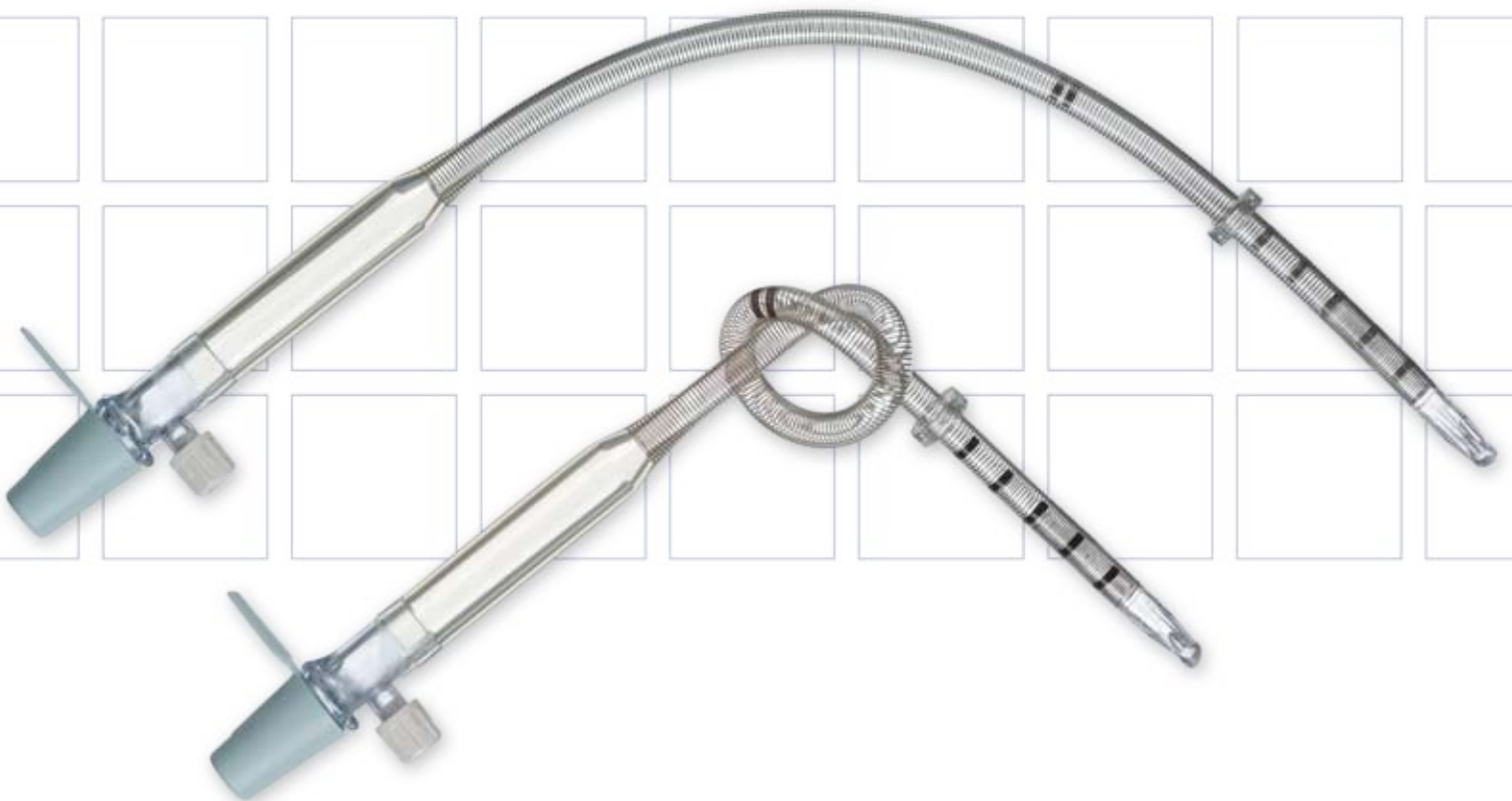


Sarns™ Soft-Flow® Aortic Cannulae

High-flow aortic perfusion with less jetting



Sarns™ Soft-Flow® Aortic Cannulae



Smooth, tapered, reverse-angle tip facilitates insertion and positioning.

Closed diffuser tip decreases velocity and distributes flow.

Large side-vent windows allow for diffuse high-flow perfusion.

Variety of cannula styles satisfies patient and surgical needs.

The best-selling arterial cannulae¹

The Sarns Soft-Flow Aortic Cannula reduces jetting action, producing significantly less peak velocities than other standard cannulae for gentle, more diffuse high-flow perfusion.

The design of the Sarns Soft-Flow cannula is based on extensive experience in blood rheology and a partnership with Delos M. Cosgrove, M.D., Chairman, Department of Thoracic and Cardiovascular Surgery at The Cleveland Clinic. Performance testing was conducted at the Ohio State University Cardiovascular Simulations Laboratory.

More diffuse flow



Gentle, diffuse perfusion of the Sarns Soft-Flow aortic cannula.

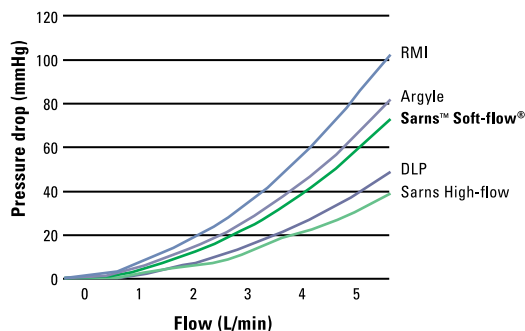


Jetting action typical of standard aortic cannulae.

Normal pressure drop

Pressure drop for the Soft-Flow cannula is in the mid-range of currently available aortic cannulae. High flow rates with the Soft-Flow cannula minimize the concern for pressure drop with no adverse effects on hemolysis.

Terumo in vitro evaluation. Data obtained with water.



High-flow aortic perfusion with less jetting

“Mechanisms of detachment of atherosclerotic material from the aortic intima include external manipulation such as aortic crossclamping, partial occlusion, cannulation, and internal disruption caused by the ‘sandblasting’ effect of the high-velocity jet of blood exiting the aortic cannula and impacting on the atherosclerotic intima or pedunculated atheroma.”²

“Roughly half of patients with coronary disease have some degree of atheroma in the ascending aorta. In only half of them, however, can the existence of aortic atheromas be diagnosed by finger palpation.”³

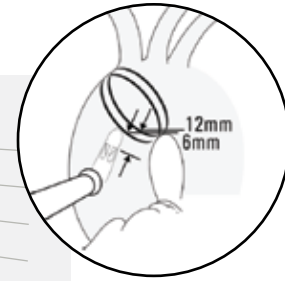
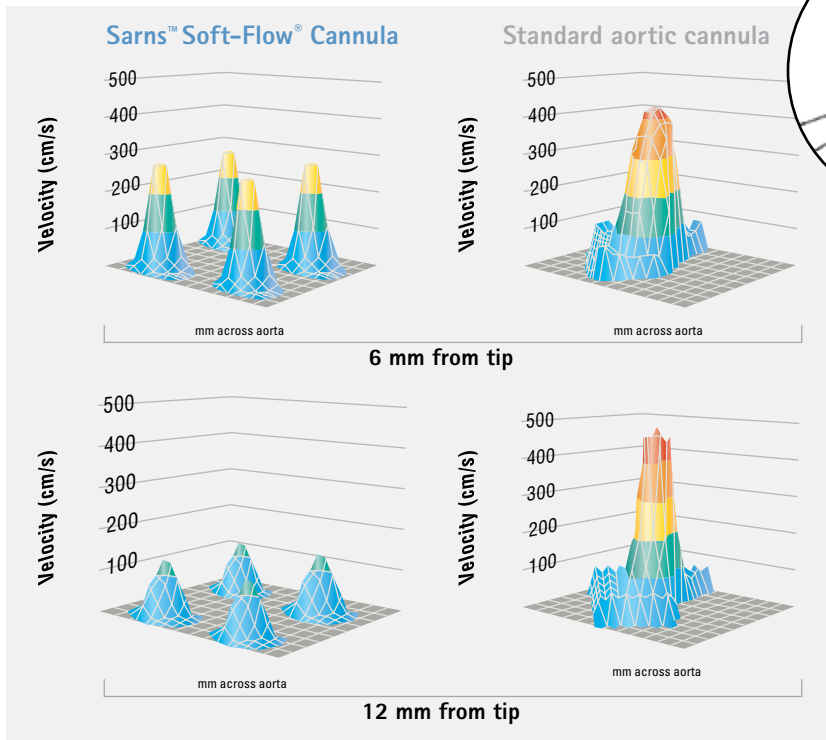


Transesophageal echocardiograph of the aortic arch showing pedunculated atheroma.

Notes

1. Based on available market data citing 350,000 arrested heart procedures annually in the U.S.
2. Blauth CI, Cosgrove DM, Webb BW, et al. Atheroembolism from the ascending aorta. An emerging problem in cardiac surgery. J Cardiovasc Surg. 1992; 103:1104-1112.
3. Bar-El Y, Goor DA. Clamping of the atherosclerotic ascending aorta during coronary artery bypass operations. J Cardiovasc Surg. 1992; 104(2):469-474.

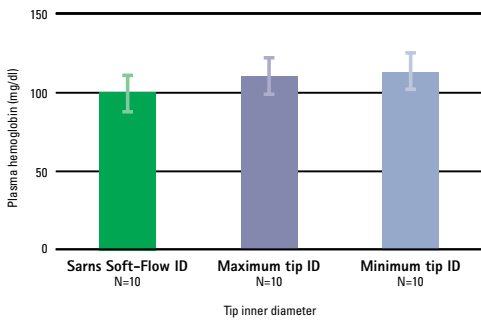
Velocity profiles⁴
(8 mm cannulae @ 6 L/min)



The Sarns™ Soft-Flow® Aortic Cannula produces much lower peak velocity profiles than standard cannulae at distances of 6 mm and 12 mm from the cannula tip opening.

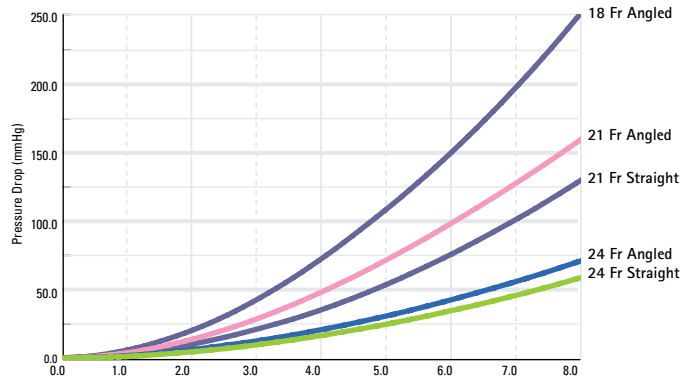
No increased hemolysis

Cannulae with outer diameters (OD) of 8 mm have varying inner diameters (ID). These three aortic cannulae produced no statistically significant difference in plasma-free hemoglobin levels. For purposes of comparison, the Soft-Flow cannula was tested against the two 8 mm OD cannulae with the maximum and minimum ID.⁵



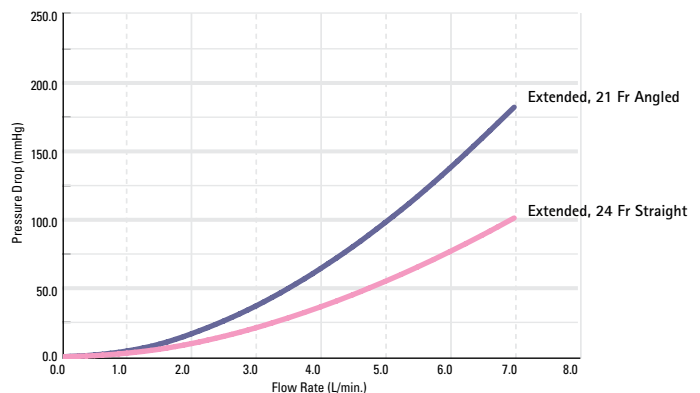
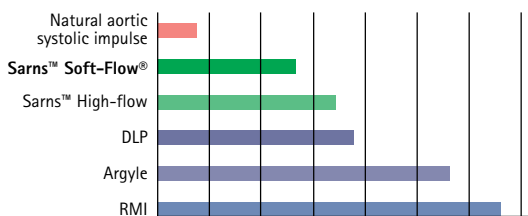
Pressure drop vs. flow rate

Sarns™ Soft-Flow® Aortic Cannula
Terumo in vitro evaluation. Data obtained with water.



Lowest peak velocity

Normal aortic systolic peak velocity is approximately 80 cm/sec. The Soft-Flow cannula is closest to this, producing the lowest peak velocity of any standard cannulae tested.



4. Velocity measured from only one window. Others extrapolated for illustrative purposes.
5. Plasma hemoglobin for 8 mm OD aortic cannulae. Testing done at Terumo Cardiovascular Systems Corporation. One liter of bovine blood in continuous circuit measured after 3 hours at 6 l/min. Soft-Flow and maximum tip flow rates and pump RPMs held constant by adding additional resistance.

The following cannulae were used in comparative testing: Sarns Soft-Flow Aortic Cannula 5762; Sarns High-flow Aortic Arch Cannula 15235; DLP® 83024; Argyle® Aortic Perfusion Cannula THI 591081; RMI ARS-024-C.

Ordering Information

DESCRIPTION

CATALOG NO.

UNITS/CASE

Sarns™ Soft-Flow® Extended Aortic Cannulae

Length: 14.5" (37 cm) long

Non-vented 3/8" connector

| | | |
|---|-----------|----|
| 7.0 mm (21 Fr) with straight tip, wire reinforced body..... | 4948..... | 10 |
| 8.0 mm (24 Fr) with straight tip, wire reinforced body..... | 4950..... | 10 |

Vented 3/8" connector

| | | |
|---|-----------|----|
| 7.0 mm (21 Fr) with straight tip, wire reinforced body..... | 4949..... | 10 |
| 8.0 mm (24 Fr) with straight tip, wire reinforced body..... | 4951..... | 10 |

Sarns™ Soft-Flow® Aortic Cannulae without Suture Flange

Length: wire reinforced: 14" (35 cm); Non-wire: 12" (30 cm)

Non-vented 3/8" connector

| | | |
|---|-----------|----|
| 7.0 mm (21 Fr) with straight tip..... | 5846..... | 10 |
| 8.0 mm (24 Fr) with straight tip..... | 5847..... | 10 |
| 7.0 mm (21 Fr) with straight tip, wire reinforced body..... | 5842..... | 10 |
| 8.0 mm (24 Fr) with straight tip, wire reinforced body..... | 5843..... | 10 |
| 7.0 mm (21 Fr) with angled tip..... | 5779..... | 10 |
| 8.0 mm (24 Fr) with angled tip..... | 5781..... | 10 |
| 6.0 mm (18 Fr) with angled tip, wire reinforced body..... | 7071..... | 10 |
| 7.0 mm (21 Fr) with angled tip, wire reinforced body..... | 5767..... | 10 |
| 8.0 mm (24 Fr) with angled tip, wire reinforced body..... | 5768..... | 10 |

Vented 3/8" connector

| | | |
|---|-----------|----|
| 7.0 mm (21 Fr) with straight tip..... | 5844..... | 10 |
| 8.0 mm (24 Fr) with straight tip..... | 5845..... | 10 |
| 7.0 mm (21 Fr) with straight tip, wire reinforced body..... | 5798..... | 10 |
| 8.0 mm (24 Fr) with straight tip, wire reinforced body..... | 5841..... | 10 |
| 7.0 mm (21 Fr) with angled tip..... | 5772..... | 10 |
| 8.0 mm (24 Fr) with angled tip..... | 5774..... | 10 |
| 6.0 mm (18 Fr) with angled tip, wire reinforced body..... | 7072..... | 10 |
| 7.0 mm (21 Fr) with angled tip, wire reinforced body..... | 5761..... | 10 |
| 8.0 mm (24 Fr) with angled tip, wire reinforced body..... | 5762..... | 10 |

Sarns™ Soft-Flow® Aortic Cannulae with Suture Flange

Length: wire reinforced: 14" (35 cm); Non-wire: 12" (30 cm)

Non-vented 3/8" connector

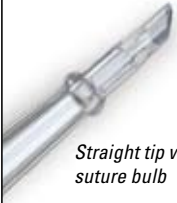
| | | |
|---|-----------|----|
| 7.0 mm (21 Fr) with straight tip..... | 6397..... | 10 |
| 8.0 mm (24 Fr) with straight tip, wire reinforced body..... | 6387..... | 10 |
| 7.0 mm (21 Fr) with angled tip..... | 6398..... | 10 |
| 8.0 mm (24 Fr) with angled tip..... | 6390..... | 10 |
| 7.0 mm (21 Fr) with angled tip, wire reinforced body..... | 6392..... | 10 |
| 8.0 mm (24 Fr) with angled tip, wire reinforced body..... | 6384..... | 10 |

Vented 3/8" connector

| | | |
|---|-----------|----|
| 7.0 mm (21 Fr) with straight tip..... | 6396..... | 10 |
| 7.0 mm (21 Fr) with straight tip, wire reinforced body..... | 6393..... | 10 |
| 8.0 mm (24 Fr) with straight tip, wire reinforced body..... | 6385..... | 10 |
| 7.0 mm (21 Fr) with angled tip..... | 6399..... | 10 |
| 8.0 mm (24 Fr) with angled tip..... | 6391..... | 10 |
| 6.0 mm (18 Fr) with angled tip, wire reinforced body..... | 7080..... | 10 |
| 7.0 mm (21 Fr) with angled tip, wire reinforced body..... | 6394..... | 10 |
| 8.0 mm (24 Fr) with angled tip, wire reinforced body..... | 6386..... | 10 |



Extended,
low profile



Straight tip with
suture bulb



Angled tip with
suture flange

Sarns™ Soft-Flow® Aortic Cannulae

Manufactured by Terumo Cardiovascular Systems Corporation, Ann Arbor, Michigan USA



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