

## Potential for Time and Cost Saving with LifeFlow

By Amy DeWinter, Ascenda Medical



### Highlights:

#### Potential Economic Impact

in Adult Shock per 500 patients



**121 fewer days in the ICU**



**Greater than \$1.5 million in aggregate hospital expenses saved**



**12X return on investment over traditional methods**

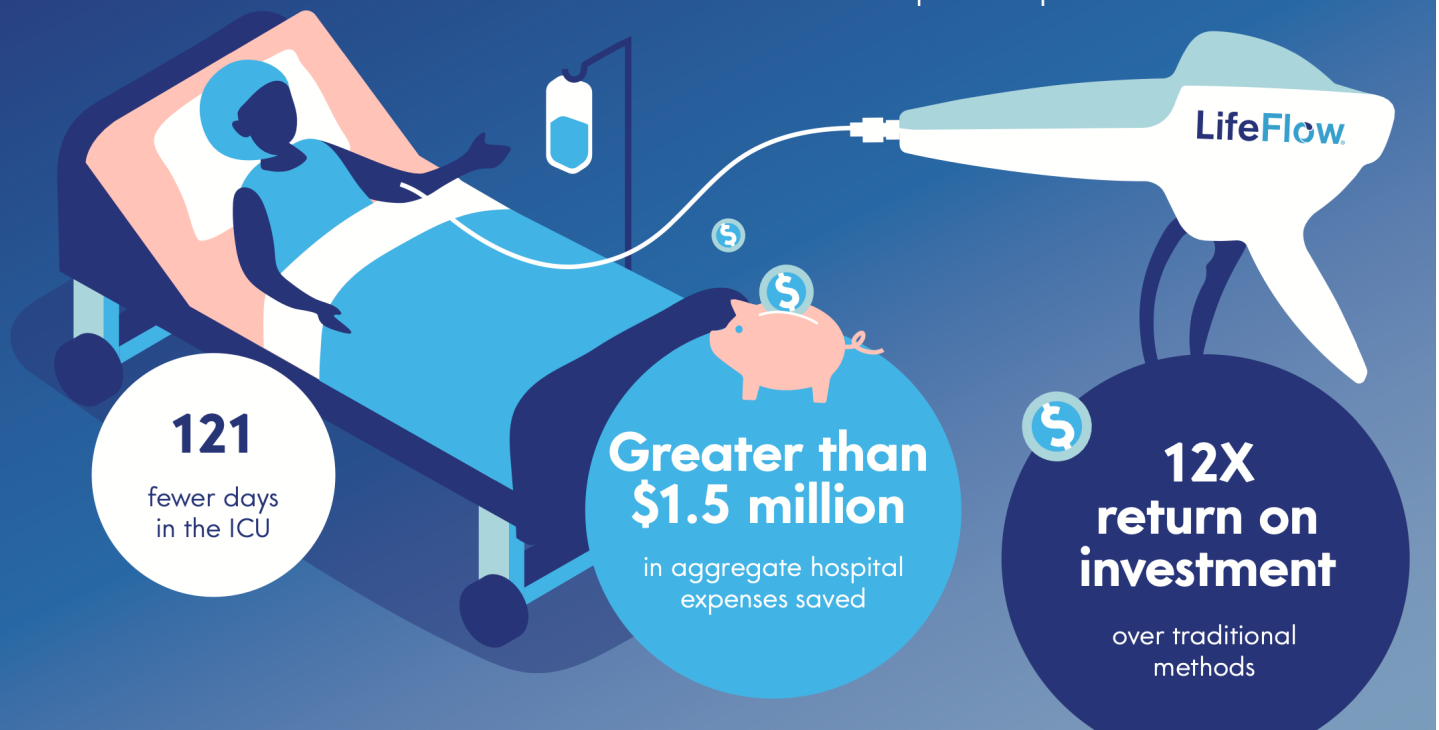
Septic shock is an urgent clinical condition that requires immediate medical attention. Early, rapid resolution of hypotension is one of the key tenets in preventing deleterious outcomes such as organ failure and mortality.<sup>1</sup> Studies have shown that earlier resuscitation can lead to reversal of hypotension and shock,<sup>2,3,4</sup> which can result in shorter stays in the ICU, fewer mechanical ventilations, and fewer in-hospital mortalities.<sup>5</sup> One such study found that patients with IV fluid resuscitation initiated within 30 minutes of severe sepsis or septic shock identification had a lower mortality (13% receiving ≤30-minute fluid

intervention vs 18.3% receiving >30-minute fluid intervention) and a significantly shorter hospital length of stay compared with patients who were resuscitated beyond 30 minutes.<sup>3</sup> Another study demonstrated that fluid initiation in less than 30 minutes was associated with reduced need for mechanical ventilation, significantly lower hospital mortality, ICU admission, length of stay, and ICU days.<sup>6</sup>

These data provide strong evidence for early fluid resuscitation. However, providers are often unable to achieve fluid delivery guidelines using current techniques.<sup>5</sup> Current methods of fluid resuscitation (gravity infusion, IV infusion pumps, mechanical rapid infusers, manual syringes, and pressure bags) have limitations. It can take 20 or more minutes to deliver 1L IV fluid bolus with a pressure bag, and flow rates are highly dependent on both catheter size and user re-inflation of the bag. Moreover, there are numerous reports of air embolisms associated with pressure bag use.<sup>7,8,9</sup> When utilized, the push-pull method is labor-intensive<sup>10</sup> and may increase the risk of contamination through non-sterile syringe contact.<sup>11</sup> These complexities often result in a limited ability to successfully administer early fluids, hence increasing the potential for complications and thus, higher treatment costs.

**LifeFlow**  
FLUID RESUSCITATION. WHEN MINUTES MATTER.

# Potential Economic Impact in Adult Shock per 500 patients



Time-to-first-bolus and volume control can improve markedly when LifeFlow, an innovative new device for rapid delivery of a fluid bolus, is used to administer fluids. Studies have shown in a simulated emergency shock patient that LifeFlow is faster<sup>12</sup> and less stressful<sup>7</sup> than traditional rapid fluid resuscitation techniques. LifeFlow can be set up and deliver 500 ml in less than 4 minutes,<sup>13</sup> up to 10 times faster than other methods.<sup>13, 14</sup>

Significant decreases in hospital and ICU lengths of stay were observed in patients when timely fluid delivery was administered in concurrence with bundle adherence.<sup>15</sup> When compared to standard IV fluid delivery methods in an analytical model, providers using the LifeFlow device can experience increased overall bundle compliance of 50–90%.<sup>5</sup> Consequently, patient outcomes for every 500 patients are projected to notably improve, with the use of LifeFlow resulting in:

**Ten lives saved**

Lower required use of mechanical ventilation: **24% vs 31%**

Decreased average length of stay: **11 vs 13 days**

Decreased average intensive care unit length of stay: **2 vs 3 days**

Decreased use of vasopressors: **17% vs 21%**



While the primary goal of resuscitation is to save and improve the quality of the septic patient's life, it is also important to look at the economic implications of early, rapid resuscitation. The same analytical model that revealed improvements to patient care with the LifeFlow device (for 500 patients versus standard fluid delivery methods) also showed considerable cost implications, including:

Reduced overall hospital costs of **\$1,569,131 (USD)**

Reduced total hospital stay of **455 days**

**Fewer** patients admitted to ICU

Reduced total ICU stay of **121 days**

	Change vs. Traditional Method <sup>1</sup>
Patient Deaths	↓ 10
ICU Days	↓ 121
Aggregate Hospital Expense	↓ \$1.6M
Patients Requiring Vasopressors	↓ 11
Patients Requiring Mechanical Ventilation	↓ 17

<sup>1</sup>For every 500 patients. Brooks, E., Piehl, M. Potential mortality and cost reduction in adult severe sepsis and septic shock through the use of an innovative fluid delivery device. *Open Access Emergency Medicine*. 2018 October 26; 10:165-170.

Even under the most conservative model assumptions, these findings suggest that LifeFlow has the potential to save lives and significantly reduce hospital costs.<sup>5</sup> These cost savings are primarily due to shorter inpatient hospital stays, reduced ICU admissions, and other related costs influenced by increased protocol compliance associated with early, rapid fluid delivery.<sup>5</sup>

There is a significant body of evidence supporting early fluids for sepsis patients, demonstrating improved outcomes, less ICU admissions, and reduced need for interventions. When compared to complicated and cumbersome standard fluid delivery methods, LifeFlow offers significantly faster and more controlled IV fluid resuscitation, which can lead to improved sepsis bundle compliance. These factors, along with published analytic model data,<sup>5</sup> suggest that LifeFlow may lead to significant hospital and patient cost savings in sepsis care.

### Contact Us:

 [info@410medical.com](mailto:info@410medical.com)

 919-241-7900

 <https://410medical.com>

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