

Understanding Families of Twins and Multiples— Health and Developmental Perspectives

Presenter : Dana M. Cox, RN, MA

Abstract of Session:

Families of multiples face special joys and challenges. Integrating her professional and personal experience as a mother of twins, this presenter will share information on the unique health and developmental issues with twins, current research and resources, and approaches to supporting families and caregivers.

Goals and Objectives:

- Recognition of twin types, and statistics related to multiple birth
- Discussion of the cultural aspects of twin birth, including issues related to individual and collective needs
- Description of perinatal and developmental risk in multiples
- Understanding of parental and care giving stress related to multiples
- Dialogue on methods that health and early child hood professionals and/or home-visiting, center or clinic-based programs can use to support the unique developmental needs of young multiples and help promote the infant-parent mental health needs of the families and caregivers of multiples.
- Application of a comprehensive list of current books, research and internet resources, including how to access international, national, state and community resources that educate and support families and professionals.

Adult Learning Principles: This presentation will help the participants integrate their current professional knowledge and personal experiences with relevant and practical information. The presenter plans to frame the presentation using power point, while incorporating large and small group discussion. Participants will develop an action plan for ways they can support families of multiples.

Summary:

My interest in the topic of twins and multiples started with my own high-risk twin pregnancy complicated with the condition Twin-to-twin Transfusion Syndrome. My identical twin sons were born via emergency cesarean section at thirty-three weeks gestation, and were in the Neonatal Intensive Care Unit for six weeks. In their first year of life, one of my son's was diagnosed with cerebral palsy, and we entered the world of special needs. My twins were both served in a variety of early intervention programs. Being a nurse with a specialty in pediatrics, I gravitated to this field especially since I valued how much the professional services and supports we received in those first three years helped our family. I also was appreciative of the parent support provided by my local Mother's of Twins Club. In 2001 I returned to graduate school to earn my degree in Early Childhood Special Education, and most recently have had the privilege to be a Infant-Parent Mental Health Fellow.

In my experience as a pediatric nurse, early interventionist, ECE instructor, and inclusion consultant to childcare programs, I have become involved with many families of twins. I have also encountered many professional caregivers trying to understand the unique developmental and infant mental health issues with multiples. Initially I had only my personal experiences to draw upon, finding the one area in all of my course work that was missing was information on multiples. I decided to make this the special project of my IPMH Fellowship. In doing this project I have researched the topic of multiple birth and parenting, including reading many books and internet sites dedicated to twin issues. There are many authors and researchers that have influenced my understanding of twins, the foremost being Nancy L. Segal Ph.D., and the recent work by Eve-Marie Arce, Ed.D. in her book "Twins and Supertwins: A Handbook for Early Childhood Professionals."

This presentation will summarize the growing body of information available now on multiples, including why it is important for 0-3 professionals to understand birth statistics, twin types, cultural aspects, birth and developmental risk, parental and caregiver stress factors, implications on social-emotional development and learning, and approaches to supporting families and caregivers. Participants will integrate their existing knowledge and experiences working with young children and families, with new concepts learned during the presentation into an action plan for their future work with young children and families of multiples.

Twin Facts & Statistics

- The term "twins" derives from the ancient German word twin or twine meaning "two together."
- The scientific study of twins is known as "gemellology."

Source: National Vital Statistics Reports, Vol 58. No. 24, August 9, 2010

1. Twin Birth Rate

- The 2007 twin birth rate was 32.2 per 1,000.
- This number has more than doubled since 1980
 - Assisted reproductive therapies (including in vitro, ovulation-inducing drugs and artificial insemination) account for 17 percent of all twins and 40 percent of all triplets born in 2007.
 - 17 percent of twins are the result of fertility treatments.
 - 40 percent of triplets are the result of fertility treatments.
 - Maternal Age Factors
 - Older women are much more likely to give birth to twins or triplets.
 - 20 percent of births to women over age 45 were twins.
 - Only 2 percent of teen mothers had twins.

2. Higher Order Multiples

In 2007, the number of higher order multiple deliveries were:

- 5,967 triplets
- 369 quadruplets
- 91 quintuplets
- 0 sextuplets or septuplets

3. Multiple Birth Death Rates

- Twins are five times more likely than singletons to die within a month of birth.
- Triplets are nearly 15 times more likely to die within a month of birth.

4. Premature Birth

- A trend towards shorter pregnancies with multiples was observed. The percentage of twins delivered preterm (prior to 37 weeks) rose to 60.4% in 2006. This compares to 11.1% for single birth babies.
- In 2007, multiples were more likely to be born small.
 - Less than 40% of twins were born at 37 weeks or later.
 - More than 12% were born prior to 32 weeks gestation.
 - 36.33% of triplets were born prior to 32 weeks.
 - About 80% of quads and higher were born before 32 weeks.
 - More than half (57 percent) of all twins and nearly all triplets (96 percent) were identified as LBW (low birth weight) babies, as compared to 6 percent of singleton babies.

5. Twinning Rates by Race

- Non-Hispanic White: 36.2 per 1,000
- Non-Hispanic Black: 36.8 per 1,000
- Hispanic: 22.2 per 1,000

Twin Types

1-**Identical** -- monozygotic (one zygote) -- twins form when a single fertilized egg splits into two genetically identical parts.

- a. The twins share the same DNA set, thus they may share many similar attributes.
- b. However, since physical appearance is influenced by environmental factors and not just genetics, identical twins can actually look very different.
- c. Identical twins are always same-sex sets.

2- **Fraternal** -- or dizygotic (two zygotes) -- twins develop when two separate eggs are fertilized and implant in the uterus.

- a. The genetic connection is no more or less the same as siblings born at separate times.
- b. They may look alike, or they may not.
- c. Dizygotic twins have separate amnions, chorions, and placentas

3-Scientists have theorized a third, hybrid type called polar body twinning, that occurs when an unfertilized egg splits into two parts and each part is fertilized by a different sperm.

- a-The twins would then share one-half of their gene set (from their mother). Because it is the father's DNA that determines the sex, the twins can be either same-sex or male/female.

Resource: E-Medicine: " Multiple Birth

<http://emedicine.medscape.com/article/977234-overview>

Zygoty Chart

From: *Multiples--About.com*

<u>Monozygotic Twins</u>	<u>Dizygotic Twins</u>	<u>Polar Body Twins</u>
Form when a single fertilized egg splits into two.	Form when two eggs are fertilized by two separate sperm.	Occur when a single unfertilized egg splits into two and is fertilized by separate sperm.
Also called <u>identical</u> .	Also called <u>fraternal</u> .	Sometimes referred to as hybrid or half-identical twinning.
Only one-third of all twins are identical.	Two-thirds of twins are fraternal.	It is not known what percentage of twins falls in this third category.
Don't "run in families" except by coincidence. No hereditary influence for identical twinning has been identified.	Can be hereditary on the mother's side. The tendency to hyperovulate (release more than one egg in a cycle) is a genetic trait that can be passed from mother to daughter.	Not known.
May have one shared placenta, two separate placentas, or two placentas fused into one. <u>See</u>	May have two separate placentas or two placentas fused into one. <u>See examples.</u>	May have two separate placentas or two placentas fused into one. <u>See examples.</u>

<u>examples.</u>		
Share 100% of their genetic markers.	Share about 50% of their genetic markers, same as singleton siblings.	Share about 75% of their genetic markers, more than fraternal but less than identicals.
Are always same sex.	May be same sex or male/female.	May be same sex or male/female.
Have the same blood type.	May have the same blood type or different.	May have the same blood type or different.
Not caused by fertility treatments, birth control pills or maternal age. No one knows what causes identical twinning.	Can be attributed to fertility treatments, advanced maternal age, birth control pills or other factors that influence twinning.	No one knows what causes this type of twinning to occur.
May be contained in one sac in utero.	Develop separate sacs in utero.	Develop separate sacs in utero.
Can result in <u>conjoined</u> twins or mirror image twins.	Not conjoined.	Not conjoined.
May be at risk for <u>Twin-to-Twin Transfusion Syndrome</u> (TTTS)	Rarely at risk for TTTS.	Rarely at risk for TTTS.

GLOSSARY

- Co-twin or co-multiple-- One child of a multiple birth set
 - Conjoined twins-- Twins born attached and sharing body; once referred to as “Siamese” twins
 - Fraternal-- Dizygotic or two egg twins resulting from the separate fertilization of two ova; fraternal siblings have their own unique genes and may be same sex or different sex.
 - Higher order multiples-- A multiple birth set consisting of three or more children (triplets, quadruplets, quintuplets, etc)
 - Identical-- Monozygotic, or one egg twins, result from one fertilized egg spitting. Monozygotic twins have all their genes in common; they have identical features, eye and hair co
 - Mirror image twins-- Occurs only in monozygotic twins; about 23 percent of identical twins will have features displayed on opposite sides of the body or “mirror images” of their twin; this may explain why a little over one-third of identical twins are left-handed.
 - Multiple birth children-- A group of two (twins) or more (higher order) children who typically are conceived at the same time of the same parents, are born at the same time, and share a certain biological and genetic make-up.
 - Singleton-- A child who is not part of a multiple birth set.
 - Supertwins-- Multiple births of three or more including triplets, quadruplets, and higher- order multiples
 - Twintyping— Determination of twin type through testing; experts suggest DNA testing
- Glossary terms and definitions (NOMOTC [2002],

Key Twin Issues in Infant-Parent Mental Health

- **Cultural Aspects:**

There are often strong cultural aspects and values related to twins. These may relate to:

- Good or evil
- Individuation—Promoting individuality vs twin-ness/ Collectiveness
- Independence/interdependence

Twins throughout history have assumed a visible position in cultural literature, art, media, mythology, and research. Perceptions about twins are often made without research findings and that allows misperceptions to persist.

- **Perinatal and Developmental Risk**

There are higher risks for pregnancy and delivery, which may lead to several significant problems such as cerebral palsy and intellectual disability. The higher rate of reading problems is associated with the speech and language difficulties and with higher rates of Attention Deficit Hyperactivity Disorder (ADHD). For many ADHD remains a controversial diagnosis. It is not just educating the multiple with special needs that matters, but also considering how the other multiple(s) and indeed the whole family are affected.

- **Parental Stress/ Mental Health Issues**

- Economic Stress
- Emotional Stress
- Psychological Stress
- Depression

There are now several population-based studies that show a higher rate of depression in parents of young twins that is not just postnatal depression, but ongoing problems right up to school-age. There have been no really convincing studies of triplets. However, one study from well before the birth found that almost 40% of parents were being treated with anti-depressants several years later. It is not clear why this happens with twins and higher multiples, but much seems to have to do with the stresses (the extra workload, the lack of sleep, the financial burden and so on) of two or more children the same age.

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<http://www.sciencedaily.com/releases/2008/07/080707100159.htm>

Article on Staying Sane Under Twin Stress:

<http://www.twinservices.org/articles/stayingsane.html>

- **Twin Myths:** The universal fascination with twins and triplets, and misunderstandings about the nature of twinning, perpetuate a mythology which has serious consequences for multiples and their families. From--Nobel, E. "Having, Twins".

MYTH #1: Twinning skips a generation.

FACT: Dizygotic or two-egg twinning passes down the female line from generation to generation.(1)

IMPACT: An expectant mother may disregard her symptoms of a multiple pregnancy, because she believes that she can't have twins since her mother did.

MYTH #2: Since multiple births are most often the result of costly infertility treatments, twinning is not a problem for middle- and low-income populations.

FACT: Although twinning rates are influenced by infertility treatments the majority of multiple births occur naturally. The highest rates are in the African-American population, which is at additional high risk for poverty.(2)

IMPACT: Policy makers and funders fail to provide resources to address the special needs of low-income families with multiples.

MYTH #3: Every pregnant woman thinks she's having twins.

FACT: Pregnant women have been found able to accurately identify the presence of multiples as much as three months ahead of the medical diagnosis. (3)

IMPACT: Under the influence of this myth, obstetricians sometimes dismiss maternal suspicions of twin pregnancy and manage the pregnancy as if there is just one [baby](#), such as limiting maternal weight gain to 20 pounds instead of the optimal 40 pounds for twins; inducing premature labor in the mistaken belief that a seven-month twin pregnancy is a post-mature singleton pregnancy.

MYTH #4: You can't breastfeed multiples, or if you breastfeed you must never use bottles.

FACT: Mothers who breastfeed multiples report that the judicious use of formula as supplementation, in times of illness or extreme fatigue, can prolong the duration of the breastfeeding period. (4)

IMPACT: Mothers of multiples who are willing to breastfeed are discouraged from attempting it. This can mean that low-birthweight infants, who are most in need of breast milk, are unnecessarily deprived of its benefits. In addition they may miss regular physical contact with their mother which the process of breastfeeding requires and which promotes the bonding process.

MYTH #5: It's so much easier with twins. Everyone helps you; and you get lots of discounts.

FACT: Childcare and household management costs more, not less, with multiples. Subsidized child care and respite programs are inadequate to meet the pressing needs of families suffering the severe sleep deprivation which accompanies the 24-hour care of infant multiples. Unless the help of relatives and friends is organized and systematic, it may actually contribute to parental stress. Mothers of multiples benefit most from the help of their husbands/partners. Cultural biases may discourage fathers from participating. Lack of information and training in child development and care may reduce the effectiveness of any help fathers do provide. Although some purchasing discounts are available, the majority of the costs of medical care, equipment, clothing, diapers and food are double for twins and increase in proportion to the numbers of infants.

IMPACT: When parents believe that the system will provide necessary help, they may fail to mobilize their own networks of support and be ill prepared to cope with the extraordinary physical demands and financial impact of twin care.

MYTH #6: There's a good twin and a bad twin in every pair.

FACT: The relationship between co-twins is a dynamic interplay of personality variables which suffers from such potentially deterministic labels. Twins are children who get along more or less well with each other depending upon a host of variables such as temperamental compatibility and their relationships with the rest of the members of the family. Young twins experiment with the balance of their relationship -- trading off being "leader and follower," or "bully and victim," as often as every hour. With good coaching and refereeing from their parents, multiples are capable of developing a mature, reciprocal relationship with lifelong benefits.

IMPACT: Obstetricians, nurses and parents label co-twins "good" and "bad" or other positive/negative stereotypes, which damage their relationship.

MYTH #7: There are all kinds of research to help parents understand the unique aspects of twin development.

FACT: The majority of research known as "twin studies" employs twin subjects to examine the heritability of biomedical and personality variables. Most of the information available on twin development is a by-product of this work. Few longitudinal studies of twin development per se exist.

IMPACT: Providers, funders and parents assume that comprehensive information about twin development is available for the asking and do not promote research on this neglected subject.

MYTH #8: Twins and triplets share everything.

FACT: Even though they have shared a womb, multiples learn to share their toys gradually, like all children do. First, each must develop a sense of ownership of their clothes and some toys. Once a child understands the concept of "mine," she or he can begin to lend and trade.

IMPACT: Parents and caregivers lump all the children's' clothes and toys together thereby retarding the development of self esteem and promote an endless round of competition between the children.

MYTH #9: Twins should always be separated in school, so that they will learn to get along without each other.

FACT: No one formula for school placement fits all twins at all times. The classroom placements for a set of multiples must be evaluated each year, just as classroom placement is evaluated annually for single born children. Young multiples who are still working out the balance of their relationship with each other benefit from starting school in the same class. There, in the comforting presence of their co-twin, they can learn to separate by participating in different activities with different groups of children. When multiples are separated before they have learned independence they will be overwhelmed with grief and anxiety and unable to concentrate on school work.

IMPACT: Principals, parents and teachers place twins in separate classrooms before they are ready and thereby slow down the separation process they mean to promote.

More...Modern Twin Myths (*italic*) – Suggested Clarification Statement (bold)

A parent cannot bond w/two or more babies at the same time.

“you won’t bond at the same time—you’ll bond with each of them individually over a period of time”

All multiple births are premature.

“not every multiple birth is premature.”

Identical twins are always identical in every way.

“Even though identical twins share the same genes and chromosomes, they are less alike than commonly thought.”

When parents have twins they love them both the same.

“Parents see their twins as individuals. They love them each uniquely as individuals.”

Twins receive the same if not more of their parents’ affection and attention than non-twins.

“This is not usually the case.”

Twins are each other’s opposites so there’s always a good twin and a “bad twin” good evil.

“The battle between ‘good’ and ‘evil’ has been acted out since ancient times in countless cultures . . . The impulse to compare twins is understandable but misguided.”

All twins have special language.

“Many twins do have a unique way of communicating with each other. It is wrongly called a “special language.”

Twins are supposed to be best friends.

“Identical twins are more likely to have similar temperaments and interests, and those may tend to support a closer friendship between them.”

All twins have ESP.

“So far there is no research to support evidence of ESP in twins.”

One twin is always dominant and assertive. **“Many twins will tell you that the balance within their relationship is very fluid, sometimes shifting back and forth with great subtlety.”**

Identical twins always experience greater problems in establishing their identity.

“Neither identical nor fraternal twinning are definitive factors in determining identity problems.”

Twins show more signs of psychopathology than non-twins. “

Scientists have long used twins as subjects of studies . . . this has undoubtedly contributed to these misconceptions.”

From: *Raising twins from birth through adolescence: What parents want to know* (Pearlman and Ganon 2000).

In the Beginning—Pregnancy and Childbirth

- **Signs of Twin Pregnancy**

Here are some of the most common signs of a twin or multiple pregnancy. Could you be having more than one? Check your symptoms against this list to see if you might be having twins or more.

<http://multiples.about.com/od/pregnancy/u/multiplepregnancy.htm>

1. Ultrasound Confirmation
2. Doppler Heartbeat Count
3. Elevated HcG Levels
4. Abnormal AFP Test Results
5. Measuring Large for Gestational Age
6. Weight Gain
7. Excessive Morning Sickness
8. Early/Frequent Fetal Movement
9. Extreme Fatigue
10. History/Hunches

- **Working Toward Healthy Pregnancies with Multiples**

In 2009, Dr. Barbara Luke introduced new guidelines for weight gain during pregnancy with twins. Dr. Luke is a Michigan State University professor who created the guidelines for the Institute of Medicine based on a research study of more than 2,000 twin pregnancies. It evaluated maternal weight gain and fetal growth to develop models of optimal weight gain based on a woman's pre-pregnancy BMI (Body Mass Index). The new guidelines recommend:

- Healthy, normal-weight mothers: 37-54 pounds
- Overweight mothers: 31-50 pounds
- Obese mothers: 25-42 pounds

<http://www.drbarbaraluke.com>

Her book available on Goggle books (See below resources):

Article on Nutrition in Twin Pregnancy

<http://www.twinservices.org/articles/nutrition.html>

Preparing Siblings for Twins:

<http://multiples.about.com/od/familyissues/a/siblingtwin.htm>

High-risk Aspects of Multiple Birth

Although the vast majority of multiples are healthy at birth, there can be an eight to ten times increase in the risk of problems surrounding the pregnancy of multiples as compared to singleton pregnancies. It is paramount to have early prenatal care that continues throughout the pregnancy. It is very important to determine what type of multiples you are carrying. Mothers with monochorionic twins (one, shared placenta) require closer scrutiny of their pregnancy. The chorionicity (e.g. one or two placentas in twins) can be easily be determined by ultrasound in the first or early second trimester. The later the ultrasound is delayed, the harder it is to accurately classify the pregnancy. Once the pregnancy is categorized, a surveillance plan to monitor the babies can be set up. The complications in multiple birth pregnancy can affect any type of multiple (fraternal or identical) and include all types (twins, triplets, quadruplets, etc). Some complications in multiple birth pregnancy are:

- 1- **Preterm Birth** Multiple birth infants can be born several weeks to months before their due date. The biggest concern with premature infants is the lack of development of the newborn's lungs and the possibility that the lungs may be immature. Immature lungs can lead to many complications including pneumonia, respiratory distress syndrome (RSV), infection, jaundice, and apnea. Preterm or premature birth is the leading cause of neonatal death in multiple pregnancies. <http://emedicine.medscape.com/article/975909-overview>
Article on Preventing Premature Birth:
<http://www.twinservices.org/articles/preventingpremature.html>
 - 2- **Low Birth Weight** Two-thirds of multiple birth infants are born at low birth weight and are at risk for short-term and long-term health problems as a result. This condition results from having less room to grow in utero. Birth weight below 2500 g (5.5 lb) is considered low, and birth weight below 1500 g (3.3 lb) is considered very low.
 - 3- **Birth Defects** The March of Dimes defines birth defects as an abnormality of structure, function or body metabolism (inborn error of body chemistry) presenting at birth or early childhood that results in physical or mental disability or is fatal. There are more than 4,000 known birth defects. Monozygotic twins (develop from one egg that divides into two) are twice as likely as dizygotic twins (develop from two fertilized eggs) to be born with congenital malformations.
 - 4- **Intraventricular Hemorrhage (IVH)** Infants born from a multiple birth pregnancy have a higher risk for cerebral palsy, mental retardation and other types of permanent neurological damage which may be resultant of IVH. Babies born at less than 34 weeks have an increased risk of bleeding in their brain. This occurs in about 1/3 of babies born at 24-26 weeks gestation.
 - 5-
- **Complications Specific to Identical Twinning:** Some complications only affect identical twins. Identical twins have either their own placenta or share a placenta. Identical twins have a greater risk than fraternal twins for complications during pregnancy or birth defects because they may share the same placenta. Rarely, they may also share the same amniotic sac. The reason for one shared placenta or one placenta for each twin is not known, however, the later the embryo splits following fertilization the more the complications.
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Information for Parents When Twins Share One Placenta

<http://www.multiplebirths.org.uk/MC%20Pregnancy%20%20Version%2012%2017%2005%2010.pdf>

- 1- **Twin to Twin Transfusion Syndrome (TTTS)** TTTS occurs in twins that share a single placenta (monochorionic). Fifteen to 20% of monochorionic twins develop TTTS. Twin to Twin Transfusion Syndrome is a disease of the placenta when blood passes disproportionately from one baby to the other through connecting blood vessels within their shared placenta. One baby, the recipient twin, gets too much blood overloading his or her cardiovascular system and the other baby, the donor twin, does not get enough blood. Without treatment, TTTS results in a high mortality rate (95%). TTTS is a sporadic condition and the chance of a recurrence of TTTS in subsequent pregnancy is exceedingly small. For more information on this condition, contact the Twin to Twin Transfusion Syndrome Foundation (www.ttsfoundation.org) and Fetal Hope Foundation (www.fetalhope.org). <http://emedicine.medscape.com/article/271752-overview>
- 2- **Selective Intrauterine Growth Restriction (SIUGR)** SIUGR is the unequal sharing of the common placenta. This may result in poor nourishment of one of the twins, resulting in subsequent poor overall fetal growth. Because this problem only affects one of the fetuses, this condition has the word “selective” in its title. SIUGR occurs in approximately 10% of monochorionic twin pregnancies. For more information on this condition, contact the Fetal Hope Foundation.
- 3- **Cord Entanglement** In monochorionic monoamniotic twins (twins that share the same sac), there is concern that the umbilical cords of the twins can entangle and cause harm to the one or both babies. Prior to 32 weeks gestation, mortality rates due to cord entanglement, is 60%.
- 4- **Acardiac Twins or Twin Reversed-Arterial Perfusion (TRAP) Sequence** TRAP is a rare and serious complication of monochorionic (one placenta) twins. Although the cause for this syndrome is not completely understood, it has been hypothesized that large vessels on the surface of the common placenta are responsible. Blood is perfused from one twin (“pump” twin) to the other twin (“acardiac” twin) by backward flow. Thus, the acardiac twin receives deoxygenated (oxygen depleted) arterial blood in the wrong direction from the pump twin. For more information on this condition, contact the Fetal Hope Foundation.
- 5- **Fetal lower urinary tract obstruction (LUTO)** LUTO is a rare condition that is caused by a blockage of fetal urination. Because the baby or babies cannot empty the bladder, the baby’s bladder subsequently becomes very large and inflated. Also, because the amniotic fluid is essentially composed of the baby’s urine beyond the middle of the second trimester, the amniotic fluid dries up. For more information on this condition, contact the Fetal Hope Foundation.
- 6- **Conjoined twins** These are twins that are joined together at parts of their bodies. It appears to be the incomplete division of the embryo is associated with incomplete separation of the twins’ bodies and the incomplete formation of various organs and systems within the twins. Conjoined twins, which are monozygotic, occur with a frequency of approximately one in 50,000 to 100,000 live births according to various surveys. Successful separation prior to 1960 has not been reported. More routine success with separation has only occurred over the last 15 to 20 years. To date, approximately 250 successful separations in which one or both twins have survived over the long-term have been recorded.

Early prenatal care that continues throughout the pregnancy is paramount. It is also important for local clubs and parents of multiples to understand and to help educate the parents of multiples-to-be about the possible complications that multiple birth

pregnancy can experience. This information is not meant to scare but to give future parents of multiples knowledge. The sooner a complication is discovered, the sooner treatment and a plan of care can be started. And this may translate to better outcomes before and after birth.

- **Loss of a Multiple**

Two key findings have emerged from the extant research on twin loss. The first is that identical twins experience the loss somewhat more intensely than fraternal twins, although there is considerable overlap--the loss experience may be just as devastating for some fraternal twins. There is also evidence of less grief reduction over time for identical than fraternal twins, on average. The second finding is that the loss of a twin is associated with greater grief than the loss of any other relative, with the exception of a spouse.

<http://www.psychologytoday.com/blog/twofold/200907/loss-twin>

- **When One or More Have Special Needs**

MULTIPLICITY The Special Challenges of Parenting Twins and More—Loss, Prematurity and Special Needs by Elizabeth A. Pector, M.D.

<http://www.synspectrum.com/multiplicity.html>

This page lists organizations, print & website resources that may be helpful for parents facing the challenges of raising multiples, working through loss of one or more multiples, or raising one or more premature or special needs child(ren). Recommendations for pamphlets, articles, grief information and book lists from a variety of sources are listed here.

Issues in Parenting Multiples in Infancy and Toddlerhood

- **Fatigue and Lack of Sleep**

Postpartum mothers of twins have significant sleep restriction and depressive symptoms, according to a research abstract that will be presented on June 9 at SLEEP 2008, the 22nd Annual Meeting of the Associated Professional Sleep Societies (APSS). According to the results, by the time the twins reached full-term, mothers were sleeping an average of 5.4 hours in a 24-hour period, with over 70 percent reporting less than six hours of sleep. Furthermore, the sleep was very fragmented, with an average of 15.1 sleep episodes daily, each lasting an average of 22.4 minutes. Almost half of mothers reported mild to severe depressive symptoms. By the time the twins had been home for eight weeks, average sleep duration had only improved marginally to 5.6 hours daily, although this was achieved in fewer sleep episodes lasting an average of 31.8 minutes each. The percentage of women with depressive symptoms decreased to less than 25 percent. Mothers reported improved sleep quality and decreased fatigue levels over time.

"As primary caregivers for families, mothers caring for twins experience enormous workload, extreme exhaustion, and limited time to meet their own needs.". "Additionally, mothers of twins are likely to be caring for babies that are premature. Premature infants are more fragile, require more vigilant care, and are more difficult to feed than full term infants. Meeting the increased demands of two premature infants places mothers at risk for sleep deprivation. Recent evidence suggests that sleep deprivation and the resultant fatigue are related to the development of postpartum depression. Postpartum depression is known to have negative effects on the quality of mother-child interactions and on the child's biological and behavioral development." Although the effectiveness of sleep strategies has not been formally evaluated for mothers of twins, tips are offered for new mothers on how to get a good night's sleep:

<http://www.sciencedaily.com/releases/2008/06/080609071210.htm>

- **Attachment/ Bonding**

- Article on Bonding with Multiples

http://www.secretsofbabybehavior.com/2010/09/lets-talk-about-twins-triplets-quads_14.html

The nature of adult twin relationships: an attachment-theoretical perspective.

Abstract --Twin relationships have been hailed as one of the most unique and intimate kinds of relationships. Unfortunately, there is a paucity of empirical research that addresses the interpersonal nature of twin relationships. In this article, the authors argue that attachment theory may provide a useful framework for understanding the nature of twin relationships. The authors present data indicating that (a) twins are more likely than non-twin siblings to use their sibling as an attachment figure; (b) the developmental course of twin attachment differs from that of other attachments; and (c) certain factors, such as genetic relatedness, empathy, including the other in the self, and shared experiences, may impact the extent to which twins use one another as attachment figures. From the Department of Psychology, University of California, Davis, CA.

Effects of early mother-twin relationships from birth to age 3, on twin bonding.

Abstract--Findings from an earlier phase of this research project clearly pointed to the mother's psychological adaptation inherent to the specificities of triadic interaction. Mothers' attitudes were classified in a typology ranging from "early twinness" where the two babies are treated as though they were a single unit,

to attempt to create two dyadic relationships. The current program deals with the effects of the type of parent-child relationship at one year on the emergence of twin bonding. Sixty-eight families of twins (26MZ, 24DZ same sex, 18DZ different sex) are followed up from birth to the age of 3 using a method based on clinical interviews, videotaped observations, and questionnaires. The data cover mothers' rearing attitudes towards organization of baby care and outward signs of twinning, maternal representations of the relationship between the twins and observation of the children's interaction in a standardized game situation. The findings are discussed in terms of zygosity, and parental SCS. Robin M, Kheroua H, Casati I

- **Logistics of Care Giving and Feeding Routines**

- http://www.ehow.com/videos-on_5594_care-twins.html

- Feeding Twins, Triplets or More (For Parents)

- <http://www.multiplebirths.org.uk/MBFParentsFeedingGuideFINALVERSION.pdf>

- Feeding Twins, Triplets or More (Professionals)

- http://www.multiplebirths.org.uk/MBF_Professionals_Final.pdf

- <http://www.multiplebirths.org.uk/Appendicesfinal.pdf>

- **Impact on the Family**

- <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2153814/pdf/canfamphys00229-0121.pdf>

- **Breastfeeding**

- <http://www.lli.org/nb/nbmultiples.html>

- <http://www.lli.org/nb/nbnovdec06p244.html>

- Karen Kerfhoff Gromada's Mothering Multiple's

- <http://www.karengromada.com>

- **Guidance and Discipline**

- <http://www.twinservices.org/articles/limitsetting.htm>

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Multiples in Preschool and Beyond

- **Supporting Social Emotional Development and Individuality**

- Article on Promoting Individuality in Multiples

<http://www.twinservices.org/articles/encouragingindivid.html>

- Joan Friedman's Core Twin Parenting Guidelines:

1. Think of your twins as two unique individuals
2. Expect to have different feelings for each child
3. Give each child consistent "alone time" with you
4. Don't attempt to provide a "fair and equal" childhood for your twins
5. Don't compare twins to each other; each is on his or her unique life path
6. Encourage twins to pursue their own friendships and interests
7. Don't rely on your twins to be each other's constant companion or surrogate parent.

(see Book--below Emotionally Health Twins)

- **Twin Discrimination**

The dictionary defines discrimination as, "the process by which two stimuli differing in some aspect are responded to differently" or "the act, practice, or an instance of discriminating categorically rather than individually." Maybe in that light it makes a bit more sense to consider some of the treatment of multiples as a form of discrimination.

<http://multiples.about.com/cs/familyissues/a/twindiscrim.htm?p=1>

<http://christinabaglivitinglof.com/2010/06/22/does-twin-discrimination%2%A0exist/>

- **Twin Relationships with Each Other**

Are twins different from singletons during early childhood? This paper examines the specificity of intra-familial experiences to which twins are exposed during early childhood, and the impact of this family context on the psychological development of twins. An overview of the literature on the psychological development of twins indicates two broad categories of findings. The first category covers studies dealing with the developmental features that appear early in twins. Although there are numerous studies comparing the psychomotor and verbal development of twins to singletons, only a few have dealt with the emergence of personality and identity, and most have been conducted in clinical settings. The second set of studies deals with mother-twin relations, explored in recent years in terms of the psychosocial stress created by twin births. Few studies have examined the mother-twin relationship in the light of major theories on mother-child bonding (psychoanalysis, attachment, interactionist model). These developmental models have mainly focused on mother-infant dyads, while the construction of this specific mother-twin relationship needs to be set within the framework of a triadic situation. Rather than describing a specific 'twin mentality', it is argued here that the twin situation should be seen as a special case of adaptative development, both for the mother and the child, which has effects on the formation of the individual.

<http://www.twinsandmultiples.org/dloads/relationships.pdf>

- **Educational Needs**

Teachers and parents need to be aware of particular issues that may affect the physical, intellectual, personal, social and emotional development of multiple birth children and to ensure that school policy and practice includes this special group of children and parents. These issues include: preterm birth catch-up and

implications for starting school; the balance of competition and co-operation among multiples; separation in school and the evidence from recent longitudinal studies; legislative and other initiatives on the development of school policy; the particular needs of higher multiples.

www.twinslaw.com/Twins.../Meeting%20the%20Education%2320F5C.doc

School Placement –Together or Apart

Research on Education and Placement for Twins:

http://www.twinslaw.com/Twins_Research_.html

Policies and check list to use when teacher and parents are deciding whether to keep multiple in same or different classrooms:

http://www.twinsandmultiples.org/dloads/school_policy.pdf

http://www.twinsandmultiples.org/dloads/school_checklist.pdf

Teaching Twins:

<http://www.teachingtwins.com>

Unique Needs of Twins in Center-Based Preschools

- **Communicational:** relates to the preschool teachers' acknowledgement and recognition of twinship.

Twins enrolled in a center-based preschool have a unique need for:

1. Acknowledgment and encouragement as both an individual and as a twin.
2. Recognition of individual and collective needs.
3. Recognition and encouragement of individuality.
4. Recognition and understanding of twin-type.
5. Recognition and encouragement of their differences without emphasis.
6. Recognition of potential for developmental delay without exaggeration.
7. Recognition of gender differences in maturational stages of boy-girl twin pair.
8. Attention to their unique medical history, home life, and interaction with children outside the twin relationship.

- **Programmatic:** relates to preschool enrollment and operational plans regarding twinship.

Twins enrolled in a center-based preschool have a unique need for:

9. Policies and practices recognizing twins as a special group with unique family circumstances.
10. Flexible school and placement policies accommodating their situational needs.
11. Principals and teachers receptive to accessing current twin research/information.
12. Added consideration in preschool admission.
13. Parent conferences and placement procedures sensitive and responsive to twinship.
14. Re-evaluation of school practices regarding mandates such as classroom separation.
15. Periodic (no less frequent than annually) consultation to review group and room placement.
16. Description of performance and progress as these relate to their peer group.

- **Relational:** relates to twin-specific interaction and interpersonal activities:

Twins enrolled in a center-based preschool have a unique need for:

17. Freedom from comparison to one another.
18. Encouragement to make individual friends as they mature.
19. Independence as they are ready.
20. Opportunities for individual activity participation.
21. Opportunities for self responsibility adjusted to each co-twins' level of maturity.
22. Remaining together as long as they want or seem to benefit.

From *Twins and Supertwins: A Handbook for Early Childhood Professionals* - Eve-Marie Arce, EdD

Resources to Support Families with Multiples

1. Books

<http://www.doubleupbooks.com>

Internet site for books on Twins and Multiples

Books used for this presentation:

- **Twins and Supertwins: A Handbook for Early Childhood Professionals -**
Eve-Marie Arce, EdD 2010
Synopsis With twins and supertwins an increasingly growing population in preschool classrooms, early childhood professionals have more questions and concerns regarding the best ways to care for and educate preschool-age children of multiple births. *Twins and Supertwins* addresses these issues and highlights the best program practices supported by recent research and study findings; includes information on physical, social, emotional, and language development; identifies unique needs of twins and supertwins; and offers guidance to create partnerships with families.

- **Entwined Lives: Twins and What They Tell Us About Human Behavior—**
Nancy L. Segal 2000
Synopsis: Almost encyclopedic in scope, this elegantly written study cogently distills and makes available to the general reader a wealth of research from the fields of behavioral genetics, evolutionary psychology and social science. A professor of developmental psychology and director of the Twins Study Center at California State, Fullerton, Segal contends that studies of twins, raised together or apart, demonstrate that genetic influence affects virtually every human characteristic, including IQ, personality, longevity, sociability, job preference and satisfaction, mathematical skills and athletic prowess. Parents, surprisingly, tend to be highly inaccurate judges of whether their offspring are identical or fraternal twins. Segal endorses testing during pregnancy or routine DNA analysis of newborns, arguing that knowledge of twin type affects parents' and educators' management of twins' behavior. A twin herself, Segal includes helpful chapters on the bonds twins develop, on how to cope with the loss of a twin and on conjoined twins, among other subjects. This survey will capture the imagination of anyone curious about twins or human behavioral development.

- **Emotionally Healthy Twins --A New Philosophy for Parenting Two Unique Children –** Joan A. Friedman Ph.D. 2008
Synopsis: Most parents try to treat their twins as individuals, but most unwittingly undermine their best intentions because they lack a practical set of guidelines for raising emotionally healthy multiples. Drawing on her unique experience as a twin, the mother of twins, and as a psychotherapist, Dr. Joan A. Friedman outlines the seven key concepts for helping twins develop into self-realized, unique individuals and offers parents specific strategies for each stage in their children's growth.
<http://www.joanafriedmanphd.com>
<http://www.emotionallyhealthytwins.com>

- **When You're Expecting Twins, Triplets or Quads:** Proven Guidelines for a Healthy Multiple Pregnancy – Barbara Luck RN and Tamara Eberlein
http://books.google.com/books?id=pPpl2_I5PwC&pg=PA59&lpg=PA59&dq=Barbara+Luke+twin+research&source=bl&ots=YWsQ1BwTfn&sig=cq4yvXRiYmOtX87AprAIRRLHwTM&hl=en&ei=TiuFTeLaK4ucsQOAY437AQ&sa=X&oi=book_result&ct=result&resnum=6&ved=0CDsQ6AEwBQ#v=onepage&q=Barbara%20Luke%20twin%20research&f=false
- **Twins 101: 50 Must-Have Tips for Pregnancy through Early Childhood**
 From Doctor M.O.M. -- Khanh-Van Le-Bucklin
http://books.google.com/books?id=vlZEsm7mcgcC&pg=PT109&lpg=PT109&dq=Twins+fairness+and+equality&source=bl&ots=EAgrmbKzc7&sig=LAEaQJ7QRWhmu8krDM1XIp2FRH8&hl=en&ei=c2uFTdK3EYm-sAOM5_n2AQ&sa=X&oi=book_result&ct=result&resnum=6&ved=0CDcQ6AEwBQ#v=onepage&q=Twins%20fairness%20and%20equality&f=false
- **Raising Twins: From Pregnancy to Preschool**—Shelly Vaziri MD
 (American Academy of Pediatrics)
<http://pediatricianmomoftwins.blogspot.com>
- **Raising Twins: From Birth Through Adolescence**—Eileen M. Pearlman PhD, and Jill Alison Ganon
<http://twinsight.com>
- **Mothering Multiples: Breastfeeding and Care for Twins or More**—Karen Kerkhoff Gromada
<http://karengromada.com>
- **The Art of Parenting Twins: The Unique Joys and Challenges of Raising Twins and Other Multiples**-- Patricia Malmstrom , and Janet Poland
<http://www.twinservices.org>
- **It's Twins!: Parent-to-Parent Advice from Infancy through Adolescence**
 -- Susan M Heim
<http://www.susanheim.com/twins.php>
- **Twins: And What They Tell Us About Who We Are**-- Lawrence Wright 1997
<http://nytimes.com/books/first/w/wright-twins.html>

2. Journals

<http://www.twinsmagazine.com>

3. Internet Sites

1. <http://twinslist.org>
2. <http://www.twinservices.org>
3. <http://multiples.about.com>
4. <http://www.raising-twins.com>
5. <http://twinsandmultiples.com>
6. <http://www.twinsandmultiples.org>
7. <http://www.gottwinz.net>
8. <http://www.multiplebirthsfamilies.com>
9. <http://www.talk-about-twins.com>
10. <http://www.bellaonline.com/site/twins>
11. <http://pediatricianmomoftwins.blogspot.com>
12. <http://www.twinslaw.com>
13. <http://www.workingmomsoftwins.com>
14. <http://www.multiplebirth.com>
15. <http://www.multiplebirths.org.uk/>
16. <http://www.twinstalk.com>
17. <http://www.twinsworld.com>
18. <http://www.twinsdoctor.com>
19. <http://www.howtoraisetwins.com>
20. <http://www.twin-pregnancy-and-beyond.com>
21. <http://www.raising-twins.com>
22. <http://www.motheroftwins.com>
23. <http://multiplesandmore.blogspot.com>
24. <http://www.naturallyparentingt看ins.com>
25. <http://breastfeedingtwins.tripod.com>
26. <http://www.identicalstrangersbook.com>

4. Support and Resource Groups

1. **National Organization of Mothers of Twins Clubs** 1-877-540-2200; www.nomotc.org referral to local, parent support groups and possible sources of recycled clothing and equipment.
2. **Triplet Connection:** 209-474-0885; www.tripletconnection.org
3. **Mothers of Super Twins:** 516-434-MOST; www.MOSTonline.org – information and resources for triplets or higher.
4. **Center for the Study of Multiple Birth:** 312-266-9093; www.multiplebirth.com - information and referral regarding multiple pregnancy.
5. **Center for Loss in Multiple Birth:** 907-746-6123; www.climb-support.org - a network of support for parents who lose infant or young multiples.
6. **Sidelines** (for women on bedrest) 888-447-4754; www.sidelines.org.
7. **Twin Services Consulting:** 510-524-0863 - message machine. Articles regarding twin development and care available on line at <http://www.twinservices.org/free-articles.html>.
8. **TwInsight:** 310-458-1373; www.twinsight.com – Counseling for twins and parents with multiples.
9. **Twin to Twin Transfusion Syndrome Foundation:** 440-899-8887 ; www.ttsfoundation.org
10. **Twins Foundation:** 401-729-1000; www.twinsfoundation.com - resources for multiples, especially adults.

Twin Research

Twin Early Development Study is one of the world's premier studies of how genes and environments shape our development from birth to young adulthood. The study is based at King's College London, one of the world's top 25 universities, under the leadership of Professor Robert Plomin, who has been ranked among the 100 most eminent psychologists in the history of science. The **TEDS** researchers use the latest discoveries in psychology and genetics to untangle the complex interplay between nature and nurture.

<http://www.teds.ac.uk/index.html>

From: University of Colorado—Longitudinal Twin Study

[Colorado Longitudinal Twin Study](#) is an ongoing research project of the Institute for Behavioral Genetics, which is a department of the University of Colorado at Boulder. The purpose of this research is to study the varying genetic and environmental influences on development, including cognition, temperament, physical development, intelligence and emotion

<http://ibgwww.colorado.edu/lts/links.htm>

[International Society for Twin Studies](#) - The International Society for Twin Studies (ISTS) is an international, nonpolitical, nonprofit, multidisciplinary scientific organization. Its purpose is to further research and public education in all fields related to twins and twin studies, for the mutual benefit of twins and their families and of scientific research in general. The Society was founded in Rome in 1974.

[The Southern California Twin Project](#) - The Southern California Twin Project coordinates a series of research studies of twins. The primary goal of this research is to understand the roles of heredity (genes) and environment (culture) in producing individual differences in human behavior. Topics of investigation include personality, cognitive abilities, mate selection, antisocial behavior and delinquency.

[Mid-Atlantic Twin Registry](#) - This site provides information on current and past research projects and results from many of the research projects in which MATR twins and their family members are participating.

[The Twin and Temperament Center](#) - The major focus of the Wisconsin Twin Project (WTP) is studying the emotional development of twins. Individual differences in emotional reactivity, mood, and temperament form the basis of personality, represent major substrates of vulnerability to psychopathology, and also contribute to physical health and diseases. Studying all types of twins allows researchers to identify both genetic and environmental influences on development.

[Twin Research and Genetic Epidemiology](#) - This center at St. Thomas' hospital in London studies the genetic and environmental factors associated with aging and lifestyle and inherited causes and effects on disease development.

[Minnesota Twin Family Study](#) - The Minnesota Twin Family Study seeks to identify the genetic and environmental influences on the development of psychological traits. It is the largest research initiative within the Department of Psychology and is composed of several independent projects

[The Center for Study of Multiple Birth](#) - The Center's purpose is to stimulate and foster medical and social research in the area of multiple birth and to provide help to parents with the special problems they and their offspring will encounter".

[Louisville Twins Study](#) - One of the largest and longest running twin studies in the United States.

[The Twins Foundation](#) - The Twins Foundation is an international membership organization and primary research information center on twins and other multiples.