AMERICAN MEDICAL ASSOCIATION  HOUSE OF DELEGATES

Resolution: 508  
(A-18)

Introduced by: Medical Student Section

Subject: Reintroduction of Mitochondrial Donation in the United States

Referred to: Reference Committee E  
(Douglas W. Martin, MD, Chair)

Whereas, Mitochondrial diseases are estimated to affect approximately 1 in 4300 adults;¹ and

Whereas, There are no existing cures for mitochondrial diseases and current therapy is aimed at symptom alleviation and haltering disease progression;² and

Whereas, The in vitro technique known as mitochondrial donation was introduced in 1995 as a means of decreasing the incidence of inherited mitochondrial diseases;³,⁴ and

Whereas, Mitochondrial donation is a technique that involves the replacement of a prospective mother’s oocyte cytoplasm, containing defective mitochondria, with healthy donor oocyte cytoplasm;⁴ and

Whereas, As of 2002, the FDA’s Biological Response Modifiers Advisory Committee (BRMAC) estimated that over two dozen births had occurred in the US using this technique;⁵ and

Whereas, While data on the wellbeing and long-term health of these individuals is not available, research on monkeys conceived via mitochondrial donation suggests that the technique produces viable, healthy offspring;⁶ and

Whereas, BRMAC recommends that “any future work in mitochondrial donation procedures must be cleared by the FDA under Investigational New Drug exemptions” on the grounds that these births represented the first cases of human germline genetic modification;⁵ and

Whereas, In 2016, the Institute of Medicine released a statement that claimed the techniques in question only represent a modification of the germline when used to produce female offspring, and it rejected a wholesale prohibition of this research, and advised that the technique be limited to male embryos for the time being, such that the modifications would not be carried on to subsequent generations;⁷ and

Whereas, in 2015, the UK’s Human Fertilisation and Embryology Authority determined that the benefits outweigh the risks associated with mitochondrial donation, and the technique was subsequently legalized, making it available to the thousands of couples who could potentially benefit from it; and

Whereas, The FDA is prohibited from accepting applications for clinical research using mitochondrial replacement therapy as stipulated under federal law; therefore be it

RESOLVED, That our American Medical Association support regulated research to determine the efficacy and safety of mitochondrial donation as a means of preventing the transmission of mitochondrial diseases. (New HOD Policy)

Fiscal Note: not yet determined

Received: 04/26/18

RELEVANT AMA POLICY:

E-7.3.6 Research in Gene Therapy & Genetic Engineering

Gene therapy involves the replacement or modification of a genetic variant to restore or enhance cellular function or the improve response to nongenetic therapies. Genetic engineering involves the use of recombinant DNA techniques to introduce new characteristics or traits. In medicine, the goal of gene therapy and genetic engineering is to alleviate human suffering and disease. As with all therapies, this goal should be pursued only within the ethical traditions of the profession, which gives primacy to the welfare of the patient.

In general, genetic manipulation should be reserved for therapeutic purposes. Efforts to enhance desirable characteristics or to improve complex human traits are contrary to the ethical tradition of medicine. Because of the potential for abuse, genetic manipulation of nongenesis traits or the eugenic development of offspring may never be justifiable.

Moreover, genetic manipulation can carry risks to both the individuals into whom modified genetic material is introduced and to future generations. Somatic cell gene therapy targets nongerm cells and thus does not carry risk to future generations. Germ-line therapy, in which a genetic modification is introduced into the genome of human gametes or their precursors, is intended to result in the expression of the modified gene in the recipient’s offspring and subsequent generations. Germ-line therapy thus may be associated with increased risk and the possibility of unpredictable and irreversible results that adversely affect the welfare of subsequent generations.

Thus in addition to fundamental ethical requirements for the appropriate conduct of research with human participants, research in gene therapy or genetic engineering must put in place additional safeguards to vigorously protect the safety and well-being of participants and future generations.

Physicians should not engage in research involving gene therapy or genetic engineering with human participants unless the following conditions are met:
(a) Experience with animal studies is sufficient to assure that the experimental intervention will be safe and effective and its results predictable.
(b) No other suitable, effective therapies are available.
(c) Gene therapy is restricted to somatic cell interventions, in light of the far-reaching implications of germ-line interventions.
(d) Evaluation of the effectiveness of the intervention includes determination of the natural history of the disease or condition under study and follow-up examination of the participants’ descendants.
(e) The research minimizes risks to participants, including those from any viral vectors used.
(f) Special attention is paid to the informed consent process to ensure that the prospective participant (or legally authorized representative) is fully informed about the distinctive risks of the research, including use of viral vectors to deliver the modified genetic material, possible implications for the participants descendants, and the need for follow-up assessments.

Physicians should be aware that gene therapy or genetic engineering interventions may require additional scientific and ethical review, and regulatory oversight, before they are introduced into clinical practice.

AMA Principles of Medical Ethics: I, V, VII
The Opinions in this chapter are offered as ethics guidance for physicians and are not intended to establish standards of clinical practice or rules of law.

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