QUIZ: Identify these plants?

Close Encounters in the Newborn

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Providing care for children in Texas

1 A: QUIZ:
What is the ‘Infant Mortality Rate’ in Texas?

Providing care for children in Texas

Demographics: US, TX, Bexar County
KIDS COUNT Latest information for year 2007 some are 2006

<table>
<thead>
<tr>
<th></th>
<th>USA</th>
<th>TX</th>
<th>BEXAR 1990</th>
<th>BEXAR 2000</th>
<th>BEXAR 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Child Population</td>
<td>76,000,000</td>
<td>6,376,714</td>
<td>1,185,394</td>
<td>1,579,314</td>
<td>1,578,414</td>
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<tr>
<td>Child Population by age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-5</td>
<td>120,571</td>
<td>120,571</td>
<td>120,571</td>
<td>120,571</td>
<td>120,571</td>
</tr>
<tr>
<td>6-11</td>
<td>116,710</td>
<td>132,255</td>
<td>132,255</td>
<td>132,255</td>
<td>132,255</td>
</tr>
<tr>
<td>12-14</td>
<td>53,725</td>
<td>65,843</td>
<td>65,843</td>
<td>65,843</td>
<td>65,843</td>
</tr>
<tr>
<td>15-17</td>
<td>54,935</td>
<td>68,268</td>
<td>71,815</td>
<td>71,815</td>
<td>71,815</td>
</tr>
</tbody>
</table>

Providing care for children in Texas

Key Indicators of Health: US, TX, Bexar County
KIDS COUNT Latest information for year 2007 some are 2006

<table>
<thead>
<tr>
<th></th>
<th>USA</th>
<th>TX</th>
<th>BEXAR 1990</th>
<th>BEXAR 2000</th>
<th>BEXAR 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children in Poverty (Income &lt; $21,834 for a family of 2 adults &amp; 2 children)</td>
<td>13,261,000</td>
<td>1,498,000</td>
<td>100,430</td>
<td>23.5%</td>
<td></td>
</tr>
<tr>
<td>Children with no Health Insurance</td>
<td>1,185,394</td>
<td>25%</td>
<td>Rank 43</td>
<td>20%</td>
<td>24.5%</td>
</tr>
<tr>
<td>Teen 16-19 yrs not in school and not HS graduates (65% of those)</td>
<td>64 (48)</td>
<td>64 (48)</td>
<td>64 (48)</td>
<td>64 (48)</td>
<td>64 (48)</td>
</tr>
</tbody>
</table>
Providing care for children in Texas

Key Indicators of Health: US, TX, Bexar County
KIDS COUNT: Latest information for year 2007 some are 2006

<table>
<thead>
<tr>
<th>Indicator</th>
<th>USA</th>
<th>Texas</th>
<th>Bexar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Birth Weight &lt; 2500 grams (% of all children born)</td>
<td>13.1, 87% (7.4%)</td>
<td>8.2%, Rank 26 (AR 9.1%, LA 10%, NM 8.8%, OK 8.2%)</td>
<td>3,579, 0.7%</td>
</tr>
<tr>
<td>Infant Mortality Rate (Per 1000 children, &lt;1 year of age)</td>
<td>6.9</td>
<td>6.3, 5.7</td>
<td>6.3</td>
</tr>
<tr>
<td>Texas Rank (Among all states)</td>
<td>34</td>
<td>31, 64, 56, 28, 49, 50, 51</td>
<td>31, 64, 56, 28, 49, 50, 51</td>
</tr>
<tr>
<td>Children enrolled in Medicaid CHIP</td>
<td>138,472, Year 2000</td>
<td>82,170, 19.6%</td>
<td>20,816, 30.7%</td>
</tr>
</tbody>
</table>

Texas Infant Mortality Rate per 1000

<table>
<thead>
<tr>
<th>Year</th>
<th>Rate/1000</th>
<th>Year</th>
<th>Rate/1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>7.0</td>
<td>1999</td>
<td>6.7</td>
</tr>
<tr>
<td>1991</td>
<td>7.4</td>
<td>2000</td>
<td>6.9</td>
</tr>
<tr>
<td>1992</td>
<td>7.6</td>
<td>2001</td>
<td>6.5</td>
</tr>
<tr>
<td>1993</td>
<td>8.1</td>
<td>2002</td>
<td>7.1</td>
</tr>
<tr>
<td>1994</td>
<td>7.6</td>
<td>2003</td>
<td>7.4</td>
</tr>
<tr>
<td>1995</td>
<td>7.9</td>
<td>2004</td>
<td>6.2</td>
</tr>
<tr>
<td>1996</td>
<td>8.1</td>
<td>2005</td>
<td>7.0</td>
</tr>
<tr>
<td>1997</td>
<td>7.9</td>
<td>2006</td>
<td>6.3</td>
</tr>
<tr>
<td>1998</td>
<td>6.7</td>
<td></td>
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</tbody>
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Pediatric Physician Workforce in Texas

Pediatric Physician Workforce in Texas
Pediatric Physician Workforce in Texas

Close Encounters in the Newborn

“A newborn baby is a long alimentary canal with a loud mouth at one end and no responsibility at the other”

George Bernard Shaw

Respiratory Rate

- QUIZ:
- What is the normal respiratory rate in the newborn?

Respiratory Distress

Case 1.
- A 3100 gram baby admitted to the transitional nursery presents with a respiratory rate of 80 per minute. Mother is a 25 year old G1, P0, who had no prenatal visit as she had no insurance up until a week ago. Infant was delivered SVD and Apgar scores were 8 at one minute and 9 at 5 minutes.

Respiratory Distress

- Respiratory Rate 88/min
- Cyanosis: none
- Grunting: Only on auscultation, no flaring of alanasii.
- Retraction: Intercostal and sub costal
- Breath sounds: Heard well on both sides.
- Place a pulse oxymeter. O2 saturation must be over 90%. If it frequently drops below 88% or the baby looks cyanotic she needs supplemental O2 blow by.
- Obtain a chest X Ray.
- Now I will try to get a more detailed history.

Respiratory Distress

Differential diagnosis for a baby who presents with respiratory distress in the newborn period
- Surfactant deficiency; Is this baby premature?
- Could this baby at 3100 grams have Surfactant deficiency?
- Transient tachypnea of the newborn (TTN, Wet lung syndrome)
- Pneumonia: What is the GBS status of this mother. What is the duration of rupture of membranes? Did this mother develop chorioamnionitis?
- Was the mother given antibiotics.
- Spontaneous pneumothorax.
- Congenital anomalies
Respiratory Distress

Quiz
What are the signs of Chorioamnionitis?
Check and give yourself 1 point for each correct answer.
1. Maternal fever.
2. Maternal tachycardia
3. Fetal tachycardia
4. Fetal bradycardia
5. Rupture of membranes
6. Total white cell count of >10,000 in the mother
7. Maternal hypertension

Respiratory Distress

Perinatal events provide “complaints” and provide the historic evidence for considering sepsis.
- Surfactant deficiency; Is this baby premature?
- 38 weeks
- Could this baby at 3100 grams have Surfactant deficiency?
- Not an IDM
- Transient tachypnea of the newborn
- Not a C. Section
- Pneumonia;
- What is the GBS status of this mother; Unknown
- What is the duration of rupture of membranes? 12 hours
- Did this mother develop chorioamnionitis? Fever, TWBC 19,000
- Was the mother given antibiotics. Ampicillin 2 hrs prior to delivery
- Spontaneous pneumothorax. Let us look at the x ray

Chest Radiographs

Common Pathogens

Quiz
Name the three common Pathogens that cause early onset infection in the newborn.
E. Coli
Enterococcus
Coag Negative Staph
Listeria
Group B strep
Staph aureus
Pseudomonas
H Influenza

GBS: Management of the Infant

<table>
<thead>
<tr>
<th>Maternal IAP for GBS</th>
<th>Signs of sepsis?</th>
<th>Gestational age</th>
<th>Number/doses of maternal IAP before delivery</th>
<th>Full diagnostic evaluation*</th>
<th>Empiric therapy*</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>NO</td>
<td>&lt;35 WEEKS</td>
<td>2 Doses</td>
<td>Limited evaluation*</td>
<td>Full diagnostic evaluation*</td>
</tr>
</tbody>
</table>

This algorithm is suggested but is not an exclusive approach of management.

Interpretation of CBC

- QUIZ:
- Which CBC value has the best correlation with presence of sepsis in the newborn?
- Total WBC Immature to Total
- Neutrophil ratio
- Total Neutrophil Eosinophils
- % Neutrophil Lymphocytes
- % Bands Platelet count
**Interpretation of CBC**
- Which CBC value has the best correlation with presence of sepsis in the newborn?
  - Total WBC (5-30 K) <5,000
  - Immature to Total neutrophil ratio >1.6
  - Platelet count <100,000

**Blood culture**
- If the blood culture is positive the infant must have CSF examination.
- Studies done in the 1970’s, 80’s and 90’s have shown that 28-33% of babies with septicemia will have meningitis.
- If the blood culture is positive the antibiotics may have to be changed to ensure adequate CSF levels and specific to the pathogen.

**Selection of Antibiotics**
- Coverage for Gram positive and Gram negative pathogens.
- Sensitivity patterns of common pathogens seen in the nursery population.
- UH Nurseries: First line antibiotics since 1981
  - Ampicillin and Gentamicin.
  - May use Ampicillin and Cephalosporin.

**GBS in UH Nurseries in 2009**
- Total blood cultures 1134
- Total positive for GBS 4
- Total GBS cultures done by the lab (All clinics, L&D) 2909
  - Positive 303 (17.3%)
  - Total Genital Cultures 504
  - Positive 42 (8.3%)

**Close Encounters in the Newborn: Summary**
The baby progressively worsened and was placed on a ventilator. The I:T ratio was 3. Baby was placed on Ampicillin and Gentamicin which was switched to cephalosporin as the infant worsened and was too unstable for spinal tap. Mom’s genital culture was positive for GBS. Infant’s 24 hour blood culture was positive for GBS. Baby improved in gradually in 48 hrs.

**Mystery case**
- Case 2
  - A 34 year old woman G5 P4 comes in and delivers precipitously in the labor room. Her eyes were yellow. The NB team is called as the baby who looked term was not breathing and was blue. There was no meconium.
  - The team found the heart rate to be 120/min, occasional gasps, cyanosis and hypotonia. Narcan .01mg/kg IM was given. The infant established more regular breaths, color and tone improved, infant was sent to the transitional nursery.
  - At 30 minutes of age the infant had repetitive jerking movements of the extremities rolling of the eyes and was very hypertonic.
Mystery Case 2

- What is your top choice for diagnosis?
- Hypoglycemia
- Hyponatremia
- Hyperthyroidism
- Neonatal abstinence
- Sepsis
- Kernicterus

Substance Abuse in Pregnancy

- QUIZ: Substance abuse is more common in the age groups?
  - Under 25 yrs
  - 25-29 yrs
  - 30 & over
  - All of the above

Bexar County: Births to mothers who smoked

<table>
<thead>
<tr>
<th>Age</th>
<th>Incidence</th>
<th>Non Smoking</th>
<th>Smoking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 25 yrs</td>
<td>5.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-29 yrs</td>
<td>5.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 &amp; over</td>
<td>5.5%</td>
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<td></td>
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</tbody>
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National Institute of Drug Abuse: 1992
Neonatal Abstinence syndrome

- Seen in 60-80% of infants of Heroin and Methadone using moms.
- Withdrawal signs manifest within 3 days in the majority but could be as late as 4 weeks.
- CNS, GI, Resp, CVS symptoms could be objectively scored using the Finnegan or Lipsitz scales.

Neonatal Abstinence syndrome

- The currently available scales are not suitable for the Premature infant.
- Premature infants may not manifest same symptoms because of immaturity of CNS.
- Abstinence scoring is done every 3 hours.
- Finnegan score of 8 or more 3 consecutive times or 12 or more 2 consecutive times calls for therapy.

NAS Treatment

- Dilute Tincture of Opium (DTO, 0.4 mg per ml)
- AAP recommended dose is 0.1 ml per Kg every 4 hours.
- Increase after every 2 doses to achieve control of symptoms.
- After allowing 2-3 days of clinical stability attempt to gradually reduce dose.

NAS Treatment

- Other drugs that have been tried and could be considered if DTO is not working are:
  - Paregoric
  - Phenobarbital
  - Parenteral morphine
  - Clonidine
  - Diazepam and chlorpromazine

Methadone Programs

- blocks the euphoric and sedating effects of opiates
- relieves the craving for opiates that is a major factor in relapse
- relieves symptoms associated with withdrawal from opiates

Methadone

- does not cause euphoria or intoxication itself (with stable dosing), thus allowing a person to work and participate normally in society
- is excreted slowly so it can be taken only once a day.
- Methadone maintenance treatment
- Dose of 60 to 120 mg per day may be needed.
- Effects on the fetus are similar if not worse.
Bexar County: Births to mothers with substance abuse

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Ave. Length of stay (Days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>105</td>
<td>19.2</td>
</tr>
<tr>
<td>2003</td>
<td>112</td>
<td>23.8</td>
</tr>
<tr>
<td>2004</td>
<td>123</td>
<td>21.3</td>
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<td>2005</td>
<td>128</td>
<td>27.4</td>
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<td>138</td>
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<td>2007</td>
<td>201</td>
<td>28.9</td>
</tr>
<tr>
<td>2008</td>
<td>246</td>
<td>27.1</td>
</tr>
</tbody>
</table>

Case 2

- Narcan is contraindicated in women who abuse opioids and when they are on Methadone. Severe symptoms including convulsions should be anticipated.
- Seizures may be controlled with Phenobarbital. May also start on higher doses of Opium solution. That was done in this infant's case.
- This infant stayed in the nursery for 7 weeks. His mother was on 130 mg of Methadone and was also taking street drugs. Paternal aunt adopted the infant.

QUIZ 8

- Which one of these are appropriate considerations to diagnose hypoglycemia?
  - Asymptomatic infants with 2 consecutive blood glucose < 36 mg/dL
  - Asymptomatic infant with blood sugar < 45 mg/dL
  - Any baby whose blood glucose < 20 mg/dL
  - Any baby with blood glucose < 36 mg/dL
  - Any baby with abnormal clinical neurological signs and Glucose below 45 mg/dL

QUIZ 9

- What is the appropriate treatment for an asymptomatic baby with blood glucose < 20 mg/dL?
  - Mini-bolus of glucose – 2 ml/kg of 10% dextrose (= 200 mg/kg/min) Followed with a constant glucose infusion of 4-6 mg/kg/min
  - Start PO feeds immediately.
  - Start a constant glucose infusion of 4-6 mg/kg/min

QUIZ 10

- What is the normal per day rate of rise of bilirubin in the newborn infant?
  - ______ mg/dL per day.

QUIZ 11

- Physiologic Jaundice is; fill the gaps?
  - It appears after ______ hours of life
  - Serum bilirubin is rising at a rate of <____ mg/dL/24 hr
  - Serum bilirubin is <____ to _____ mg/dL in full-term infants and _____ to _____ mg/dL in preterm infants
  - Jaundice declines before _____ to _____ days of life
  - Direct-reacting bilirubin is <2 mg/dL at any time
  - Anything that does not fit this definition is pathological jaundice.