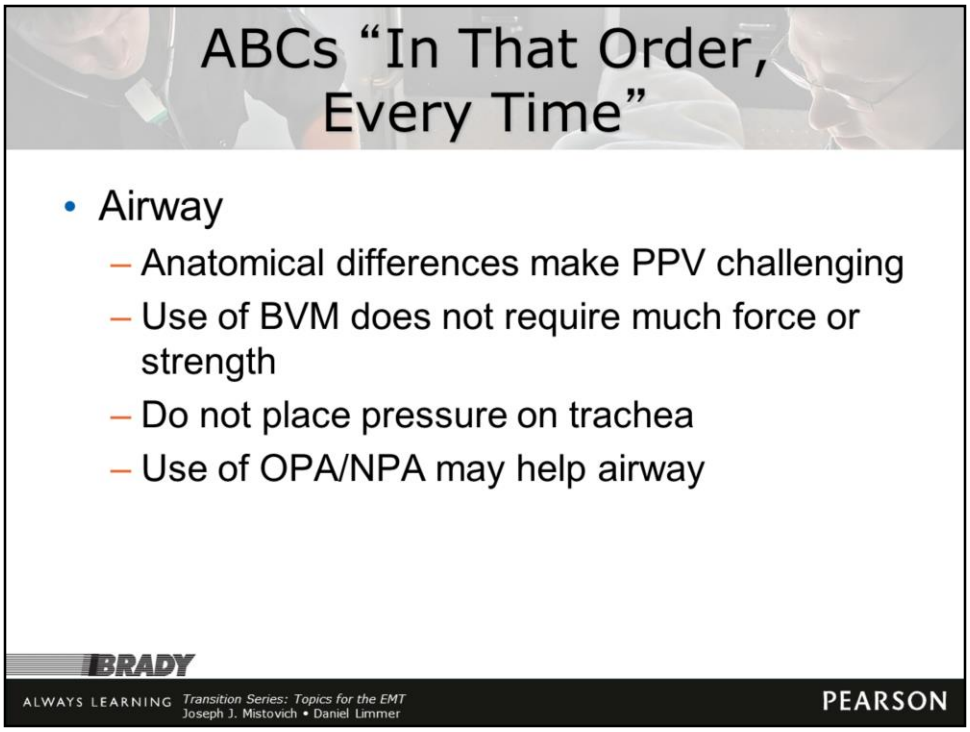
10 Leading Causes of Death by Age Goup-2001

	Age Groups										
Rank	<1	1–4	5–9	10–14	15–24	25–34	35–44	45–54	55–64	65+	Total
1	Congenital Anomalies 5,513	Unintentional Injury 1,714	Unintentional Injury 1,283	Unintentional Injury 1,553	Unintentional Injury 14,411	Unintentional Injury 11,839	Malignant Neoplasms 16,559	Malignant Neoplasms 49,562	Malignant Neoplasms 90,223	Heart Disease 582,730	Heart Disease 700,142
2	Short Gestation 4,410	Congenital Anomalies 557	Malignant Neoplasms 493	Malignant Neoplasms 515	Homicide 5,237	Homicide 5,204	Unintentional Injury 15,945	Heart Disease 38,399	Heart Disease 62,486	Malignant Neoplasms 390,214	Malignant Neoplasms 553,768
3	S1DS 2,234	Malignant Neoplasms 420	Congenital Anomalies 182	Suicide 272	Suicide 3,971	Suicide 5,070	Heart Disease 13,326	Unintentional Injury 13,344	Chronic Low Respiratory Disease 11,166	Cerebro-vascular 144,466	Cerebro-vascular 163,536
4	Matemal Pregnancy Comp. 1,499	Homicide 415	Homicide 137	Congenital Anomalies 194	Malignant Neoplasms 1,704	Malignant Neoplasms 3,394	Suicide 6,635	Liver Disease 7,259	Cerebro-vascular 9,608	Chronic Low Respiratory Disease 106,904	Chronic Low Respiratory Disease 123,013
5	Placenta Cord Membranes 1,018	Heart Disease 225	Heart Disease 98	Homicide 189	Heart Disease 999	Heart Disease 3,100	HIV 5,867	Suicide 5,942	Diabetes Mellitus 9,570	Influenza & Pneumonia 55,518	Unintentional Injury 101,537
6	Respiratory Distress 1,011	Influenza & Pneumonia 112	Benign Neoplasms 52	Heart Disease 174	Congenital Anomalies 505	HIV 2,101	Homicide 4,268	Cerebro-vascular 5,910	Unintentional Injury 7658	Diabetes Mellitus 53,707	Diabetes Mellitus 71,372
7	Unintentional Injury 976	Septicemia 108	Influenza & Pneumonia 46	Chronic Low Respiratory Disease 62	HIV 225	Cerebro-vascular 601	Liver Disease 3,336	Diabetes Mellitus 5,343	Liver Disease 5,750	Alzheimer's Disease 53,246	Influenza &Pneumonia 62,034
8	Baderial Sepsis 698	Perinatal Period 72	Chronic Low Respiratory Disease 42	Benign Neoplasms 53	Cerebro-vascular 196	Diabetes Mellitus 595	Cerebro-vascular 2,491	HIV 4,120	Suicide 3,317	Nephritis 33,121	Alzheimer's Disease 53,852
9	Circulatory System Disease 622	Benign Neoplasms 58	Cerebro-vascular 38	Influenza & Pneumonia 48	Influenza & Pneumonia 181	Congenital Anomalies 458	Diabetes Mellitus 1,958	Chronic Low Respiratory Disease 3,324	Nephritis 3,284	Unintentional Injury 32,694	Nephritis 39,480
10	Intrautenine Hypoxia 534	Cerebro-vascular 54	Septicemia 29	Cerebro-vascular 42	Chronic Low Respiratory Disease 171	Liver Disease 387	Influenza & Pneumonia 983	Homicide 2,467	Septicemia 3,111	Septicemia 25,418	Septicemia 32,236

Note: Homicide and suicide counts include terrorism deaths associated with the events of September 11,2001, that occurred in New York City, Pennsylvania, and Virginia, A total of 2,926 U.S. residents lost their lives in these acts of terrorism in 2001, of which 2,922 were classified as (transportaion-related) homicides and 4 were classified as suicides.
Source: National Center for Health Statistics, (NCHS) Vital Statistics Systems.
Produced by : Office of Statistics and Programming, National Center for Injury Prevention and Control, CDC.



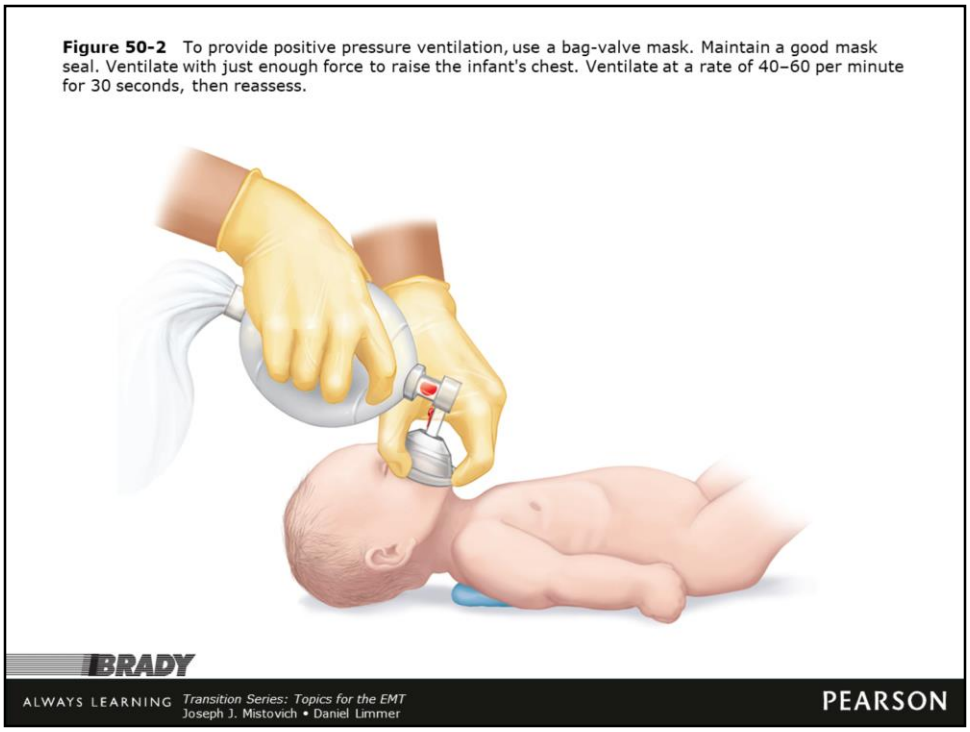
Review terms with students.



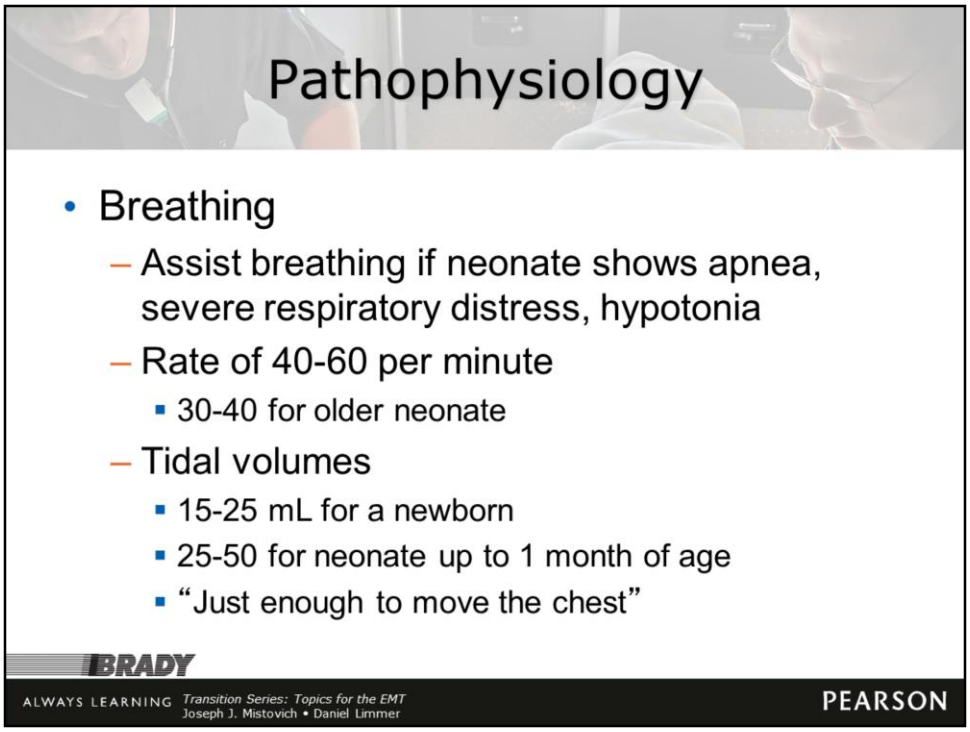
Review the anatomical differences between the neonate and the adult airway.

Stress BVM should not be a difficult technique.

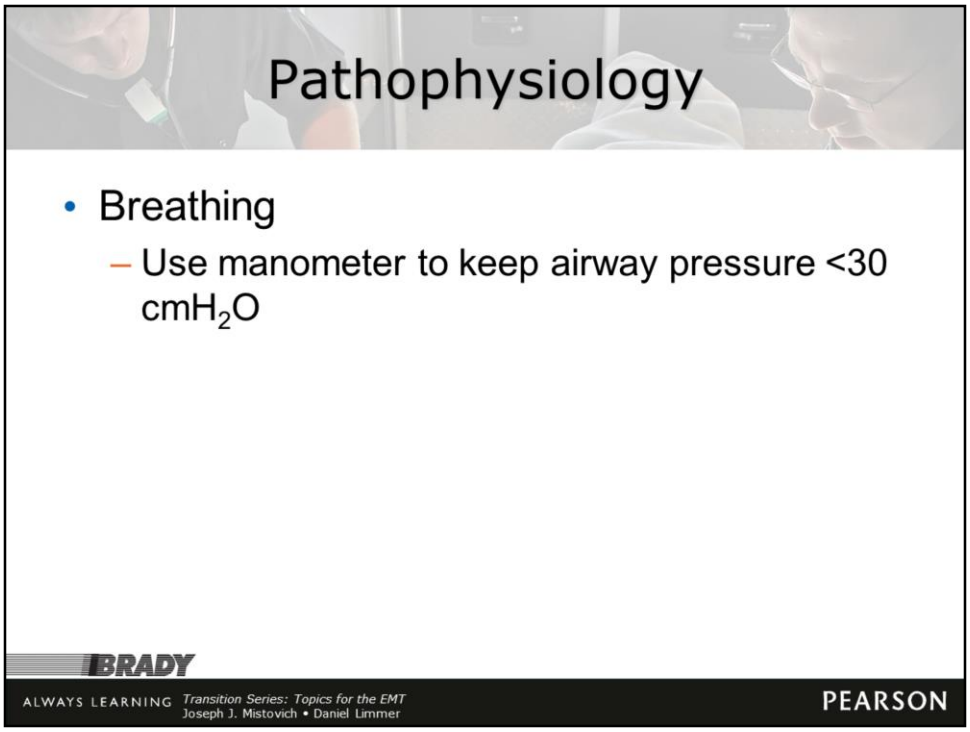
Early use of manual techniques and simple mechanical will help keep a closing airway open.



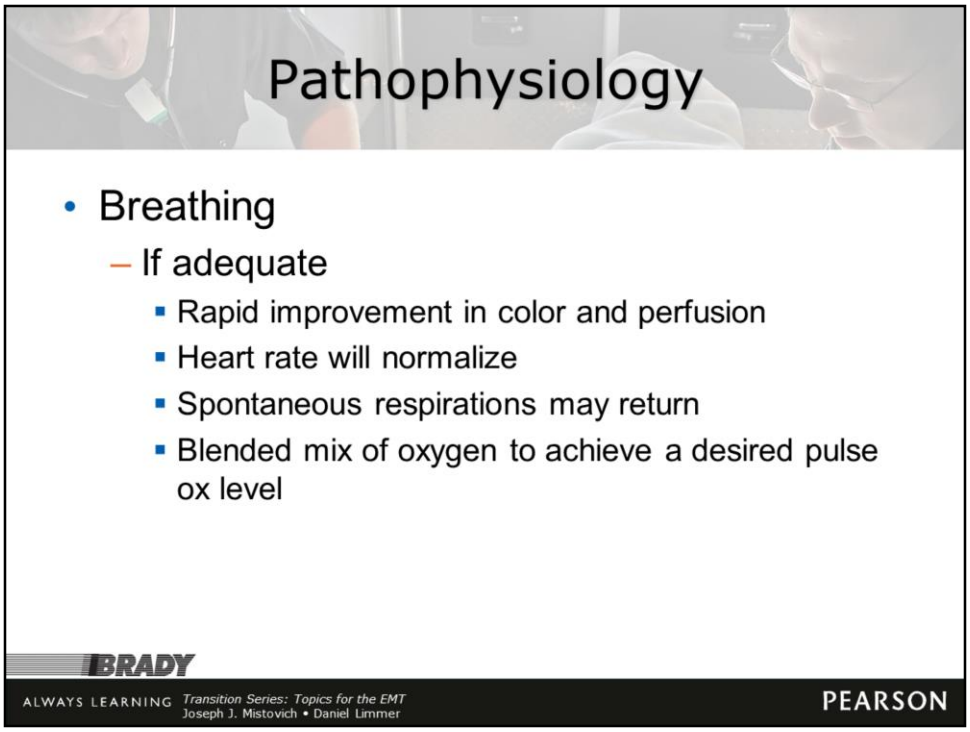
You are transporting an infant who is having periods of apnea, but you don't have the appropriate size mask to provide assisted ventilations. Before starting mouth to mouth nose assisted ventilations, you could try an adult size mask creating a seal over the infants entire face.



When the airway patency has been established, assisted ventilation should be performed in any neonate with significant respiratory distress, apnea, or significant hypotonia (e.g., a floppy baby).



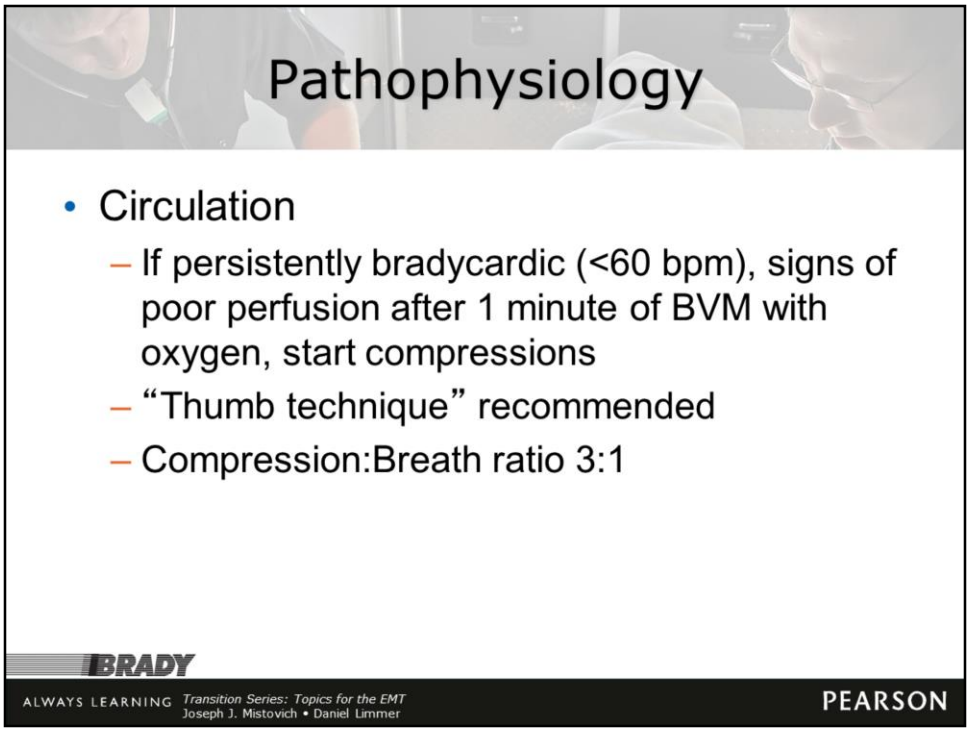
When the airway patency has been established, assisted ventilation should be performed in any neonate with significant respiratory distress, apnea, or significant hypotonia (e.g., a floppy baby).



Blended oxygen to achieve SpO_2 levels:

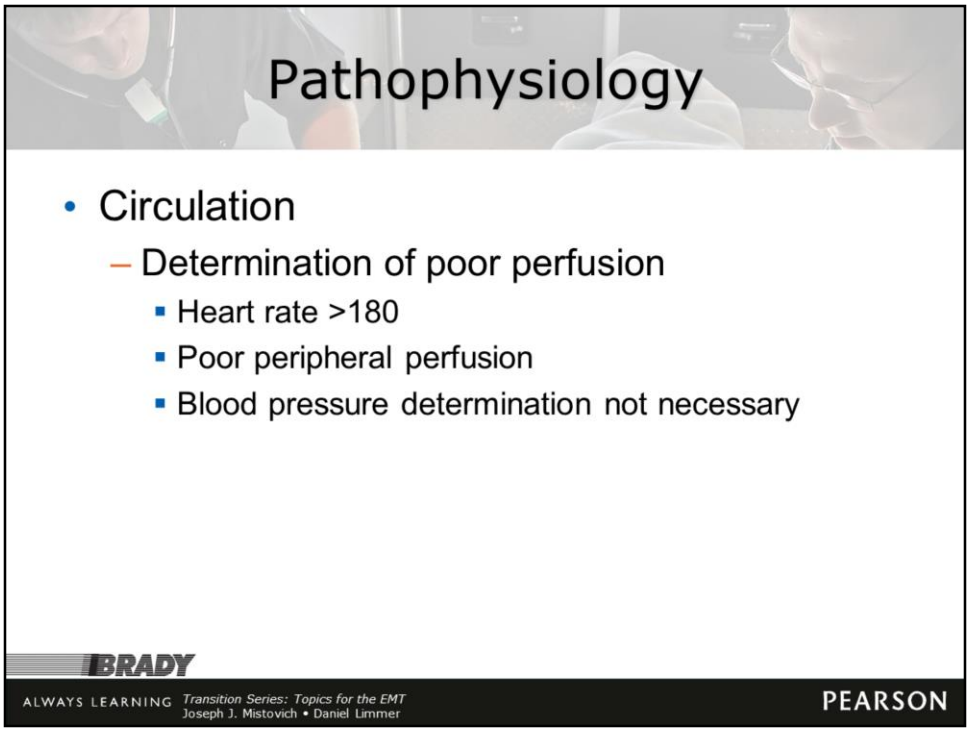
- 60 to 65 percent after 1 minute
- 65 to 70 percent after 2 minutes
- 70 to 75 percent after 3 minutes
- 75 to 80 percent after 4 minutes
- 80 to 85 percent after 5 minutes
- 85 to 95 percent after 10 minutes

If the heart rate is less than 60 bpm after 90 seconds of resuscitation, the oxygen concentration should be increased to 100 percent until the heart rate increases to more than 100 bpm.



Discuss the importance of gauging peripheral perfusion in a neonate as a measure of cardiovascular function.

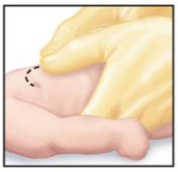
If bradycardic and poorly perfusing after a trial of PPV, start compressions.

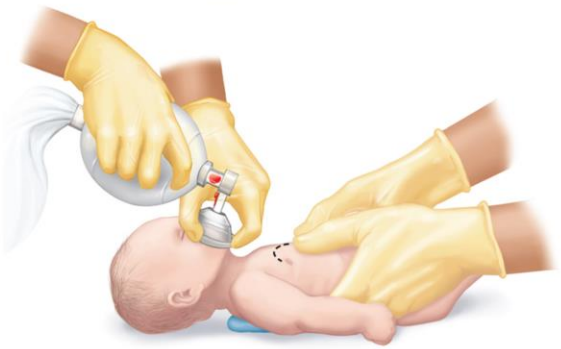


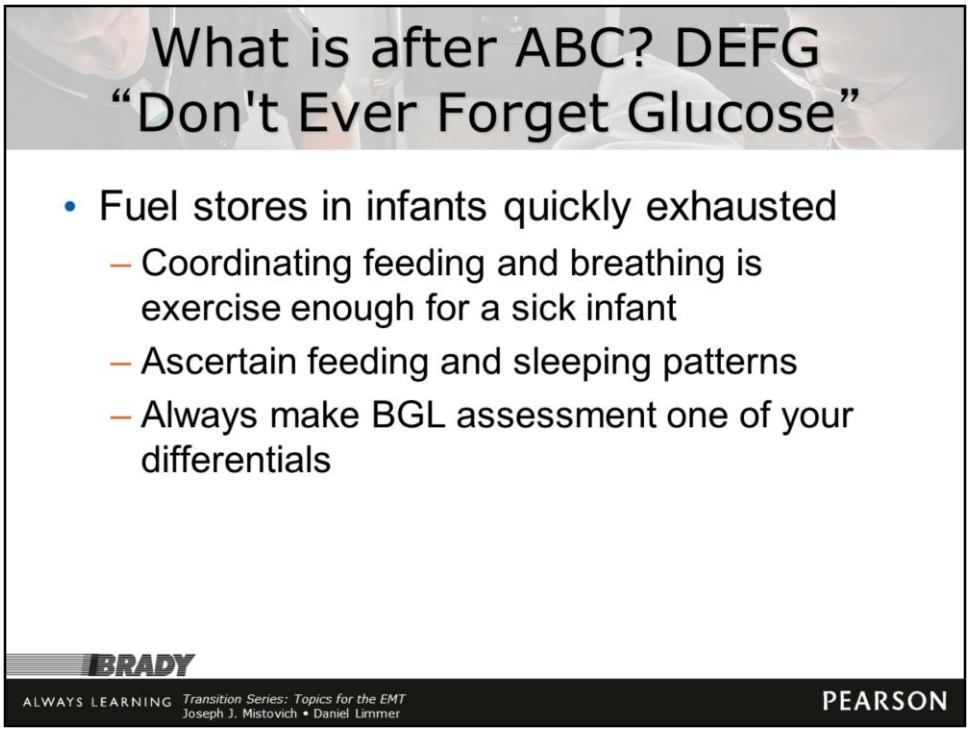
Discuss the importance of gauging peripheral perfusion in a neonate as a measure of cardiovascular function.

If bradycardic and poorly perfusing after a trial of PPV, start compressions.

Figure 50-3 To provide chest compressions, circle the torso with the fingers and place both thumbs on the lower third of the infant's sternum. If the infant is very small, you may need to overlap the thumbs. If the infant is very large, compress the sternum with the ring and middle fingers placed one finger's depth below the nipple line. In the newborn, compress the chest one-third the depth of the chest at the rate of 120 per minute and a ratio of 3:1 compressions to ventilations.







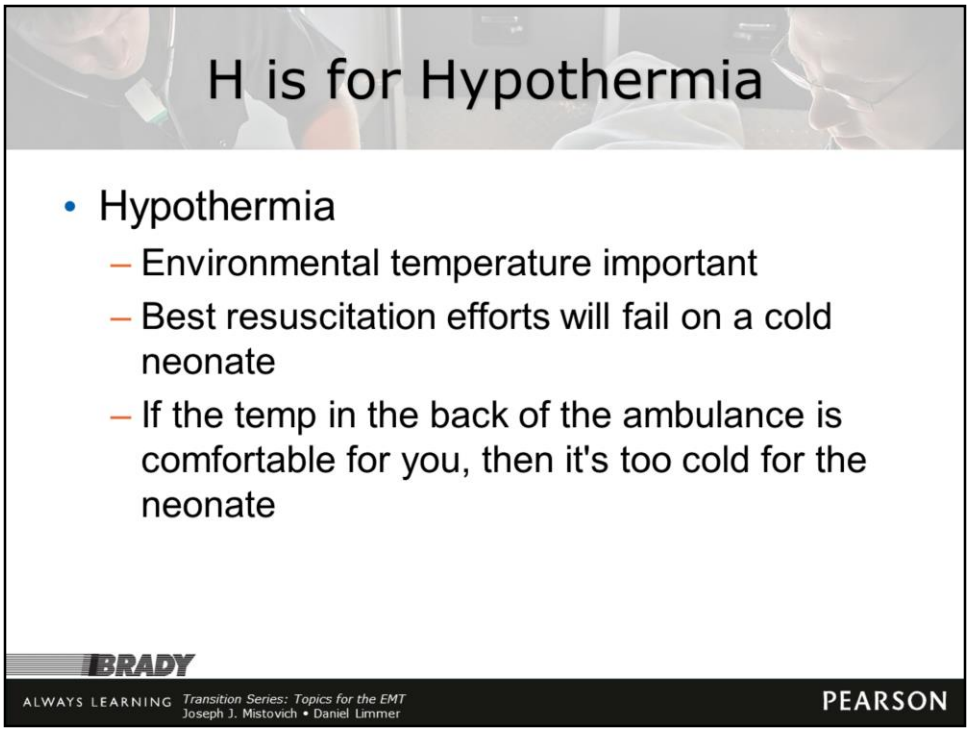
Feeding for newborns and infants is their exercise.

It can be exhausting for a sick infant to feed, to coordinate the muscles of respiration and those of swallowing.

This is especially true for premature or fragile infants with medical conditions.

For this reason, questions around the infant's feeding (amount, duration, frequency, and whether there was any emesis, sweating, or frequent coughing) can be very important clues to the underlying problem.

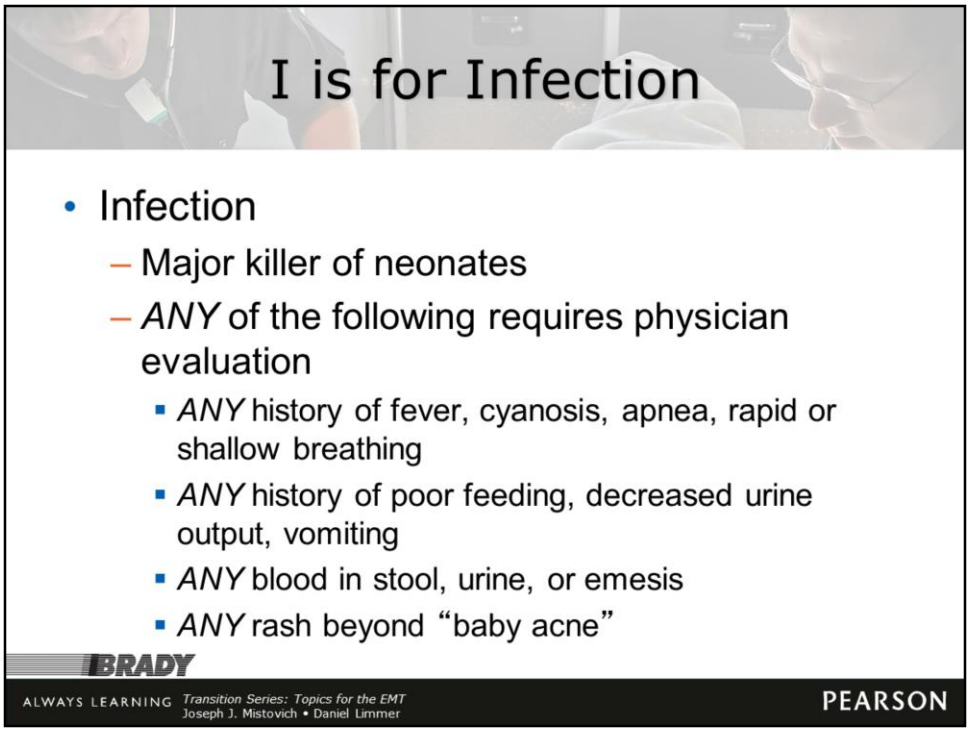
In a sense, the newborn infant's "day" can be reduced to four hour cycles of sleeping, crying to communicate discomfort, feeding, and some period of alertness before sleeping again.



Once again, it cannot be overemphasized how important attention to the environmental temperature is to the care of an infant.

Even the best resuscitation skills and efforts will fail if the infant is cold.

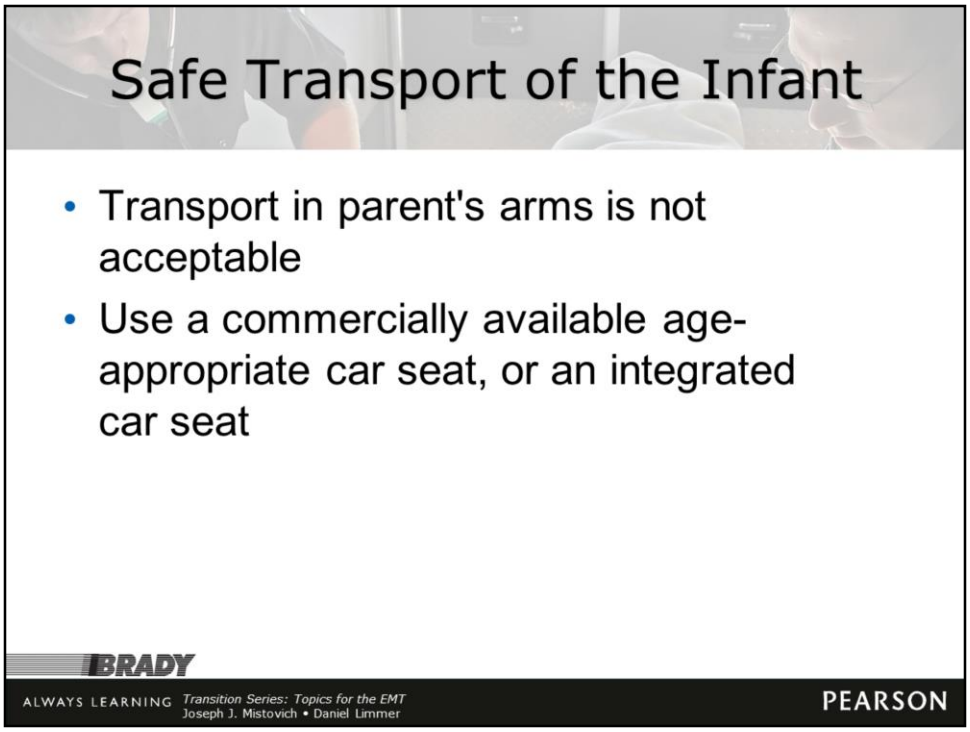
A corollary to the old EMS adage "They're not dead until they're warm and dead" is that the infant will not survive until they are warm.



Infection is a major killer of neonates and can have a very rapid presentation.

Sometimes the history is only of a fussy baby who was not feeding very well, whose breathing became more labored and then would stop occasionally (apnea) and have episodes of turning blue (cyanosis).

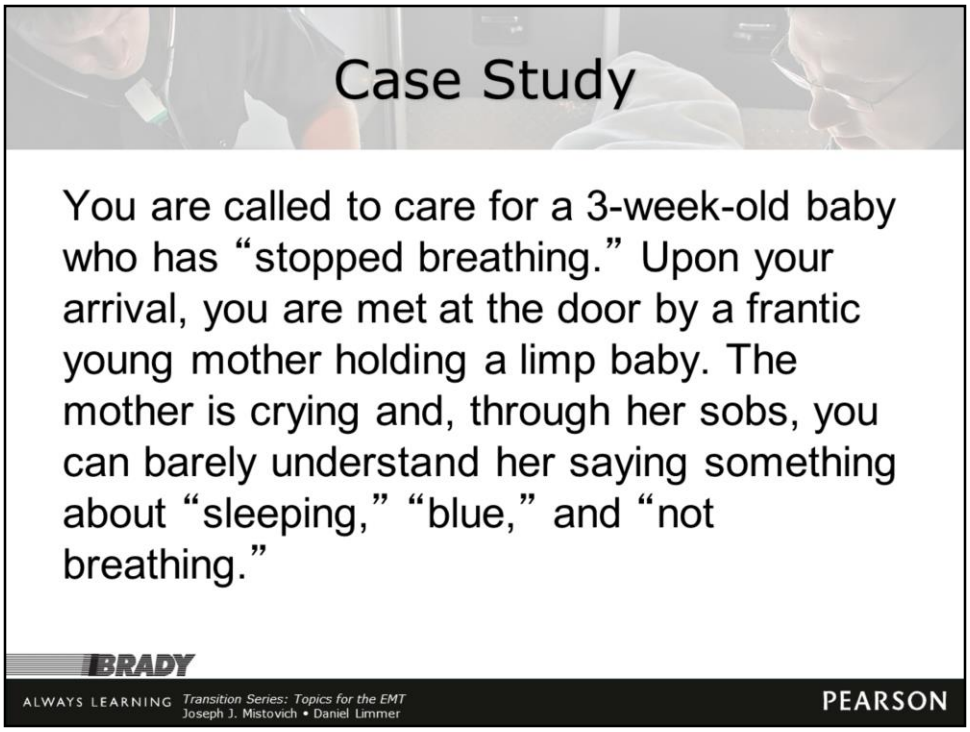
This is the common introduction to the story of a potentially very sick and dying neonate and cannot be overlooked or discounted by health care professionals.



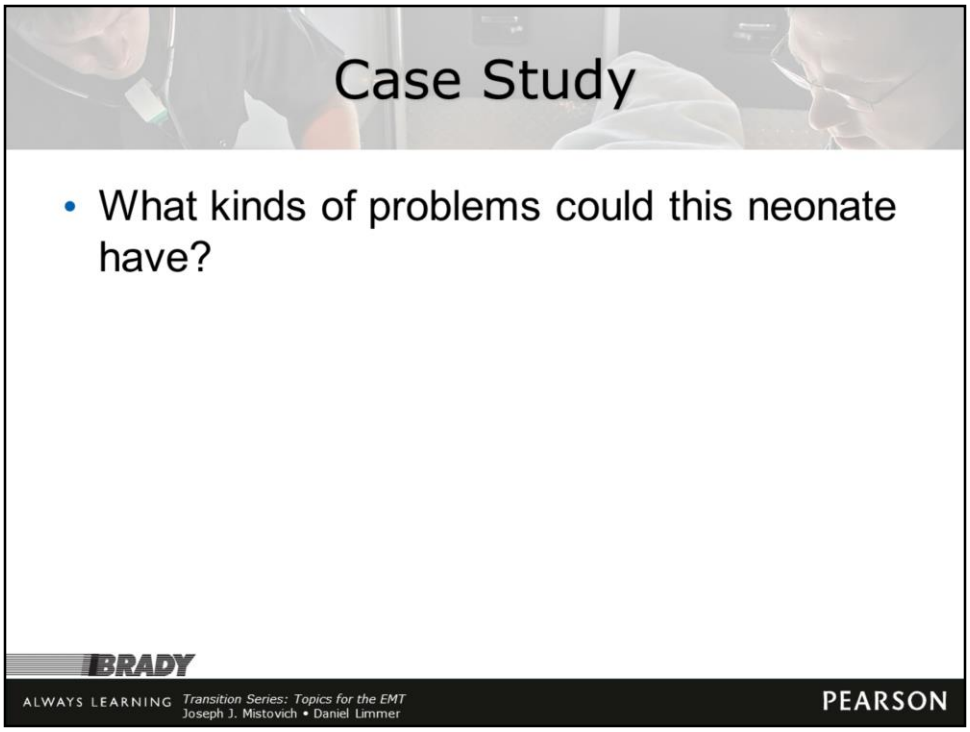
Having a convertible child passenger restraint system (car seat) with two belt paths and a five-point harness system that can be adjusted to the size of the child is standard of care.

Transporting the neonate in an isolette is ideal, as the chamber can be heated. In the absence of that, a car bed that lies across the stretcher and is strapped down using the stretcher's harnessing is next best.

Few EMS systems have these, however, and most may not even have car seats (although that should change).



Present case study.



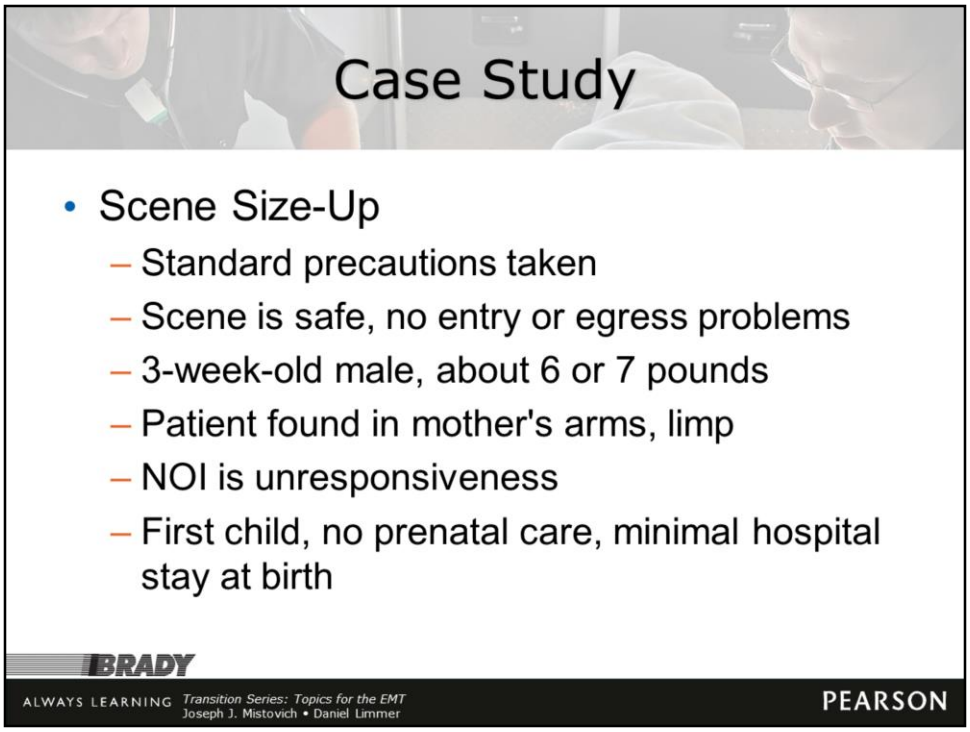
A limp infant is the worse case scenario.

It may be circling cardiac arrest or be in cardiac arrest.

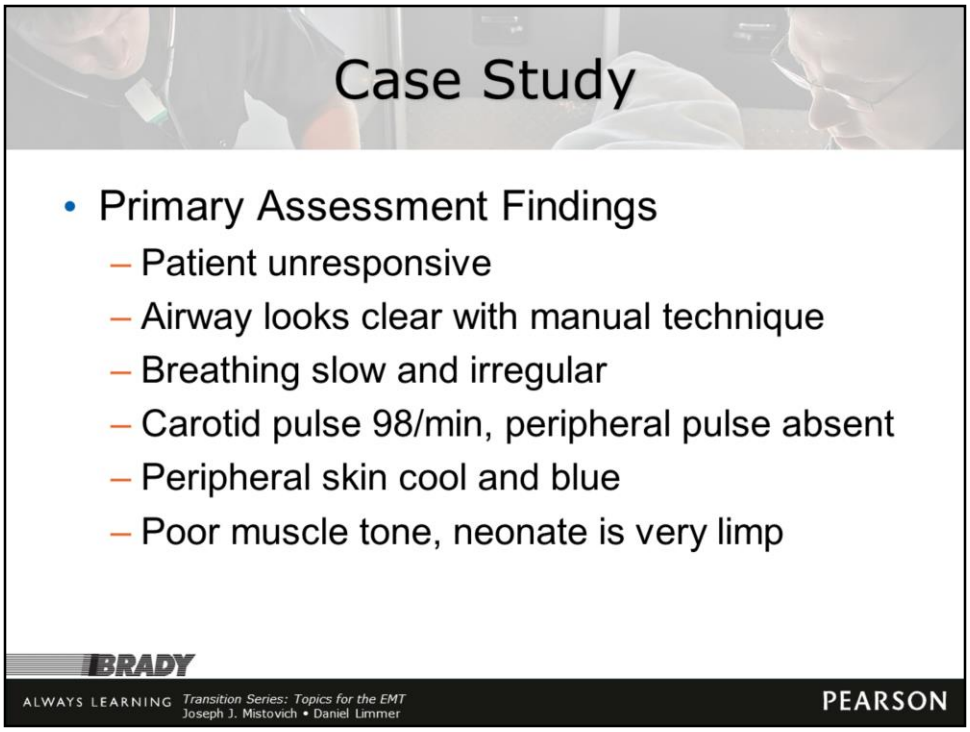
The problem could be airway (the number one cause for arrest in infants), the problem could be a congenital problem with the heart, the problem could stem from poor feeding and dehydration, or from some traumatic event.

That being said, the goal is to first assess ABC's and support lost function.

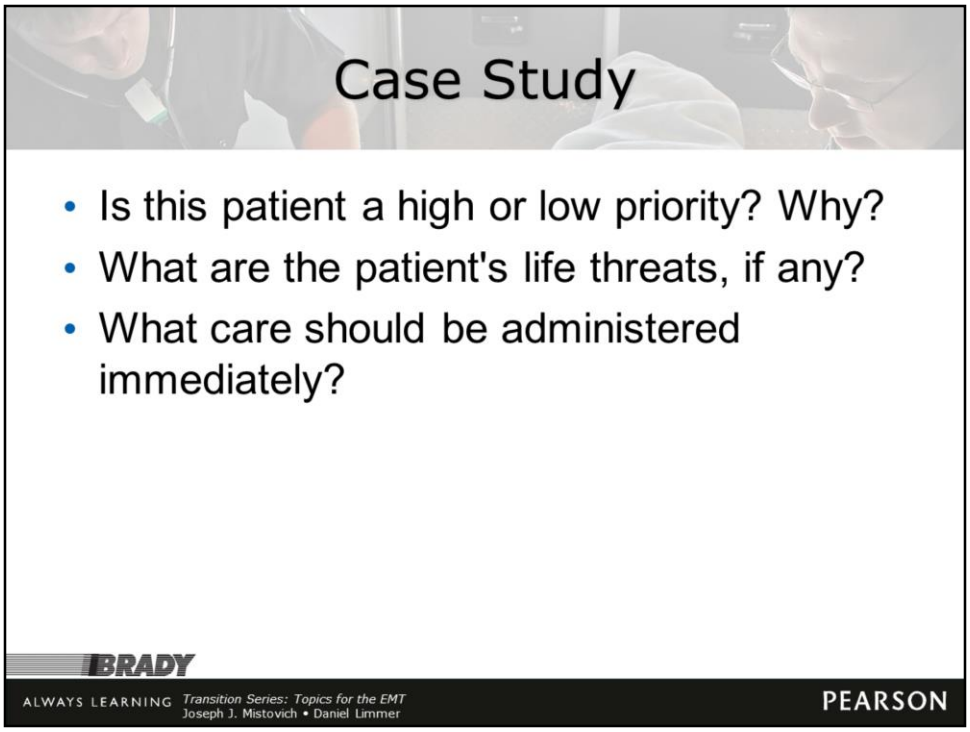
The differential diagnosis will come eventually, but not if the baby is dies first!



Present case study.



Discuss case presentation.

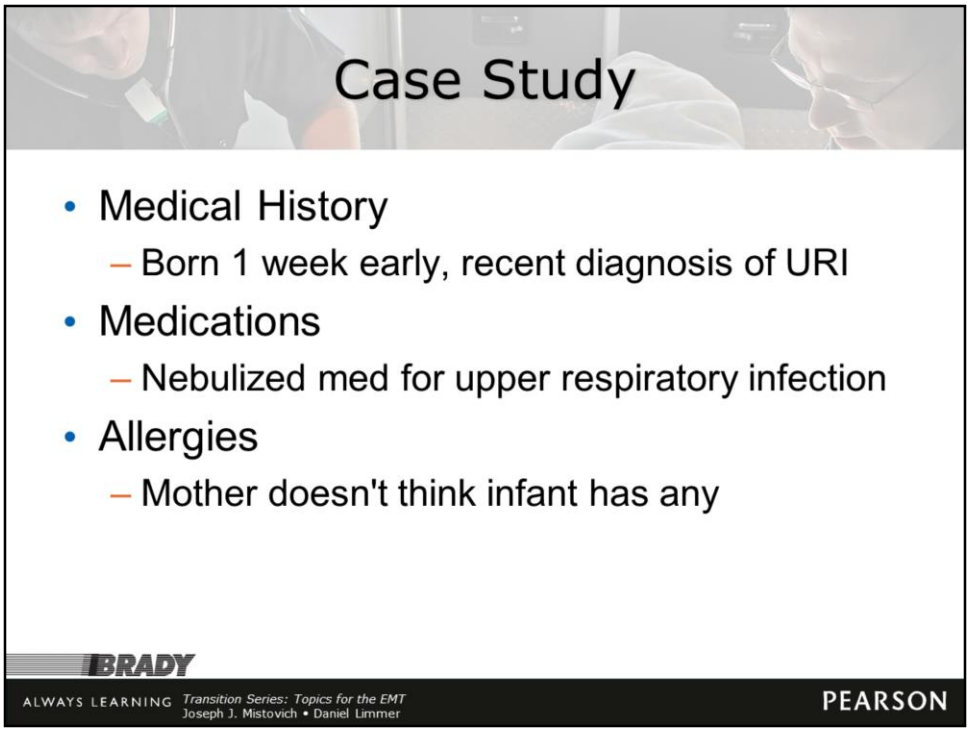


This patient would be categorized as unstable due to color, pulse, breathing, and mental status.

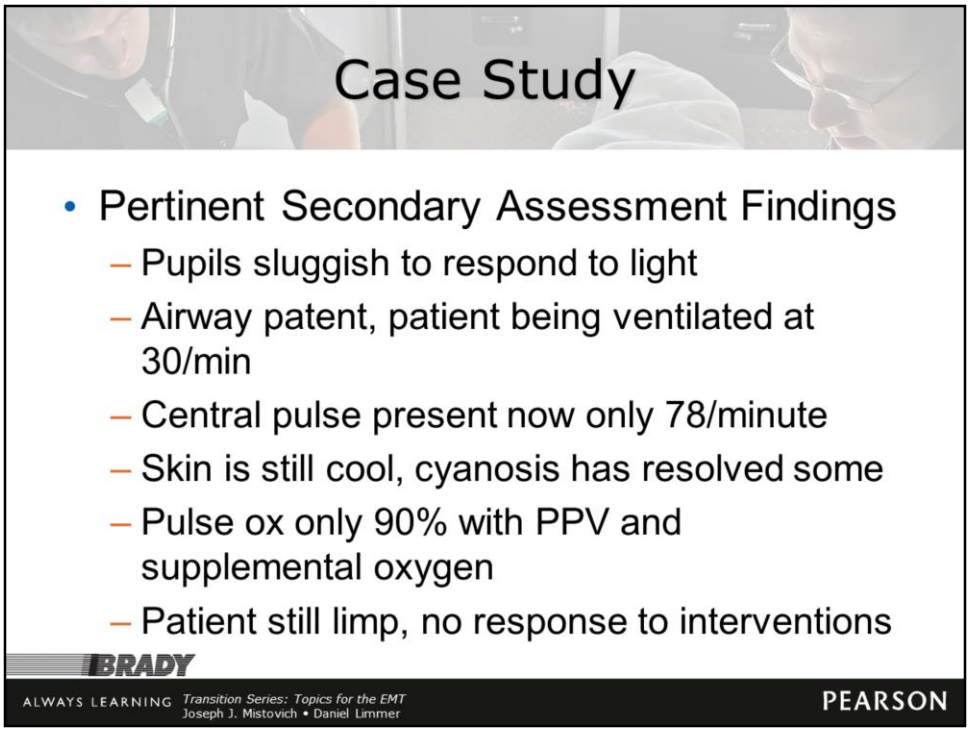
The primary life threat is that the infant is not breathing effectively, which will quickly turn into cardiopulmonary arrest (that carries with it dismal resuscitation outcomes).

The patient should be laid down supine and the airway opened carefully using a manual technique. Positive pressure ventilations should be initiated at 30/min with supplemental oxygen, providing just enough tidal volume to create chest rise and fall.

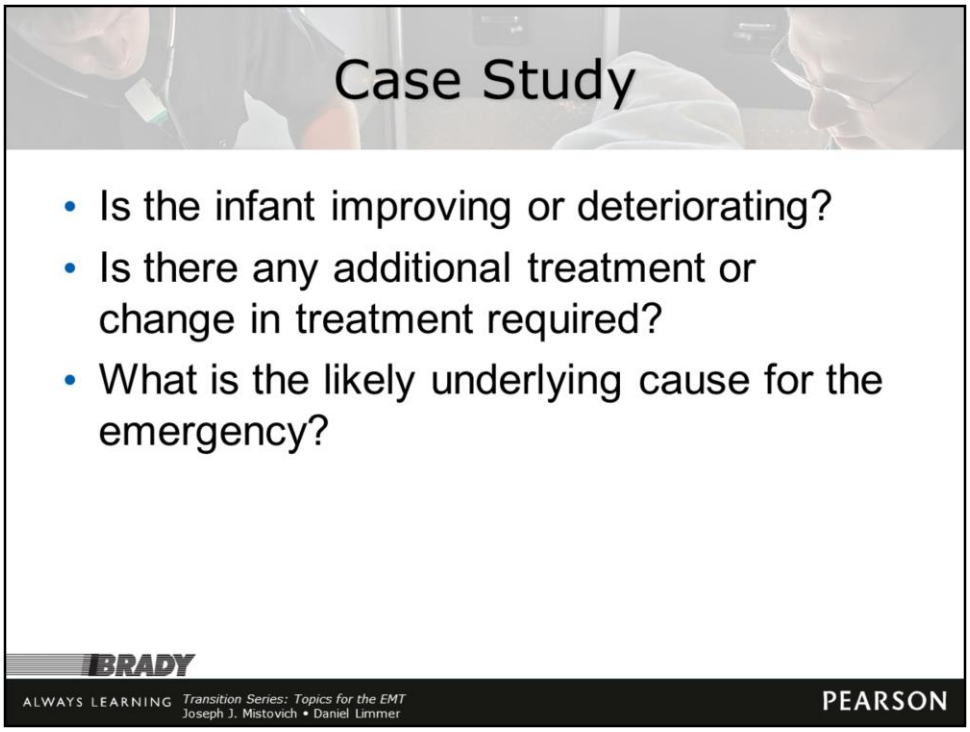
Cover the infant to help preserve/promote normothermia.



Discuss case study.



Discuss case study.

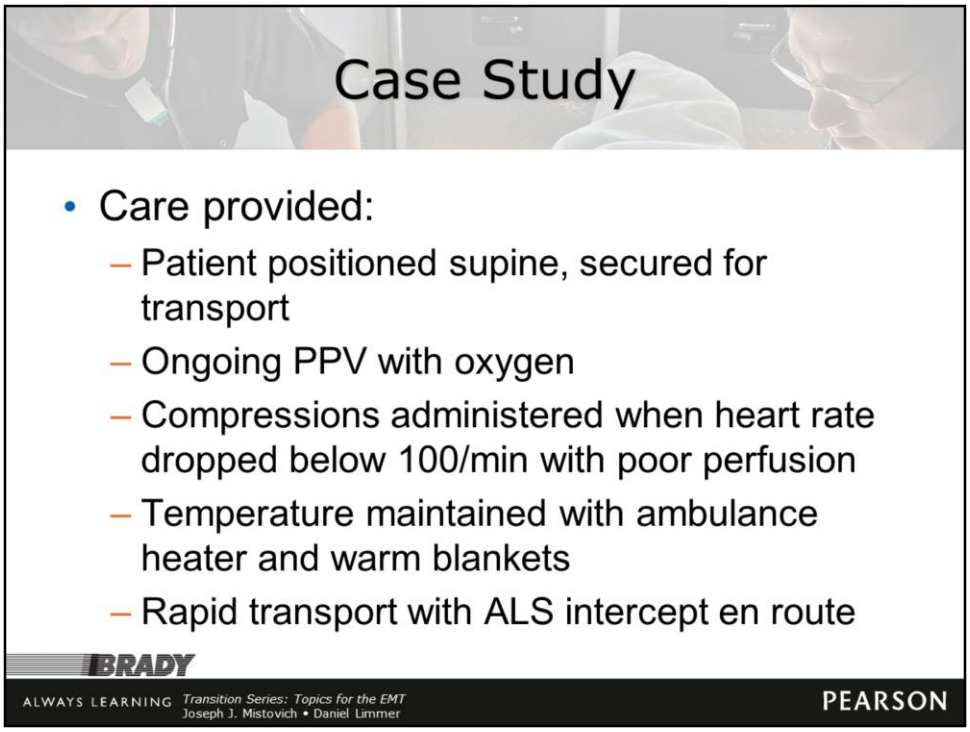


Although the color improved slightly, more importantly the body is still limp and the heart rate is now declining.

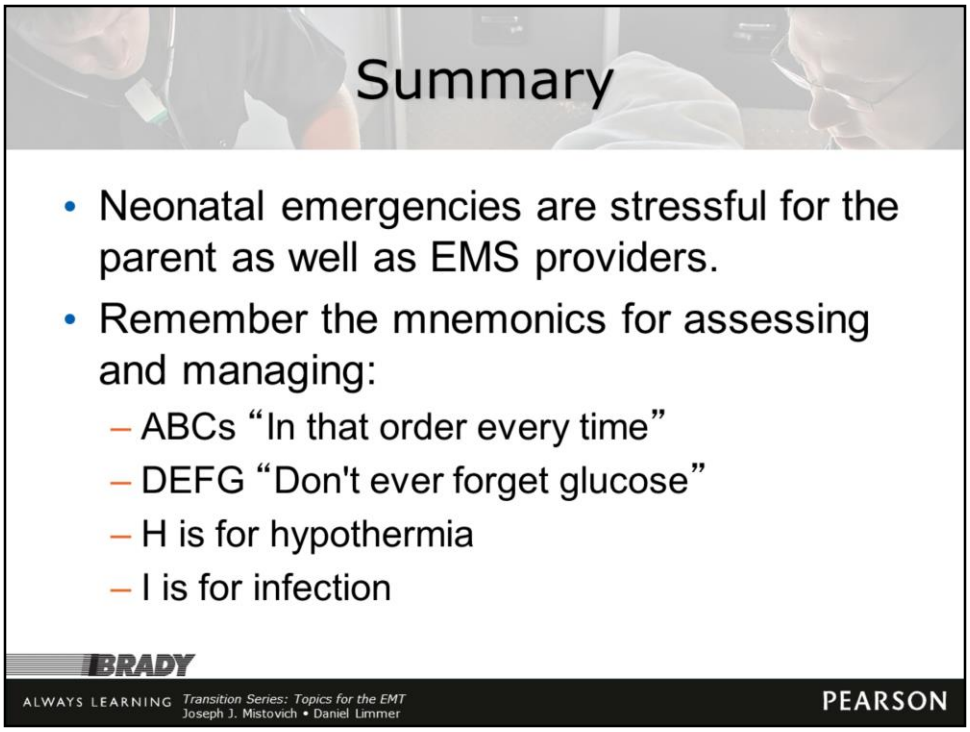
The EMT should initiate external compressions at a 3:1 ratio, at a rate of 120/min.

The patient was probably fatigued and weak from trying to breath with the URI.

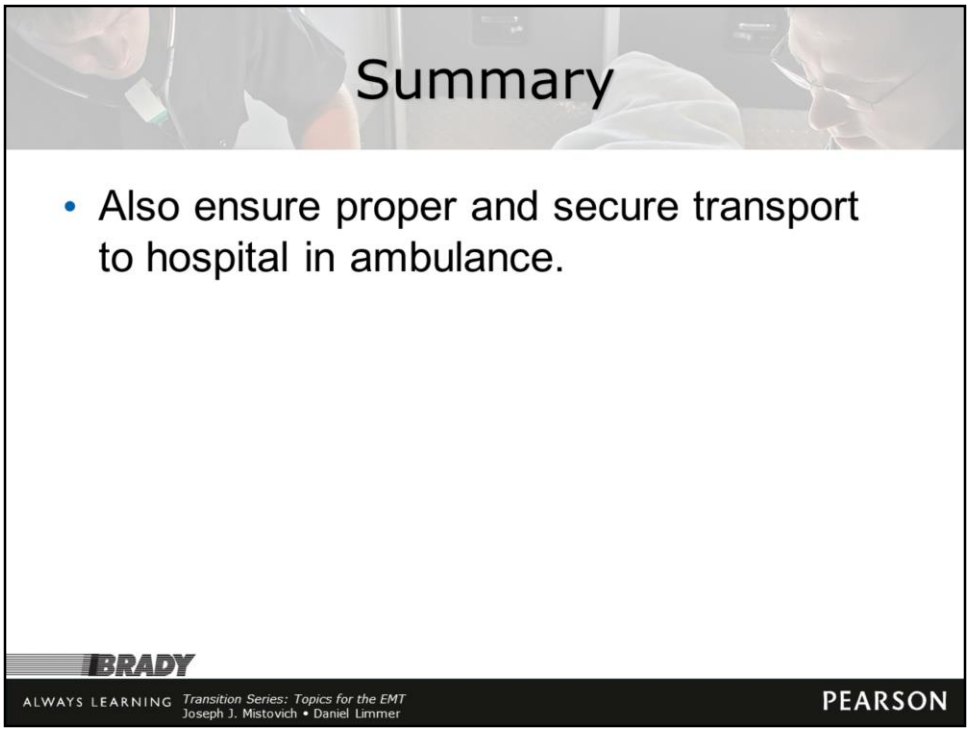
The patient just got to a spot where they could no longer maintain and started to acutely deteriorate.



Discuss management.



Review as appropriate.



Review as appropriate.