# Abdominal Organ Transplant Center Tobacco Use Policies Vary by Organ Program Type

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## ABSTRACT

**Background.** Smoking is a modifiable risk factor for cardiovascular disease, malignancy, and surgical complications. Transplant center practices toward smokers vary widely and evoke the classic tension between the ethical principles of justice and utility. We sought to assess current smoking policy variation in U.S. kidney, liver, and pancreas transplant centers.

**Methods.** An online survey was sent to program directors of all United Network for Organ Sharing–approved solid abdominal organ transplant programs regarding their policies toward prior and current tobacco use.

**Results.** Responses were received from 26% of kidney, 31% of liver, and 37% of pancreas transplant centers. Across organ programs, virtually all centers (97% to 100%) reported transplantations for former smokers, whereas 59% of kidney, 62% of liver, and 33% of pancreas programs reported transplantations for current smokers. Organ programs reported similar rates of having smoking cessation programs (74% to 77%) and performing serum cotinine testing (31% to 38%). Smoking was an absolute contraindication to transplantation at 38% of kidney, 15% of liver, and 50% of pancreas programs. Programs with absolute contraindication policies were less likely to perform transplantations in current smokers and more likely to check serum cotinine levels, but no more likely to have smoking cessation programs.

**Conclusions.** There is variation in tobacco use policies among abdominal organ transplant programs and centers. Balancing equity and justice when deciding which patients to waitlist requires an individualized approach to the tobacco-using patient, consideration of organ-specific factors, tobacco-related disease burden, and overall patient health. Such multifaceted assessments might be favorable to inflexible tobacco use policies.

TOBACCO smoking remains the leading preventable cause of premature death in the United States [1]. Historically, listing policies for tobacco-using transplantation candidates have varied across American transplant centers. A survey in the year 2000 revealed 8% of kidney, 20% of liver, and 15% of kidney–pancreas transplant programs considered smoking an absolute contraindication to transplantation [2]. Research over the last

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2 decades has demonstrated smoking to be a risk factor for reduced recipient and graft survival among kidney transplant recipients [3–7], whereas the limited evidence for liver and pancreas transplantation outcomes remains inconsistent. Although there have been no prospective studies into the long-term outcomes of smoking cessation near transplantation, some abdominal organ transplant programs enforce tobacco-free candidate status through serum cotinine checks, either globally or in selected patients with tobacco-related comorbidities such as chronic obstructive pulmonary disease, coronary or peripheral arterial occlusive disease, or other significant comorbidity.

Beyond the impact of smoking on organ-specific transplant outcomes, differing interpretations of a fundamental bioethical issue also underlie the varying application of tobacco use policies among the different transplant programs. In selecting candidates suitable for transplant, similar to the ethical considerations involved in developing the United Network for Organ Sharing (UNOS) allocation algorithms, transplant programs must balance equity—or fairness in allocating donor organs—with utility—or maximizing the medical benefit of transplants [8]. As the chasm between organ supply and demand widens, and waitlist mortality increases, providers at the bedside increasingly grapple with weighing their commitment to patients against a sense of obligation to the broader transplant community and the requirements of the federal Final Rule. Whereas transplant programs assess utility—maximizing the aggregate good to the transplant community through outcomes assessments—prior to waitlisting patients, equity requires consideration of the way in which transplant benefits are distributed. This tension has significant bearing on the rigor with which smoking policies are supported. Should a social variable such as smoking negate access to a lifesaving treatment, given the variability in the impact of smoking on transplant outcomes by organ type? Additionally, smoking does not necessarily limit access to other potentially life-saving therapies for other disease states (eg, colon cancer resection). Competing considerations with individual patient care, such as center-specific outcomes and reimbursement constraints of third party payors, further complicate the objective of equitable organ allocation. In light of the fluid interpretation of the equity–utility balance, as well as the varying impact of tobacco on transplant outcomes, we hypothesized that listing policies would vary between transplant centers and among transplantable organs. To appreciate these discrepancies, the aim of this study was to survey the current status of tobacco use policies and clinical practices at U.S. transplant centers based on the different abdominal transplant program types.

## METHODS

After obtaining the list of active transplant centers and program directors from UNOS, we conducted a survey of these UNOS-approved solid abdominal organ transplant programs regarding their policies toward prior and current tobacco use. Program directors were asked to complete an online survey via e-mail. Nonresponders were reminded by email 3 times. Data were collected from May 2012 through February 2013. Because each respondent was permitted to answer questions pertaining to every organ program, if multiple responses were received from within the same transplant center, responses of transplant directors were used for their respective programs, and the responses of other respondents were discarded. The study was reviewed by the institutional review board of University Hospitals Case Medical Center and deemed exempt (IRB #NHR-11-17).

Survey questions were designated by organ program: kidney, liver, and pancreas (inclusive of simultaneous pancreas–kidney, pancreas after kidney, and pancreas transplant alone). Although intestinal programs also were surveyed, the number of respondents prevents meaningful analysis. Data were stratified by organ program, with individual center data remaining confidential. A list of questions included in the survey follows:

- How many [organ] transplantations were performed at your institution last year?
- Does your institution perform [organ] transplants on CURRENT smokers?
- Does your institution perform [organ] transplants on PREVIOUS smokers?
- If you transplant former smokers, how many MONTHS does your institution recommend the patient to be tobacco free prior to activation on the list?
- Does your institution have a program to assist current smokers in quitting prior to undergoing [organ] transplant?
- Does your institution have a policy where current tobacco use is an ABSOLUTE contraindication to [organ] transplant?
- Does your institution have a policy where current tobacco use is a RELATIVE contraindication to [organ] transplant?
- Does your institution check serum cotinine levels (for current tobacco use) on recipients prior to [organ] transplantation?
- Does your institution accept [organ] from DECEASED DONORS who used tobacco products?
- How many living donor [kidney or liver] transplants were performed at your institution last year?
- Does your institution perform living donor [kidney or liver] transplants where the DONOR is a CURRENT smoker?
- Does your institution perform living donor [kidney or liver] transplants where the DONOR is a PREVIOUS smoker?

Comparisons of responses between groups were made by $\chi^2$ tests for categorical variables and by Mann-Whitney $U$ tests for continuous variables. $P < .05$ was considered significant. Statistical analysis was performed using SPSS Statistics version 22.0 (IBM Corp., Armonk, New York, USA).

## RESULTS

Responses were received from 61 of 235 (26%) kidney transplant centers, 39 of 127 (31%) liver transplant centers, and 42 of 115 (37%) pancreas transplant centers. Within each organ program, all 11 UNOS regions were represented, and among organ programs there were no significant differences in the proportional representation of any individual UNOS region. Characteristics of responding transplant centers are listed in Table 1.

Across organ programs, virtually all centers reported transplantations for former smokers and accepting organs from deceased donors who smoked (Table 2). Organ