LIVER FAILURE TREATMENTS
- Artificial Liver Assist Devices
- Hepatocyte Transplantation

Coverage for services, procedures, medical devices and drugs are dependent upon benefit eligibility as outlined in the member's specific benefit plan. This Medical Coverage Guideline must be read in its entirety to determine coverage eligibility, if any.

The section identified as “Description” defines or describes a service, procedure, medical device or drug and is in no way intended as a statement of medical necessity and/or coverage.

The section identified as “Criteria” defines criteria to determine whether a service, procedure, medical device or drug is considered medically necessary or experimental or investigational.

State or federal mandates, e.g., FEP program, may dictate that any drug, device or biological product approved by the U.S. Food and Drug Administration (FDA) may not be considered experimental or investigational and thus the drug, device or biological product may be assessed only on the basis of medical necessity.

Medical Coverage Guidelines are subject to change as new information becomes available.

For purposes of this Medical Coverage Guideline, the terms "experimental" and "investigational" are considered to be interchangeable.

Artificial liver assist devices and hepatocyte transplantation have been investigated as a means to provide temporary liver support to individuals with acute liver failure, as a bridge to liver transplantation or as treatment for drug overdose and poisoning.

**Artificial Liver Assist Devices:**

**Nonbiological Artificial Liver Assist Devices:**
Similar to the device used for renal dialysis. Filters containing absorbent material remove a wide range of substances, both toxic and normal, from blood flowing through it. The absorbent material can be a charcoal or albumin suspension. The following are FDA-approved liver assist devices:

- BioLogic-DT® System by HemoCleanse (may also be known as HemoTherapies Liver Dialysis Unit)
- Molecular Adsorbent Recirculation System (MARS®) by Gambro Renal Products
LIVER FAILURE TREATMENTS (cont.)

- Artificial Liver Assist Devices
- Hepatocyte Transplantation

Description: (cont.)

Artificial Liver Assist Devices: (cont.)

Biological Artificial Liver Assist Devices: Hollow-fiber cartridges lined with living hepatocyte (liver) cells that imitate certain functions of the liver. Blood flows through the cartridges exposing it to the metabolic activities of the liver cells. The liver cells perform some, but not all, of the normal liver's metabolic functions. Liver cells used are human, porcine and lapin. The following liver assist devices have received “Orphan Designation”¹ from the FDA. They are not FDA-approved for marketing:

- BLSS® by Excorp Medical, Inc.
- ELAD™ Artificial Liver System by Vital Therapies
- HepatAssist™ Liver Support System by Circe Biomedical, Inc.

¹ “The Orphan Drug Act (ODA) provides for granting special status to a product to treat a rare disease or condition upon request of a sponsor. The combination of the product to treat the rare disease or condition must meet certain criteria. This status is referred to as orphan designation. Orphan designation qualifies the sponsor of the product for the tax credit and marketing incentives of the ODA. A marketing application for a prescription drug product that has been designated as a drug for a rare disease or condition is not subject to a prescription drug user fee unless the application includes an indication for other than a rare disease or condition”.

Other biological artificial liver assist devices being investigated as a treatment for liver failure or as a bridge to liver transplant are:

- LiverX2000™ Bioartificial Liver System by Algenix
- Modular Extracorporeal Liver Support (MELS)® by Charite Virchow Clinic-Berlin
- Sybiol® by Xenogenics Corporation

Hepatocellular Transplantation:
Non-surgical procedure. Genetically manipulated human donor hepatocytes are directly transplanted through a catheter placed into the recipient’s liver. Xenotransplantation refers to non-human donor hepatocytes.
LIVER FAILURE TREATMENTS (cont.)

• Artificial Liver Assist Devices
• Hepatocyte Transplantation

Criteria:

Artificial Liver Assist Devices:

➢ Biologic-DT is considered medically necessary for ANY of the following indications:

1. Acute hepatic encephalopathy due to decompensation of chronic liver disease or fulminant hepatic failure
2. Drug overdose and poisoning (drug or chemical must be dialyzable e.g., acetaminophen, tricyclics, barbiturates, tranquilizers, anticancer agents, antimicrobials, theophylline, herbicides, and insecticides)

➢ Biologic-DT for treatment of chronic liver conditions or as a bridge to liver transplantation is considered experimental or investigational based upon:

1. Lack of final approval from the Food and Drug Administration, and
2. Insufficient scientific evidence to permit conclusions concerning the effect on health outcomes, and
3. Insufficient evidence to support improvement of the net health outcome, and
4. Insufficient evidence to support improvement of the net health outcome as much as, or more than, established alternatives, and
5. Insufficient evidence to support improvement outside the investigational setting.

➢ All other artificial liver assist devices not previously listed are considered experimental or investigational based upon:

1. Insufficient scientific evidence to permit conclusions concerning the effect on health outcomes, and
2. Insufficient evidence to support improvement of the net health outcome, and
3. Insufficient evidence to support improvement of the net health outcome as much as, or more than, established alternatives, and
4. Insufficient evidence to support improvement outside the investigational setting.
LIVER FAILURE TREATMENTS (cont.)

- Artificial Liver Assist Devices
- Hepatocyte Transplantation

Criteria: (cont.)

Hepatocyte Transplantation:

- Hepatocyte transplantation or xenotransplantation for the treatment of liver conditions or as a bridge to liver transplantation is considered experimental or investigational based upon:

1. Insufficient scientific evidence to permit conclusions concerning the effect on health outcomes, and
2. Insufficient evidence to support improvement of the net health outcome, and
3. Insufficient evidence to support improvement of the net health outcome as much as, or more than, established alternatives, and
4. Insufficient evidence to support improvement outside the investigational setting.

Resources:

1. Wittebole X, Hantson P. Use of the molecular adsorbent recirculating system (MARS) for the management of acute poisoning with or without liver failure. *Clin Toxicol (Phila)*. Nov 2011;49(9):782-793.


LIVER FAILURE TREATMENTS (cont.)

- Artificial Liver Assist Devices
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Resources: (cont.)


LIVER FAILURE TREATMENTS (cont.)

- Artificial Liver Assist Devices
- Hepatocyte Transplantation

Resources: (cont.)


FDA 510K Summary for Biologic-DT® System:

- FDA-approved indication: For treatment of acute hepatic encephalopathy due to decompensation of chronic liver disease or fulminant hepatic failure; for treatment of drug overdose and poisonings. The BioLogic-DT is not indicated for the treatment of chronic liver conditions or as a bridge to liver transplant.

FDA 510K Summary for Molecular Adsorbent Recirculating System (MARS):

- FDA-approved indication: For treatment of drug overdose and poisonings.

  For treatment of Hepatic Encephalopathy (HE) due to a decompensation of a chronic liver disease.

  The MARS is not indicated as a bridge to liver transplant.