The sooner the better

A guide to MARS® — the liver support therapy
Liver failure and MARS® therapy

Developing acute liver failure or deteriorating from a chronic liver disease, thousands of people are enlisted on liver transplant waiting lists every year. With a shortage of organs, time becomes extremely important and management of these patients represents a significant challenge for physicians around the world.

Gambro, the leading supplier of artificial support systems, brings you the Molecular Adsorbent Recirculating System (MARS) for the treatment of patients with liver failure.

Liver patients benefit from getting support as soon as possible

With early interventions, the MARS system helps prevent the evolution of irreversible multiorgan failure and facilitates an improved environment for hepatic regeneration and clinical recovery. The MARS system removes protein-bound and water-soluble toxins with albumin dialysis. This reduces plasma toxicity, improves patient clinical conditions (hemodynamics, hepatic encephalopathy, urine output), enhances the regeneration of liver cells and may help to recover native liver functions.

Clinically applied since 1993, the MARS system is the most extensively used non-biological liver support therapy in the world, with an ever-growing base of clinical experience and evidence. By 2009, more than 9,000 patients from 150 centers in 30 different countries had already been treated with a safe profile, and in more than 36,000 performed treatments.

Indications treated include:

- Acute-on-chronic liver failure
- Acute liver failure, including from drug overdose and poisoning
- Graft dysfunction after LTx
- Liver failure after liver surgery
- Secondary liver failure
- Intractable pruritus in cholestasis
The MARS® system stabilizes patients and has a positive impact on:

- Survival \(^6,^7,^11\)
- Hemodynamics \(^2,^5,^7,^17,^18\)
- Brain function \(^1,^6,^8,^9\)
- Kidney function \(^7\)
- Liver function \(^15,^20\)
- Liver recovery in ALF \(^12,^13,^15\)
- Quality of life \(^14,^21,^22,^23\)
- Overall therapy costs \(^24,^25\)
How the MARS® system works

The MARS system combines the efficacy of sorbents to remove albumin-bound toxins with the high selectivity of highly biocompatible dialysis membranes. In this way, common dialysis or CRRT machines can be expanded into a modern system for liver support therapy. The blood of the extracorporeal circuit runs through the fibers of the MARS FLUX™ dialyzer. Water-soluble and protein-bound toxins in the blood can pass through the membrane due to the albumin dialysate on the other side. The albumin dialysate solution is free from stabilizers when dialysing the patient.

The now toxin-enriched albumin solution is then passed through another dialyzer to remove water-soluble toxins. Albumin-bound toxins are removed in the two adsorber cartridges, one filled with activated charcoal, the other with an anion exchanger. The regenerated albumin solution is then ready for new uptake of toxins from the blood.

Removable protein-bound and water-soluble substances

- Ammonia
- Bilirubin
- Bile acids
- Aromatic amino acids
- Medium and short chain fatty acids
- Tryptophan
- Copper
- Creatinine
- Urea
- Diazepam
Section of the semi-permeable membrane. Water-soluble and albumin-bound toxins can pass through.
Putting you in control of your patient’s therapy

The MARS system is compatible with several hemodialysis machines and CRRT devices, and requires minimal staff involvement before and during treatment.

Deliver the prescribed treatment with high safety standards

- Simultaneous selective removal of albumin-bound and water-soluble substances
- High effectiveness and selectivity
- Management of fluid, electrolyte and acid/base balance
- Control of glucose and lactate level
- High safety standards: safety barrier between patient’s blood and adsorber columns, cell-free operation, high biocompatible membrane
- Extracorporeal blood volume limited to one filter
- Compatible with a wide range range of renal replacement equipment
- Features of dialysis and CRRT machines usable
- No major side-effects
- Cost-effective regeneration of the albumin dialysate

Features

Combined detoxification: interaction between the MARS monitor and standard CRRT or hemodialysis device.

[See also ‘List of allowed device combinations’ available at your local sales agent.]
Randomized controlled trials


Other clinical trials

12. Camus, C. et al. Liver transplantation avoided in patients with fulminant hepatic failure who received albumin dialysis with the molecular adsorbent recirculating system while on the waiting list: impact of the duration of therapy. Ther Apher Dial. 2007;13(8):549-55

The next step
Gambro as the leading company in artificial liver support systems keeps innovating to bring you the best treatments for the management of patients suffering from liver failure.
Partners in care

... David, Ellen, Tom, Enrico, Beatriz. They are just a handful of the hundreds of thousands of men, women and children around the world who every day rely on our products and your care to survive liver or kidney conditions and enjoy a better life. Every step we take together, every improvement in care we make, touches lives and provides new hope to José, Xiuxiu, Vladimir, Fred, Jamila ...

Gambro—the pioneer and leading innovator in dialysis therapy passionately committed to promoting life by advancing products, services and customer partnership within hepatic and renal care.

Contact us at partner@gambro.com