

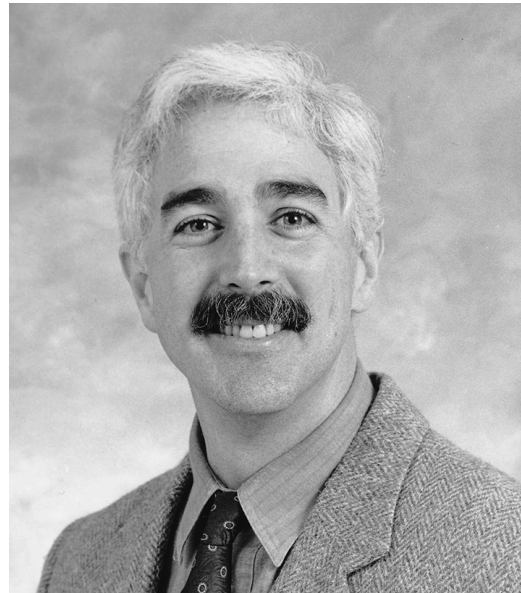
From the Editor

The Importance of Size: When a 'Mini' becomes a 'Maxi'

When dealing with issues of dimension we often use extremes to emphasize the point. Evolution has transcended four billion years, which makes those extra minutes spent in traffic seem rather inconsequential in the time continuum, yet monumental in the daily scheme of things. Such is the case with perfusion as well.

The development of devices used in the cardiopulmonary bypass circuit is based upon two main tenets: mechanical efficiency and clinical safety. Mechanical efficiency is dependent upon numerous variables including the synthetic materials utilized, and the geometrical design of the device. These in turn control the physical movement of fluid through the device, which effects overall performance. Clinical safety issues are likewise a factor of the synthetic materials utilized as well as operating within the operational constraints of the device. During the last several decades a tremendous amount of effort was directed at reducing the overall size of perfusion equipment with the hope of reducing surface area exposure to circulating blood. This had the desirable effect of reducing patient inflammatory response to extracorporeal flow, and lowering dependency upon allogeneic blood products. Despite the interest in such a plausible quest, safe adult cardiopulmonary bypass circuits still require between 1200 and 1800 milliliters of prime solution, while pediatric circuits range from 250 to 1000 milliliters.

During the last year several companies have touted the benefits of pursuing the miniaturization of extracorporeal circuitry in an effort to enhance clinical benefit. One of the leaders in this area has been Cardiovention™ and their system, termed CorX®. has succeeded in reducing the prime volume of extracorporeal flow through an integrated design of standard cardiopulmonary bypass devices. Other manufacturers have embraced this concept as well, Terumo®, Cardiovascular, COBE®, Cardiovascular and Jostra® Corporation will all have commercially available circuits, which are based on an integrated approach to miniaturized bypass. The evaluation of these systems will move rapidly, and if found to be reliable, safe and consis-



tent with cardiopulmonary bypass practice, they will find their way into day-to-day perfusion.

In this issue of the Journal, Merkle and associates describe the use of a 'miniaturized' system of mechanical support in the pediatric population. They have demonstrated that the Berlin Heart Ventricular Assist Device has been used successfully for over 15 years in patients as young as 2 days of age, with a significant number of patients going on to cardiac transplantation. As one of the leading centers for cardiac surgery in the world, such experience is notable for numerous reasons with the ultimate benefit seen in their impressive patient outcomes. As with the interest in mini-bypass, the ventricular assist technology emphasizes the benefit of miniaturization of cardiac devices, and provides us with a clearer path towards the future of extracorporeal circulation. Such a vision seems closer than we could imagine, awaiting only clinical validation and scientific scrutinization.

Sincerely,
Alfred H. Stammers, MSA, CCP
Editor