# Fresh Versus Elective Frozen Embryo Transfer

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## Introduction

Embryo transfer refers to a step in the process of assisted reproduction in which embryos are placed into the uterus of a female with the intent to establish a pregnancy. In vitro fertilization (IVF) is widely performed as an infertility treatment and has resulted in the births of more than 5 million infants worldwide. However, there are concerns about the safety of the procedures for women and for their infants. The transfer of fresh embryos is generally preferred over the transfer of frozen embryos for IVF, but some evidence suggests that frozen-embryo transfer may improve the live-birth rate and lower the rates of the ovarian hyperstimulation syndrome and pregnancy complications in women with the polycystic ovary syndrome.(2) The first randomized controlled trial (RCT) comparing frozen and fresh embryo transfer was published in 1999 to evaluate the safety and efficacy of eFET in patients. The results concerning the clinical outcomes of FET cycles have improved tremendously during the past few years. This research focuses on whether elective frozen embryo transfer (eFET) should be offered to the overall IVF population or only to specific subsets of patients.(1)

## Method

The first study with the support of a research librarian, a systematic literature search using PubMed/MEDLINE and EMBASE was performed to identify all relevant RCTs on the eFET strategy published from 1 January 2016 to 22 March 2018.(1) The second study was performed on 1,508 patients with a diagnosis of the polycystic ovary syndrome (PCOS) who were undergoing IVF were enrolled in United States.(3) Lastly, the third study was performed in china which was randomly assigned 1508 infertile women with the PCOS who were undergoing their first IVF cycle to undergo either fresh-embryo transfer or embryo cryopreservation followed by frozen-embryo transfer. All the women were between the ages of 20 and 34 years and weighed at least 40 kg. After 3 days of embryo development, women underwent the transfer of up to two fresh or frozen embryos.(2)

## Results

In the first study on 5379 patient, the risk of moderate/severe ovarian hyperstimulation syndrome (OHSS) was significantly lower with eFET than with fresh embryo transfer. In contrast, the risk of pre-eclampsia increased with eFET.(1) In the second study, singleton infants born after frozen embryo transfer were more likely to be large for gestational age than those born after fresh embryo transfer (25.2% vs. 17.5) . Twin pregnancy after frozen embryo transfer had a higher risk of pre-eclampsia than those after fresh embryo transfer (12.0% vs. 2.8%).(3) Lastly, the third study observed Frozen-embryo transfer resulted in a higher frequency of live birth after the first transfer than did fresh-embryo transfer (49.3% vs. 42.0%). Women who underwent frozen-embryo transfer also had a lower frequency of pregnancy loss (22.0% vs. 32.7%) and of the ovarian hyperstimulation syndrome (1.3% vs. 7.1%) but a higher frequency of preeclampsia (4.4% vs. 1.4) (2)

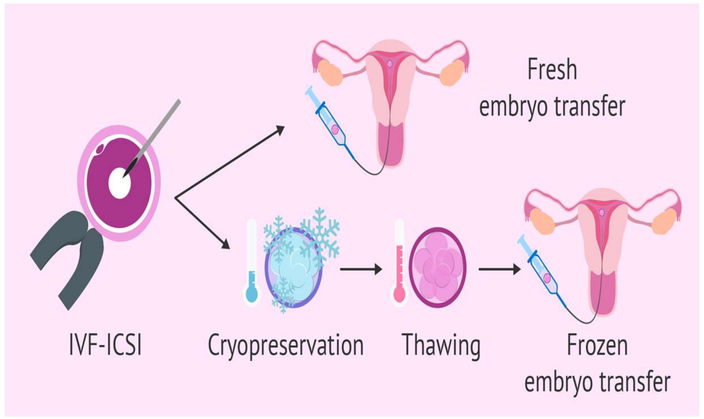


Figure 1. image Fresh Versus Elective Frozen Embryo Transfer

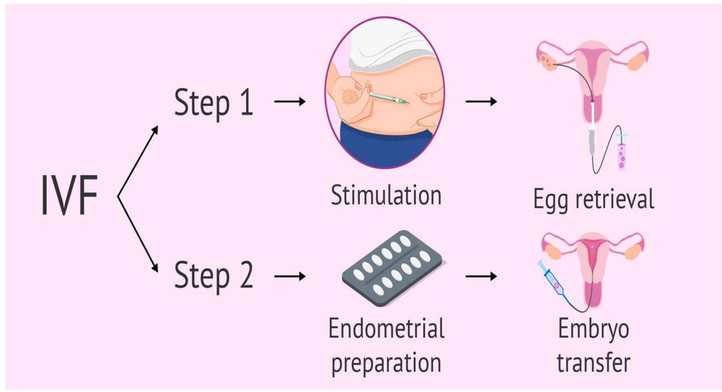


Figure 2. image endometrial preparation on day 2 or 3 of the second menstrual cycle

## Discussion

All the patients received a standardized ovarian stimulation regimen, oocyte retrieval, and fertilization (fig 1). In brief, recombinant follicle-stimulating hormone at a daily dose of 112.5 IU for patients weighing 60 kg or less and 150 IU for those weighing more than 60 kg was started on day 2 or 3 of the menstrual cycle. Gonadotropin-releasing–hormone antagonist at a daily dose of 250 µg was started when the largest follicle exceeded 12 mm. chorionic gonadotropin at a dose of 4000 to 8000 IU was administered to induce oocyte maturation when two or more follicles measured 18 mm or more. Oocyte retrieval was performed 34 to 36 hours later. On the day of oocyte retrieval, if an adequate number of oocytes (>3 and <30). For patients who were assigned to the fresh-embryo group, intramuscular progesterone at a daily dose of 80 mg was administered for luteal-phase support, beginning on the day of oocyte retrieval until 10 weeks after conception. For patients who were assigned to the frozen-embryo group, no luteal-phase support was administered after oocyte retrieval, and day-3 embryos were cryopreserved for later transfer. Oral estradiol valerate was administered for endometrial preparation on day 2 or 3 of the second menstrual cycle after oocyte retrieval (fig 2). Intramuscular progesterone at a dose of 80 mg per day was added when the endometrial thickness reached 8 mm or more. On day 4 of the progesterone regimen, two day-3 frozen embryos were thawed and transferred. The luteal-phase support with estradiol valerate and intramuscular progesterone for endometrium preparation continued until 10 weeks after conception.(2)

## Conclusion

Among infertile women with the polycystic ovary syndrome, frozen-embryo transfer was associated with a higher rate of live birth, a lower risk of the ovarian hyperstimulation syndrome, and a higher risk of preeclampsia after the first transfer than was fresh-embryo transfer. In women with PCOS, frozen embryo transfer resulted in an increased risk of large for gestational age in singleton pregnancy. In contrast, eFET may increase the cost of treatment and workload, requiring additional embryo manipulation and, ultimately, an increase in the time to live birth.

## References

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