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## COMMENTARY

# Oocyte banking for anticipated gamete exhaustion (AGE) is a preventive intervention, neither social nor nonmedical



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**Abstract** The scope of female fertility preservation through cryopreservation of oocytes or ovarian cortex has widened from mainly oncological indications to a variety of fertility-threatening conditions. So far, no specific universally accepted denomination name has been given to cryopreservation of oocytes or ovarian cortex for the prevention of age-related fertility decline. We argue that the commonly used phrases 'social' and 'nonmedical freezing' to denote the indication for cryopreservation are not entirely correct. We suggest 'AGE banking', as this has not only the advantage of being catchy but also depicts the exact indication for the strategy, anticipated gamete exhaustion. 

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**KEYWORDS:** AGE banking, age-related fertility decline, elective freezing, fertility preservation, ovarian ageing, social freezing

## Introduction

This last decade, techniques have been developed for preserving female gametes through cryopreservation of either oocytes or ovarian cortex. This breakthrough adds to the female reproductive autonomy, since there is no need for spermatozoa before storage (Homburg et al., 2009). Three indications for female fertility preservation can be distinguished: iatrogenic gonadal damage, genetic predisposition for premature ovarian failure and age-related fertility decline. Most of the clinical outcomes reported for oocyte cryopreservation have been obtained from oocyte donation programmes (Cobo et al., 2010). Based on available literature, the expected success rate in terms of live

birth for women aged 30 or 35 years is 24.1% and 18.1%, respectively, per six vitrified–warmed oocytes (Cil et al., 2013). However, more time is needed to collect information about the proportion of women returning to their stored oocytes after fertility preservation and the expected outcome when using these oocytes. So far, only three live births have been reported after fertility preservation for oncological reasons (Fujino et al., 2013; Garcia-Velasco et al., 2013; Kim et al., 2011) and only a few articles report on live births after oocyte banking for age-related fertility decline (Garcia-Velasco et al., 2013; Knopman et al., 2010). Although the American Society of Reproductive Medicine (ASRM) (Practice Committees of ASRM and SART, 2013) recently removed the experimental label of

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oocyte vitrification, information about the long-term follow up of children is still unavailable and more data are needed about the efficiency of oocyte vitrification at more advanced ages (Chang et al., 2013; Wennerholm et al., 2009).

Women requesting fertility preservation techniques to protect themselves against age-related fertility decline *per se* are a unique group as they are considered to be healthy (Dondorp and De Wert, 2009; Nekkebroeck et al., 2010). Therefore, the indication is commonly referred to as 'social' or 'nonmedical' (Lockwood, 2011; Stoop, 2010, 2011). The terms 'social freezing' or 'social egg freezing' are currently probably the best-known denominations for the procedure and are frequently used in the lay media. The question is, however, whether the term 'social freezers' is appropriate to describe this group of patients? Here, we describe a few important considerations in support of our plea to omit the denomination 'social freezing'.

### On 'social' and 'nonmedical'

Egg cryopreservation is by no means a 'social' activity as there are no other people involved apart from the woman herself. Moreover, only a few centres offer this expensive treatment leading to limited accessibility of the treatment and as such this treatment is not part of the social notion of solidarity. The treatment is not social in the altruistic sense either, given that the oocytes will be used by the woman herself. The act would only be social if the woman determines she does not need her frozen oocytes and decides to donate them to another woman to use. Unfortunately, the average age of the women who perform oocyte banking is about 37 years, which is too old to be considered suitable for oocyte donation (Gold et al., 2006; Nekkebroeck et al., 2010).

Although societal changes have led to an overall postponement of motherhood, it is the prevention of age-related infertility that motivates women to store their gametes. Also, many other fertility treatments are performed against this background of societal changes and cause exposure to age-related fertility decline, such as IVF or intracytoplasmic sperm injection at an advanced maternal age (AMA), in poor responders or by oocyte donation. All of these treatments are labelled 'medical', but are basically dealing with the same underlying problem, including the societal changes, and are referred to as 'nonmedical' or 'social' egg freezing.

The association of the term 'social' to a certain treatment is rarely used and commonly indicates the absence of a medical indication. It refers to medical treatments performed purely based on the desire of a person, a deliberate choice (e.g. social abortion, social sex selection or a social Caesarean section). Unlike the cryopreservation of oocytes, these other treatments do not serve a preventive medical purpose. Obviously, the decision to freeze oocytes is deliberate. However, it is impossible to judge to what extent a women's timing to become a mother is a deliberate choice or an inherent need to proceed to methods to optimize future reproductive chances. The indication for oocyte cryopreservation does differ from the aforementioned treatments as it deals with an impending ovarian failure instead of an established ovarian failure, but this difference

makes oocyte cryopreservation a preventive medical treatment rather than a 'nonmedical' treatment. Therefore, the term 'social freezing' sounds judgemental to those women who undertake preventive action by implicitly inferring that these women deliberately postpone motherhood.

Fertility preservation in oncological patients is never considered 'nonmedical'. This is strange, since the underlying pathology (i.e. a risk of gamete exhaustion) is the same in patients treated with chemotherapy and patients who are at risk for diminished ovarian reserve due to ageing. It is often ignored that iatrogenic damage in many cases is related to a disease and/or treatment that in itself may be a reason to postpone motherhood, hence exposing women to age-related fertility loss. Women that take preventive actions to protect themselves against iatrogenic gonadal damage by treatments such as chemotherapy are therefore also protecting themselves against ovarian ageing. In short, it is not because treatments are described as nonmedical that they are to be considered 'social', and treatments are not necessarily nonmedical because they have no immediate curative nature. The focus of oocyte cryopreservation lies on the preventive aspect of subfertility with a possibly curative function in the future. Some may argue that conditions relating to ageing do not need to be prevented, as they are 'natural'. However, nobody would argue against preventive measures against osteoporosis or Alzheimer's disease if they were available.

Apparently, infertility and, more specifically, reproductive autonomy are often considered odd ones out, as illustrated for instance by the introduction of contraception. At its introduction, contraception was not considered a purely medical consideration but as 'medicine diluted by a large amount of religion and social mores', as stated in a paper by Guttmacher (1952). In 1947, the same author performed a survey in the USA among gynaecologists and general practitioners on their views on medical and medico-social indications for contraception (Guttmacher, 1947). Of the about 3400 responding physicians, 97.2% believed that at least some health problems were needed to prescribe contraception, while only 68% approved the idea of providing contraceptive advice to any married woman who requested it. At the time, 'child spacing' through contraception, as a 'nonmedical' indication, was considered sufficiently important to justify the prescription of contraception by 86% of the respondents. Today, the use of contraception is widely accepted regardless of its indication, and indications that were initially considered 'social', and thus controversial, now constitute the main reason for contraceptive use. As a consequence, the dichotomy between medical and social indications has disappeared.

### Anticipated gamete exhaustion (AGE)

The phenomenon of oocyte freezing has also been referred to as a form of elective oocyte self-donation (Knopman et al., 2010; Raybak and Lieman, 2009). The thawing or warming of the oocytes in case of age-related infertility is indeed an autologous donation, the procedure of storing eggs is just the anticipation to do so in case of age-related infertility.

In the absence of a short name, authors have often used descriptive names such as 'elective egg freezing for fertility preservation' (Gold et al., 2006), 'egg freezing for age-related fertility decline' (Shkedi-Rafid and Hashiloni-Dolev, 2011) or oocyte cryopreservation for age-related fertility loss (ESHRE Task Force on Ethics and Law, 2012). These names are objective and clear descriptions of the procedure but, unlike a term such as 'social freezing', these descriptive names are too long to adopt for universal use and are even more complex after translation.

Women perform freezing or vitrification of their oocytes or ovarian tissue to store their reproductive potential. They do so in anticipation of the exhaustion of their pool of gametes through ageing. The medicalization of infertility has expanded to such an extent that its effects reverberate throughout the fertile population (Conrad, 2007; Martin, 2010). The anticipated infertility further relates to arguments by sociologists and anthropologists about the transformation of medicine into a science of risk analysis (Martin, 2010). Banking for ageing is therefore part of continuous medicalization of society, rather than a medical intervention with a nonmedical or social indication. We would therefore suggest the use of the term 'AGE banking' for this procedure. AGE, as an acronym, stands for 'anticipated gamete exhaustion' and clearly describes the intention of the procedure. On the other hand, the word 'AGE' points to the threat to reproductive chances against which one tries to protect. AGE is a high-frequency word. These words are more easily recognized, produced and recalled faster and with greater accuracy than low-frequency words or than a more complex newly generated acronym (Izura and Playfoot, 2012).

The word 'social' may be associated with different subliminal influences compared with the word 'age'. Words can invoke subconscious value-laden associations that might enhance positive (social) or negative (ageing) perceptions, a phenomenon in cognitive psychology known as 'automatic attitude activation'. The word 'AGE' and the reference to ageing may therefore be more confronting for women.

Female reproductive potential can be stored through the cryopreservation of oocytes or ovarian tissue. In this regard, ovary cryopreservation and transplantation can be considered as a method to preserve fertility against age-related fertility decline (Silber, 2012). To distinguish these two methods, we would suggest referring to oocyte versus ovarian cortex AGE banking.

## Conclusion

The cryopreservation of oocytes for the prevention of age-related fertility decline has never been named in a short and precise way. In view of the large variety of available names and the aforementioned limitations, we would like to suggest naming it 'AGE banking' or 'anticipation of gamete exhaustion banking'. This term has the advantage of being short, clear and easy to remember. It can easily be adopted in the lay media and other languages, while it is also beneficial when used as a uniform keyword in scientific literature.

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