

# WHAT IS EMBRYO FREEZING AND WHY IS IT IMPORTANT?



INFORMATION FOR PATIENTS FROM THE AFRICAN NETWORK AND REGISTRY FOR ART

To increase the chance of having a baby with assisted reproductive technology (ART), it is important to try and obtain several eggs from the woman's body. Every egg means a chance to have a baby. Many steps are involved for one egg and one sperm to result in a pregnancy and baby, but not every egg manages to take all these steps successfully. Early and important steps include:

## FERTILIZATION

Eggs are fertilized by sperm in the laboratory (the sperm enters the egg or is injected into the egg). Fertilized eggs start dividing into a cluster (group) of cells called "embryo".

## IMPLANTATION

Once an embryo is placed back into the womb, it must successfully embed in the womb. This is called "implantation". Once implantation has happened, the pregnancy test is positive.

## VISIBILITY ON ULTRASOUND SCAN

Around 6-7 weeks of pregnancy, the ultrasound scan can show the presence of a tiny baby (called "fetus") and whether its heart is beating. Most pregnancies that reach this important milestone result in a live baby.

STEP 1

STEP 2

STEP 3

STEP 4

STEP 5

## EMBRYO GROWTH

The embryo continues to grow and develop in the laboratory. Younger, less developed embryos are called "cleavage-stage embryos", more developed embryos are called "blastocysts".

## FURTHER GROWTH IN THE WOMB

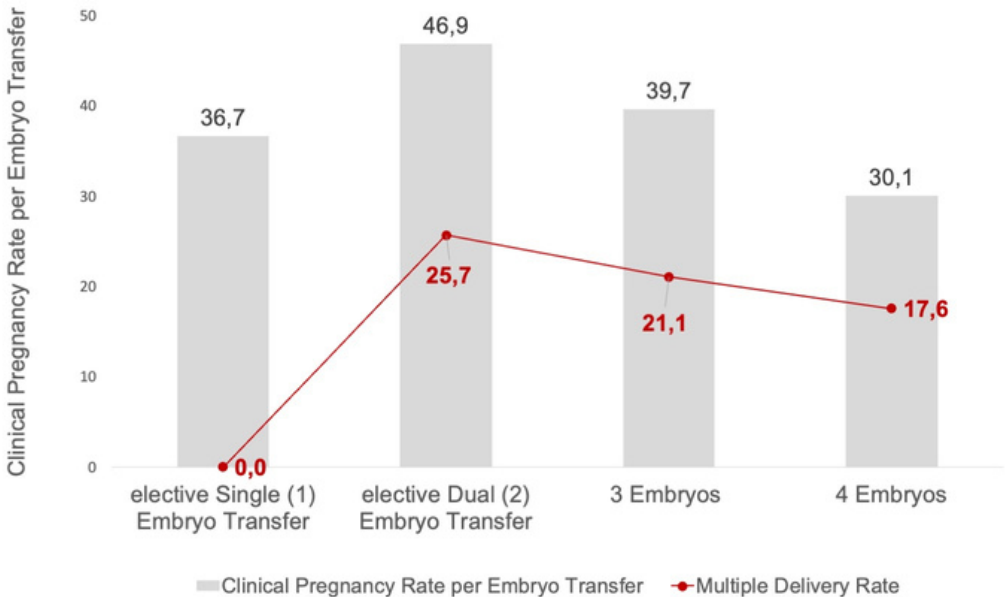
The implanted embryo must continue to grow and develop.

## WHAT HAPPENS TO ALL THE EMBRYOS?

When several embryos of a woman/couple are growing successfully in the laboratory, one or more will be selected for transfer (placement) into the womb of the woman. Any remaining good quality embryos can and should be frozen.

The decision which embryo to transfer and how many is very important. Good quality embryos and more mature embryos (“blastocysts”) are more likely to result in a pregnancy than lower quality or less mature embryos. Results from the African Registry document that the chance of pregnancy does not increase beyond replacement of two embryos. (Fig 1). Therefore, it is usually sufficient to transfer one or maximally two embryos and to freeze all other good quality embryos.

FIGURE 1: Clinical pregnancy rate per embryo transfer by number of embryos transferred. (Source: The African Registry for ART, 2020)



## HOW ARE EMBRYOS FROZEN?

Most embryos are frozen when they have become a “blastocyst” and in a process called “vitrification”. First, they are placed in a freezing device or freezing chamber which is carefully labelled with the details of the patient/couple. Then the device or chamber is plunged into liquid nitrogen (which has a temperature of -195 Degrees Celsius). Thereafter the embryos are stored in a liquid nitrogen tank, again carefully labelled. There is no limit to how long embryos can remain frozen, but many ART centres and some countries restrict the length of freezing for practical reasons.

### EMBRYO FREEZING HAS SEVERAL IMPORTANT ADVANTAGES:

#### 1. Treatment efficiency and safety

Embryo freezing helps to avoid transferring too many embryos at the same time. Transferring too many embryos usually does not increase the chance for a baby. But it greatly increases the risk of having more than one baby at once which greatly increases the risk of complications in pregnancy.

#### 2. Additional chance of success

Embryo freezing provides additional chances to get pregnant if the first ART cycle does not result in a baby. Or, if a baby was born, it provides the chance of having another baby. Importantly, this additional chance comes without the need and cost of a repeat “fresh cycle” with hormonal stimulation and egg collection.

#### 3. Preimplantation genetic testing

In some ART cycles, the patient/couple decide to make use of “preimplantation genetic testing” (PGT). This means embryos are tested to assess if they are genetically normal (whether they have normal “cell codes”) before they are being transferred. Because PGT results are usually not immediately available, tested embryos are frozen until the results are ready.

## WHAT IS A FREEZE ALL EMBRYO CYCLE?

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This is a cycle in which all embryos are frozen, and no fresh embryos are transferred. Reasons for this include egg donation cycles, unfavorable conditions for a fresh transfer related to the individual cycle, or if a woman needs urgent treatment for a medical condition, like cancer, before getting pregnant.

## WHAT HAPPENS IN A FROZEN EMBRYO TRANSFER CYCLE?

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Frozen embryo transfer (FET) cycles are simple and patient friendly. First, the womb is prepared for the transfer. This can be either through a natural ovulatory cycle or with the help of medication. Once the womb has been prepared, the frozen embryo(s) is/are thawed and placed back into the womb. Not every frozen embryo tolerates the process of freezing and thawing, but more than 90% do.

## IS EMBRYO FREEZING NATURAL?

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No, embryo freezing is not natural. It relies on very advanced laboratory technology. But it is not less natural than, for example, fertilizing human eggs in the ART laboratory. There are many medical and laboratory treatment options in the world today that are not natural but save lives, or – in the case of ART – assist in generating new life.

## IS EMBRYO FREEZING SAFE?

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Yes, embryo freezing is safe and an established part of quality ART. Compared to the transfer of fresh embryos, pregnancies resulting from frozen-thawed embryos carry similar or fewer risks, and babies have similar health.

## DO ALL ART CENTRES OFFER EMBRYO FREEZING?

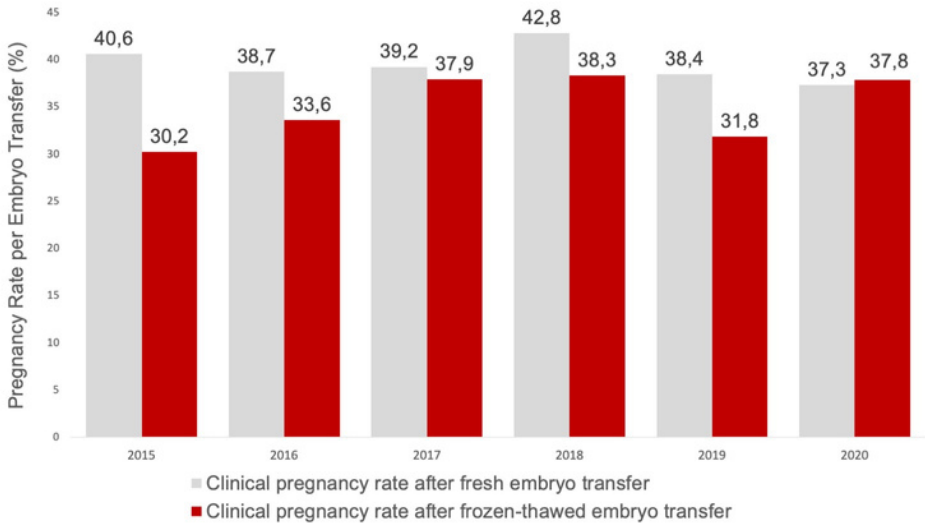
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Most but not all ART centres in Africa offer embryo freezing. Some centres have not yet acquired the necessary infrastructure or lack the required supply chain of equipment and consumables.

## IS EMBRYO FREEZING EFFECTIVE?

Embryo freezing is not a guarantee for a baby but each year many thousands of babies are born after frozen-thawed embryo transfers. Today, there are more frozen-thawed embryo transfers performed in the world than fresh transfers. Data from our African Registry for ART show that the clinical pregnancy rate after frozen-thawed embryo transfers is very similar to the clinical pregnancy rate after fresh embryo transfers. In addition, the success of frozen-thawed embryo transfers cycles continuous to improve (Figure 2).

FIGURE 2: Clinical pregnancy rate per embryo transfer (fresh and frozen).  
(Source: The African Registry for ART, 2020)



This factsheet is brought to you by the African Network and Registry for ART (ANARA) in cooperation with the Latin American Registry of Assisted Reproduction (RLA) and Network (REDLARA). It is endorsed by the International Committee for Monitoring ART (ICMART), the African Federation of Fertility Societies (AFFS)\*, and Groupe Interfricain d'Etude, de Recherche et d'Application sur la Fertilité (GIERAF)\*\*.



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