

News, views and comments

Most Unusual Twin Pairs: A Look at Uterus Didelphys / Twin Research Reviews: Prenatal Aneuploidy Screening for Twin Pregnancies; Twin Conceptions by Same-Sex Male Couples; Legal Personality of Conjoined Twins; Twin Study of Cannabis Use / Human Interest and Importance: Being Taken for Twins Saved Sisters; Twin Children of Jailed Nobel Prize Winner; British ‘Biracial’ Twins; Triplets Born at Start of Russian Attack on Ukraine; Twins Born in Different Years

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Abstract

A review of an unusual twin type—twins born to women with two uteri (uterus didelphys)—is presented. This review is followed by summaries of recent research and perspectives concerning prenatal aneuploidy screening for twin pregnancies, twin conceptions by same-sex male couples, legal personality of conjoined twins, and a twin study of cannabis use. Interesting information about twins that has appeared in the media is also presented, namely how being taken for twins saved a pair of sisters; twin children of a jailed Nobel Prize winner, British ‘biracial’ twins, triplets born at the start of Russia’s attack on Ukraine, and twins born in different years.

(Received 28 February 2024; accepted 28 February 2024)

Most Unusual Twin Pairs: A Look at Uterus Didelphys

News of twins born to two women with the rare condition of uterus didelphys (UD) inspired a closer look at what UD entails. It is a congenital condition caused by failure of the Müllerian ducts to fuse. This failure leads to the development of two uterine bodies that each have a cervix, fallopian tube, and septate vagina (vagina that has been divided into two parts; Warnasuriya et al., 2022). A recent media report of twins born to an Alabama woman with UD was circulated worldwide (Echols, 2023). That report referenced another mother of twins in Bangladesh who had been diagnosed with UD (BBC, 2019); mention of this second report was most likely prompted by the Alabama case, given its unusual aspect as explained below. Risks posed by twins carried by a woman with UD include preterm labour and birth, intrauterine fetal growth restriction, malpresentation and cesarean delivery (Warnasuriya et al., 2022). Note that these are the same risks to which typical twin pregnancies may be susceptible.

The estimated frequency of UD is between 1/1000 to 1/30,000 females (Warnasuriya et al., 2022), while the estimated frequency

of UD combined with multiple conception remains speculative. Warnasuriya et al. (2022) cited a study indicating that twin births among women with UD may be as rare as one in one million pregnancies, but some experts place the estimate closer one in 50 million (Rudy, 2023). My own search in Google Scholar for 2023 publications listed approximately 25 papers. A comprehensive review of these cases would be a valuable addition to the literature.

I cited the Alabama case in my previous article in *Twin Research and Human Genetics* (Segal, 2024). In brief, Kelsey Hatcher, age 32 years, was a mother of three children between the ages of 2 and 6 years when her twins were conceived. Prior to their births, the twins’ estimated weights were 6 to 7 pounds each. Hatcher delivered twin girls, Roxi and Rebel, 10 hours apart on December 19 and December 20, respectively (Echols, 2023). Roxi was born vaginally, whereas Rebel was born by cesarean section. (All of Hatcher’s children have names beginning with R.)

I noted that the author of this article (Echols) wrote ‘twins’ in quotation marks, suggesting that Hatcher’s children are not truly twins. Perhaps that was because the infants developed in separate uteruses, whereas typical MZ twins and other MZ multiples develop in the same uterus, although they can be encased in separate amnions and/or chorions (fetal membranes). This raises the question of the precise definition of a twin. In my previous publications contrasting MZ twins and clones, I asserted that MZ twins are clones (genetically identical organisms), but clones are not twins (Segal, 1997, 2017). I reasoned that clones do not share the distinctive features of twinship, namely simultaneous

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Cite this article: Segal N. L. Most Unusual Twin Pairs: A Look at Uterus Didelphys / Twin Research Reviews: Prenatal Aneuploidy Screening for Twin Pregnancies; Twin Conceptions by Same-Sex Male Couples; Legal Personality of Conjoined Twins; Twin Study of Cannabis Use / Human Interest and Importance: Being Taken for Twins Saved Sisters; Twin Children of Jailed Nobel Prize Winner; British ‘Biracial’ Twins; Triplets Born at Start of Russian Attack on Ukraine; Twins Born in Different Years. *Twin Research and Human Genetics* <https://doi.org/10.1017/thg.2024.14>

conception, common intrauterine environment, brief birth interval, shared parents (other than in a biological sense), and same generation. It could be argued that twins born to mothers with UD are not twins in the strictest sense; however, I would disagree and believe they are truly twins. That is because there are exceptional MZ twins who do not fulfill all twinship criteria yet would still be classified as twins. Specifically, MZ twins may be adopted apart; MZ higher order multiples may be formed at slightly different times, depending on when the fertilized egg divides; and MZ twins may not be born on the same day. This argument extends to the multiples born in Bangladesh who pose an extraordinary twin-triplet situation.

In 2019, Arifa Sultana, age 20 years, delivered a nontwin infant, followed by twins 26 days later who had been gestated in a separate uterus. Sultana, who comes from a poor rural village, claims not to have known she was still pregnant after giving birth to her singleton. Following a series of stomach pains, she entered a different hospital and was cared for by Dr Sheila Poddar who delivered healthy male-female twins. Another physician on the staff speculated that three eggs had been released and fertilized; this would create an unusual set of triplets.

It is important to verify this case, given its medical and public interest. It has been widely cited in a variety of news sources, such as the BBC, with comments from Dr Poddar. (I attempted to reach Dr Poddar and the hospital administrator with the help of Bangladeshi researchers, but was unsuccessful.) Turning to colleagues in gynecology and obstetrics, I asked about the possibility of such a case and what the effects might be. Dr Reuben Quintero (Fetal Institute, Miami, Florida) responded, 'It is not known if both fetuses could get the same nutrition. Therefore, it would not be surprising if one of them is growth restricted and the other is not. Each fetus is responsible for its own nutrition/interaction with the maternal blood supply. It should be no different than any other dichorionic twin gestation, but the uterine anomaly may increase the risk of growth restriction for both . . . Yes, it's called delayed delivery of a twin. It can happen in a normal uterus. I have had such a case, but not in a didelphys uterus.' In answer to one of my questions, Dr Shari Leipzig (Park Avenue Women's Center, New York) wrote that infants in the separate uteruses would both be susceptible to the consequences of the mother's diet and medications. However, Leipzig questions the possibility that the twin-triplet situation truly happened, but added, 'Isn't nature incredible?'

There are many natural variations on twinning that still require scientific documentation. Only then can we know the frequency of these events, how to manage them medically, and how to provide the best assistance to these multiple birth infants and their families.

Twin Research Reviews

Prenatal Aneuploidy Screening for Twin Pregnancies

Prenatal aneuploidy screening has been conducted mostly for trisomy 21 or Down syndrome. However, there are a number of screening procedures that may improve detection and counseling when aneuploidies are detected or suspected. Buckley et al. (2023) have reviewed the advantages and disadvantages of these procedures, with reference to twins. It is important and interesting to note that multiple pregnancies have a reduced rate of trisomy 21, compared with age-matched nontwin pregnancies. Furthermore, MZ twins show greater risk reduction than DZ twins, possibly due to preimplantation testing of DZ twin pregnancies when assisted

reproductive methods are used or increased risks of early pregnancy loss in twin pregnancies. It is also the case that less is known about twin versus singleton risks for other aneuploidies, such as trisomies 13 and 18.

The authors of this review cover several twin-related topics of interest; for example, first and second trimester screening, and the validity and challenges of cell-free fetal DNA screening. Buckley et al. (2023) urge diagnostic testing (chorionic villus sampling or amniocentesis) when an aneuploidy is detected or a definite result cannot be obtained. The risk of fetal loss from these invasive procedures poses the same level of risk as when conducted with controls not undergoing such testing. Most importantly, Buckley et al. (2023) recommend cell-free DNA assessment for all twin gestations — in their view, it is a better procedure than examination of maternal serum or ultrasound screening.

Twin Conceptions by Same-Sex Male Couples

A Canadian study on the frequency of same-sex male couples having twins via egg donation and surrogacy is now a decade old (Grover et al., 2013). However, it is worth reviewing because in vitro fertilization (IVF) and other reproductive techniques, while developed to assist childless couples to conceive, have become methods of choice for some same-sex couples and single adults wishing to have families. Furthermore, my search for more recent publications did not identify other such studies—there have, however, been general interest articles on the topic; see, for example, Dodge (2021).

Grover et al. (2013), noting the lack of relevant research, conducted a study of 37 same-sex male couples and 8 single men (7 of whom were homosexual) who had sought reproductive assistance at the CREATe Fertility Center in Toronto. This number represented a 21-fold increase in such clients since 2003. Twenty-eight couples used sperm contributed by each father. Among the 25 deliveries were eight sets of twins, all genetic half-siblings since they share maternal, but not paternal reproductive contributions. This process replays the natural occurrence of superfecundation, as I explained in my recent book, *Gay Fathers, Twin Sons* (Segal, 2023). That book tells the story of a high-profile lawsuit against the U.S. State Department and Secretary of State for denial of citizenship to one twin son created with sperm from an Israeli father. Note that the nationalities of the egg donor and surrogate have no bearing in such cases and these individuals relinquish all right to resulting infants. A recording of my presentation of this book by C-SPAN-2 Book TV can be seen at <https://www.c-span.org/video/?530176-1/gay-fathers-twin-sons-citizenship-case-captured-world>

Legal Personality of Conjoined Twins

An essay by Sunil (2023) addressing issues and questions of legal personality, identity and ethics of surgically separating conjoined twins is intriguing. The views of various individuals are cited and include arguments both favoring conjoined twins as separate individuals and denying that two individuals exist. It is unthinkable to me that anyone would consider conjoined twins as less than two separate people in their own right. Perhaps this reasoning reflects the backgrounds of the experts cited who are not involved with twin science. We know that the well-known pair, Chang and Eng, had opposing views when it came to drinking and raised separate families. We also know that a long-surviving female pair, Lori and Reba, have different interests and talents (Mütter Edu Staff, 2016; Segal, 2000).

Twin Study of Cannabis Use

Genetic influences on recreational cannabis use was examined via a longitudinal twin study in the United States (Zellers et al., 2023). A specific issue under analysis was whether a difference might be observed between states that had and had not legalized recreational use of this substance. Two longitudinal prospective samples, one from the University of Minnesota and the other from the University of Colorado, were used. They included 111 MZ twin pairs discordant for living in states that have legalized recreational cannabis use. Key findings were that the frequency of cannabis use increased by approximately 24% due to legalization. More interestingly, twins living in a state with legalization showed a 20% higher use of cannabis than their cotwin living in a state without legalization. Evidence of genetic effects on cannabis use were inconclusive and specific to the legal environment.

Human Interest and Importance

Being Taken for Twins Saved Sisters

I learned about Italian sisters, Andra and Tatiana Bucci, in December 2023 while I was on tour at the magnificent Magnus Collection of Jewish Art and Life, in Berkeley, California. The sisters are not featured there, but the curator, Sergio Spanolo, knowing my interest in the twin survivors of Auschwitz-Birkenau (Segal, 2023), told me their story. I researched them further.

The sisters were aged 4 and 6 years old when they were transported to Auschwitz from Fiume (now part of Croatia) in April 1994 with their mother and other relatives (Joseph, 2022). The girls, who looked remarkably alike as young children, became the subjects of Dr Josef Mengele's horrific medical experiments. The sisters speculate that having been mistaken for twins most likely saved them. They remained in Auschwitz-Birkenau until January 1945 (January 27, 1945 was the date of the 'death march' during which prisoners were escorted out of the camp due to news that Soviet liberators were approaching). After a stay in a Czechoslovakian orphanage, the sisters arrived England in 1946 and were cared for in a home for child survivors. Andra and Tatiana and their parents were eventually reunited and settled in Trieste. The sisters have written a book titled, *Always Remember Your Name* (Bucci & Bucci, 2022).

I have documented several cases in which Nazi officers mistakenly assigned siblings as twins for the purposes of Mengele's experiments. There were also cases in which unrelated individuals passed themselves off as twins, believing this would help their survival (Segal, 1985, 2023). Aside from the horrific nature of the experiments, this aspect of Mengele's work adds to the uselessness of his efforts.

Twin Children of Jailed Nobel Prize Winner

Iran's famous peace activist, Narges Mohammadi, was awarded the Nobel Peace Prize, but could not attend the December 10, 2023 ceremony in Oslo, Norway (Bubola, 2023). She is currently being held in Iran's Evin Prison because she had worked to advance women's rights. Her 17-year-old male-female twins, Ali Rahmani and Kiana Rahmani, accepted the award on their mother's behalf in a speech that she had written: 'I write this message from behind the tall and cold walls of a prison', urging 'globalization of peace and human rights'. It is unclear whether the twins will see their mother again so it is fortunate that they have each other.

British 'Biracial' Twins

Fraternal twin boys, Klay and Cole, appear to be unrelated, but they share both biological parents. Their mother, Jade Ball, from Salford, Great Manchester in England, delivered the twins on April 16, 2020 (Muzaffar, 2021). Hall identifies herself as white, while her partner is half Jamaican. The twins' older brother is a physical blend of both parents, but Klay appears to be white, while Cole appears to be black. Klay has blonde hair and blue eyes, while Cole has dark hair and dark eyes. Hall admits that people are often incredulous when she says her sons are twins. However, we are seeing more of these unusual types of twins as intermarriage becomes more common. I am currently conducting interviews with parents of such twins to learn more about the psychological issues such twins face, or could potentially face, in addition to the child-rearing challenges. I would welcome contacts from interested twins and families.

Triplets Born at Start of Russian Attack on Ukraine

Months before the start of the Russian attack in Ukraine, Hannah and Andriy Berezyneets learned they were to become the parents of triplets — after first learning they were to have twins. Hannah entered the maternity hospital in Ukraine on February 23, 2022 with a cesarean delivery scheduled for the following morning (BBC, 2023). The three baby girls — Emilia, Olivia and Melania — who appear to be identical based on inspection of their photographs, were delivered in that order. They arrived just as the war broke out. That night, Hannah had to relocate to the hospital's bomb shelter with her three infants. They were healthy, but premature, and would normally have been kept in incubators. The smallest baby (Olivia) required intensive care, but Hannah refused to leave her baby alone. The family left the hospital approximately one month later, living in Slovakia before returning home. Unfortunately, Hannah's 51-year-old father was sent to Eastern Ukraine where he was killed, never knowing his new grandchildren.

Twins Born in Different Years

It is astonishing to think of twins with different birthdays, especially when they are born in different years. Twin boys, Ezra and Ezekiel, were delivered 40 minutes apart, Ezra on December 31, 2023 and Ezekiel on January 1, 2024 (Stamm, 2024). The delivery took place at Virtua Voorhees Hospital in Voorhees Township, New Jersey. The couple are pleased with this situation since they now have a captivating story to tell. It turns out that their father shares his January 1 birthday with Ezekiel, his second-born twin son.

References

- BBC. (2019, March 28). Bangladesh woman with two wombs has twins one month after first birth. <https://www.bbc.com/news/world-asia-47729118>
- BBC. (2023, December 23). The Ukrainian triplets born into war. <https://www.bbc.com/news/world-europe-67716987>
- Bubola, E. (2023, December 10). Children of jailed Narges Mohammadi accept her Nobel Peace Prize. *New York Times*. <https://www.nytimes.com/2023/12/10/world/middleeast/narges-mohammadi-nobel-peace-prize-ceremony.html>
- Buckley, L., Hopkins, M., Kuller, J. A., & Dugoff, L. (2023). Prenatal genetic screening in twin pregnancy. *Clinical Obstetrics and Gynecology*, 66, 624–628. <https://doi.org/10.1097/GRF.0000000000000805>.
- Bucci, A., & Bucci, T. (2022). *Always remember your name: A true story of family and survival in Auschwitz*. Astra House.

- Dodge, D.** (2021, June 16). A family like ours: Portraits of gay fatherhood. *New York Times*, <https://www.nytimes.com/2021/06/16/well/family/gay-fatherhood-photos.html>
- Echols, H.** (2023, December 22). Double the uterus, double the babies, double the birthdays: Alabama mom delivers rare twins at UAB. *UAB News*. <https://www.uab.edu/news/health/item/13917-double-the-uterus-double-the-babies-double-the-birthdays-alabama-mom-delivers-rare-twins-at-uab>
- Grover, S. A., Shmorgun, Z., Moskovtsev, S. I., Baratz, A., & Librach, C. L.** (2013). Assisted reproduction in a cohort of same-sex male couples and single men. *Reproductive Biomedicine Online*, 27, 217–221. <https://doi.org/10.1016/j.rbmo.2013.05.003>
- Joseph, A.** (2022, January 27). The sisters who survived Auschwitz. *The Jewish Chronicle*. <https://www.thejc.com/life-and-culture/the-sisters-who-survived-auschwitz-tt34wo21>
- Mütter Edu Staff.** (2016, August 3). Bonded by livers and love: The Chang and Eng story. *Mütter Museum*. <https://muttermuseum.org/stories/posts/bonded-livers-and-love-chang-and-eng-story>
- Muzaffar, M.** (2021, July 28). Mother of mixed race twins says she is constantly having to explain to strangers how they are related. *Independent*. <https://www.independent.co.uk/world/salford-mixed-race-twins-mother-uk-b1891956.html>
- Rudy, M.** (2023, December 9). Alabama woman with rare double uterus prepares to give birth to her 'miracle' twins. *Fox News*. <https://www.foxnews.com/health/alabama-woman-rare-double-uterus-prepares-give-birth-miracle-twins>
- Segal, N. L.** (1985). Holocaust twins: Their special bond. *Psychology Today*, 19, 52–58.
- Segal, N. L.** (1997). Behavioral aspects of intergenerational cloning: What twins tell us. *Jurimetrics*, 38, 57–67. <https://www.jstor.org/stable/29762525>
- Segal, N. L.** (2000). *Entwined Lives: Twins and what they tell us about human behavior*. Plume.
- Segal, N. L.** (2017). *Twin mythconceptions: False beliefs, fables, and facts about twins*. Academic Press.
- Segal, N. L.** (2023). *The twin children of the Holocaust: Stolen childhood and the will to survive*. Academic Studies Press.
- Segal, N. L.** (2023). *Gay fathers, twin sons: The citizenship case that captured the world*. Rowman & Littlefield.
- Segal, N. L.** (2024). Partnership with the University of São Paulo Panel of Twins: A four-city tour and more. *Twin Research and Human Genetics*. Advance online publication. <https://doi.org/10.1017/thg.2024>
- Stamm, D.** (2024, January 1). NJ parents welcome twins in 2 separate years. *NBC*. <https://www.nbcphiladelphia.com/news/health/new-years-baby-firsts/3733674/>
- Sunil, A.** (2023). The legal personality of conjoined twins: An analysis. *Indian Journal of Law and Legal Research*, 5, 1–8.
- Warnasuriya, S., Senarathne, I., Selvathushanth, S., & Jayasekara, D.** (2022). Term delivery of dicavity twins in a uterus didelphys by bilateral caesarian section. *Sri Lanka Journal of Obstetrics and Gynaecology*, 44, 91–96. <https://doi.org/10.4038/sljog.v44i2.8052>
- Zellers, S. M., Ross, J. M., Saunders, G. R., Ellingson, J. M., Anderson, J. E., Corley, R. P., Iacono, W., Hewitt, J. K., Hopfer, C. J., McGue, M. K., & Vrieze, S.** (2023). Impacts of recreational cannabis legalization on cannabis use: A longitudinal discordant twin study. *Addiction*, 118, 110–118. <https://doi.org/10.1111/add.16016>