

Designer Babies: Creating the perfect Child

LONDON, England (CNN) -- Bring your partner, grab a seat, pick up your baby catalog and start choosing.

Will you go for the brown hair or blond? Would you prefer tall or short? Funny or clever? Girl or boy? And do you want them to be a muscle-bound sports hero? Or a slender and intelligent book worm?

When you're done selecting, head to the counter and it's time to start creating your new child.

Does this sound like a scary thought?

With rapid advances in scientific knowledge of the human genome and our increasing ability to modify and change genes, this scenario of "designing" your baby could well be possible in the near future.

Techniques of genetic screening are already being used -- whereby embryos can be selected by sex and checked for certain disease-bearing genes. This can lead to either the termination of a pregnancy, or if analyzed at a pre-implantation stage when using In Vitro Fertilization (IVF), can enable the pregnancy to be created using only non-disease bearing genes.

British scientists last week developed a "genetic MoT" test, which offers a universal method of screening embryos for diseases using a new technique of karyomapping, which is more efficient than previous processes.

The test would be taken on a two-day-old IVF embryo and is yet to be validated, but it could mark a significant change; allowing doctors to screen for gene combinations that create higher risks of diabetes, heart disease or cancer.

Experts estimate the test, if licensed by the Human Fertilization and Embryology Authority, could be available for around \$3000.

In the future we may also be able to "cure" genetic diseases in embryos by replacing faulty sections of DNA with healthy DNA, in a process called germ line therapy. This has been performed on animal embryos but is currently illegal for humans.

Furthermore, the developing technologies of genetic alteration open up a whole new set of possibilities -- which could result in so-called "designer babies."

The technique -- known as inheritable genetic modification -- modifies genes in eggs, sperm or early embryos and results in the altered genes being passed on to future generations. **Should parents be allowed to create their babies?**

This could potentially irreversibly alter the human species. So, the obvious question arises: should we be doing this?

Some countries have made genetic screening or alteration illegal by law, and the ethical questions surrounding the uses of the technology are vast -- creating a palpable tension over the subject.

In September, Internet giants Google and Microsoft withdrew adverts for sex selection products and other services considered illegal in India when they were threatened with legal action.

The Center for Genetics and Society is trying to encourage debate on the topic -- as soon as possible.

Executive director of the organization, Richard Hayes, told CNN that the general public of most countries was missing out on taking part in the debate.

"The debate has taken place amongst scientists and science journalists, but average people feel overwhelmed with the technical detail. They feel disempowered."

Hayes said his organization supported the use of embryo screening to help prevent the passing on of serious diseases and disorders like Cystic Fibrosis, but is wary of other technologies and how genetic screening and alteration can be misused.

"We support the use of that to allow couples at risk to have healthy children. But for non-medical, cosmetic purposes, we believe this would undermine humanity and create a techno-eugenic rat race," Hayes said.

He said there were immense amounts of resources being poured into developing gene altering techniques and no laws in many countries to stop them from starting clinics that could offer selected cosmetic traits.

"As technology advances it is possible that any number of human characteristics in part influenced by genes could come under human control. Right now there is an enormous amount of research being conducted to correlate specific genes with specific characteristics."

One of the organizations researching genetic alteration is the University of California Irvine's Sue and Bill Gross Stem Cell Research Center.

Professor of biological chemistry and developmental and cell biology, and co-director of the Center, Peter Donovan, feels the research could have massive benefits.

After his team discovered a greatly improved method for genetically manipulating human embryonic stem cells earlier this year, Donovan said:

"The ability to generate large quantities of cells with altered genes opens the door to new research into many devastating disorders.

"Not only will it allow us to study diseases more in-depth, it also could be a key step in the successful development of future stem cell therapies," Donovan

But according to Hayes the potential for misuse of this technology could have dire consequences for the human race.

"This runs many risks. It's used in many countries to avoid the birth of female children.

"The technologies are going to be accessible to affluent couples and would be used in ways that could increase inequality. The last thing we need now is a genetic elite.

"This designing aspect would also lead to an objectification of children as commodities."

Hayes said it was important that people began debating the issues now so the correct "rules, regulations and regulatory oversights" could be established before the technology was complete and accessible.

The big debate: Should we alter human genes?

LONDON, England (CNN) -- Ever since scientists began seriously exploring the possibilities of human genetic alteration, observers have tossed around the term, "designer baby."

But with genetic screening already happening -- including the ability to select a baby's sex -- the possibility of being able to "design" a baby has never been more real.

British scientists have recently revealed a new karyomapping test that could become a universal way to screen for potential disease in embryos. This would allow parents a chance to dictate which types of genes are implanted in the woman's womb.

And the rush to identify which genes provide which characteristics in the human body is on, meaning we could one day be able to inject specific genes into an embryo to achieve a desired result.

While many scientists talk of the benefits of genetic screening and genetic alteration, including most notably the potential for eliminating hereditary diseases and disorders, others are more skeptical and have great concerns about the technology.

The Center for Genetics and Society is trying to encourage debate about the topic. It says there is a huge risk that this technology could be misused and lead to clinics where future parents could select the skin and hair color, height, and many other characteristics of their child.

The center's executive director, Richard Hayes, fears genetic alteration could lead to a race of genetic elites -- or cause irreversible damage to the human race.

Share your views on designer babies

What do you think of sex selection and other types of genetic alteration?

Do you think we should be able to choose the sex or even hair color of our children? Or is this dangerous?

Do the medical purposes of this technology outweigh the negatives?

'Designer' baby for British couple

LONDON, England -- A British couple have had a so-called designer baby after undergoing IVF treatment in the United States in an attempt to save their other sick son.

Jayson and Michelle Whitaker had what is believed to be Britain's first genetically-selected baby after receiving the treatment at a Chicago genetics institute.

The new baby, named Jamie, was delivered by Caesarean section on Monday after being genetically matched, while still an IVF embryo, to his four-year-old brother Charlie.

Charlie has a rare form of anemia and his parents traveled to the United States for treatment after being refused permission to genetically select a tissue match embryo by the Human Fertilisation and Embryology Authority, the couple told British newspaper The Daily Mail.

The father, a 33-year-old business manager from Derbyshire, central England, told the newspaper: "All we did was change the odds from a one-in-four chance of a tissue match to a 98 percent chance.

"There was no selection on the basis of color of eyes or hair or sex."

Charlie has Diamond Blackfan anemia which can only be cured with a transplant of stem cells from a sibling with a perfect tissue match.

Dr. Lana Rechitsky of the Chicago Reproductive Genetics Institute, told BBC Radio's Today program that doctors had selected among 10 embryos to see which one was normal, and would be able to provide appropriate stem cells.

"These are not designer babies," she added.

"We are not creating anything new. We are just trying to choose between the embryos to find the one that is normal and can save the life of its sibling.

"These are not babies brought into the world just to save the sibling's life. These are families who want a healthy child, and if that healthy child can also save the life of the child they already have, I think it is a double blessing.

"There was no other way for Charlie to survive."

It is still not certain that Jamie can help his brother. The new born baby is currently undergoing blood tests to see if he has perfect tissue match and the family will have to wait six months to ensure that he is not affected by the same syndrome.

The vital stem cells have already been collected from Jamie's umbilical cord.

Dr. Rechitsky said it was hoped there was no more than three percent chance of the boys sharing the condition.

'Designer babies' in Thailand

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Pros	Cons
<ul style="list-style-type: none">• Many Genetic Disorders can be Prevented• Can Create the perfect Donor match• Children in born in the future can be born “healthy” with no signs of disease	<ul style="list-style-type: none">• The process itself may have problems• Personality genes cannot be altered (they may not even exist)• There might not be much diversity among children since parents will want basic traits in their children such as Beauty, intelligence, and healthy.

<http://designerbabies.weebly.com/cons.html>