Multiple Pregnancy

- **Pre-eclampsia**: Twins 3x, Triplet 9x
- **Preterm Birth**: Twins 50% < 37wk
- **Stillbirth**: Twins 10-15, Triplet 30/1,000
- **Congenital abnormalities**: 5%
- **Maternal mortality**: 2.5x

**UK multiple birth rate 1980–2015**

- **16 per 1000 total births**

**Sources**
- NICE 2011
- Sebire NJ et al., BJOG 1997
- Barigye O et al., PLoS Med 2005
- National Vital Statistics Reports 2010
- Centre for Maternal and Child Enquiries (CMACE) Perinatal Mortality 2008: UK
Multiple pregnancy contributes disproportionately to stillbirths, neonatal death and cerebral palsy.

<table>
<thead>
<tr>
<th></th>
<th>Births</th>
<th>2%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stillbirth</td>
<td></td>
<td>7%</td>
</tr>
<tr>
<td>NND</td>
<td></td>
<td>18%</td>
</tr>
<tr>
<td>Cerebral palsy</td>
<td></td>
<td>6 times</td>
</tr>
</tbody>
</table>
Multiple pregnancy contributes disproportionately to stillbirths

(CMACE 2011)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Singleton</td>
<td>1 in 200</td>
<td></td>
</tr>
<tr>
<td>Twins</td>
<td>2.4 in 200</td>
<td>• Stillbirth in twins is 2-3 times</td>
</tr>
<tr>
<td>Triplet</td>
<td>6.2 in 200</td>
<td>• Early neonatal death in twins is 6-8 times</td>
</tr>
</tbody>
</table>
USA: Stillbirth in Multiple Pregnancy

- % of Births: 3%
- % of Stillbirth: 9%

Rate per 1,000 live births and specified fetal deaths:
- Total: 6.22
- Single: 5.85
- Twin: 16.08
- Triplet or higher-order multiple: 27.18

CDC/NCHS 2005
Multiple pregnancy contributes disproportionately to negligence claims

Since 2005, the number of patient safety incidents involving multiple pregnancies has risen by 419%*

From 2005-2010 alone, these cases resulted in pay outs amounting to £93 million and account for 10% of all NHSLA maternity cases

This equates to the total cost of providing all AN appointments for uncomplicated twin pregnancies for a whole year

Multiple Births: Written parliamentary question – 217335, 5 December 2014
Multiple Births: Written parliamentary question – 217336, 5 December 2014 (*Between 2005 and 2013 there was a significant rise in all patient safety incidents reported to the National Reporting and Learning System. Since 2005 there has been a 270% increase in the total number of patient safety incidents
http://www.nrls.npsa.nhs.uk/resources/?entryid45=135304.)
http://www.nice.org.uk/guidance/cg129/resources/cg129-multiple-pregnancy-costing-report2 (Costs of delivering the optimum number of antenatal appointments in an uncomplicated dichorionic twin pregnancy estimated at £851)
What is the contribution of IVF to twins?
ART pregnancies

- Twins: 32%
- Singletons: 68%

General population

- Twins: 3%
- Singletons: 97%

Centers for Disease Control and Prevention
IVF: Twins or Triplets and Higher order pregnancies

97% Twins

3% Triplet and higher order
Reduction in Triplets – Systematic Review

In trichorionic triplets, embryo reduction to twins:
- does not improve the chance of survival
- significantly increases the gestation at delivery
- reduction in preterm birth may have an impact on disability

- Continue whole pregnancy
- Terminate whole pregnancy
- Embryo reduction

Papageorghiou 2006, Wimalasundera 2010
Timing of selective termination

- **≤16 wks**
  - Miscarriage: 5%
  - Delivery <33w: 6%

- **12 wks**
  - Miscarriage: 5%
  - Delivery <33w: 6%

- **>16 wks**
  - Miscarriage: 14%
  - Delivery <33w: 20%

- **20 wks**
  - Miscarriage: 14%
  - Delivery <33w: 20%

-Evans et al 1994
Selective Reduction

Triplet pregnancy

Which fetus to reduce?

- All three normal
- 1 and 2 monochorionic
- 1 anencephalic
- 2 and 3 increased NT
In DC or TC pregnancies: TA ultrasound-guided 20-22 gauge needle, intracardiac or intrafunicular injection of KCl or lignocaine, preferably in the first trimester.

MC pregnancies: cord occlusion, intrafetal coagulation (laser or radiofrequency ablation)
- Survival >80%
- Premature rupture of the membranes and PTB <32 weeks 20%
- Adverse neurological sequelae

Khalil et al UOG 2016
<table>
<thead>
<tr>
<th></th>
<th>Miscarriage (%)</th>
<th>PTB &lt;34 weeks (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TCTA expectant</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TCTA ER to 2</td>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td>TCTA ER to 1</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td><strong>DCTA expectant</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCTA ER to 2</td>
<td>13</td>
<td>31</td>
</tr>
<tr>
<td>DCTA ER to 1</td>
<td>17</td>
<td>9</td>
</tr>
</tbody>
</table>

Chaveeva et al, *Fetal Diagn Ther* 2013
Selective Reduction from DC Triplets to DCDA twins

Embryo Reduction in Dichorionic Triplets to Dichorionic Twins by Intrafetal Laser

Petya Chaveeva a Przemek Kosinski a Cahit Birdir a Laszlo Orosz a
Kypros H. Nicolaides a,b

- Case series of 22 DCTA triplet pregnancy
- US guided Laser ablation of the pelvic vessels of one of the MC twins
- 11–13 weeks
- 18-gauge needed
- 50% loss rate of the co-twin within 2 weeks

- Prophylactic antibiotics (cefuroxime 750 mg i.v.)
- US examination to select the fetus for ER that could be accessed without traversing the MC intertwin membrane. A transverse section of the lower fetal abdomen is obtained and colour flow Doppler was used to visualize the internal iliac arteries and intraabdominal umbilical vein
- Local anaesthesia (10 ml 1% lidocaine)
- An 18-gauge needle guided to the fetal abdomen with the tip being adjacent to the pelvic vessels
- 400-μm laser fibre inserted into the needle and advanced to a couple of mm beyond the tip of the needle.
- Laser coagulation NdYag laser (Dornier MedTech) 40 W
- This results, within a few seconds, in hyperechogenicity of tissues in the lower abdomen and cessation of blood flow in the iliac arteries and umbilical vein
- Fetal heart activity stops soon or continues for several minutes
- After a period of rest for about 60 min another US examination is carried out to confirm death of one MC twin and survival of the DC twins
- The patient is discharged home
- Follow-up US within 2 weeks
Increase in twins: IVF or advanced maternal age
Fertility Treatments and Multiple Births in the United States

Aniket D. Kulkarni, M.B., B.S., M.P.H., Denise J. Jamieson, M.D., M.P.H., Howard W. Jones, Jr., M.D., Dmitry M. Kissin, M.D., M.P.H., Maria F. Gallo, Ph.D., Maurizio Macaluso, M.D., Dr.P.H., and Eli Y. Adashi, M.D.
IVF and Zygosity vs Chorionicity
**Monozygotic twins**

<table>
<thead>
<tr>
<th>Spontaneous</th>
<th>ART</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5%</td>
<td>13%</td>
</tr>
</tbody>
</table>

*Figure 1* A schematic drawing showing the three different types of monozygotic twins and their potential origins.
Do these factors increase the frequency of monozygotic twins?

- Transfer of cleavage-stage versus blastocyst stage embryos (Day 2/3 versus Day 5)
- Controlled ovarian stimulation, ART protocol or culture media
- Maternal age
- The cause of infertility or the fertilization method (IVF versus ICSI)
- The morphology of the embryo
Determinants of monozygotic twinning in ART: a systematic review and a meta-analysis

Kathrine Vauvert R. Hviid, Sara Sofia Malchau, Anja Pinborg, and Henriette Svarre Nielsen

1Fertility Clinic 4071, Rigshospitalet, Copenhagen University Hospital, Blegdamsvej 9, DK-2100 Copenhagen Ø, Denmark 2Fertility Clinic, Hvidovre Hospital, Copenhagen University Hospital, Kettegaard Alle 30, DK-2650 Hvidovre, Denmark
• **Transfer of Day 2/3 embryo versus Day 5 blastocyst**
• **Controlled ovarian stimulation, ART protocol or culture media**
• **Maternal age**
• **The cause of infertility or the fertilization method**
• **The morphology of the embryo**

• Higher frequency of MZT following blastocyst transfer (OR 2)
• A younger maternal age may increase the MZT rate
• Zona pellucida manipulating techniques: studies disagreed
• Extended culture to-blastocyst stage is a potential risk factor for MZT, but it is uncertain whether this phenomenon is due to the extended time, culture media or greater likelihood of younger oocytes to reach the blastocyst stage.
• Only limited literature on the role of embryo morphology; remains unresolved
Risk factors for monozygotic twinning after in vitro fertilization: a systematic review and meta-analysis

Andrea Busnelli, M.D., a Chiara Dallagiovanna, M.D., a,b Marco Reschini, M.Sc., b Alessio Paffoni, Ph.D., c Luigi Fedele, M.D., a,b and Edgardo Somigliana, Ph.D. a,b

a Department of Clinical Sciences and Community Health, Università degli Studi di Milano, Milan; b Dipartimento per la Salute della Donna, del Bambino e del Neonato, Fondazione IRCCS Ca’ Granda, Ospedale Maggiore Policlinico, Milan; c ART Unit, Azienda Socio Sanitaria Territoriale Lariana, Como, Italy

- Blastocyst transfer is associated with an increased risk of both MZT and MCT pregnancies after IVF (OR 2).
- Further evidence is needed to clarify the impact of female age, insemination method and assisted hatching.
IVF in twins and adverse pregnancy outcome
Preeclampsia acts differently in in vitro fertilization versus spontaneous twins

Rania okby¹ · Avi Harlev¹ · Kira Nahum Sacks¹ · Ruslan Sergienko² · Eyal Sheiner¹

- PET is more common
- IVF twins with PET are at an increased risk for Caesarean section, PTB and LBW.
What are the risk factors for stillbirth in twins?
<table>
<thead>
<tr>
<th>Factor</th>
<th>Crude OR</th>
<th>Adjusted OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART</td>
<td>1.4</td>
<td>6.2</td>
</tr>
<tr>
<td>MCMA</td>
<td>6.2</td>
<td>7.7</td>
</tr>
<tr>
<td>MCDA</td>
<td>3.7</td>
<td>4.3</td>
</tr>
<tr>
<td>Non-western origin</td>
<td>11.4</td>
<td>12.3</td>
</tr>
<tr>
<td>Consanguinity</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>BMI &gt;25Kg/m2</td>
<td>1.8</td>
<td>-</td>
</tr>
<tr>
<td>Smoking</td>
<td>1.2</td>
<td>-</td>
</tr>
</tbody>
</table>
Dizygotic twin pregnancies after medically assisted reproduction and IVF:

Published studies report controversial findings as some do not adjust for:

- Chorionicity
- Other known risk factors
- Misclassification bias (ovarian stimulation allocated to the natural conception group)

Bensdorp et al Fert Ster 2016
IVF and twins

- aOR 0.74
- aOR 1.38
- aOR 1.56
Overall, maternal and perinatal risks other than those due to multiplicity are similar for twin pregnancies conceived after medically assisted reproduction and after natural conception.
Singleton pregnancies from ART have a significantly worse perinatal outcome than natural conception, but this is less so for twin pregnancies. In twin pregnancies, perinatal mortality is about 40% lower after ART compared with natural conception.
What about donor oocyte and twins?
Twins: Donor oocyte is an independent risk factor for hypertension in pregnancy (OR 4 compared to own oocyte)
IVF and twins: fresh vs frozen embryos?
Twin pregnancies and perinatal outcomes: a comparison between fresh and frozen embryo transfer: a two-centre study

- Frozen vs fresh embryo: significantly lower risk of second trimester miscarriage, LBW, VLBW and SGA infants
- No significant difference in GA at delivery, discordancy rate, malformation rate, and hospitalization duration
IVF in twins and long-term childhood outcome
Research Article
Comparison of Naturally Conceived and IVF DZ Twins

No differences in:
• Growth
• Motor milestones
• Behavioural development

Nearly all development aspects in IVF and NC children are similar

• Netherlands Twin Register
• 1534 IVF DZ twins and 5315 naturally conceived twins
• Matched on maternal age, education, smoking, gestational age and sex
• Longitudinal study; ages 1, 2, 3, 7, 10 and 12 years
Do we need to modify antenatal care in twins according to mode of conception?
### Dichorionic Twin Pregnancy

**11-14 week**
- Dating, labelling
- Chorionicity
- Screening for trisomy 21

**20-22 week**
- Detailed anatomy
- Biometry
- Amniotic fluid volume
- Cervical length

**24-26 week**
- Assessment of fetal growth
- Amniotic fluid volume
- Fetal Doppler

**28-30 week**
- Assessment of fetal growth
- Amniotic fluid volume
- Fetal Doppler

**32-34 week**
- Assessment of fetal growth
- Amniotic fluid volume
- Fetal Doppler

**36-37 week**
- Assessment of fetal growth
- Amniotic fluid volume
- Fetal Doppler

**Delivery**

### Monochorionic Twin Pregnancy

**11-14 week**
- Dating, labelling
- Chorionicity
- Screening for trisomy 21

**16 week**
- Fetal growth, DVP
- UA PI

**18 week**
- Detailed anatomy
- Biometry, DVP
- UA PI, MCA PSV
- Cervical length

**20 week**
- Fetal growth, DVP
- UA PI, MCA PSV

**22 week**
- Fetal growth, DVP
- UA PI, MCA PSV

**24 week**
- Fetal growth, DVP
- UA PI, MCA PSV

**26 week**
- Fetal growth, DVP
- UA PI, MCA PSV

**28 week**
- Fetal growth, DVP
- UA PI, MCA PSV

**30 week**
- Fetal growth, DVP
- UA PI, MCA PSV

**32 week**
- Fetal growth, DVP
- UA PI, MCA PSV

**34 week**
- Fetal growth, DVP
- UA PI, MCA PSV

**36 week**
- Fetal growth, DVP
- UA PI, MCA PSV

**38 week**
- Fetal growth, DVP
- UA PI, MCA PSV

**40 week**
- Fetal growth, DVP
- UA PI, MCA PSV

**Delivery**
NIPT and IVF-conceived Twins
Risk factors for Failed NIPT:

- **Maternal BMI** (dilutional)
- **IVF** (impaired placentation)

Sarno et al UOG 2016
Although the total fetal fraction in twins is 1.6 x singletons, the average fetal fraction per twin is lower.
## Trisomy 21 – Meta-analysis

<table>
<thead>
<tr>
<th>Study</th>
<th>Total</th>
<th>DR (%)</th>
<th>Total</th>
<th>FPR (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lau et al 2013</td>
<td>1</td>
<td>100</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Huang et al 2014</td>
<td>9</td>
<td>100</td>
<td>180</td>
<td>0</td>
</tr>
<tr>
<td>Benachi et al 2015</td>
<td>2</td>
<td>100</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Sarno et al 2016</td>
<td>8</td>
<td>100</td>
<td>409</td>
<td>0</td>
</tr>
<tr>
<td>Tan et al 2016</td>
<td>4</td>
<td>100</td>
<td>506</td>
<td>0</td>
</tr>
<tr>
<td><strong>Pooled analysis</strong></td>
<td><strong>24</strong></td>
<td><strong>100</strong></td>
<td><strong>1110</strong></td>
<td><strong>0</strong></td>
</tr>
</tbody>
</table>

Lau et al 2013; Huang et al 2014; Benachi et al 2015; Sarno 2016; Tan 2016; Gil et al UOG 2017
## Trisomy 18/13

<table>
<thead>
<tr>
<th>Study</th>
<th>Detection Rate</th>
<th>False Positive Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarno et al 2016</td>
<td>67% (2/3)</td>
<td>0% (0/254)</td>
</tr>
<tr>
<td>Published studies</td>
<td>63% (5/8)</td>
<td>0.15% (1/658)</td>
</tr>
<tr>
<td>CHROMOSOME</td>
<td>RESULT</td>
<td>PROBABILITY</td>
</tr>
<tr>
<td>------------</td>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>T(21)[T13]</td>
<td>Low Probability</td>
<td>Less than 1.0%</td>
</tr>
<tr>
<td>T(18)[T13]</td>
<td>Low Probability</td>
<td>Less than 1.0%</td>
</tr>
<tr>
<td>T(13)[T13]</td>
<td>Low Probability</td>
<td>Less than 1.0%</td>
</tr>
</tbody>
</table>
Do we need to modify gestation at delivery or mode of delivery in twins according to mode of conception?
Prospective risk of stillbirth/neonatal complications

BMJ

Prospective risk of stillbirth and neonatal complications in twin pregnancies: systematic review and meta-analysis

- 25,946 twin gestations
- Delivery at:
  - 36+0 - 36+6 weeks in MCDA
  - 37+0 - 37+6 weeks in DCDA

Cheong-See et al BMJ 2016
Timing of Delivery in Multiple Pregnancy

- MCDA twins: from 36+0 wk after a course of steroids
- DCDA twins: from 37+0 wk
- Triplets: from 35+0 wk after a course of steroids

Issue date: September 2011

Multiple pregnancy

The management of twin and triplet pregnancies in the antenatal period
When to deliver MCMA Twins?

- 193 MCMA twin pregnancies
- Fetal death 18%
- IUD risk exceeds the risk of a postnatal non-respiratory complication at 32+4 weeks

Neonatal complications

IUD

Van Mieghem et al Obstet Gyn 2014
<table>
<thead>
<tr>
<th>DCDA</th>
<th>Depends on Twin 1 presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Twin 1 cephalic</td>
<td>Aim for vaginal delivery</td>
</tr>
<tr>
<td>Twin 1 non-cephalic</td>
<td>CS</td>
</tr>
</tbody>
</table>

**Mode of delivery**
### Mode of delivery

<table>
<thead>
<tr>
<th>DCDA</th>
<th>Depends on Twin 1 presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCDA</td>
<td>Commonly CS in the UK but!!!</td>
</tr>
<tr>
<td>MCMA</td>
<td>CS</td>
</tr>
<tr>
<td>Triplet</td>
<td>CS</td>
</tr>
</tbody>
</table>

- **DCDA** (Depends on Twin 1 presentation)
- **MCDA** (Commonly CS in the UK but!!!)
- **MCMA** (CS)
- **Triplet** (CS)
Single Embryo Transfer
HAVING HEALTHY BABIES
ONE AT A TIME

Why are we worried about twin pregnancies?

- Almost 3 out of 5 twin babies are born preterm, or at less than 37 weeks of pregnancy. Twin babies are nearly 6 times as likely to be born preterm as single babies.

- About 1 out of 4 twin babies are admitted to the neonatal intensive care unit (NICU). Twin babies are more than 5 times as likely to be admitted to the NICU as single babies.

- About 7 out of 1,000 twin babies have cerebral palsy. Twin babies are more than 4 times as likely to have cerebral palsy as single babies.

- Twin babies are more likely to be stillborn, experience neonatal death, have birth defects of the brain, heart, face, limbs, muscles, or digestive system, and have autism than single babies.

- Almost 1 out of 10 women carrying twins gets pregnancy-related high blood pressure. Women carrying twins are twice as likely to get pregnancy-related high blood pressure as women carrying single babies.

- Almost 1 out of 20 women carrying twins gets gestational diabetes. Women carrying twins are 1.5 times as likely to get gestational diabetes as women carrying single babies.

The best way to reduce the chance of twins from IVF is to reduce the number of embryos transferred.
• <38 year old, embryos created from their own eggs, and with >1 embryo available for transfer.
• Any age, using embryos created from donor eggs.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>At least 1</th>
<th>Twins</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 fresh embryo Day 2-3</td>
<td>38%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>1 fresh embryo Day 5-6</td>
<td>51%</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>
The option to transfer 1 fresh embryo followed by 1 thawed embryo, if needed, offers the highest chance to have a baby without increasing the chance for twins.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>At least 1</th>
<th>Twins</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 fresh embryos Day 2-3</td>
<td>49%</td>
<td>16%</td>
</tr>
<tr>
<td>2 fresh embryos Day 5-6</td>
<td>60%</td>
<td>27%</td>
</tr>
</tbody>
</table>
What are my chances with ART?

Welcome to the SART Patient Predictor. SART has developed this predictor based on nearly 500,000 cycles of therapy to more than 320,000 women throughout the United States since 2006. This calculator is meant to help you understand your chances of having a live birth, based on your personal situation. The answers to the following questions influence the likelihood that the IVF treatment will be successful. Some of the answers you may know — like your height and weight. Other answers — such as the diagnosis of the cause of infertility — will depend on whether or not you have been seen by a physician, and may change during your course of treatment. The calculations from this Patient Predictor assume that you have not had prior IVF treatment.

Background and Reproductive History

How old are you?

39

How tall are you?

158 meters

How much do you weigh?

47 kg

How many prior pregnancies have you had?

0

How many prior full-term (>= 37 weeks) births have you had?

0
You Entered
Age: 39  Height: 158 meters  Weight: 47 kgs  BMI:  Prior Pregnancies: 0  Prior full term births: 0  Egg Source: My own eggs
Cause of infertility: I don’t know my diagnosis, Unexplained (no reason was found for either partner)

Cumulative Live Birth Rates:

- Probability of live birth after one cycle is 20%
- Probability of live birth after two cycles is 37%
- Probability of live birth after three cycles is 54%

Detailed information about your results
The goal of IVF treatment is a healthy singleton baby born at full-term gestation. On this page, we are comparing the live birth rates and the chance of a multiple birth (twins, triplets, or quadruplets) when two embryos are transferred.

**Why are pregnancies with twins, triplets and multiples high-risk?**

Compared to singletons, the risk of infant death is more than 4-fold higher with twins and 13-fold higher with triplets.

---

**One Cycle with One embryo:**

- Probability of live birth is **19%**
- Risk of multiple pregnancy is **1%**

---

**Two Cycles with One embryo:**

- Probability of live birth is **36%**
- Risk of multiple pregnancy is **2%**

---

**One Cycle with Two embryos:**

- Probability of live birth is **30%**
- Risk of multiple pregnancy is **23%**
Campaign aims

We launched One at a Time in 2007 to tackle the high multiple birth rate following IVF – one in four births were multiple births at that time – 20 times higher than natural conception. Multiple pregnancies and births are riskier for the mother and her babies – and if there is a problem, the effects are sometimes lifelong.

We have met our multiple birth target of 10% for the first time in 2017, having reduced from 24% in 2008.

The campaign is part of a national collaboration between us as the regulator and patient groups, fertility

Key facts

The multiple birth rate has decreased from 24% in 2008 to 11% in 2016.

Birth rates haven’t fallen.

You can view a clinic’s multiple birth rate on our website.
Elective single embryo transfer and

- Single vs double embryo transfer: ↓ LBW and PTB
- Single embryo transfer vs spontaneous conception: ↑ PTB, placenta previa, gestational diabetes, and ectopic pregnancy
Social influence: Celebrities Having Twins
How to improve the pregnancy outcome?
Success story
Stillbirth in twins

Singleton Twins

Stillbirth ↓ 50%

NND ↓ 30%

Neonatal mortality rate per 1000 birth

Year

Singleton Twins

2014 2015 2016

0 2 4 6 8 10 12

Stillbirth rate per 1000 birth

Singleton Twins

2014 2015 2016

0 2 4 6 8 10 12

Maternal, Newborn and Infant Clinical Outcome Review Programme

MBRRACE-UK
Perinatal Mortality Surveillance Report

UK Perinatal Deaths for Births from January to December 2016

June 2018
Stillbirth in twins

Stillbirth rate per 1000 total births

Twins

Year

MC twin
DC twin
singleton

2013 2014 2015 2016
Take-home Messages

- Twins are high risk pregnancies
- IVF in twins and adverse outcome: controversial evidence
- IVF is associated with higher NIPT failure rate
- IVF blastocyte transfer: increased risk of monochorionicity
- Triplet or higher order multiples: consider reduction >11 weeks
- Single embryo transfer policy

Thank you
Multiples

Spontaneous: 84%
ART: 16%

All infants

Spontaneous: 98%
ART: 2%