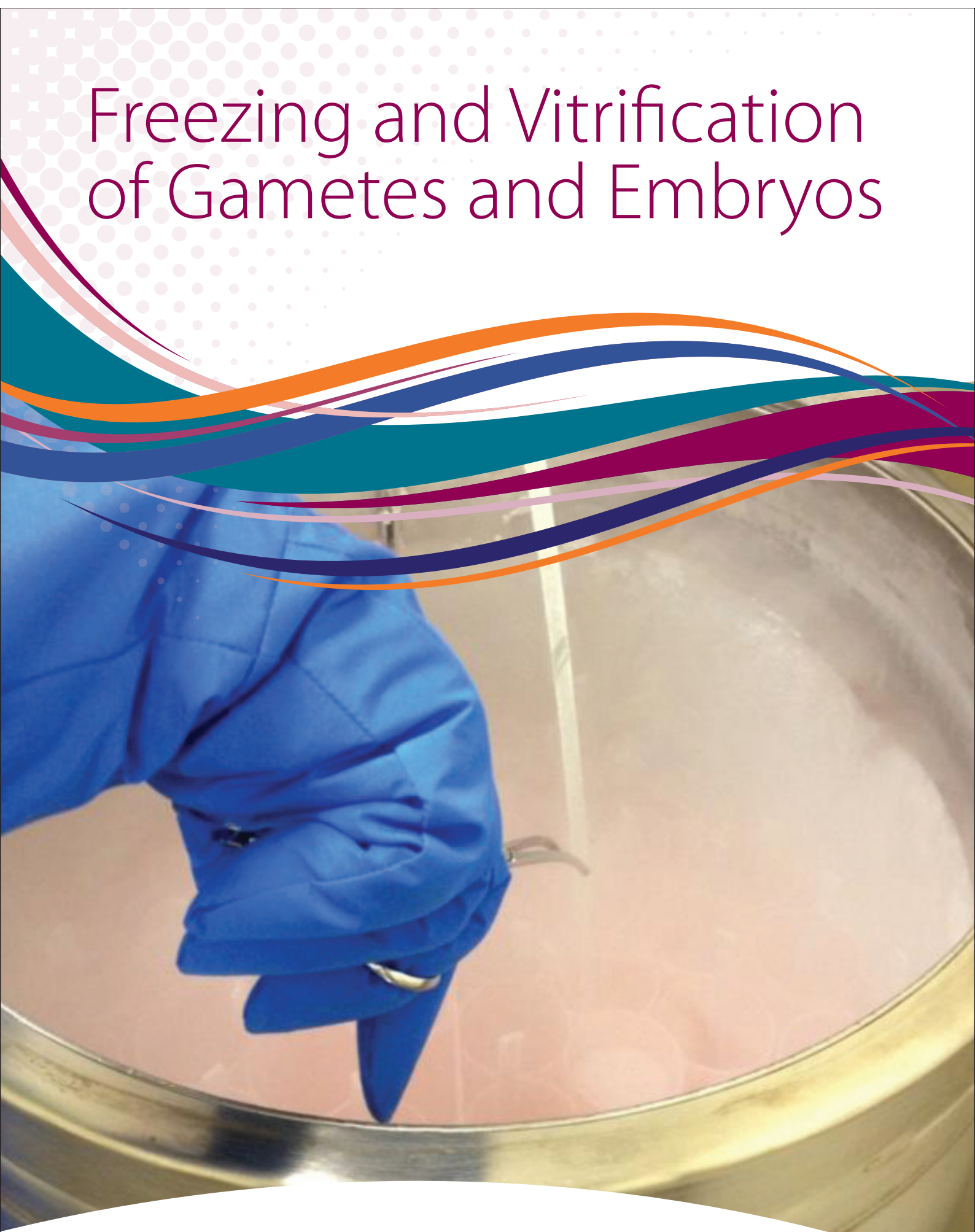
Freezing and Vitrification of Gametes and Embryos



British Infertility Counselling Association

British Fertility Society

British Andrology Society

The Association of Clinical Embryologists

Association of Biomedical Andrologists

- Eggs, sperm, ovarian tissue, testicular tissue and embryos can be stored
- Freezing increases the chances of a pregnancy from a single egg collection which reduces risk and expense
- Not all patients will have embryos suitable for freezing
- Cryopreservation may be included in NHS treatment but may be charged separately in private treatment
- Cryopreservation is routine in fertility clinics and is believed to be safe
- Legally samples can be stored for up to 10 years; with a medical reason this can be extended to 55 years
- Long-term storage in liquid nitrogen at 196°C is believed to be safe
- Patients are screened for transmissible viruses to prevent cross-contamination
- Before freezing, patients are counselled and consented and the risks are explained
- When water freezes it expands and ice crystals can form inside cells causing damage
- Two techniques are routinely used to store samples: 'slow rate freezing' and 'vitrification'
- Slow-rate freezing uses culture media to gradually remove water from cells, replacing it with a 'cryoprotectant' to prevent damage. Samples are loaded into storage devices and placed in a computer-controlled freezer which slowly reduces the temperature to remove more water before samples are stored in liquid nitrogen
- Vitrification uses much higher cryoprotectant concentrations than slow-rate freezing and the cooling rate is much higher, preventing ice crystal formation
- Survival rates seem to favour vitrification, especially for eggs but many clinics run very successful slow-rate freezing programs
- To use cryopreserved samples, they are removed by reversing the freezing process to remove the cryoprotectant and replace it with water
- Not all samples that are stored will survive the thawing process and thawing success rates vary from clinic to clinic
- Success rates with frozen samples may be lower than treatments using fresh samples in some clinics but in others are comparable
- Egg freezing is a newer technique so fewer children have been born from frozen eggs than frozen embryos and the success rates are lower

Prepared for the UK Professional Fertility Societies by The Association of Clinical Embryologists