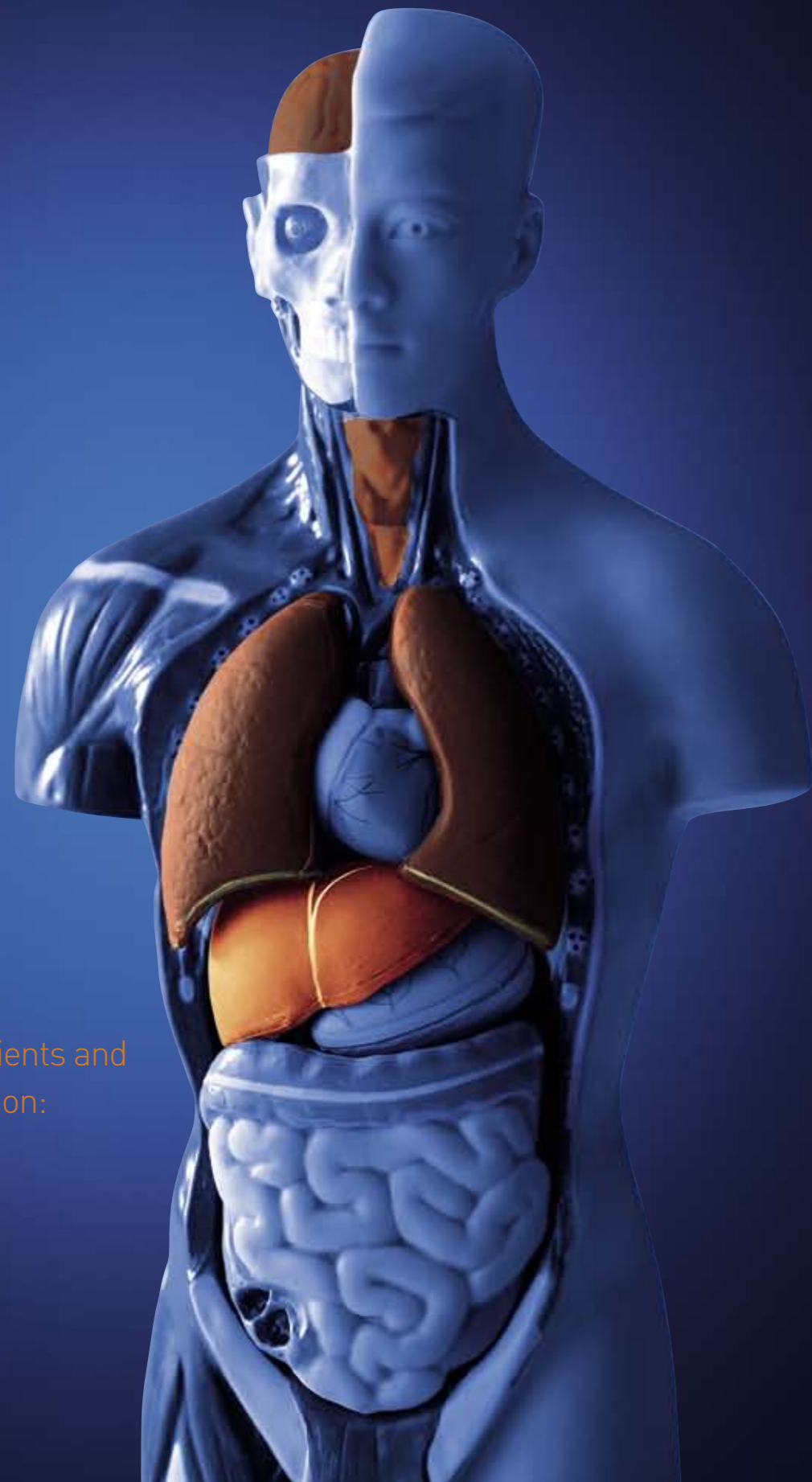


MARS® stabilizes patients and has a positive impact on:

- Survival
- Hemodynamics
- Brain function
- Kidney function
- Liver function
- Immune function
- Quality of life
- Overall therapy costs



## Literature on MARS® therapy

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 **GAMBRO®**

# With liver failure, the sooner you give support, the better



A guide to MARS®  
—the liver support therapy

 **GAMBRO®**

# Supporting liver recovery. Or a transplant

Whatever the planned treatment, liver patients benefit from getting support as soon as possible

With early interventions, MARS® (Molecular Adsorbents Recirculating System) helps prevent the evolution of irreversible multiorgan failure and facilitates an improved environment for hepatic regeneration and clinical recovery. MARS removes protein-bound and water-soluble toxins with albumin dialysis. This enhances the regeneration of liver cells and reduces plasma toxicity.

## Compatible, flexible and clinically effective

Clinically applied since 1993, MARS is the most extensively used non-biological liver support therapy in the world, with an ever-growing base of clinical experience and evidence covering more than 8,000 patients from 150 centers in 30 different countries.

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

## Indications treated include:

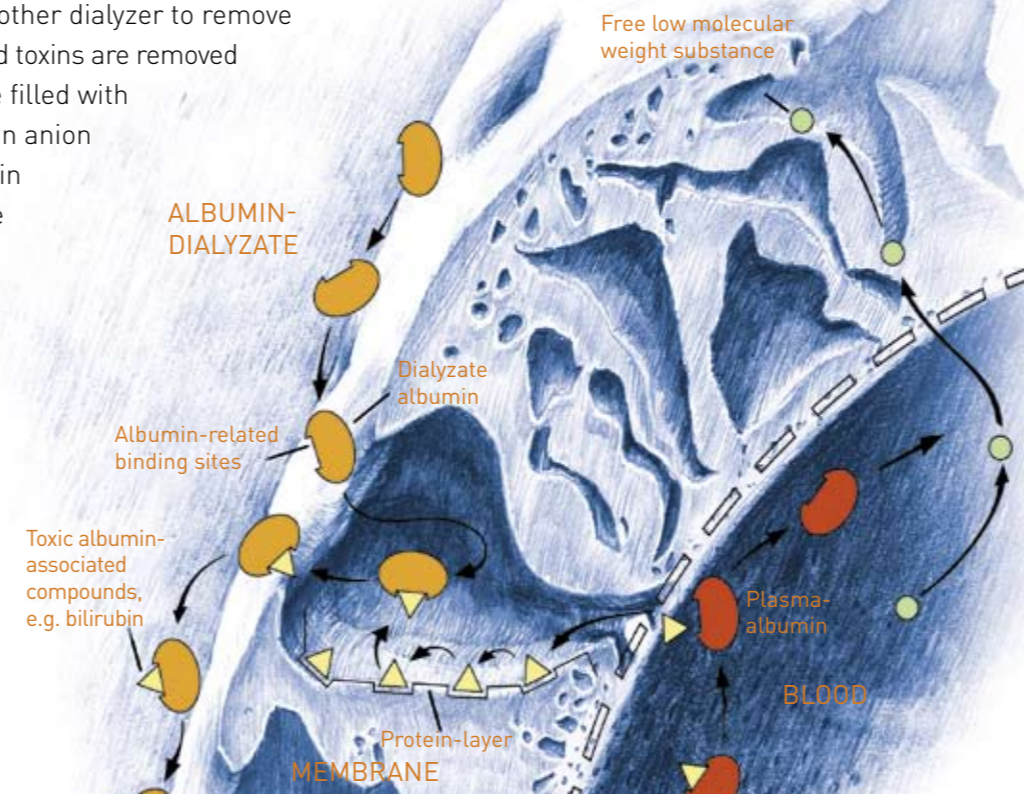
- Acute-on-Chronic liver failure
- Acute liver failure
- Graft dysfunction after LTx
- Liver failure after liver surgery
- Secondary liver failure
- Intractable pruritus in cholestasis
- Others in adult and pediatric cases



# How MARS® works

MARS 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 dialyzer on the other side. 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.

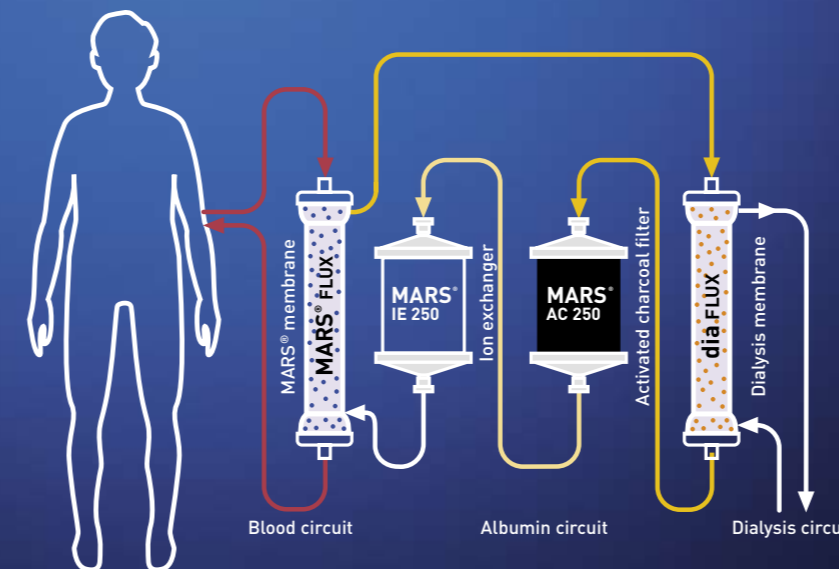


Section of the semi-permeable membrane. Water-soluble and albumin-bound toxins can pass through.

## 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

\* Mitzner et al., Curr Opin NephrolHypertens 2001; 10: 777-83



# Putting you in control of your patient's therapy

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
- Compatible with a wide range of renal replacement equipment
- Features of dialysis and CRRT machines usable
- No major side effects
- Cost-effective regeneration of the albumin dialyzer

## 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.)

