Research implications of embryo cryopreservation choices made by patients undergoing in vitro fertilization

In 782 cryopreservation cases over 11 years, 60% of patients personally used their embryos, 26% kept their embryos in storage, 8% discarded their embryos, 5% gave them to research, and 1% anonymously donated them to other couples. (Fertil Steril 2004;81:1154–5. ©2004 by American Society for Reproductive Medicine.)

Very little is published on what patients, who have undergone in vitro fertilization (IVF), choose to do with their cryopreserved embryos. As expected, most patients use them for personal family building. However, many embryos are not used by the patient and are left to alternative fates. We undertook this study to review what has happened to the cryopreserved embryos at our university IVF clinic since cryopreservation was first offered.

We reviewed 782 IVF cases where embryos were cryopreserved at our clinic over the past 11 years (1991–2001) to determine how those embryos were utilized. A retrospective chart review was undertaken of 782 IVF cycles that had qualified as having at least 2 good quality embryos cryopreserved.

For the past 10 years, our fertility center has provided the option to cryopreserve excess embryos. When IVF consent forms are signed, patients who choose embryo cryopreservation are required to indicate one or more fates for all remaining embryos that they do not wish to use to build their families. The fate of these embryos is decided only after a couple has indicated that they do not desire any future frozen embryo transfers. Their options are to: donate the embryos to another infertile couple, use them for approved research (on the condition that new life will not be created), or discard them. At the same time, the patient must decide ownership of any stored embryos in priority: either the woman (and if she is incapacitated, then her partner must decide) or the woman and her partner jointly (and then the survivor). Annually, the patients are required to renew cryopreservation consents and pay the yearly storage fee if they want the clinic to store the embryos. This allows patients the flexibility to modify consents as needed. The clinic annually sends a registered letter to each patient who has embryos frozen at our facility. When no response is obtained, every effort is undertaken to locate and contact the patient. In cases where the patient received the letter but no response was given to the clinic, the physician directed the outcome of the surplus embryos according to the patient’s consent.

A total of 782 cryopreservation cases occurred from 1991–2001 (Table 1). During that time, 470 patients (60%) thawed all their embryos for their personal use. The mean time for patients to thaw and transfer their embryos was 12 months (range of 2–61 months). An additional 203 (26%) patients still have some embryos frozen (most from treatments in the last 2 years); 60 (8%) patients chose to discard excess embryos; 38 (5%) allowed their embryos to be used for research; and 11 patients (1%) anonymously asked for their embryos to be adopted by another infertile couple. Of the 14% of couples that chose to not use their embryos, 72% achieved a pregnancy from the fresh embryo transfer, and 17% did not respond to the yearly registered letter asking them to renew their consents with us.

The use of surplus embryos for research is a controversial topic. With the advent of embryo freezing, the decision to create embryos can occur years before their use. A couple that initially contracted to cryopreserve embryos may undergo life-changing events such as multiple births, divorce, or the loss of a spouse. These changes may alter how they wish to use their stored embryos. It is critical that clinics that offer the option to cryopreserve excess embryos also undertake to discuss both the disposition and ownership of any unused embryos; however, the system that clinics use must be flexible to allow for changes in the patient’s life circumstances. The majority of patients will use their excess embryos for themselves. The time from the freeze to the thaw of the embryos was an average of 12 months, with another large percentage occurring at approximately 24 months (range 2–61 months). Couples that were considering a frozen embryo transfer usually chose to do so before paying another year of storage fees.

A total of 109 cases (14%) chose not to use their excess embryos for themselves. Of those who chose not to use their stored embryos, 72% had become pregnant from the fresh transfer; 17% of this group did not
TABLE 1


<table>
<thead>
<tr>
<th>Embryo disposition</th>
<th>No. of cases</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thawed for personal use</td>
<td>579</td>
<td>74</td>
</tr>
<tr>
<td>Still frozen</td>
<td>94</td>
<td>12</td>
</tr>
<tr>
<td>Discarded</td>
<td>60</td>
<td>8</td>
</tr>
<tr>
<td>Given to research</td>
<td>38</td>
<td>5</td>
</tr>
<tr>
<td>Donated to others</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>Totals</td>
<td>782</td>
<td>100</td>
</tr>
</tbody>
</table>


respond to the annual renewal letter from the clinic and abandoned their excess embryos, allowing them to be discarded based on the consent given in the initial contract. One Swedish survey of IVF patients found that most couples planned to use their frozen embryos only if the fresh IVF cycle was not successful (1). Cryopreservation offered security should the initial attempt not work. That clinic also had problems with patients not responding to letters asking whether they intended to use their frozen embryos. They felt that a nonresponse might constitute a tacit agreement to dispose of the embryos, or it may have represented an expression of the patient’s desire to not be responsible for the decision to discard the embryos.

Eleven couples anonymously donated 54 embryos to other couples. In this group, 82% were pregnant in the initial IVF cycle, and 45% of them had twins. This group thought of their frozen embryos as unborn children, and they were reluctant to discard them. Many of them stored their embryos for a number of years until they were certain they were happy with their family size. Other clinics have also found that the donation of frozen embryos after IVF is uncommon. Hounshell and Chetkowski (2) reported a 4% donation rate at their clinic, and Lornage et al. (3) reported a donation rate of 6%. Both reviews showed higher rates than the 1% found in our clinic, but their total number of embryos was smaller. Thirty-eight couples chose to donate 158 embryos to research. In this group, 76% were pregnant in the initial cycle, and 55% of them had had multiples (mostly twins). These couples finished with their family building and wanted to return something to the system that had helped them achieve their dreams.

Over one-half of the group that did not use their embryos for family building chose to discard their excess embryos (8%). This clinic allows patients to choose the destiny of their frozen embryos and supports that choice. Considering the shortage of human embryos that are available for ethical research, it is our hope that with better information about the type of research our lab has done in the past and the assurance that the embryos will be treated with the respect, couples may choose to donate more embryos to research in the future. Annas (4) stated, “The donation of spare human embryos for important medical research that cannot be conducted by other means is ethically superior to either destroying them or keeping them perpetually cryopreserved.” According to Lornage et al. (3), a French clinic found a similar rate of excess embryos being discarded, but according to Hounshell and Chetkowski (2), an American group had a much higher rate of 17%. The situation may be even more problematic in countries that have laws governing the length of time that embryos can be stored. Oghoetuoma et al. (5) reported that 67% of the embryos in storage for 5 years or more at two British centers were discarded.

Any embryo cryopreservation system must be flexible so that couples can change their minds over time. Through patient surveys, the French group of Lornage et al. (3) reported that 28% of their patients changed their attitude regarding the fate of their cryopreserved embryos. Those that initially opted for destruction or research did not modify their attitude, but those that initially chose donation to other infertile couples often did. The American group Hounshell and Chetkowski (2) found that 35% of couples in their clinic that were initially willing to donate excess embryos to other couples ultimately decided to discard them. It is one thing to think in the abstract (when one is suffering from the pain of infertility) and to opt for embryo donation because it is the seemingly altruistic choice. However, it is an entirely different matter when you have a real, living example of what an embryo can become and to imagine that your child will have biological siblings whom he or she will not know. In addition, childless couples that have been unsuccessful in their IVF treatments may not be able to live with the possibility that another couple could raise their genetic child whom they will never know.

Although the overwhelming majority of patients will use their frozen embryos in hopes of having a family, a significant proportion will abandon them or direct alternate disposition. By obtaining consent for their disposition before therapy begins, the couple can make choices that are more rational, and coercion can be avoided. With an annual renewal of the storage contract, couples are allowed the flexibility to change their disposition wishes. Our system has provided a small but constant source of embryos for anonymous adoption and research. These results have encouraged our clinic staff to spend more time educating couples on alternate fates for the surplus embryos that they may consider discarding.

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References

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