

## Reproductive Technologies

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All human societies in all historical periods have developed techniques to prevent and to facilitate conception, and to shape culturally the physiological processes of gestation, labor, birth, and breastfeeding. There is, however, no precedent for the rapid expansion of reproductive technologies in the latter half of the twentieth century—an expansion that has dramatically redefined the parameters of biological reproduction. From the birth of the world's first test-tube baby in 1978 to the cloning of a higher vertebrate from an adult cell in 1997, the last half of the twentieth century has constituted the most intensive period of human intervention into the reproductive process ever known. The new technologies developed to intervene in human reproduction include, among many others: birth control technologies such as intrauterine devices (IUDs) and the birth control pill; assisted conception technologies such as artificial insemination and in-vitro fertilization (IVF); screening technologies such as ultrasound, amniocentesis, and blood testing; reparative technologies such as fetal surgeries performed in utero; labor and birth technologies such as electronic fetal monitoring, synthetic hormones for labor induction and augmentation, and multiple types of anesthesia; and postnatal technologies such as infant surgeries and high-tech treatment of babies in neonatal intensive care units (NICUs). All of these technologies are increasingly affected by developments in biotechnology, such as genetic engineering, which have major implications for the control and management of human fertility.

Similar to the obstetrical forceps developed by the Chamberlen brothers in the sixteenth century, the new reproductive technologies, often known as the NRTs, have double-edged implications for women and their offspring. While those early forceps did save the lives of babies who otherwise might

have died, their overzealous and ill-informed application during childbirth by male midwives and obstetricians often left the mother's body severely damaged and led to increased maternal and fetal morbidity. The NRTs have been fraught with similar contradiction and paradox, often creating as many problems as they solve and causing as much damage as they repair. Maternal mortality as a result of ovarian hyperstimulation, and increased congenital abnormality due to multiple births, are but two examples of the "downside" of IVF. This paradoxical situation is one of several reasons the NRTs have become a focal point for feminist analysis from the early 1980s on.

Reproductive technology has affected every facet of the reproductive process, from preconception onward. To an extent, these developments respond to specific impediments to fertility: in vitro fertilization (IVF), for example, was originally used to assist women with blocked ovarian tubes. Feminist critics, however, have rightly pointed to other, less woman-centered, influences shaping the development of these technologies. For example, Robert Edwards, the research scientist who helped to develop IVF, was trained in embryology and foresaw tremendous research potential from the ability to manipulate the human embryo ex vivo. This potential has been extensively exploited in the rapid expansion of human embryo experimentation in the 1980s and the 1990s.

The encounter between a largely male medical and scientific establishment and women's reproductive capacity is very pointed in the context of IVF, which is often represented as being a response to the "desperate" desires of infertile women, but can as readily be interpreted as a response to the irresistible scientific urge to "unveil" and indeed to redesign "the facts of life." The tremendous value of early embryonic cells--both commercially and in terms of research--has made IVF an important source of human embryonic stem cells. This fact exists in uneasy tension with women's demands for improved reproductive services. As in other historical periods, the neglect of women's reproductive needs is most evident in terms of which kinds of services will be developed and prioritized. While new embryo therapies are used to detect, and even to eliminate, genetic disease, other reproductive priorities remain devalued and underfunded. For example, little progress has been made in screening technology for cervical and breast cancer, both diseases of women's reproductive tissue. And while

ever more sophisticated technologies are developed to deal with the complications of labor and birth, the normal physiological needs of laboring women remain understudied and unfulfilled. The scientific evidence that does exist supports simple technologies like eating and drinking during labor, woman-centered, supportive care, and upright positions for delivery as being of far more help to birthing women than high tech machines (Davis-Floyd 1992).

Two major influences continue to shape the development of reproductive technology in ways that are not in women's interests. One is the continuing, and indeed worsening, effects of global inequality that are borne most heavily by women and young children – especially infants. Adequate, or indeed any, access to basic contraceptive technology remains out of reach of the majority of the world's female population (despite concerns about population growth, and largely as a result of US anti-abortion policy). Consequently, resource intensive and largely private fertility care is provided to a predominantly wealthy world elite (not just in Western countries but globally). Meanwhile, enduring tragedies of high maternal and infant mortality due to preventable causes (such as malnutrition and lack of a clean water supply), inadequate access to abortion or contraceptives, and limited, nonexistent, or ineffective reproductive healthcare are the main issues affecting the majority of the world's women. In sum, proper sanitation, adequate nutrition, improved vaccination programs, access to culturally appropriate forms of birth control, access to community midwives backed by adequate transport systems, and above all increased literacy and education rates among women remain the most important and life-saving "reproductive technologies."

At the other end of the spectrum, at the cutting edge of twenty-first century medical science, the second pervasive influence is the resurgence of a new genetic essentialism. Reproductive technology is shifting its focus in the direction of germline gene therapies (therapies that can be genetically transmitted because they modify reproductive cells). Annexed to the project of mapping the human genome, reproductive science and medicine are increasingly aimed at both the elimination of genetic pathology and the effort to re-engineer the genomes of humans and other life forms. In addition to existing means of technologically assisting conception, the effort to alter human genealogy is the single

most important influence on contemporary reproductive technologies. This effort is driven by enormously competitive economic forces, and by an "if we can do it, we must do it" technocratic mentality, resulting in rapidly escalating and largely unregulated technological innovation.

While some commentators argue that reproductive technologies such as the freezing of eggs, cloning by nuclear transfer, germline gene therapy, and embryo biopsy will have a radical effect on gender roles and kinship definitions, the majority of evidence demonstrates a reverse effect: the restabilization of traditional and conservative family ideologies in the face of their potential disruption. At the same time, other influences, such as the lesbian and gay movement, the increase in transnational adoption, rising divorce rates, and greater economic independence for women, have proven more influential in the redefinition of family and parenthood. Consequently, although some uses of reproductive technology have created more parenting options, such as the use of artificial insemination by lesbians, the overwhelming pattern of access to NRTs is defined by the goal of enhancing conventional parenting arrangements by married, heterosexual, and middle-class couples.

Feminist concern about reproductive technologies in the twenty-first century will increasingly overlap with the criticisms of biotechnology and genetic engineering raised by environmentalists and the general public. Concern about genetically modified organisms in the food chain and in medical applications will increase, particularly as the human-animal border becomes ever more permeable. The extensive feminist literature on NRTs anticipates with great precision many of the profound social, ethical, and political concerns surrounding new forms of genetic and biological determinism arising out of the attempt to alter the human genome. In addition to the effort to redefine medical and scientific priorities in relation to women's reproductive health worldwide, feminist scholarship will continue to insist upon the primacy of fully informed reproductive decision-making, in its widest sense, as a fundamental component of human rights.

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