

ClearLine IV is the only FDA-approved product to detect and remove air from IV lines continuously. Air can be introduced easily into your lines when a bag is insufficiently de-aired or emptied, or while changing a bag or injecting medications. This creates a potentially catastrophic clinical event. Now, there is finally a way to detect and remove this air automatically and avoid the long-term clinical complications, extended hospital stays and medical liability costs associated with air embolisms.

# ClearLine IV

## Constant Vigilance Against Dangerous Air Intrusion

- ✓ Detects air in IV lines using software-controlled, ultrasound sensing technology
- ✓ Automatically diverts air in the IV line to a collection bag when it is detected so it never enters the patient's vasculature
- ✓ Redirects necessary fluids to the patient line after the air is entrapped, ensuring continuous fluid flow to the patient without manual intervention
- ✓ Works with any pump, warmer or IV bag set



Visually inspecting lines and manually removing air is the current standard of care for removing an air mass in IV lines, resulting in inconsistent monitoring and avoidable, adverse outcomes. ClearLine IV detects air masses as small as 25 microliters, which is 50% smaller than today's technology. This easy-to-use, hands-free device significantly reduces the potential for human error when inspecting lines. It works with all pumps, warmers and IV bag sets to deliver fluid safely to the patient.

### Air Embolisms

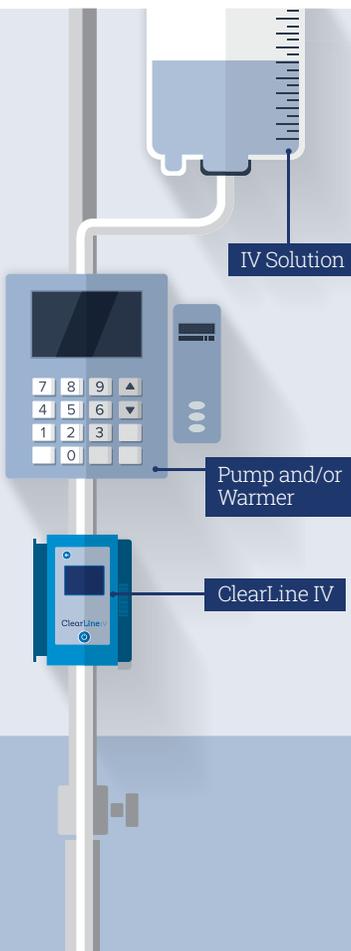
According to the Centers for Medicare and Medicaid Services (CMS) and the American Academy of Orthopaedic Surgeons (AAOS), air embolisms are the second most common serious, preventable, adverse event.<sup>1</sup> An air mass can enter the body through a vein and travel quickly to the brain, heart or lungs.

#### Some complications include:

- Mortality
- Coma/encephalopathy
- Paralysis
- Vascular complications
- Neurological complications
- Stroke
- Cardiac arrest

**"Few patients are more vulnerable to air embolisms than our Shriners pediatric patients. ClearLine IV has dramatically and actively increased our safety margins."**

— Frederic Bushnell, MD, MBA, Shriners Hospital for Children, Los Angeles



## Hospital Costs

Air embolism treatment costs range from \$8,000-\$12,000 per case. This avoidable problem also may result in large settlement payout costs for hospital administration. A FDA total product life cycle report on infusion pumps<sup>2</sup> showed that 3% of issues were caused by air embolisms with a 30% mortality rate.

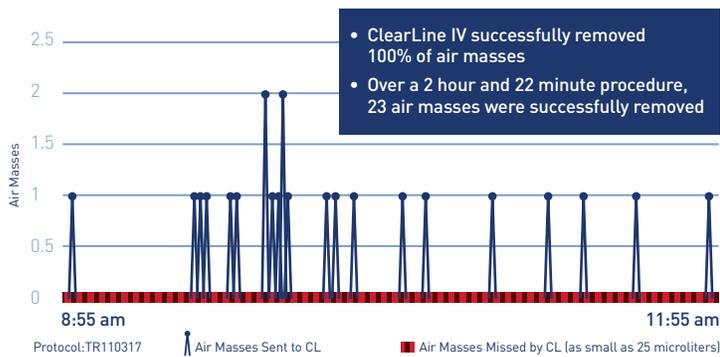
Case law data according to a Frenkel + Company report<sup>3</sup> on air embolism settlement and jury verdict values:

State	Patient	Damage	Settlement
Maine	3-day-old infant	Brain damage, cerebral palsy and quadriplegia	\$2.5M to the family because air was not removed from the IV line during intestinal surgery
Wisconsin	Male infant	Brain damage	\$2.3M to the family for an air mass in an IV line during a blood transfusion
Washington	1-day-old infant	Death	\$750,000 to the family because a doctor allowed an air embolism during a blood transfusion

<sup>2</sup>Chubb internal reporting

<sup>3</sup>Frankel + Company internal reporting

### Fluid Warmers are Well Known to Create Air in the Process of Warming



**AIF Warmer Test: Tested with EnFlow model 121 and ClearLine IV**  
 Data: 4/20/2011; filled with Saline; temp 40°C  
 Reference: "Amount of Air Infused to Patient Increases as Fluid Flow Rates Decrease When Using the Hotline"

**"Venous gas embolism occurs when gas enters the systemic venous system... causing arrhythmias, pulmonary hypertension, right ventricular strain, and eventually cardiac failure."**

—Muth, C.M., Shank, E.S. Gas Embolism. The New England Journal of Medicine, 2000, 342: 476.

**"Information on the lethal dose of air varies in the literature from 50 to 300ml; and complications have been reported with as little as 20ml given intravenously. In severely ill patients, the lethal dose of air has been reported to be as low as 10ml, while 0.5ml of air in the left anterior descending coronary artery has been shown to cause ventricular fibrillation."**

—Von Jurgenson, Silke. British Journal of Nursing, 2010. Vol. 19. No. 10.

## About ClearLine MD

Founded by forward-thinking device engineers based on first-hand knowledge of an avoidable, clinical event, ClearLine MD develops and markets fluid management devices that advance operational safety. The Company is delivering a new standard of care for eliminating air from IV lines and avoiding air embolisms.

For more information or to schedule a demonstration, contact [info@clearlinemd.com](mailto:info@clearlinemd.com)