

# Neonatal Care from Delivery to Discharge

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## Objectives

- Examine the 'Usual' Course of Preterm Infant
- Meet Piper....
- Examine the 'Usual' Course of a Term Infant
- Meet Paul....



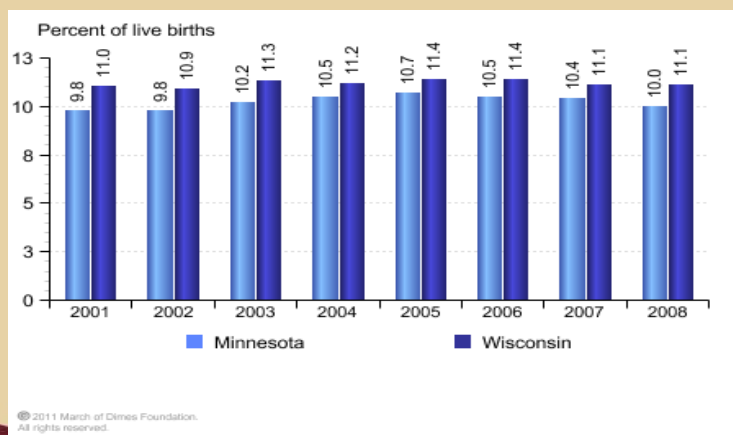
## Definition of Preterm

- Preterm: <37 completed weeks
- Late preterm: 34 to 36 weeks
- Moderately preterm: 32 to 36 weeks
- Very preterm (VPT) : <32 completed weeks



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## Preterm Births in Minnesota and Wisconsin (Preterm is defined as less than 37 weeks)

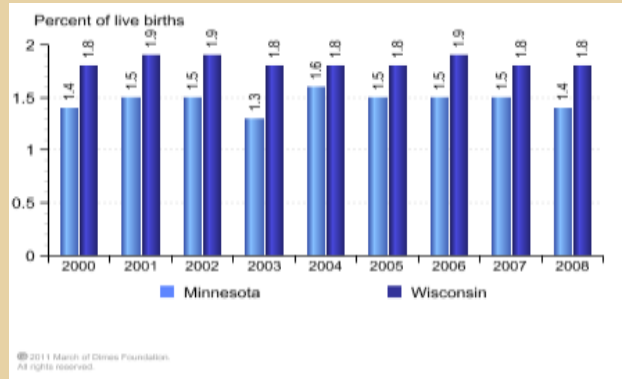


National Center for Health Statistics, final natality data. Retrieved October 18, 2011, from [www.marchofdimes.com/peristats](http://www.marchofdimes.com/peristats).



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## Very Preterm Births in Minnesota and Wisconsin (Very Preterm is defined as less than 32 weeks)

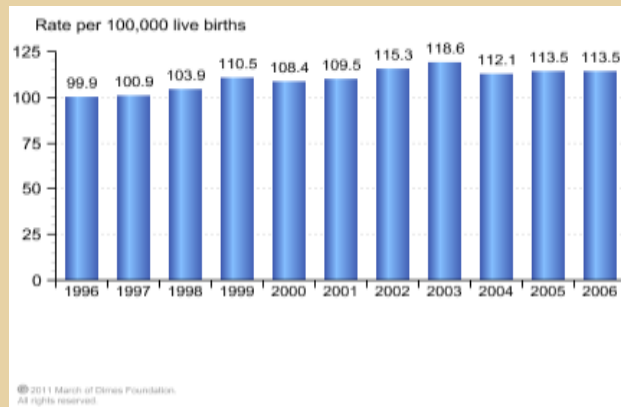


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## Infant Deaths due to low birthweight/prematurity in the United States



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## A 'Usual' Course for a Preterm Infant????

- Early intervention NCPAP
- Intubation and surfactant administration
- iNO, HFOV or HFJV
- PDA medical or surgical closure
- Feeding intolerances vs NEC
- Extubation(s)
- NCPAP or HFNC



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- Low flow Oxygen
- Temperature Regulation
- Diuretic Management (including weaning)
- Caffeine Management (including weaning)
- Eating and breathing simultaneously!
- Oral feedings vs. Gastrostomy Feedings
- Eye Surgery....Hernia Surgery....Surgery?



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- Car Seat Trials/MMU's/Home monitors?
- Home oxygen/Home Care
- Discharge teaching (hours to weeks)...
- Rooming in(days to weeks)....
- Home?????



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## Piper's Story....

- 387 grams at birth,
- 24 1/7 week gestational age
- Pregnancy complicated by severe pre-eclampsia, HELLP and thrombocytopenia
- Born via C-section
- Apgars 3 and 7



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## Piper's first days...



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## Piper's Respiratory Care

- Piper received 3 doses of Curosurf
- iNO per Ballard protocol
- HFJV for 57 days
- Remained intubated for 6 months...multiple extubation attempts



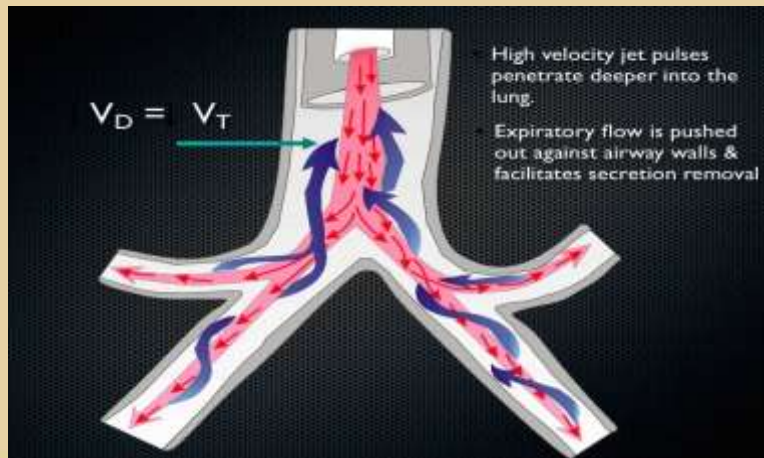
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## High Frequency Jet Ventilation

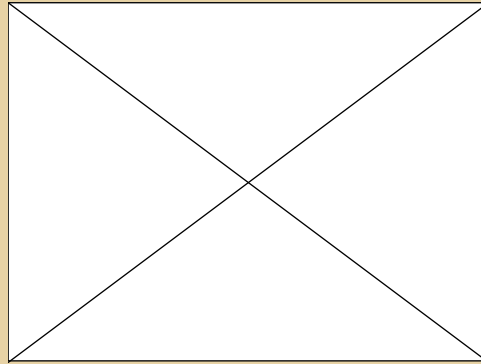


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## Mechanism of Ventilation



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## Getting stronger..still on the Jet



## Moving to Conventional Ventilation



- Drager Babylog allows for both pressure and volume ventilation
- Can also be used for NCPAP delivery
- Can also be used in conjunction with iNO

## Happy Halloween...



4 months old and getting bigger

## Nasal CPAP

- She transitioned to NCPAP for 4 weeks



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## NCPAP and Not Happy....



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## Sleeping Beauty...



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## HFNC

- Useful for infants with Chronic Lung Disease weaning from CPAP or any infants recently extubated
- Typically flow rates less than 5 LPM
- Used in conjunction with a blended oxygen system
- Can be used to effectively deliver iNO



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## Discharge Medications for Chronic Lung Disease

- Oxygen
- Diuril
- Aminophylline
- Azithromycin
- Flovent



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## Getting ready to go home!!!



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## Additional Challenges

- Retinopathy of Prematurity
- Bilateral Ventral Hernia Repairs and Lysis of Abdominal Adhesions due to NEC/Free Air
- G-tube placement
- GERD
- Thrombi treatment with Lovenox
- Intraventricular Hemorrhage and HIE



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## Piper and Her Mom...



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## Erin's thoughts

- “Having a baby on a ventilator is a difficult thing. You know the ventilator is saving their life, but there are many emotional challenges. It's challenging to hold your baby, you worry that they are uncomfortable, and it's difficult for a non-medical person to understand vent settings and the weaning process. However, we are thankful that this technology exists in it's current state; it allowed our daughter to live and thrive in the NICU and to eventually join us at home.”



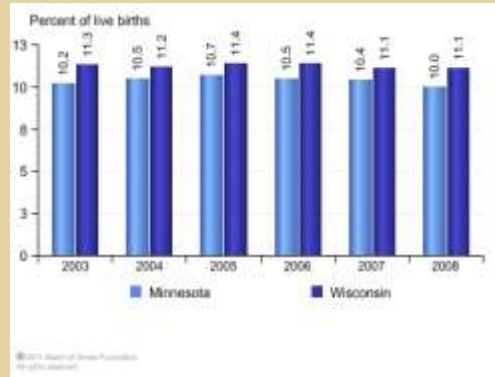
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## Term Infants and Their Story.....



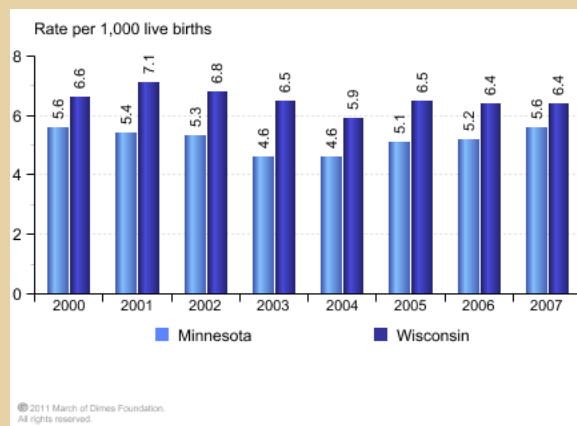
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## Term Infants



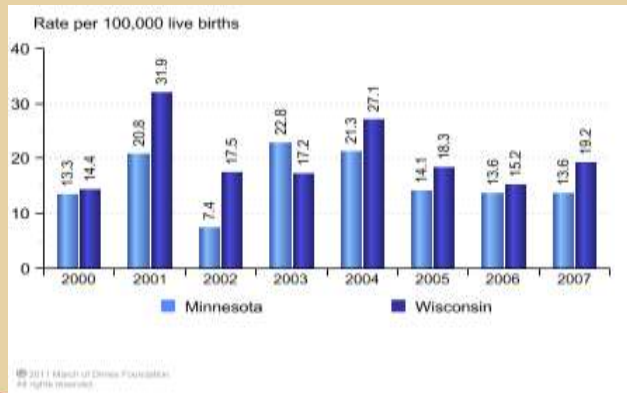
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## Infant Mortality Rates



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## Infant Deaths due to Respiratory Distress Syndrome



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## The 'Usual' Course for Term Infants

- CPAP or Intubation in the delivery room?
- Intubation in the NICU after NCPAP and increasing distress?
- Surfactant treatment?
- iNO if PPHN is found....
- CMV, HFOV or HFJV



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- IV Fluids and Antibiotics
- UAC/UVC
- Enteral Feedings
- Extubation...
- HFNC or NC
- Establishing oral feedings
- Resolution of the reason(s) that the infant came to the NICU.....



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## Paul's Story.....

- Born at 37 5/7 weeks
- NSVD assisted with pitocin
- 2<sup>nd</sup> pregnancy
- Clear fluid-ruptured for approximately 20 hours
- Good prenatal care...



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- Developed respiratory distress in the delivery room requiring blow-by oxygen
- Apgars 7 and 9
- Transitioned to the newborn nursery for further observation....



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## Special Care Nursery....

- Requiring headbox oxygen 40% Fio<sub>2</sub>
- Blood cultures drawn and antibiotics started
- Chest x ray consistent with retained amniotic fluid vs pneumonia
- Tertiary facility called and assumed it was TTN and further evaluation was not needed



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## Post Resuscitation Challenges

- Pulmonary Hypertension (PPHN)
  - Pulmonary blood vessels remain constricted and shunt deoxygenated blood into systemic circulation
  - Typically seen in infant's >34 weeks
  - More common in babies that were hypoxic and acidemic around the time of birth (Venous cord Ph <7.20 and BE -8)



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## Transport Team Notified....

- 100% Headbox with Spo2 70-90's
- CBG 7.06/83/44/23
- CXR obtained showing bilateral pneumothoraces



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## Stabilization

- Infant was intubated with a 3.5 ETT
- UAC/UVC placed
- Pneumothorax evacuated and then reaccumulated
- Bilateral chest tubes were placed
- IV Fluids started



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## Additional Post Resuscitation Challenges

- Respiratory Distress
- Hypoglycemia
- Temperature Instability
- Management of acidosis
- Hypotension
- Fluid Management
- Seizures or Apnea



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Settled in....



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## Hospital Course

- Intubated for 3 days
- CT to waterseal x 24 hours
- First held on Day of life #3
- Extubated to a nasal cannula
- Oral feeds started on day of life #4
- Discharge to home on day of life #6



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## Extubated.....



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## First time to hold....



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## Additional Challenges for Paul...

- Establishing feedings
- GERD
- Recurrent infections
- Recurrent hospitalizations for RSV
- Home nebulizers
- Vest Therapy and Homecare



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## Paul all grown up...



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## Teka's Thoughts

- Our stay in the NICU was emotional, scary and at times quite overwhelming. Looking back at the pictures for this presentation all of the anxiety, sadness and loss came flooding back. I know that he was in the very best of hands and that NICU team allowed me to take home a healthy baby and for that I owe them everything.



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## Special Thanks

A special thank you to Piper and her family for allowing their story to be shared.

A special thank you to Paul for allowing me to share his story.



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## Questions?



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