

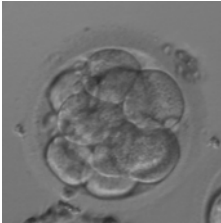
Everything you ever wanted to know about embryos but were afraid to ask.

EMBRYO FAQ

*By Alison Coates, BSc

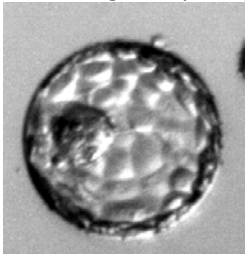
Q: What is the difference between a three day embryo and a blastocyst?

A: An embryo that has been growing for 3 days typically has between 6 and 8 cells and looks like this:



It is the same size as an egg but the cells get smaller within the shell. All the cells are doing the same job and are identical at this point.

An embryo that continues to grow to day 5 becomes a Blastocyst. The cells start to specialize into different kinds of cells and a cavity forms in the middle which is filled with fluid. A “good quality” blastocyst looks like this:



Q: Why are blastocysts special?

A: An embryo that has reached the blastocyst stage of development has a good chance of making a baby. We know that the embryo is still growing and is a good choice for replacement in the uterus.

Q: How come not all clinics conduct blastocyst transfers?

A: A laboratory has to be able to grow embryos successfully to the blastocyst stage and also has to be able to freeze embryos at this stage of growth

Q: Why do blastocysts have a higher implantation rate than embryos that are day two or day four?

A: Typically only half of the embryos available will carry on growing to day 5. Therefore by watching them grow until day 5 we are able to get much more information about the viability of each embryo. This helps us to choose the ones more likely to lead to a baby.

Q: When my embryologist talks about the “Coculture” or “Media” that embryos grown in, what is that?

A: “Media” is the solution that the embryos grow in and take nutrients from while they are in the laboratory. These days the solutions are more like the fluid found in the body than they were 10 years ago and this has given us the ability to grow embryos better in the lab. “Coculture” is where the embryos are grown along with cells taken from the Endometrium.

Some clinics believe that these cells produce a more “natural” environment for embryos to grow in.

Q: How does my embryologist rate or grade embryos, and what is the grading criteria?

A: All clinics have their own grading system, some are similar to others but all grading systems are meant to distinguish between “Good, Average and Poor” quality embryos. When we talk about “Embryo quality” we are only looking at the appearance of the embryo under the microscope. There are many other factors that go into a “baby making embryo” that we are not able to assess just by looking down the microscope.

Day 3 embryos are graded on their rate of growth and the degree of fragmentation and most clinics will use a grading system of 1-5 with 1 being the best (but some use 5 as the best.)

Day 5 embryos have a much more complicated system of grading. They are graded on how expanded the cavity is with 4 being the most expanded, the inner cell mass (baby making part) and trophectoderm (part that implants and makes the membranes around the baby) are graded on a scale of ABC with A being the best.

The “grade” is therefore stated as “4AA” (for example) which would be a blastocyst of very good appearance. Many clinics use this system.

All that really matters when getting information about the quality of your embryos from the clinician or embryologist is if the embryos are good, average or poor quality.

Q: What is an expanded blastocyst?

A: An expanded blastocyst is an embryo that has grown to 5 or 6 days old and has become a hollow ball of cells taking in fluid from the external environment. The cells have specialized into 2 kinds of cells, baby making cells and membrane making cells.

Q: What is a morula?

A: A morula is the stage of development before a blastocyst is formed. The cells on day 3 are separate and round and on day 4 they start to squeeze together so that the edges of the cells are not clear. This is the morula stage.

Q: When my embryologist freezes embryos as a 2pn stage, what exactly is 2pn? And what does it mean?

A: A 2pn stage embryo is a fertilized egg. It shows the evidence of fertilization in 2 spherical structures in the middle. One of the spheres contains the male genetic material and one contains the female genetic material. It looks like this:



Q: What is egg vitrification?

A: Vitrification is a process of snap freezing in a very concentrated protective solution. The rapid freezing technique does not produce ice crystals within the cell and therefore there is less damage during the freezing process. We are able to freeze eggs successfully using this technique.

Q: How are embryos frozen?

A: Embryos are currently frozen using the vitrification technique described above

Q: How are they thawed?

A: They are thawed by a rapid warming technique and moved through decreasingly less concentrated solutions to remove the cryoprotectants from the cells before transfer.

Q: What is PGD? And what percentage of PGD embryos are damaged through the process?

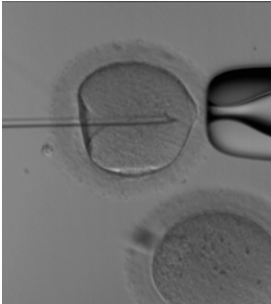
A: PGD stands for Preimplantation Genetic Diagnosis. This is where a cell is removed on day 3 and the cell is sent to a lab in San Francisco for analysis. All the cells are equal at this point and up to 12 chromosomes can be looked at to see if the embryo has a normal chromosome number. The other type of PGD is where an embryo can be screened to see if it is affected with a known genetic disease such as cystic fibrosis or Huntingtons Chorea. Some embryos can be slowed down in their growth rate after a biopsy but in experienced hands we believe that most embryos are not harmed by the process. For both kinds of PGD the cells are removed on day 3 and the results are available for the embryos by day 5, the day of the transfer.

Q: Does PGD cause birth defects?

A: We do not believe that PGD causes birth defects. However the long term effects of PGD if any are not known as the technique has only been used for the last 12 years or so.

Q: What is ICSI? Can ICSI cause birth defects?

A: ICSI stands for "Intra-Cytoplasmic Sperm Injection". If there is a problem with the sperm and the quality or quantity is sub-optimal then mature eggs can be injected with a single sperm on the day of the egg collection like this:



We have routinely been using ICSI for the last 15 years and in the biggest studies the incidence of genetic abnormalities has been shown to be at the same level with standard IVF or ICSI.

Q: My RE told me my partner has male factor issues? What does that mean exactly?

A: That he has poorer quality sperm which is not of good appearance or is swimming slowly or the number of sperm is below the normal range.

Q: How does the embryologist decide on what embryos to transfer and which ones to freeze?

A: The embryologist always chooses the best embryos for a fresh transfer and will freeze any remaining good quality embryos after the transfer.

Q: What is assisted hatching?

A: Once we put the embryos into the uterus they have to implant in the lining. To do this they have to escape from the "shell" that the egg and embryo have been growing in for 5 days and burrow into the wall of the uterus. If the embryo cannot break out of it's shell then it cannot implant and will never make a baby. Some older women may benefit from having an artificial hole made in the "shell" so that the embryo does not get trapped. We do this routinely for women of 38 and older, or have high FSH levels, or whose embryos have thickened "shells" when we look at them under the microscope.

Q: What is Microscopic Testicular Sperm Extraction (TESE)?

A: Some men do not have sperm in their ejaculate. This can be caused by a blockage or they produce very small numbers of sperm. Sperm can be surgically removed by inserting a needle into the testes and extracting sperm. The sperm is always poor quality and will always require IVF with ICSI to achieve a pregnancy.

Q: Why does the embryologist wash and spin my partner's semen sample?

A: If the semen is deposited in the vagina during intercourse, the sperm swim out of the seminal plasma through the cervix and into the uterus, leaving behind all the dead sperm, prostaglandins and bacteria that are found in any normal ejaculate. If we are putting sperm directly into the uterus then we need to centrifuge ("spin") the sample to remove the sperm from the seminal plasma. When we are using the sperm for IVF then we need very clean

sperm to place alongside or inject into an egg so we use the same process of centrifugation to clean up the sample.

Q: How many embryos survive the freezing process?

A: Around 70% would typically survive the freezing thawing process.

Alison Coates, BSc, Directs the day-to-day operations of the Reproductive Medicine Laboratory at Oregon Reproductive Medicine. Alison has many years of experience in the field of clinical embryology and has had hands-on experience with over 6000 In Vitro Fertilization cases. Alison is also highly specialized in micromanipulation techniques such as ICSI. Alison worked at one of the most prestigious in vitro fertilization clinics in Europe at the Hammersmith Hospital, London. In 1991, Alison moved to Leeds in the north of England where she established and directed one of the largest in vitro fertilization laboratories in Great Britain, carrying out over 1500 cycles of in vitro fertilization per year.

***The information contained on this FAQ is for educational purposes only and is not meant to provide or address any specific diagnosis or treatment plan. Any information found on this website is general in nature and should not be substituted for specific medical advice provided by the appropriate health care professional. The use of any information found on this website should be discussed your health care professional before being inserted into your treatment plan.*

You understand that your use of this website is at your own risk and that PVED, its affiliates, sponsors or contributors assume no liability for any damages arising directly or indirectly from any information provided herein.