Title: THE IMPACT OF LIVER TRANSPLANT PROGRAMS ON ANESTHESIA PERSONNEL AND SERVICES

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Introduction. The cyclosporin era has allowed for the rapid development of organ transplantation programs. In 1983, there were nine liver transplant programs (LTP) in the United States. Today more than 30 hospitals nationwide are involved in LTP. Liver transplantation is one of the most challenging surgical procedures encountered by the anesthesia team. As the patient is subjected to major hemodynamic, metabolic, coagulation and respiratory derangements; the team endures physical, emotional, and cognitive demands for periods of time that, routinely exceed 12 hours. Additionally, liver transplants often occur during non-prime surgical hours requiring rapid mobilization and rearrangement of staff. The following study was developed to examine demographics, personnel management, and the impact of LTP on anesthesia services.

Methods. A list of 39 LTP was compiled. Questionnaires were sent to the anesthesia LTP directors at each of these centers. The questionnaire included the following: 11 demographic questions which focused on hospital size, medical school affiliation, population served, number of transplants performed per annum, the number of personnel involved, and staff requirements for individual cases. Three questions were asked about staffing, with particular attention to how personnel are selected. Six questions examined the effect of cases on staffing requirements and the scheduling of other cases when a liver transplant is performed. Nineteen questions were asked about job enrichment and compensation for the personnel involved. One question about employee protection from hepatitis was included. The effects on recruitment and research were questioned 3 times. Perioperative anesthesia involvement was examined in 2 questions.

The attitude response of team members to LTP was investigated in 11 questions. Responses to these questions were scored for positive, ambivalent or negative attitudes to LTP. The sum of the added scores for each questionnaire yielded an overall attitude score. Discriminant analysis was performed between attitude scores demographic factors, staffing requirements, job enrichment, and compensation variables. Demographic data was analyzed for means, medians, sums and standard deviations of respective variables.

Results. Thirty responses were received of which stated they did not perform LTP. The growth of LTP in the preceding 7 years can be seen in Figure 1. Demographic data is shown in Table 1. The impact of LTP on personnel attitude showed, 1) a high positive (N=8), 2) a low positive influence (N=11) and a negative influence N=7. The factors weighing most heavily upon these subjective responses as defined by the first discriminate functions were: 1) the number of transplants per institution, 2) the number of anesthesiologists participating on the LTP team, 3) the implementation of a protocol for personnel management and, 4) the percentage of volunteers to assigned personnel involved in LTP.

Discussion. The number of liver transplants are proceeding at a mathematically increasing rate. Anesthesia services are being directed by anesthesiologists in the early phase of their careers. This manpower finding is a response to the professional challenge, the demands of long hours, and the stress encountered in doing liver transplant anesthesia. The effect of LTP upon the anesthesia team’s attitudes shows an even distribution between positive and negative responses. Those people with positive responses did less than 8 transplants per year. Whereas, those with negative attitudes did greater than 21 cases per year. The excitement and professional challenge of these most difficult cases may be overshadowed by stress and physical toll when their frequency increases. Protocols for personnel management (i.e. breaks, call schedule, etc) were in place in 8 institutions and the majority appeared to be implemented in response to dissatisfied staff. As the number of liver transplant cases increases in the future, anesthesia departments should be prepared to meet these demands with personnel protocols and adequate staffing. Forethought and planning may prevent staff dissatisfaction with LTP that leads to resentment, decreased job dissatisfaction, job distribution and may strengthen LTP by fostering job enrichment.

Figure 1

![Figure 1](image)

Table 1

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