



# The Perinatal Gazette

Newsletter of the Regional Perinatal Center Maria Fareri Children's Hospital at Westchester Medical Center

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## Late Preterm Babies... They're NOT Just Small Full-Term Infants

Preterm birth rates in the United States have been continually rising by approximately 0.2% annually since the early 1980's. This is despite the concerted efforts of such organizations as the Department of Health (U.S. Healthy People 2010), and the March of Dimes to reduce the incidence of preterm deliveries. In 2004, preterm birth rates peaked at 12.5% which accounted for over 500,000 neonates born at less than 37 completed weeks of gestation. Interestingly, the rate of very preterm births (less than 32 weeks gestation) has remained relatively stable during this time period. It is in fact the more mature preterm infants (34-36 weeks gestation) formerly known as "near term" infants which account for this continual rise in preterm deliveries. Although this subgroup of preterm infants represents the vast majority of preterm births (over 70% of preterm infants), little is known about how their preterm status influences their developmental, behavioral and cognitive outcomes. This dearth of knowledge is probably secondary to the fact that in comparison to their very preterm counterparts, these infants are usually not as ill, and require little interventional care during their NICU stay, if they are admitted to the NICU at all. They therefore, are often thought of as small full term infants and their ultimate needs and outcomes are perceived as being equal to that of a term infant.

In 2005, the National Institute of Child Health and Human Development of the NIH assembled a panel of experts to discuss the many aspects related to the care and outcome of "near term" infants. One of their first orders of business was to galvanize the terminology used to identify "near term" infants.

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## RESEARCH ABSTRACT

### Title: Maternal Factors and Risk of Late Preterm Delivery

**Background:** Late preterm infants (34-36 wks gestation) account for 70% of all premature infants and are the fastest growing subgroup of preterm infants. However, little is known about why the birth rate in this group continues to rise.

**Objective:** To determine if there are maternal risk factors associated with delivery of late preterm infants.

**Design/Methods:** Data were obtained from NY Vital Statistics on late preterm and term ( $\geq 37$  wks gestation) infants born in Westchester County, NY from 2004-2005. Data included delivery characteristics, receipt of prenatal care, and maternal demographics. Poisson regression was used for analysis of relative risks (RR).

**Results:** There were 2320 late preterm births and 20936 term births with a total birth population of 25165. There was a significantly increased risk of c-section (c/s) delivery in late preterm infants compared to terms (RR 1.05, 95% CI 1.02-1.07). There was no difference in the risk of having an elective c/s between the late preterms and terms (RR 1.11, 95% CI 0.97-1.27). Risk of c/s for a non-pregnancy related maternal condition was not different between the 2 groups (RR 1.08, 95% CI 0.85-1.39). The risk of having a c/s for maternal conditions related to pregnancy or fetal risk was significantly increased in the late preterm vs. term infants (RR 1.55, 95% CI 1.39-1.72; RR 1.16, 95% CI 1.08-1.24). Prenatal care did not differ between the late preterms and terms (RR 0.95, 95% CI 0.87-1.02). There was a significantly increased risk of late preterm delivery in mothers < 17 and > 35 yrs old (RR 1.14, 95% CI 1.02-1.28; RR 1.04, 95% CI 1.02-1.06). There was no difference in Medicaid use in the late preterms vs. terms (RR 1.01, 95% CI 0.99-1.04)

**Conclusions:** Late preterm infants are more likely than terms to be delivered via c/s for a maternal condition related to pregnancy and fetal risk. They are also more likely to be born to mothers at the extremes of age, those <17 and >35 yrs old. Interestingly there was no difference in risk of

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### Job Opportunity – MFM Outreach Coordinator

**3. Research Abstracts:** Comparison of Utilization of Interventional Therapies between Moderately Preterm and Very Preterm Infants at 12 month Corrected Age; The Relationship between Congenital Malformation and Preterm Birth.

**SAVE THE DATE – 6<sup>TH</sup> Annual RPF Conference**

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Previously, there had been no uniformity utilizing this term; therefore “Late Preterm” (LP) infants were defined as those being born between 34 and 36 (day 239 through 259) weeks of gestation. These children would no longer be referred to as “near term” because this may imply that these infants were almost term and therefore mature. Their risks for morbidity and mortality related to preterm birth are often underestimated. It was felt that the term “Late Preterm” would convey a better sense of vulnerability, would alert the medical team to be more vigilant in the care and observation of these patients, and stress the need to follow their developmental progress.

Although survival rates for LP infants are over 95%, these children are at a 5 times increased risk for mortality in the neonatal period in comparison to full term infants. In addition, they are at a significantly increased risk for morbidities associated with prematurity such as respiratory distress syndrome, hypoglycemia, hyperbilirubinemia, temperature instability, feeding difficulties, increased length of hospital stay at birth, apnea of prematurity, and rehospitalization to name a few. These issues can lead to medical problems later in life such as reactive airway disease or gastroesophageal reflux at a significantly greater rate than their full term counterparts.

Delays in cognitive, motor and behavioral development have been well established in the literature regarding very preterm infants. However, little is known about the long-term outcomes in the LP infant group. Given that these children are at an increased risk for the morbidities of prematurity which have been shown in the very preterm infants to be associated with developmental delays, it would reason, that LP children who experienced these morbidities would also be at risk. In addition, the brain of a 35 week infant is only 60-65% the size of a full term infant's brain. This means that a significant amount of brain development which was intended to occur in utero will now occur after birth. How do these new environmental stressors influence brain development? We do not know. Studies have shown that LP children do have an increased prevalence of significant behavioral problems in their childhood years in comparison to full term children. LP children assessed at the Regional Neonatal Follow-up Program from the Maria Fareri Children's Hospital exhibited that they will require interventional services for developmental delays at 12 months corrected age at a significant rate, possibly as high as 30-35%. Should these numbers represent our general population of LP children, given that they comprise over 400,000 live births per year, this would equate to over 100,000 new children requiring therapeutic services for developmental delay associated with preterm birth. These unique infants therefore, will have a tremendous impact upon our society and its resources.

Because preterm birth rates continue to be an escalating problem in our country, and given the fact that it is the LP children who are primarily influencing this elevation, it would behoove us to address these children in future evaluations. We have defined who they are, and at

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what rate they are being born, however, we need more information. We need to better define the specific causes of this expanding population, and what may be done to reduce their preterm birth rates. Are there unique morbidities associated with this subgroup, and if so, how likely are they to occur? Finally what are their ultimate deficiencies and needs amongst these children? Only with answers to these questions can we appropriately counsel parents regarding what their child's future may hold. Until that time, however, one fact remains clear; Late Preterm Infants are NOT just small term children.

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### **Maternal Fetal Medicine Outreach Coordinator**

20hrs./week

Exciting opportunity for a Registered Nurse with strong clinical obstetrical background who is looking for a position that offers flexibility and the opportunity to be creative and innovative.

This person will:

- Maintain communication between the Regional Perinatal Center (RPC) and our 13 affiliate obstetrical services.
- As an educator assess affiliate hospital obstetrical learning needs.
- Assist with developing and implementing a plan to meet identified needs based on regional maternal statistical data and quality assurance issues.
- Collect and analyze regional maternal statistical data.
- Participate in RPC Quality Assurance meetings at affiliate hospitals and the Regional Perinatal Forum. (Perinatal Public Health Initiative)

Please send resume to:

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## **SAVE THE DATE**

### **6TH ANNUAL HUDSON VALLEY REGIONAL PERINATAL FORUM CONFERENCE**

“Improving Perinatal Health:  
Enhancing Families' Access to Care &  
Insurance Coverage”

Thursday • October 25, 2007 • 8 a.m. - 4 p.m.  
Marriott Westchester • 670 White Plains Road • Tarrytown, NY

KEYNOTE SPEAKER: **RICHARD CARMONA, MD, MPH, FACS**  
(17<sup>th</sup> US Surgeon General)

GUEST SPEAKERS: **Deborah Bachrach, JD, Deputy Commissioner,**  
NYS DOH, Office of Health Insurance Programs  
**Richard Gottfried, NYS Assemblyman, 64<sup>th</sup> Dist.**

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elective c/s in late preterm vs. term infants suggesting an unexpectedly high rate of elective preterm delivery. This study allows us to begin to identify and target mothers at risk for late preterm delivery.

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### **Title: Comparison of Utilization of Interventional Therapies Between Moderately Preterm and Very Preterm Infants at 12 months Corrected Age:**

**Background:** Moderately preterm infants (MP; 32-36 wks gestation) comprise the majority of preterm infants. Their morbidity and mortality rates are higher than full term babies, yet there is scant literature regarding their developmental outcomes and therapeutic needs.

**Objective:** To determine the requirement for therapeutic services in MP infants compared to their very preterm (VP; <32 weeks gestation) counterparts, at 12 months corrected age.

**Design/Methods:** Preterms seen at the Regional Neonatal Follow-up Clinic at 12 mo corrected age (CA) were stratified into MP and VP groups. Logistic regression was used to compare odds ratios (ORs) for enrollment into early intervention (EI) and use of physical therapy (PT), occupational therapy (OT), speech therapy (ST) and special education (SE). Adjustments were made for antenatal, demographic, and neonatal factors.

**Results:** The dataset contains 497 preterm (< 37 wks gestation) infants.

Those evaluated at 12 ±2 mo CA were included in the analysis (n=169). VP infants (n=77) and MP infants (n=92) had a mean CA of 12.1 mo and 11.9 mo respectively at 12 mo CA. In the MP, 36% were enrolled in EI, 28% received PT, 17% OT, 16% ST, and 8% SE. In the VP, 70% were enrolled in EI, 66% received PT, 32% OT, 32% ST, and 21% SE. VP patients were more likely to be enrolled in EI (OR 4.2, 95% CI 2.2-8.0) and receive PT (OR 5.0, 95% CI 2.6-9.6), OT (OR 2.3, 95% CI 1.1-4.7), ST (OR 2.5, 95% CI 1.2-5.1), and SE (OR 3.2, 95% CI 1.2-8.2). Of the 9 factors used to adjust this relationship, RDS and the receipt of caffeine for apnea of prematurity were the only confounders.

**Conclusions:** VP had a higher rate of EI enrollment and increased PT, OT, and ST use compared to MP infants. However, 36% of MP were enrolled in EI and 28% utilized PT. With over 70% of singleton preterm births being MP, this represents a large proportion of the population requiring these services. While some institutions do not routinely follow moderately preterm infants in neonatal follow up clinics, it is imperative that this group of at risk infants be screened and referred for interventional therapies.

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### **SAVE THE DATES:**

#### ***"How to Identify, Work With and Refer Substance-Abusing Women"***

A 2 day training for MDs Nurses, health educators, social workers, case managers & other health care & human service professionals.

June 20 & 21, 2007 - 9 am – 4 pm - Newburgh, NY

For further information or to be added to the mailing list for registration brochure contact:

Stephanie Sosnowski, Maternal-Infant Services Network of Orange, Sullivan & Ulster Counties

845-928-7448 ext. 15

ssosnowski@misn-nv.org

### **Title: The Relationship Between Congenital Malformations and Preterm Birth**

**Background:** Preterm birth (PT;<37 weeks) and congenital malformations (CM) are the most common causes for neonatal and infant death in the United States. CM in fetuses are known contributors to the incidence of PT birth, as well as morbidities in the newborn.

**Objective:** To investigate CM in a 5 county region of the Lower Hudson Valley in NY State and its relationship with PT delivery during a four year span.

**Design/Methods:** Aggregate data from the NY State Department of Health Vital Statistics and Congenital Malformations Registry was utilized regarding CM, classified by gestational age (GA). Individual ICD9 codes were collected for the same time period (2000-2003) categorized by GA from 5 counties in the Lower Hudson Valley Region (Putnam, Orange, Rockland, Sullivan, and Westchester). Live-birth cases of CM diagnosed up to 2 years of age were included. Poisson regression analysis was used to establish relative risk (RR) of having a CM and PT delivery. A second analysis compared CM in moderately PT (MP; 32-36 wks) and very PT (VP; <32 wks). Odds ratio (OR) was used to analyze if having a single vs. multiple CM influenced the rate of PT delivery.

**Results:** In this time period, there were 97,848 births, 10,261 PT deliveries resulting in a PT rate of 10.8%; 3,043 children were born with some type of CM (CM rate=3.1%), 631 of which were preterm resulting in 5.9% of all preterm children being born with some type of CM. Children born with at least 1 CM were almost 2.5 times more likely to be born PT (RR: 2.4; CI: 2.2-2.6) than full term. After subcategorizing preterm children by their GA status, it was found that children born with at least 1 CM were 2 times more likely to be born in the MP group (RR: 2.0; CI: 1.9-2.3) than full term, and were more than 3.5 times more likely to be born VP (RR: 3.8; CI: 3.4-4.4) than term. Children with CM were 80% more likely to be born VP than MP (RR: 1.8; CI: 1.5-2.2). Relative to children with 1 CM, children with multiple CM were 70% more likely to be born PT (OR: 1.7; CI: 1.4-2.1) than term.

**Conclusions:** It seems obvious from the results of these analyses that a child born with a CM is therefore at a significantly greater risk of being born preterm. Not only does it increase the risk of preterm birth, but it influences the degree of prematurity at birth. Further it seems likely that it is the CM associated with the fetus which directly influences the probability of that pregnancy resulting in prematurity. This statement may be supported by the fact that a fetus with multiple CM is at significantly greater risk of being born preterm than those with just one malformation.

However, the results of this study express an association between these two conditions not necessarily a cause and effect relationship. This association however may be the result of multiple causes. The "abnormal" fetal unit may directly affect the ability of the pregnancy to persist to term. The pregnancy of a child with a prenatally diagnosed CM may increase the vigilance with which that pregnancy is monitored, and therefore, increase the likelihood that a problem will be detected which will require an intervention resulting in preterm birth. Maternal conditions which may have led to a resultant fetus with a CM may also impact the likelihood that the pregnancy will end with a preterm birth.

Whatever the cause of this relationship, it is clear that there is a direct association between a fetus with one or more CM and preterm delivery. This association has very serious implications both for the patient, their family, as well as society. Each condition individually results in increased morbidity and mortality for these children in the neonatal period and beyond. However, when these issues are present together, they synergistically compound the likelihood that these children will have significant morbidities which may also lead to increased mortality. In light of the continual escalation of the preterm birth rate in the United States, it is obvious that fetuses with a CM are one contributing factor. Addressing causes which may lead to CM formation in fetuses may additionally have a positive impact upon reducing preterm births in our country.

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