

Three-Parent IVF Treatment Approved in UK

Peter Russell | December 15, 2016



Permission to create babies from 2 women and 1 man has been granted by the UK's fertility regulator.

The controversial technique, developed at Newcastle University, uses genetic material from a 'second mother' to repair faulty DNA. This can help prevent babies being born with deadly genetic diseases.

First Treatment Expected Next Year

Mitochondrial IVF will be licensed for use in clinics across the UK. Treatment could start as early as spring 2017.

It is thought that mitochondrial donation could help as many as 250,000 women in the UK who are at risk of passing on harmful DNA mutations in the mitochondria that could lead to debilitating conditions in their children.

Mitochondria are responsible for producing energy that cells in our body need in order to function and are sometimes referred to as the cell's 'batteries'.

When babies are born with defective mitochondria, they can develop serious health problems, such as heart and liver disease and respiratory problems.

The technique has run into opposition from some pro-life groups and some church leaders who have warned it could lead to so-called "designer babies."

"Cautious" Use

Today's approval by the Human Fertilisation and Embryology Authority (HFEA) comes after a recommendation last month by an independent panel of experts that the technique should be made available for "cautious" use in "specific circumstances".

The HFEA says this means that the technique can be used in certain cases where alternative treatments would be of little or no benefit to mothers at risk of passing mitochondrial disease onto their children.

In a statement, Sally Cheshire, chair of the HFEA, says: "Today's historic decision means that parents at very high risk of having a child with a life-threatening mitochondrial disease may soon have the chance of a healthy, genetically related child. This is life-changing for those families.

"After a lot of hard work and invaluable advice from the expert panel, who reviewed the development, safety and efficacy of these techniques over 5 years and 4 reports, we feel now is the right time to carefully introduce this new treatment in the limited circumstances recommended by the panel.

"Although it is tempting to rush ahead with new treatments, the UK approach of testing public opinion, putting the issue to parliament and carefully monitoring laboratory research has proved to be the most responsible and sustainable of introducing new, cutting edge treatments into the clinic. Such an approach has allowed us to balance innovation with safety, maintaining public trust as we go."

Clinics will now need to apply for a licence to perform the treatment. Professor Sir Doug Turnbull, director of the Wellcome Centre for Mitochondrial Research at Newcastle University, said they wanted to treat up to 25 carefully selected patients each year.

Today's approval followed votes in the House of Commons and House of Lords backing regulations allowing mitochondrial donation IVF to take place.

How It Works

The technique involves transferring genetic material from the nucleus of an egg or embryo from a woman carrying a mitochondrial disease into an egg or embryo from a healthy donor that has had its nuclear DNA removed, but where the healthy mitochondria remain.

That means the resulting embryo will have the affected mother's nuclear DNA but will not inherit the mitochondrial disease, allowing a woman carrying defective mitochondria to have healthy children.

The resulting embryo has the nuclear DNA of the mother and father, including their physical characteristics and traits, but the healthy mitochondrial DNA of the donor.

This is why the technique has earned the name "3-parent IVF."

"Historic Decision"

Commenting on today's announcement in a statement, Professor Adam Balen, chair of the British Fertility Society, says: "Today's decision by the regulator marks a major milestone in helping families to overcome mitochondrial disease, which can have devastating effects on people's lives.

"There are many different medical disorders that can be described as mitochondrial disease. They range from mild to severe or life threatening. However, mitochondrial DNA is only inherited from mothers, and women can be at risk of passing on serious disease to their children. Preventing the transmission of mitochondrial disease will allow women carrying the mutations to give birth to children free of the disease."

In a statement, Robert Meadowcroft, CEO of Muscular Dystrophy UK, which helped fund research into the treatment, says: "Today, this historic decision will open the door to the first licensed treatments being offered to eligible women affected by mitochondrial disease.

"Families have, understandably, had to wait through years of thorough ethical, safety and public reviews. We know of many women who have faced heartache and tragedy, and the sorrow of stillbirths, while trying to start their own family, and this decision gives them new hope and choice for the first time.

"We recognise this approach is not without some uncertainty, and, in any trial, success cannot be guaranteed. However, it is important that women are able to make informed choices by understanding the risks and the potential benefits."

Simon Stevens, chief executive of NHS England, comments in a statement: " The NHS has given the world medical innovations ranging from modern cataract surgery, new vaccines and hip replacements, and today we take a world-leading next step to harness ground-breaking science for the benefit of our children."

"Ethical Recklessness"

However, approval for 3-parent IVF has been met with alarm by some.

The campaign group Human Genetics Alert claims the HFEA's decision is "based on a tissue of scientific lies and ethical recklessness". Its director, Dr David King, says in an emailed statement: "This decision opens the door to the world of GM [genetically modified] designer babies. Already, bioethicists have started to argue that allowing mitochondrial replacement means that there is no logical basis for resisting GM babies."

SOURCES:

Human Fertilisation and Embryology Authority (HFEA)

British Fertility Society

Science Media Centre

Muscular Dystrophy UK

Human Genetics Alert

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