

# **AN AI BASED PERSONALIZED FERTILITY CALCULATOR (PFC) TO ASSIST DECISION-MAKING BEFORE OOCYTE CRYOPRESERVATION.**

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## **Abstract Body**

Oocyte Cryopreservation (OC) is rising among women who face iatrogenic ovarian insufficiency (i.e., chemotherapy) or for social fertility preservation. To better educate women on age-related fertility decline, we developed an artificial intelligent (AI) based personalized fertility calculator (PFC) to predict the expected oocyte yield per treatment cycle, and the probability for live birth from these oocytes' pool. This in turn, will assist them to plan how many treatment cycles are needed for a wished cumulative live birth rate (cLBR).

The AI algorithm estimates the number of retrieved oocytes with one controlled ovarian stimulation (COS) and cLBR from these matured oocytes. The expected number of retrieved oocytes per age was calculated using 924 oocyte retrieval cycles of 599 patients in 2020-2022, at IHR. The possible impact of BMI, Ethnicity, AMH, endometriosis, and polycystic ovarian syndrome, when known, on oocyte yield, was adjusted based on published reviews/large studies. The tool is based on a data-driven literature integration approach, considering demographic and clinical factors with significant and predictable impact. The median AMH according to age is assumed in the calculation in the absence of an actual test result.

The developed PFC, predicts healthy women in their 20's to have average 18 total retrieved oocytes with 90% cLBR, while women in their mid-30's are to have 12 retrieved oocytes with only 48% cLBR. This PFC is publicly available at <http://calc.embryonics.me>.

This data-driven first AI PFC allows women to educate themselves on possible outcomes of OC. After consulting a fertility specialist, the PFC will adjust predictions based on additional clinical or lab results. Further research and validation on a large cohort of OC, including other study populations, and followed thawing cycles, will overcome this study limitations. This PFC can be used by women and by ART clinics as an educational tool before OC.