

Provider Knowledge and Support of Uterus Transplantation: Surveying Multidisciplinary Team Members

Kirsten A. Riggan, MS, MA; Zaraq Khan, MBBS; Carrie L. Langstraat, MD; and Megan A. Allyse, PhD

Abstract

Objective: To determine relevant provider opinions on uterus transplantation (UTx).

Patients and Methods: We invited 1933 providers in obstetrics and gynecology, transplant surgery, transplant medicine, internal medicine, and family medicine at a large, integrated health care system to complete an online survey containing a series of questions on their attitudes about the ethics and clinical utility of UTx. The survey was open from June 4, 2018, through July 2, 2018. We received 449 responses overall (23.2% response rate).

Results: Of 433 physicians who responded, 195 (45.0%) believe that UTx is ethically justified, and just over a third (160 of 446 [35.9%]) would introduce the possibility of UTx to a patient with absolute uterine factor infertility (AUI). Respondents indicated the risks to donor, recipient, and child carried the most weight in their ethical evaluation and were most supportive of UTx in a patient with congenital uterine absence (334 of 743 [45.0%]; participants were allowed to choose more than one answer). A majority stated that a living or cadaveric donor would be an acceptable donor source (238 of 395 [60.3%]).

Conclusion: Provider support for UTx is qualified by safety concerns and its expansion to patient populations other than women with AUI. This survey suggests that most providers limit their support of UTx to patients with the most demonstrated clinical need, childless women with AUI.

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From the Biomedical Ethics Research Program (K.A.R., M.A.A.), Department of Obstetrics and Gynecology (Z.K., C.L.L., M.A.A.), Division of Reproductive Endocrinology and Infertility (Z.K.), Division of Minimally Invasive Gynecologic Surgery (Z.K.), and Division of Gynecologic Surgery (C.L.L.), Mayo Clinic, Rochester, MN.

The first reported live birth following successful uterus transplant (UTx) by Brännström et al¹ in 2014 opened the possibility for women with absolute uterine factor infertility (AUI) to achieve pregnancy. The disorder affects 1 in 500 women, resulting in approximately 85,000 women of reproductive age in the United States and 1.5 million women worldwide with an absent or nonfunctional uterus for congenital or acquired reasons.^{2,3} The most common cause of AUI is hysterectomy for benign indications, including uterine fibroids and uncontrolled postpartum bleeding. Hysterectomy for cervical cancer or other reproductive cancers is also not uncommon among women of reproductive age. Although rare, Müllerian duct anomalies, such as Mayer-Rokitansky-Küster-Hauser syndrome (MRKH), result in congenital AUI; MRKH affects 1 in 4500 women, representing 3% of women with

AUI. The majority of UTx attempts to date have been performed in women with MRKH. A broad range of specialists must be involved in the evaluation and care process of a UTx program. A typical team would include specialists from reproductive medicine, gynecologic surgery, transplant medicine and surgery, psychology, clinical immunology, anesthesiology, internal medicine, radiology, maternal fetal medicine, and social work.^{4,5}

To date, approximately 60 UTx attempts have been made worldwide using living or deceased donors, with at least 15 births of healthy infants reported.^{6,7} The majority of transplants have used the uterus of a living donor, but in 2018 and 2019, 2 successful births from deceased donors were reported in Brazil and the United States.^{8,9} Several American centers have begun trials using living and/or deceased organ donors, including the Cleveland Clinic, Baylor University Medical Center,

University of Pennsylvania, and Brigham and Women's Hospital ([ClinicalTrials.gov](https://clinicaltrials.gov) identifiers: NCT02573415, NCT02656550, NCT03307356, NCT02741102). In November 2017, the first of 2 live infants in the United States were born at Baylor University following living donor UTx.^{10,11}

Uterus transplant is considered a vascularized composite allograft (VCA), requiring the removal of the organ and vasculature. Unlike other solid organ transplants, UTx is not life-saving but is for the purpose of restoring childbearing potential. As such, it is intended to be an ephemeral transplant, with removal of the graft following the birth of the desired number of children; current protocols intend for graft removal following 1 or 2 successful pregnancies.⁷ Since its inception, uterus transplantation has generated intense debate about its resource-intensive nature, appropriateness given nonrescue status, the use of living or deceased donors, and appropriate donor and recipient candidates. Because the successful implementation of a UTx program is dependent on the participation of multidisciplinary team members, we surveyed providers who would hypothetically be involved in care teams for individuals and donors during UTx to assess their willingness to participate in such a program and their ethical concerns about UTx. Although broad support is necessary for the establishment of such a program, provider attitudes on UTx may also influence the scope of the program, including which patients are considered the most appropriate candidates for UTx and the inclusion of living and/or deceased donors.

PATIENTS AND METHODS

Survey Development

An anonymous, 22-item survey was developed by specialists in reproductive medicine, gynecology and transplant surgery, and bioethics to explore provider opinions, attitudes, and beliefs about UTx ([Supplemental Appendix](#), available online at <http://www.mcpiqjournal.org>). The target population for the survey were providers in obstetrics and gynecology, transplant medicine and surgery, internal medicine, and family medicine across 3 main Mayo Clinic sites in Rochester, Minnesota, Scottsdale, Arizona, and Jacksonville, Florida, as well all Mayo

Health System—affiliated hospitals in the tristate area of Minnesota, Wisconsin, and Iowa. These sites were selected because their patient populations include women of reproductive age, and hypothetically, they may refer patients for UTx evaluation and/or serve as surgical sites for UTx. Questions were divided into 2 types, depending on content. Single-answer, multiple-choice questions were used to quantify provider knowledge, decisions on UTx in clinical practice, and ethical beliefs. Multiple-choice questions with multiple answers to which respondents selected all applicable answers were used to explore their responses in greater depth, with an option to select “other” if the set responses did not apply. Respondents were invited to provide a written response if they selected “other” for any response, as well as to explain their reasoning as to whether a living or cadaveric donor is the most appropriate source of a donor uterus. The instrument also solicited demographic information such as time in practice, preferred pronoun, area of specialty, location of practice, and parent status.

Recruitment

The survey was internally fielded through REDCap and was open from June 4, 2018, through July 2, 2018. Institutional practice-specific email lists were used to invite the target population described previously. These groups of specialists were chosen given their potential involvement in UTx care teams, as well as to explore attitudes and opinions among general providers who care for women of reproductive age. The survey was open to all providers within these specialties. The providers cared for women in academic and private practice settings in rural and urban areas within the Midwest.

Statistical Analyses

Descriptive statistics were calculated by statisticians in Mayo Clinic's Survey Research Center using SAS statistical software (SAS Institute).

RESULTS

Demographic Characteristics

Survey invitations were sent to 1933 providers, and 449 surveys were returned (response rate of 23.2%). Total response numbers varied for each

question. The average age of survey respondents was 46.3 years (Table 1). Most respondents practiced in internal or family medicine (225 of 406 [55.4%]), had practiced medicine for more than 5 years (324 of 404 [80.2%]), were based in an academic medical center (rather than health care system) (308 of 401 [76.8%]), and cared for women of reproductive age (394 of 405 [97.3%]).

Participants were also asked about their personal experience with infertility and

TABLE 1. Demographic Characteristics	
Variable	No. (%) of respondents
Average age at survey (y)	46.3
Preferred pronoun (N=395)	
Him/he	150 (38.0)
She/her	223 (56.5)
They/them	10 (2.5)
Other	12 (3.0)
Practice (N=406)	
OB/GYN	57 (14.0)
Internal medicine	119 (29.3)
Family medicine	106 (26.1)
Transplant medicine	35 (8.6)
Transplant surgery	10 (2.5)
Other	79 (19.5)
Years in practice (N=404)	
<5	80 (19.8)
5-10	95 (23.5)
11-20	92 (22.8)
>20	137 (33.9)
Practice setting (N=401)	
Private-rural	53 (13.2)
Private-urban	16 (4.0)
Academic medical center	308 (76.8)
Private-academic affiliate	24 (6.0)
Care for women of reproductive age (N=405)	
Yes	394 (97.3)
No	11 (2.7)
Personal experience with infertility (N=403)	
Yes	271 (67.2)
No	132 (32.8)
Personal use of assisted reproductive technologies (N=404)	
Yes	242 (59.9)
No	162 (40.1)
Have children (N=402)	
Yes	321 (79.9)
No	81 (20.1)

OB/GYN = obstetrics and gynecology.

reproduction. Two-thirds of providers (271 of 403 [67.2%]) reported experiencing, or having a close family member or friend experience, infertility. Likewise, 242 of 404 (59.9%) had used, or had a close family member use, assisted reproductive technology to achieve pregnancy. A majority (321 of 402 [79.9%]) reported having children of their own.

Provider Knowledge of UTx

Most respondents (279 of 447 [62.4%]) had previously heard of UTx (Table 2); the most common source of knowledge was from social media or a news source. A quarter (87 of 343 [25.4%]) heard of UTx from a professional society. The remainder heard about it from other professional sources, including medical lectures, journals, and colleagues.

In considering the relevance to their practice, 17.9% of respondents (80 of 446) agreed UTx is relevant; 30.9% (138) indicated that it might be relevant. Notably, 22.2% of obstetrics and gynecology specialists (14 of 63), 35.1% of transplant medicine providers (13 of 37), and 58.3% of transplant surgeons (7 of 12) said the procedure was not relevant to their practice (Supplemental Table, available online at <http://www.mcpiqjournal.org>). No major differences were found between demographic groups other than medical practice specialty. When asked if they would consider introducing the possibility of UTx to a patient facing AEFI, the majority answered “yes” (160 of 446 [33.6%]) or “maybe” (205 [46.0%]). Only 18.2% (81) said they would not introduce the possibility of UTx to a patient with AEFI.

Ethics of UTx

In a context where surrogacy is legally permitted, 45.0% of participants (195 of 433) agreed that UTx is ethically justifiable. Another 21.7% (94) believed it is justifiable under certain circumstances, such as when surrogacy is prohibited. Only 10.2% (44) disagreed with UTx under any circumstance. Among this group, a few participants cited an opposition to assisted fertility technologies more broadly, including the belief that it is morally wrong to create multiple embryos (Table 3). Even among participants who indicated that they found the procedure generally

TABLE 2. Physician Knowledge and Attitudes About UTx^a

Variable	No. (%) of respondents
Heard of UTx (N=447)	
Yes	279 (62.4)
No	168 (37.6)
Heard about UTx from (N=343)	
Social media or news source	184 (53.6)
Medical society	87 (25.4)
Other	72 (21.0)
UTx is relevant to practice (N=446)	
Yes	80 (17.9)
No	228 (51.1)
Maybe	138 (30.9)
Would introduce UTx to AUI patient (N=446)	
Yes	160 (35.9)
No	81 (18.2)
Maybe	205 (46.0)
UTx for pregnancy is ethically justifiable (N=433)	
Yes	195 (45.0)
No	44 (10.2)
Under certain circumstances	94 (21.7)
Not sure	100 (23.1)
Moral and ethical factors in UTx (N=1661) ^b	
Religious perspectives	129 (7.8)
Risk to donor	331 (19.9)
Risk to recipient	393 (23.7)
Risk to child	342 (20.6)
Use of medical resources	284 (17.1)
Importance of reproduction	165 (9.9)
Other	17 (1.0)
Regulation of UTx (N=863) ^b	
Institution	136 (15.8)
Professional societies	177 (20.5)
Similar to other solid organ transplants	318 (36.8)
FDA	195 (22.6)
Other	37 (4.3)
Financial coverage of infertility treatment (N=411)	
Individual	160 (38.9)
Institution	3 (0.7)
Private insurance	186 (45.3)
Medicaid	4 (1.0)
Other	58 (14.1)
Financial coverage of UTx (N=413)	
Individual	193 (46.7)
Institution	6 (1.5)
Private insurance	147 (35.6)
Medicaid	3 (0.7)
Other	64 (15.5)

^aAUI = absolute uterine factor infertility; FDA = US Food and Drug Administration; UTx = uterus transplant.

^bParticipants were allowed to choose more than one answer.

acceptable, some expressed ambivalence, stating they did not have enough information or had not thought about UTx enough to offer unequivocal support (Table 3).

Respondents were asked to select all factors that applied in their evaluation of the acceptability of UTx (Table 2). The most common responses included risk to the recipient (393 of 1661 [23.7%]), donor (331 [19.9%]), and child (342 [20.6%]) and the appropriate use of medical resources (284 [17.1%]). A small minority listed other factors they considered when evaluating the ethics of UTx including availability of adoption, patient values and goals of care, personal autonomy, risks of immunosuppressants, and use in patients without AUI (Table 3).

When asked who should decide whether UTx is acceptable, 36.8% of respondents (318 of 863) thought UTx should be regulated similar to other solid organ transplants, and 22.6% (195) believed the US Food and Drug Administration should regulate UTx. Professional societies and institutions were less frequent responses (20.5% [177] and 15.8% [136], respectively). Respondents who selected “other” indicated that acceptability of UTx should be determined by the individual patient, should be a shared decision between patient and provider, or should be determined by an institutional review board, with some recommending input from medical ethics and society at large.

Financing UTx

When asked who should pay for the majority of infertility treatment, 45.3% of providers (186 of 411) thought private insurance companies should pay, with 38.9% (160) believing individuals should be responsible (Table 2). Some providers argued that infertility should be covered by insurance companies similar to other medical conditions (Table 3). Most believed the individual patient (193 of 413 [46.7%]) or private insurance (147 [35.6%]) should be responsible for financing UTx. Other responses included a combination of payers (patient, insurance, institution) or that the institution should cover the cost, at least while the procedure is considered experimental.

TABLE 3. Representative Quotes From Open-Ended Responses

Variable	Response
Ethics of uterus transplant	
Opposition to assisted reproductive technologies	<i>"It's not acceptable if excess embryos will be created."</i>
Ambivalence to uterus transplant	<i>"Solid organ transplants do not produce an impact on the unborn or conception. Question if there is enough data to assess risks. Those risks may accrue to the fetus. Difficult to compare to abortion since ending a pregnancy is finite defineable [sic] outcome whereas transplant one has to wonder what is accomplished with the other options present. Difficult to compare to lifesaving organ transplants."</i>
Resource allocation	<i>"I don't think we should be spending our precious medical resources on this at all."</i>
Use in patients without AUI	<i>"Expansion into other populations not typically able to carry pregnancies (males)."</i>
Financing uterus transplant	
Insurance should cover infertility treatment	<i>"Infertility is a medical diagnosis and should be covered by healthcare services as any other service (public or private payers)."</i>
Institution should cover while experimental	<i>"While still largely experimental, institution should pay. Later, insurance should contribute."</i>
Patient responsibility	<i>"Private insurance should pay part, but I would surmise that, in most cases, these are elective procedures and the individual should have some financial responsibility."</i>
Priority should be on addressing existing health disparities	<i>"With regard to uterine transplantation, until everyone in our country is covered for basic medical services, cutting edge therapies for non-life threatening concerns should be covered by the individual seeking treatment [sic] or other private, charitable funds."</i>
Living vs deceased donors	
Impact to donor fertility	<i>"In our society we don't remove a part of someone's body for transplantation to someone else if it will leave that organ system nonfunctional. If a person has one kidney, that person wouldn't be a transplant donor. If a person donates marrow, we presume they will make more of their own. We don't transplant organs that could be needed by the donor in the future - and a donor would only have 1 uterus to give."</i>
Need for cadaveric consent	<i>"Until this use is specifically consented by cadaveric patients then no because there potentially could be many debated ethically regarding this in certain circumstances i.e. transgender wanting to conceive."</i>
Risks to living donor	<i>"With cadaveric donation, there is no risk to the donor whereas if it is a living donor, there is now increased risk not only to the recipient but also the donor herself."</i>
Clinical utility	<i>"As long as the uterus functions to the end goal of fertility, it doesn't matter the source."</i>

AUI = absolute uterine factor infertility.

UTx in Clinical Practice

A minority of participants (23.5% [93 of 395]) expressed that only a cadaveric donor would be appropriate (Table 4) because of the risk to the donor or concerns that the donor's fertility would be unjustly impacted (Table 3). Commenting on their rationale, a small minority argued that living donor procedures were more likely to be successful and thus should be preferred. However, the majority (60.3% [238 of 395]) expressed that either a living or cadaveric donor was an acceptable source for the donated organ. Many explained this choice by stating they

would choose the source that had the potential for the best outcome for the recipient.

Finally, providers evaluated 4 hypothetical candidates for UTx (Table 4). Of the 743 responses (participants were allowed to choose more than one answer), 334 [45.0%] believed a 22-year-old female born without a uterus would be a good candidate for UTx. There was less support for a woman with uterine loss who already has 2 children (139 [18.7%]), a transgender woman desiring a pregnancy (132 [17.8%]), and a woman with uterine fibroids slightly over childbearing age (76 [10.2%]). Sixty-two of the respondents

(8.3%) would not recommend UTx to any patient. Most of the physicians indicated that they considered either a premenopausal or postmenopausal altruistic donor the most acceptable. There was less support for non—family member and postmenopausal donors than family member and premenopausal donors.

DISCUSSION

Uterus transplant is among an expanding group of transplants that are generally grouped together under VCA transplant programs. Vascular composite allograft programs also include transplants of the upper extremities (hands), face, and male reproductive organs (penile transplants). Each of these procedures has been considered controversial at some point, given their nonlifesaving nature. Among these procedures, UTx is unique in that it is the only one to permit live donor transplant and the reproductive use of the transplant (penile transplants are deliberately engineered to make reproduction impossible). It is perhaps for these reasons that it has generated more than usual amounts of ethical attention. Particularly in the early exploratory days of the procedure, many clinicians and ethicists questioned whether it should be pursued at all, citing the nonlifesaving nature of fertility restoration and arguing that women should not be permitted to undergo such significant health risk for the purposes of birthing a child, especially given the potential for other pathways to parenthood.¹²⁻¹⁶

Nevertheless, centers that have initiated programs in uterus transplantation report considerable interest in the procedure among women with AUFL.¹⁷ Two previous studies have reported public opinion on the acceptability of UTx,¹⁸ and the opinions of reproductive endocrinologists and gynecologic surgeons are reported in the literature.¹⁹ However, this survey is the first to explore a broader range of provider opinions, in different practice settings, from the wide range of specialties involved in treating UTx recipients and donors.

Risk and Donation

Unlike previous VCA programs, uterus transplantation was first contemplated and accomplished using a living donor. Clinicians

hypothesized that a living donor would provide a higher chance of success, especially if it could be established that the uterus was capable of gestation. With the addition of the necessity for HLA matching, this gave rise to the most common donor in the Swedish cohort, namely, the mother of the recipient. Since then, however, research groups have solicited donations from living altruistic (ie, nondirected) donors as well as deceased donors. Ethically speaking, it can be argued that family members are problematic donors because they may feel familial pressure toward donation and/or greater psychological distress if the transplant or pregnancy fails. This may especially be the case given the association of depression and other negative psychosocial effects with infertility,^{20,21} leading to the concern that the desire to relieve a family member's distress may unduly influence the potential donor's decision absent the lifesaving justification of other solid organ transplants. At the same time, if one postulates that female family members gain emotional and psychological benefit from helping a family member have children and in welcoming those children to the family as loved ones, then it would appear ethically preferable that those who might benefit bear the risk. By the same token, an undirected anonymous donor would be ethically more problematic since there is less benefit but substantial risk, especially since the radical hysterectomy required to retrieve a uterus from a live donor is arguably the riskiest portion of the entire process. Deceased donors are arguably the least ethically problematic given the absence of risk, but it is unknown if the success rate for deceased donor procedures will be as high.

It is therefore interesting to note that although the risk to the donor was the second highest ranked ethical consideration in the acceptability of UTx, participants indicated, by a large margin, that either a living or deceased donor would be equally acceptable, with many explaining their choice in terms of clinical utility (ie, organ availability and/or viability) rather than ethical merit. Furthermore, they ranked nondirected altruistic donors as the most desirable source for uterus donation, ahead of donation from either a premenopausal or postmenopausal family

TABLE 4. Physician Beliefs on UTx in Clinical Practice^a

Variable	No. (%) of respondents
Potential candidates for UTx (N=743) ^b	
22-Year old female born without a uterus	334 (45.0)
28-Year old transgender female who desires pregnancy	132 (17.8)
46-Year old female with nonfunctioning uterus due to uterine fibroids	76 (10.2)
32-Year old who has 2 children but had a hysterectomy due to postpartum bleeding.	139 (18.7)
None of the above.	62 (8.3)
Donor (N=395)	
Living donor	64 (16.2)
Cadaveric donor	93 (23.5)
Either	238 (60.3)
Appropriate living donor (N=355)	
Known premenopausal family member	89 (25.1)
Known postmenopausal family member	70 (19.7)
Premenopausal non-family member	34 (9.6)
Postmenopausal non-family member	12 (3.4)
Altruistic donor (premenopausal or postmenopausal)	150 (42.3)
^a UTx = uterus transplant.	
^b Participants were allowed to choose more than one answer.	

member. This preference suggests a lack of knowledge among providers about the risks to donors and recipients, as risks to a living donor are generally greater than the risks to the recipient. However, it may also reflect inconsistent application of ethical concerns or differential weighing of other factors regarding donor acceptability.

Reproductive Transplant and Parenthood

A little less than half of providers believed that UTx was ethically justifiable in a context where surrogacy is legal. This is similar to a survey of reproductive endocrinologists and minimally invasive surgeons where 45%

agreed that UTx is an ethical surgical procedure.¹⁹ In the same study, 42% of respondents agreed that UTx should be considered a potential treatment option for women with AUI. It is interesting to note that more respondents supported the availability of UTx in settings where surrogacy is legal, suggesting some providers calculate the acceptability of UTx in the context of absolute patient autonomy. Qualified support for UTx under certain circumstances suggests belief in parenthood as a legitimate medical goal, but when alternatives to achieving parenthood are legally available, the less risky method should be employed. In particular, nearly 10% of the cohort confirmed that they considered “the importance of reproduction” as a relevant moral consideration when contemplating the acceptability of UTx. Another interesting correlation is the percentage of the respondent population who felt that a woman who already had biological children was a less appropriate candidate for UTx than one who was childless, despite the fact that both were of reproductive age and lacked a uterus. Again, this suggests that some providers view UTx in instrumental, rather than deontological, terms. By this assessment, UTx is permissible to resolve infertility in a narrow, defined set of circumstances (ie, a childless woman with AUI). The view that UTx should be evaluated according to certain immutable principles, such as prohibitions against third-party involvement in reproduction or the disruption of a living donor’s bodily integrity, appeared to be less common. Instead, providers’ comments suggest that many evaluate the ethics of UTx according to consequentialism, weighing the value of restoring or enabling childbearing in each patient population with the risks of the procedure to the donor, recipient, and child. By contrast, a small subset of the cohort rejected consequentialist arguments in favor of the view that UTx is, a priori, unethical.

Regulation and Financing

At present, UTx is offered only through clinical trials that are subject to federal human participant research guidelines. Participants—both donor and recipient—are recruited and screened according to institutional research protocols. If UTx enters clinical practice, a regulatory mechanism will be

required to ensure patient safety, procedure efficacy, and just organ allocation. Solid and VCA organ transplantation is regulated through the Organ Procurement and Transplantation Network, a unique private-public partnership establishing policies related to organ procurement and distribution that are enforced by the nonprofit United Network for Organ Sharing. Respondents in the current study indicated a preference for this existing framework in regulating UTx. The need for broad regulation is evident: the first UTx attempt in the United States failed due to a *Candida albicans* infection allegedly left unreported by the agency procuring the organ from the deceased donor as well as a failure to include antifungal medications in the initial transplant protocol.²² Moreover, an international registry or other database would be beneficial to evaluate UTx, including the use of living vs deceased donors and protocol variations. Although 30 UTx attempts have been described in the scientific literature to date, the true number is estimated to be 60,⁶ suggesting the need for greater transparency and systematic data collection of UTx outcomes.

The direct costs of UTx are estimated to be \$150,000 to \$500,000.²³ Although participation in clinical trials is covered by research funding, the high cost of UTx has engendered questions about the clinical financing of UTx procedures. It is speculative at present whether private insurance would, or be legally compelled to, cover UTx considering only 15 US states require private insurance companies to offer coverage for fertility treatment. Interestingly, while almost half of respondents agreed that fertility treatments should be covered by insurance, the majority believed UTx should be covered by the individual. This suggests that UTx is largely viewed as an elective procedure distinct from other assisted reproductive technologies. The high cost of UTx raises ethical questions regarding the allocation of health care resources and equity of access. It is likely that costs of this procedure would be prohibitive for the majority of the US population. Greater exploration of how the implementation of UTx may impact the US health care system and existing disparities is needed.

Strengths and Limitations

The low response rate (23.2%) and the limited number of sites surveyed are limitations of this study. This survey was fielded before the announcement of successful UTx and subsequent pregnancy using a deceased donor in Brazil and the United States; several prior UTx attempts with a deceased donor were unsuccessful, including the highly publicized first attempt in the United States in February 2016.²⁴ Survey responses may be different with the proof-of-concept use of a deceased donor.⁸ Only 80 respondents indicated that UTx is directly relevant to their practice, suggesting either underrepresentation from transplant and reproductive medical providers or that even providers in those practice areas do not place a high priority on offering UTx procedures. However, the large population of internal medicine and family medicine providers is a relative strength because they may be the first providers to whom patients report their reproductive concerns or seek referrals for specialty care, including potentially for UTx.

CONCLUSION

A successful UTx program requires broad support from a wide range of specialties from initial patient referral to delivery and follow-up of the potential child. Although a little less than half of the providers in this study believe UTx for AUI is ethically appropriate, fewer providers would recommend UTx to a patient, suggesting that this support is qualified. Indeed, the lack of clear majority views on the acceptability and clinical utility of UTx in this sample may be reflective of the ethical uncertainty surrounding this procedure. Concerns as to its safety as well as expansion to other patient populations may be barriers to wider acceptance of this procedure. An established record of safety and efficacy may convince some providers that UTx is an acceptable intervention for infertility, especially if weighed in the context of personal autonomy and the assumption of financial burden by the patient. At present, however, support for UTx appears to be narrowly applied to patients with the most compelling medical and personal justification for this intensive procedure, namely, childless women of reproductive age with AUI.

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SUPPLEMENTAL ONLINE MATERIAL

Supplemental material can be found online at <http://mcpiqjournal.org>. Supplemental material attached to journal articles has not been edited, and the authors take responsibility for the accuracy of all data.

Abbreviations and Acronyms: **AUFI** = absolute uterine factor infertility; **MRKH** = Mayer-Rokitansky-Küster-Hauser syndrome; **UTx** = uterus transplant; **VCA** = vascular composite allograft

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Correspondence: Address to Megan Allyse, PhD, Biomedical Ethics Research Program, Mayo Clinic, 200 First St SW, Rochester, MN 55905 (Allyse.megan@mayo.edu; Twitter: [@MAllyse](https://twitter.com/MAllyse)).

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