**Clinical Review Criteria**

**Liver Transplant**
- Liver Transplant: Adult/Pediatric
- Living-Donor Liver Transplant: Adult – Adult
- Organ Transplantation in Members with HIV/AIDS

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**Criteria**

**For Medicare Members**

<table>
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<tr>
<th>Source</th>
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<tr>
<td>CMS Coverage Manuals</td>
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**For Non-Medicare Members**

**Living-Donor Liver Transplant: Adult-to-Adult**
**Liver Transplant: Adult/Pediatric**

Kaiser Permanente has elected to use the Liver Transplant (S-795) MCG* for medical necessity determinations.

> *MCG are proprietary and cannot be published and/or distributed. However, on an individual member basis, Kaiser Permanente can share a copy of the specific criteria document used to make a utilization management decision. If one of your patients is being reviewed using these criteria, you may request a copy of the criteria by calling the Kaiser Permanente Clinical Review staff at 1-800-289-1363.

**If requesting this service, please send the following documentation to support medical necessity:**
- Copy of final summary report from multidisciplinary transplant team

**Background**

Liver transplantation or hepatic transplantation is the replacement of a diseased liver with a healthy liver from another person (allograft). Liver transplantation is a viable treatment option for end-stage liver disease and acute liver failure. Kaiser Permanente chose to use the MCG Liver Transplant criteria as they are nationally based and support requirements by most transplant centers.

**Evidence and Source Documents**

The MCG evidence is used for this criteria document.

**Medical Technology and Assessment Committee (MTAC)**

**Living-Donor Liver Transplant – Adult-to-Adult**

**BACKGROUND**
Living donor liver transplantation (LDLT) was developed as an alternative to cadaveric liver transplants due to the dramatic shortage of available livers. LDLT to pediatric recipients was introduced into clinical practice in 1989 and the procedures are now performed worldwide. Adult-to-adult LDLT was initiated in the United States in the late 1990s. In 1997, one adult-to-adult LDLT was performed at one center in the U.S. and this grew to 266 procedures at 38 centers in 2000 (Brown et al, 2003). Left lateral segmentectomy, which uses approximately 20% of the hepatic mass, is generally used for LDLT to pediatric donors. However, these grafts provide insufficient liver mass for an average sized adult recipient. With adult recipients, a larger portion of the donor's liver must be taken which poses increased risks to the donor. Adult-to-adult liver transplantation involves either a full left or right hepatic lobe. Initially, all adult LDLT used the smaller left hepatic lobe. The hepatic mass was sufficient for some Asian recipients, but not for the average U.S. patient. Currently, adult-to-adult LDLTs in the U.S. use donation of the right hepatic lobe, which represents about 60% of the hepatic mass. Risks to the donor in adult-to-adult LDLT include the possibility that the donor will not be left with sufficient hepatic function, the possibility of biliary complications, risks associated with blood transfusion, risks associated with surgery and unknown, long-term risks associated with major hepatic resection. (American Society of Transplant Surgeons: Ethics Committee, 2000; Renz and Roberts, 2000; Hayashi & Trotter, 2002). There is an ethical debate on adult-to-adult LDLT centering on the question of whether or not it is acceptable for a consenting healthy individual to undergo this surgery and take the risk of complication or death in order to potentially save the life of a loved one. LDLT programs conduct extensive physical and psychological examinations of donors. Related ethical issues are how to select adult recipients of LDLT (i.e. to what extent are they at risk of dying), how successful LDLT is in adult recipients (i.e. increased life expectancy in recipient vs. risk to donor) and how to allocate cadaveric livers.

04/12/2000: MTAC REVIEW
Living-Donor Liver Transplant – Adult-to-Adult

Evidence Conclusion: The limited amount of evidence available is not sufficient to determine the safety and efficacy of LRLT. Case series reports were the best available evidence. The published case studies have small sample sizes and were not rigorously performed (i.e. did not specify inclusion/exclusion criteria or outcome measurement, had variable and relatively short length of follow-up). In addition, the published studies report on different clinical techniques for performing LRLT and these individual techniques have not been systematically evaluated.


The use of Adult to Adult Living Related Donor Liver Transplant treatment of Liver Failure does not meet the Kaiser Permanente Medical Technology Assessment Criteria.

06/11/2003: MTAC REVIEW
Living-Donor Liver Transplant – Adult-to-Adult

Evidence Conclusion: There is a lack of evidence on the effectiveness of adult-to-adult living-donor liver transplantation compared to cadaveric whole or split-liver transplantation and one small study (Liu) that addresses the effectiveness of LDLT compared to remaining on a wait list for cadaveric transplantation. Liu found a higher survival rate with right lobe LDLT than no transplantation among patients with acute liver failure; however, findings do not necessarily generalize to patients with other indications for transplantation. The remaining studies are case series. One-year recipient survival rates were 72% in the case series of 308 adults from Japan (Todo) in which 71% of the operations were left-lobe transplantsations and 85% for 50 right-lobe operations in the U.S. (Miller). No peri-operative donor mortality was reported in the recent case series articles. Brown identified one donor death among 449 right-lobe adult-to-adult living-donor transplantations performed in the U.S. between 1997 and 2000. Brown's survey found a 14.5% donor complication rate including 6% experiencing biliary leakage and 4.5% needing re-operation. A limitation of the case series data and the Brown survey data is variability in the eligibility criteria and interventions across centers and within centers over time. There are no quality long-term data on outcomes among recipients or donors.
Kidney Transplantation in the treatment of HIV+

BACKGROUND

HIV infected patients are at risk for end-stage renal disease caused by HIV-related disease such as HIV-associated nephropathy and hepatitis C infection. HIV-positive patients co-infected with hepatitis B or hepatitis C are also at risk of progression of liver disease (Roland & Stock; Fishman). Until recently, HIV-positive patients have been excluded from organ transplantation programs. A primary reason for this exclusion has been the belief that patients in an immuno-compromised state would be adversely affected by the immunosuppression required for transplantation. Several changes have occurred that have caused some transplant centers to question the exclusion based on HIV infection. Highly active anti-retroviral therapy (HAART) became available in the mid to late 1990s. HAART can prolong survival in HIV-positive patients, thereby increasing the number of patients with stable HIV infection who progress to end-stage organ failure. In addition, there have been improvements in immunosuppressive drug regimens and surgical techniques associated with transplantation. This review will evaluate the evidence published to date on the safety and efficacy of organ transplantation among HIV-positive patients in the HAART era. Kidney transplantation in HIV positive patients was previously reviewed by MTAC in December 2001. At that time, the evidence consisted of several case series with five or fewer HIV-positive patients and the item failed MTAC evaluation criteria. Other types of organ transplantation (liver, lung, heart) have not been reviewed by MTAC.

12/12/2001: MTAC REVIEW

Kidney Transplantation in the treatment of HIV+

Evidence Conclusion: There is insufficient published evidence on which to base a conclusion about the effect of kidney transplant in HIV-positive patients on health outcomes. Although recent changes in the prognosis of HIV-positive individuals suggest that some may benefit from kidney transplant, there are no direct empirical data to support this claim.

Articles: The search yielded 64 articles, many of which dealt with other related procedures or populations or were review articles or opinion pieces. No articles with empirical data were included in the search. Three older case series were identified in the reference list of the Gow review article. Each of these case series included 5 or fewer HIV-positive patients receiving kidney transplants. None of the articles was suitable for critical appraisal.

The use of Kidney Transplantation in the treatment of HIV+ patients with renal failure does not meet the Kaiser Permanente Medical Technology Assessment Criteria.

Heart, Lung, Kidney, & Liver Transplantation in the treatment of HIV+

Evidence Conclusion: There were two primary issues addressed in this review: 1) evidence on the safety and effectiveness of organ transplantation for HIV-positive individuals and; 2) evidence on whether survival among HIV-positive individuals who receive organ transplants is lower than among HIV-negative individuals. There is no published evidence on the safety and effectiveness of lung transplantation in HIV-positive individuals and only two case reports of heart transplants. There were no articles comparing transplantation to another intervention in HIV-positive patients with end-stage liver or kidney disease. The best published evidence on kidney and liver transplants in HIV-positive individuals is from cohort studies conducted in the HAART era. Abbott did a retrospective study comparing outcomes in HIV-positive and HIV-negative individuals, all of whom were identified in a national database of kidney transplants. Ragni compared survival in a prospective series of HIV-positive
patients and a retrospective analysis of selected HIV-negative patients from the UNOS Scientific Registry for Liver Transplantation. In both studies, three-year survival rates did not differ significantly in the HIV-positive and HIV-negative groups. Limitations of both studies include: The relatively small sample sizes of HIV-positive patients, 24 in the Ragni study and 47 in the Abbott study. The HIV-positive and HIV-negative groups may have differed in ways that affected outcomes (despite statistical adjustment for confounding in the Abbott study). The authors commented that clinicians may have selected the healthiest HIV-positive patients for transplantation which might increase the likelihood of a successful outcome compared with the HIV-negative patients. The Abbott study was retrospective and the Ragni study included a prospective group of HIV-positive patients but did a retrospective analysis of the HIV-negative control group. Prospective designs are preferred. A prospective, multi-center uncontrolled study to evaluate the safety and efficacy of kidney and liver transplants performed in HIV-positive patients is currently in its early phases. The study is being coordinated by UCSF. The investigators anticipate enrolling up to 275 transplant recipients and following them for 2-5 years.

**Articles:** The search yielded 217 articles. Most were opinion pieces, on technical aspects of transplantation in HIV-positive patients and articles on related clinical topics. Empirical studies on specific types of organ transplantation were as follows: Lung There were no studies with empirical data. Heart There were two case reports, each reporting on a single case. The articles were ineligible for critical appraisal. Kidney and Liver There was one study on kidney transplants (Abbott et al., 2004) and one study on liver transplants (Ragni et al., 2003) that compared outcomes in HIV-positive patients to outcomes in HIV-negative patients. Data from HIV-negative patients were taken from national transplantation databases in both studies. These two studies were critically appraised. The largest published series from UCSF included 14 patients, 10 received kidney transplants and 3 received liver transplants (Stock et al. 2003). Newer reports with additional patients have been presented at conferences and discussed in review articles, but the data have not been published in empirical articles. The case series was not critically appraised due to the small sample and availability of comparative studies. There was also a retrospective cohort study evaluating data on kidney transplants from 1987-1997; this study was not critically appraised because it primarily included cases from the pre-HAART era.


The use of Heart Transplantation in the treatment of HIV+ patients with heart failure does not meet the Kaiser Permanente Medical Technology Assessment Criteria.

The use of Lung Transplantation in the treatment of HIV+ patients with lung failure does not meet the Kaiser Permanente Medical Technology Assessment Criteria.

The use of Kidney Transplantation in the treatment of HIV+ patients with renal failure evidence is not sufficient to determine whether HIV infection should or should not be an exclusion for kidney transplantation.

The use of Liver Transplantation in the treatment of HIV+ patients with renal failure the evidence is not sufficient to determine whether HIV infection should or should not be an exclusion for liver transplantation.

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MDCRPC Medical Director Clinical Review and Policy Committee

MPC Medical Policy Committee

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<td>10/06/2015</td>
<td>Merged Living Donor Related criteria to Liver Transplant criteria</td>
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<tr>
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**Codes**

CPT:
Liver Transplant: 47135
Liver Donor – Adult to Adult: 47140, 47141, 47142, 47146, 47147, 0494T, 0495T, 0496T