

Maximizing Flow with the ELSA

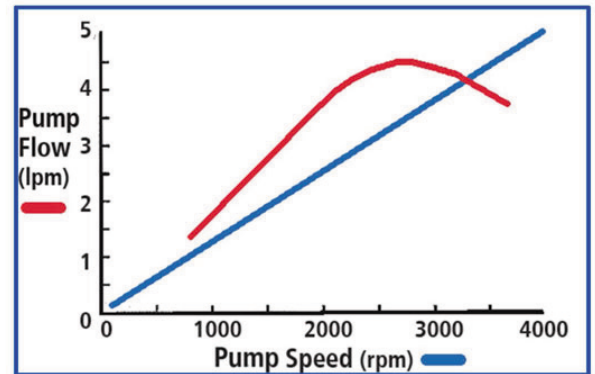
Maximizing patient blood flow during an ECMO run flow is identifying the pump speed that will deliver the highest flow through the ECMO circuit. But simply maximizing flow will not necessarily increase the flow through the patient, or the patient's effective cardiac flow (ECF) proportionally, when recirculating blood is returning directly back to the circuit without going into the patient's circulatory system.

A perfusionist's standard response to maximizing flow is to increase pump speed in order to restore pressure. However, maximizing flow in this standard manner

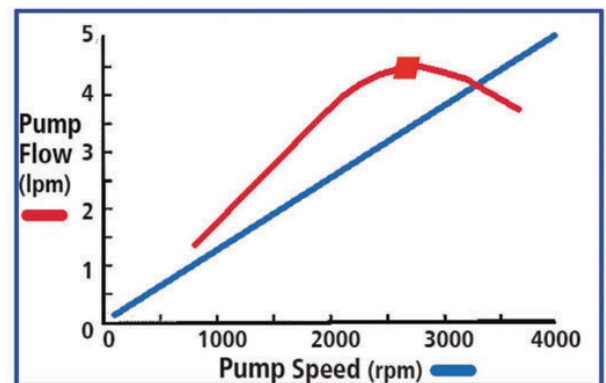
- Doesn't proportionally increase the effective cardiac flow;
- Increases right atrial (RA) pressure;
- Prolongs the treatment.

As shown in the graphs on the right, centrifugal pump speed increases linearly (blue line), but then flow falls off after maximizing, due to turbulence. To maximize flow, minimum flow is identified, and the pump is re-set to the point on the graph (red dot) that is maximum flow.

Maximizing the effective cardiac flow (ECF) shortens the ECMO treatment, but increasing recirculation does not. If increasing flow boosts recirculation considerably, but not ECF, there is a problem. At the very least the treatment will be extended and the patient might be prevented from turning the corner.



Centrifugal pump speed increases linearly (blue line), but the flow falls off after maximizing, due to turbulence.



The maximum flow is identified, and the pump speed re-set to that point (red dot) on the graph that it is maximum.