

# Posthumous assisted reproduction policies among a cohort of United States' in vitro fertilization clinics

Emma Trawick, M.D.,<sup>a</sup> Amani Sampson, B.A.,<sup>b</sup> Kara Goldman, M.D.,<sup>c</sup> Lisa Campo-Engelstein, Ph.D.,<sup>d</sup> Arthur Caplan, Ph.D.,<sup>e</sup> David L. Keefe, M.D.,<sup>b</sup> and Gwendolyn P. Quinn, Ph.D.<sup>b</sup>

<sup>a</sup> Department of Obstetrics and Gynecology, Northwestern University Feinberg School of Medicine, Chicago, Illinois;

<sup>b</sup> Department of Obstetrics and Gynecology, Grossman School of Medicine, New York University, New York; <sup>c</sup> Division of Reproductive Endocrinology and Infertility, Northwestern University Feinberg School of Medicine, Chicago, Illinois;

<sup>d</sup> Alden March Bioethics Institute, Albany Medical College, Albany, New York; and <sup>e</sup> Division of Medical Ethics, Grossman School of Medicine, New York University, New York

**Objective:** To assess the presence and content of policies toward posthumous assisted reproduction (PAR) using oocytes and embryos among Society for Assisted Reproductive Technology (SART) member clinics in the United States.

**Design:** Cross-sectional questionnaire-based study.

**Setting:** Not applicable.

**Patient(s):** A total of 62 SART member clinics.

**Intervention(s):** Questionnaire including multiple choice and open-ended questions.

**Main Outcome Measure(s):** Descriptive statistics regarding presence and content of policies regarding PAR using oocytes and embryos, consent document content regarding oocyte and embryo disposition, and eligibility of minors and those with terminal illness for fertility preservation.

**Result(s):** Of the 332 clinics contacted, 62 responded (response rate 18.7%). Respondents were distributed across the United States, and average volume of in vitro fertilization (IVF) cycles per year ranged from <250 to >1,500, but 71.2% (n = 42) reported a volume of <500. Nearly one-half (42.4%, n = 25) of clinics surveyed reported participating in any cases of posthumous reproduction during the past 5 years, and 6.8% (n = 4) reported participation in >5 cases. Participation in cases of posthumous reproduction was not significantly associated with practice type or IVF cycle volume among those surveyed. Only 59.6% (n = 34) of clinics surveyed had written policies regarding PAR using oocytes or embryos, whereas 36.8% (n = 21) reported they did not have a policy. Practice type, IVF cycle volume, fertility preservation volume, and prior participation in cases of PAR were not significantly associated with the presence of a policy among respondent clinics. Of those with a policy, 55.9% (n = 19) reported they had used that policy, 59.1% (n = 13) without a policy reported they had considered adopting one, and 63.6% (n = 14) reported they had received a request for PAR services. Only 47.2% (n = 25) of clinics surveyed specified that patients not expected to survive to use oocytes due to terminal illness are eligible for oocyte cryopreservation, whereas 45.3% (n = 24) did not specify.

**Conclusion(s):** Respondent clinics reported receiving an increasing number of requests for PAR services, but many also lacked PAR policies. Those with policies did not always follow ASRM recommendations. Given the low response rate, these data cannot be interpreted as representative of SART clinics overall. As PAR cases become more common, however, this study highlights poor reporting of PAR and institutional policies toward PAR, suggesting that SART clinics may not be equipped to systematically manage the complexities of PAR. (*Fertil Steril Rep*® 2020;1:66–70. ©2020 by American Society for Reproductive Medicine.)

**Key Words:** Posthumous reproduction, assisted reproduction, policy, consent, survey

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Reprint requests: Gwendolyn P. Quinn, Ph.D., 550 First Ave, NBV 9N1-F, New York, New York 10016 (E-mail: [Gwendolyn.quinn@nyulangone.org](mailto:Gwendolyn.quinn@nyulangone.org)).

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**P**osthumous reproduction has historically referred to birth by a pregnant woman after the death of a male partner (1). The widespread availability of assisted reproductive technology (ART) has expanded posthumous reproduction to posthumous assisted reproduction (PAR), which includes the use of cryopreserved sperm, eggs, or embryos from deceased individuals for future family building attempts (2).

Posthumous assisted reproduction can be classified as planned or unplanned. Planned PAR involves gamete, embryo, or tissue cryopreservation before death, as with fertility preservation (FP) before gonadotoxic chemotherapy or active duty military service, and includes explicit consent from the source allowing their use posthumously (3). Planned PAR is generally accepted by laypeople and people using ART (4–6). More controversially, unplanned PAR involves perimortem or posthumous retrieval of tissue or gametes in the case of unexpected death or illness (7). Although uncommon, cases of unplanned PAR have been widely discussed in the lay press because of their ethical complexities, raising major questions about consent of the deceased and concern for offspring (8–10). Planned PAR involving cryopreservation before death has been less widely discussed.

As reproductive medicine providers face increasing requests for both planned and unplanned PAR, and as these cases become more publicized and litigated (11, 12), the American Society for Reproductive Medicine (ASRM) Ethics Committee has suggested that ART programs develop clear policies outlining the circumstances under which they would participate in PAR (13). Despite clear recommendations, however, the widespread adoption of institutional policies is not clear. Our objective was to examine the participation of Society for Assisted Reproductive Technology (SART) member clinics in planned and unplanned PAR, and to assess the presence and content of policies toward posthumous reproduction using oocytes and embryos among those clinics.

## MATERIALS AND METHODS

This study was deemed non-human subjects research by self-certification through our institutional review board. We performed a cross-sectional web-based questionnaire study of SART clinics nationwide. We identified all SART member clinics using its online database, and we included only clinics when the medical directors were members of ASRM with accessible e-mails. The survey was administered by e-mail to the medical director of each clinic and included cover letter with a link to a Qualtrics survey. Clinic contact information was extracted from the SART website and ASRM membership data. The survey was administered through a modified Dillman method, with three e-mail invitations to complete the survey sent out between April and May 2018. All survey data were anonymously collected and recorded.

The survey consisted of 33 multiple choice questions and 2 open-ended questions separated into 4 sections. For the purposes of the survey, posthumous reproduction was defined as “the creation of a pregnancy when one or both biological parents are deceased.” The first section addressed practice

characteristics of each clinic, including clinic state, clinical volume, and experience with cases of posthumous reproduction. The second section addressed the presence and content of policies toward posthumous reproduction, and whether clinics did not have a policy, clinic preferences and practices were assessed. The third and fourth sections addressed policies toward fertility preservation and oocyte and embryo disposition, which could include provisions for posthumous use or transferred control of oocytes and embryos. The third section addressed eligibility criteria for embryo or oocyte cryopreservation. The fourth section addressed how clinic consent documents addressed embryo and oocyte disposition after a patient’s death. The questionnaire allowed for participants to upload their clinic’s policies or consent documents, and the final open-ended question invited free responses. The complete survey is available in [Supplemental Appendix 1](#) (available online).

The associations of clinic characteristics with policy presence and content were assessed, where appropriate, using Fisher’s exact test. Specifically, the association of having a policy toward posthumous reproduction with clinic characteristics including in vitro fertilization (IVF) cycle volume, cancer-related oocyte cryopreservation volume, cancer-related embryo cryopreservation volume, volume of embryo transfers after FP related to a cancer diagnosis, and participation in cases of PAR (coded as participated or not participated). Association of past participation in cases of PAR with aforementioned clinic characteristics was also assessed. Incomplete responses or responses of “not sure” were treated as missing in these analyses.

## RESULTS

Of the 386 SART clinics in the SART database at the time of distribution, 332 clinics were included. All clinic medical directors were sent the survey three times. Sixty-two clinics completed the questionnaire, for a response rate of 18.7%.

Clinic practice characteristics are shown in [Table 1](#). Clinic respondents were geographically diverse, with 28 states represented. The distribution of private practice versus university affiliated clinics was reflective of SART clinics overall (14). Volume was also diverse, with a range of IVF volumes. Number of cycles related to fertility preservation was low, although oocyte cryopreservation was more common than embryo cryopreservation. Nearly 60% of clinics had performed <10 embryo transfers after medical fertility preservation.

Of clinics who responded, 42.4% ( $n = 25$ ) had participated in any cases of posthumous reproduction in the previous 5 years; this represented 6.5% of SART clinics overall. More than half (58.6%,  $n = 30$ ) reported they had a policy toward PAR using oocytes and embryos. There were few patterns associated with clinic policy toward PAR or clinic exposure to PAR. The presence of a policy toward PAR was not associated with IVF cycle volume, cancer-related oocyte cryopreservation volume, cancer-related embryo cryopreservation volume, volume of embryo transfers after FP related to a cancer diagnosis, or participation in cases of PAR ( $P > .05$ ). The volume of embryo transfers performed related to a cancer

TABLE 1

## Demographic and clinical characteristics of clinics surveyed.

Characteristic	N	%
Region (US Census Bureau)		
West	15	25.9
Midwest	7	12.1
South	20	34.5
Northeast	16	27.6
Practice type		
Private	36	60.0
University-based	16	26.7
University-affiliated private	8	13.3
Average number IVF cycles/y		
<250	23	39.0
250–500	19	32.2
500–1,000	11	18.6
1,000–1,500	2	3.4
>1,500	4	6.8
Average number egg freezing cycles related to cancer diagnosis/y		
<10	25	43.1
11–30	28	48.3
31–50	4	6.9
>50	1	1.7
Not sure	0	0
Average number embryo freezing cycles related to cancer diagnosis/y		
<10	33	55.0
11–30	25	41.7
Not sure	2	3.3
Average number of embryo transfer procedures performed after medical fertility preservation/y		
<10	35	59.3
11–20	12	20.3
21–30	3	5.1
>30	5	8.5
Not sure	4	6.8
Cases of posthumous reproduction (creation of a pregnancy when one or both biological parents are deceased) in previous 5 y		
>5	4	6.8
<5	21	35.6
Zero	33	55.9
Not sure	1	1.7

Note: IVF = in vitro fertilization.

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diagnosis was associated with clinic exposure to PAR ( $P = .014$ ). There was no significant association of clinic exposure to PAR with IVF cycle volume, cancer-related oocyte cryopreservation volume, or cancer-related embryo cryopreservation volume.

Of those with a policy, 55.9% ( $n = 19$ ) reported using that policy in practice. Those with a policy had variable policy content (Table 2). Nearly all required prior written consent from the deceased for use of cryopreserved oocytes (96.7%,  $n = 29$ ) and embryos (93.3%,  $n = 28$ ) for PAR, and only 50% ( $n = 15$ ) also required consent from the surviving biological parent for use of cryopreserved embryos. Forty-one percent ( $n = 13$ ) of those with a policy specified a waiting period or bereavement period after a patient's death and before the use of stored embryos or oocytes, as recommended by ASRM (13). More than half (51.6%,  $n = 16$ ) of clinics did not address a waiting period in their policy. Of those who specified a bereavement period, 61.5% ( $n = 8$ ) specified the period to be between 6 months and 1 year, and 30.8% ( $n = 4$ ) specified

TABLE 2

## Presence of policy toward posthumous assisted reproduction in surveyed clinics.

Question	N	%
Does your clinic have a policy toward posthumous reproduction using cryopreserved embryos or oocytes?		
Yes	34	59.6
Has this policy been used?		
Yes	19	55.9
No	12	35.3
Not sure	3	8.8
No	21	36.8
Has your clinic considered adopting a policy towards posthumous reproduction using cryopreserved embryos or oocytes?		
Yes	13	59.1
No	8	36.4
Not sure	1	4.5
Has a patient or relative of a patient at your clinic ever requested services relating to posthumous reproduction?		
Yes	14	63.6
No	7	31.8
Not sure	1	4.5
Not sure	2	3.5

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the period be >1 year. When asked if the clinic's policy specified a time frame after a patient's death during which the surviving partner or non-partner recipient must request the deceased patient's cryopreserved oocytes or embryos for use, and after which the oocytes or embryos cannot be requested, 83.3% ( $n = 25$ ) reported their policy specified no such time limit, and one clinic reported a time limit of 6 months. Nine clinics (30%) reported their policy addressed perimortem retrieval of oocytes or ovarian tissue from a dying patient, as would be the case in a sudden-onset life threatening condition, whereas 21 (70%) did not address this scenario. Six clinics reported they would consider perimortem retrieval of ovarian tissue if prior consent was obtained, one clinic reported they would consider perimortem retrieval regardless of prior consent, and two clinics reported they would not perform such a retrieval under any circumstance.

Twenty-one clinics (36.8%) reported they had no policy toward PAR using oocytes and embryos. Of those without a policy, 59.1% ( $n = 13$ ) reported they had considered adopting such a policy. Of note, 63.6% ( $n = 14$ ) of clinics without a policy had received a request for services relating to PAR from a patient or relative of a patient in the past.

Although most clinics specified minors were eligible for FP (71.7%,  $n = 38$ ), the eligibility of terminally ill patients was less clear (Table 3). Whereas 47.2% ( $n = 25$ ) and 52.8% ( $n = 28$ ) of clinics reported that patients not expected to survive were still explicitly eligible for FP using oocytes and embryos, respectively, many clinics did not specify whether these patients were eligible for oocyte (45.3%,  $n = 24$ ) or embryo (37.7%,  $n = 20$ ) cryopreservation.

**TABLE 3**

**Eligibility of minors and individuals with terminal illness for oocyte and/or embryo cryopreservation (if applicable) among clinics surveyed.**

Patient population	Eligible		Ineligible		Not specified		Not sure	
	N	%	N	%	N	%	N	%
Minors	38	71.7	7	13.2	6	11.3	2	3.8
Patients not expected to survive to use oocytes	25	47.2	3	5.7	24	45.3	1	1.9
Patients not expected to survive to use embryos	28	52.8	4	7.5	20	37.7	1	1.9

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Finally, almost all clinics addressed the disposition of cryopreserved oocytes (97.8%, n = 44) in the case of death of the patient and cryopreserved embryos in case of death of one (97.8%, n = 45) or both (91.3%, n = 42) of the intended parents. Details of how consent documents addressed oocyte disposition are shown in Table 4. Most clinics specified cryopreserved oocytes could be requested by an individual identified in a deceased patient’s original consent (70.5%, n = 31) or last will and testament (47.7%, n = 21). Many clinics specified that a spouse (45.5%, n = 20), partner (34.1%, n = 15), or nonrelated recipient (2.3%, n = 1) could request a patient’s cryopreserved oocytes in the event of the patient’s death. Most clinics (58.7%, n = 27) explicitly stated that cryopreserved embryos could be requested by a surviving partner, and many clinics specified that cryopreserved embryos could be requested by an individual specified in a patient’s consent documents (50%, n = 23) or last will and testament (37%, n = 17).

**DISCUSSION**

In this survey of a sample of SART clinics, nearly half of the clinics surveyed had participated in posthumous assisted reproduction cases. Despite this, nearly 40% lacked explicit institutional policies toward PAR, and many without policies had received requests for PAR. The eligibility of terminally ill patients for oocyte and embryo cryopreservation was also often not specified. Most respondents with policies did not adhere to ASRM recommendations, with nearly 70% lacking a policy toward perimortem retrieval of gametes or ovarian tissue.

Our results further confirm what the ASRM Ethics Committee has previously outlined, namely that PAR is complex and increasingly common, and clinics may not have adequate policies in place to guide their PAR practices. As only 62 clinics participated in this survey; however, the data cannot be interpreted as representative of SART clinics overall. The data do suggest that policies regarding PAR using oocytes and embryos may be lacking, which are consistent with a recent study (15) suggesting only 26.8% of major academic medical centers had policies regarding posthumous sperm

**TABLE 4**

**Responses to questions regarding consent documents for oocyte and embryo cryopreservation for clinics surveyed.**

Question	N	%
How does your consent document address cryopreserved oocyte disposition?		
Oocytes will be destroyed if storage fee not paid within specified time frame	34	75.6
Oocytes will be destroyed in the event of death of patient	15	33.3
Oocytes will be destroyed if storage fee not paid and patient deceased	11	24.4
Oocytes cannot be destroyed without written consent from patient or surviving legal partner	8	17.8
Disposition of oocytes is determined by the patient's last will and testament	18	40.0
Oocytes will be donated to research	15	33.3
Oocytes will be donated to prespecified recipient	18	40.0
Other	6	13.3
Who may request a patient's cryopreserved oocytes in the case of that patient's death?		
Spouse	20	45.5
Sexually intimate partner of deceased patient	15	34.1
Nonrelated recipient	1	2.3
Any individual specified in deceased patient's last will and testament	21	47.7
Any individual specified in deceased patient's prior written consent	31	70.5
Not sure	2	4.5
Who may request a patient's cryopreserved embryos in the case of a donor's death?		
Surviving partner with whom embryos were created	27	58.7
Any individual specified in deceased patient's prior written consent	23	50.0
Any individual specified in deceased patient's last will and testament	17	37.0
Not sure	3	6.5

*Note:* Each question allowed for selection of more than one option; table values represent the percentage of clinics that responded affirmatively to the question.

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retrieval. More research is needed to capture the prevalence of not only PAR policies, but also posthumous reproduction requests and procedures in fertility clinics, and the potential need for clinics to standardize their reporting of PAR. This study takes the first steps in characterizing PAR using oocytes and embryos in reproductive medicine clinics nationwide.

The presence of PAR policies is essential in reproductive medicine clinics. As FP becomes more common, more terminally ill patients may present to ART clinics. Given recent media and legal attention to cases of posthumous reproduction, patients and their families are likely to be more aware of the

possibility of PAR (11, 12, 16). Discussions of oocyte and embryo disposition, including the possibility of posthumous reproduction, are essential to counseling these patients, and clinics should have policies in place to help systematically address these cases.

Only three-fourths of clinics surveyed explicitly include minors in their eligibility criteria for FP treatment. This may suggest that minors are excluded from pursuing FP in many clinics, which may contribute to underutilization of FP among adolescent and young adult (AYA) cancer patients. Similarly, if minor eligibility for FP is not addressed, clinics may also not address the disposition of stored minor gametes. Future research should better examine how clinics address the disposition of stored minors' gametes. The ASRM recommends minor gametes be destroyed upon death of the minor; however, this may not be standard practice. Although use of minor gametes for posthumous reproduction was not adequately explored by this study, clear policies at a national and institutional level are likely necessary to help navigate the ethical challenges inherent to minor reproduction (17).

This study has limitations, particularly with regard to generalizability. The number of respondents was low, and represented a minority of all SART clinics. This exposes the data to significant nonresponse and sampling bias. Some of the heterogeneity in our results may be due to expected variation in practice patterns across reproductive medicine clinics. The survey methodology also presents potential social desirability bias, as this survey invited clinics to self-report on practices, and respondents may have been likely to report what they knew to be ASRM guidelines rather than their actual clinic practices. An additional issue warranting further research is the extent to which state laws regarding storage and disposition of gametes may affect policy. Given these limitations, these results should be interpreted with caution.

The low rates of adoption or creation of policy by respondent clinics remains concerning. A better understanding is needed on how national guiding organizations, like ASRM, can facilitate improved reporting of PAR cases and uptake of clinic PAR policy. Although many clinics surveyed did not explicitly address posthumous reproduction, >90% addressed the disposition of cryopreserved oocytes and embryos in the event of the death of one or both of the intended parents, suggesting that policies may be implicit, rather than explicit. The low response rate may also suggest limited engagement with the topic of PAR among reproductive medicine clinics, although this was not explicitly addressed by the survey. Ideally, concise policies could aid clinics in navigating the complex ethical scenarios inherent to PAR and help facilitate informed decision-making by patients and families.

In conclusion, in our survey of 62 SART clinics, 42% reported participating in cases of PAR in the past 5 years, and 37% lacked policies toward PAR to help guide their practice. Of those with policies, their content was variable and not uniformly adherent to ASRM Ethics Committee Guidelines. Eligibility criteria for participation in FP was similarly variable,

with minor status and terminal illness not always addressed. Our study was limited by low response rate and demonstrates under-reporting of PAR cases and institutional policies addressing PAR. Further research is needed on PAR practice. As requests for posthumous retrieval of gametes may become more common, reporting of these cases should be standardized, and clinics should have policies in place to help systematically address the management of these cases.

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