### Most Common Surgical Procedures

<table>
<thead>
<tr>
<th>Surgery</th>
<th>Description</th>
<th>Potential Areas of Bleeding</th>
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<tbody>
<tr>
<td>Carotid endarterectomy (CEA)</td>
<td>Opening of the common carotid artery for removal of plaque, followed by closure with sutures alone or in conjunction with a graft or patch.</td>
<td>Anastomotic suture-line bleeding and/or needle-hole bleeding.</td>
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<td>Abdominal Aortic Aneurysm (AAA) Repair</td>
<td>The AAA repair involves the abdominal aorta extending from the diaphragm to the pelvis where it divides into the common iliac arteries. Depending on the patient’s anatomy, and the location of the aneurysm, the aorta can be reconstructed with a tube graft, an aortic iliac bifurcation graft (Y-graft), or an aortofemoral bypass.</td>
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<td>Femoral-Femoral Bypass (Fem-Fem)</td>
<td>A bypass graft procedure(s) to provide revascularization of blood flow to the lower legs using a graft that bypasses the femoral artery to below the popliteal artery or from one femoral artery to the other.</td>
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<td>Arteriovenous (AV) Fistula</td>
<td>Surgical joining of an artery and a vein under the skin for the purpose of hemodialysis. Sometimes the vessels in the arm are damaged and are not suitable for forming an AV fistula. In these cases a synthetic graft is used to form the attachment between an artery and a vein.</td>
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COSEAL SURGICAL SEALANT IS INDICATED FOR SEALING SUTURE LINES ALONG ARTERIAL AND VENOUS RECONSTRUCTIONS AND FOR PATIENTS UNDERGOING CARDIOVASCULAR SURGERY TO PREVENT OR REDUCE THE INCIDENCE, SEVERITY AND EXTENT OF POST SURGICAL ADHESION FORMATION.

### Application

<table>
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<tr>
<th>Benefits of Using COSEAL Surgical Sealant in Vascular Surgery</th>
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<tbody>
<tr>
<td>1. COSEAL is a flexible and completely synthetic sealant, unlike other sealants such as BIOGLUE. COSEAL is strong enough to withstand the pressures of even the largest vessels, with burst pressures 3x that of high (hypertensive) aortic pressure (in vitro burst test for closure of puncture defects 0.6-0.9 mm in diameter in an animal model).</td>
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<td>2. COSEAL has been clinically proven to adhere to Dacron, ePTFE grafts, and tissue/autologous grafts, which is ideal for vascular reconstruction procedures.</td>
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FOR INTERNAL USE ONLY
Challenges in Vascular Surgery
- Intraoperative and postoperative bleeding from anastomotic sites
- Coagulopathy induced by cardiopulmonary bypass or anticoagulant and antiplatelet drugs
- Bleeding from ePTFE and Dacron graft materials
- Calcified and friable tissue and thin arterial walls

Probing Questions
Questions before COSEAL introduction:
- Is it more challenging to achieve hemostasis in a typical vascular surgery than it was 5-10 years ago?
- How has the increased use of Clopidogrel (PLAVIX) affected your patient’s ability to achieve hemostasis during surgery? What proportion of patients are on this drug? In vascular surgery, do you often keep these patients on anti-platelet drugs before and after the surgery due to embolism risks?
- Do you use products, such as SURGICEL, for hemostasis? For SURGICEL and similar products, the mechanism of action is platelet aggregation. Thus, it is not effective in patient’s with platelet dysfunction or low platelet counts. Do you think it would be best practice to apply something that provided an enduring seal allowing time for the patient to accumulate platelets at the anastomoses?
- What is your overall level of interest in blood management conservation? Do you think that intraoperative and postoperative bleeding from anastomotic sites is an important consideration in any blood management program?
- How often do you experience challenging anastomotic situations because of friable and/or calcified tissue? What are the hemostatic challenges associated with this and how do you manage them?
- What are your concerns regarding postoperative pressure spikes (hypertension) and their impact on the anastomotic suture lines after the patient is awake or sits up for the first time?
- Postoperative bleeding can result in hematomas. Do you routinely use drains to help mitigate this? What are the downsides of using drains (aesthetics, comfort, infection, etc.)?

Objections
I currently use an active topical hemostatic agent (e.g., SURGICEL, AVITENE) to achieve hemostasis. Although these products may be helpful in some patients, topical hemostatic agents such as SURGICEL or AVITENE require a functioning coagulation system to work properly. Many patients undergoing vascular or cardiovascular surgery may not have optimal coagulopathy for a variety of reasons (e.g., use of Clopidogrel (PLAVIX), aspirin, herbal supplements, etc.). COSEAL provides a mechanical barrier at the site of application which requires no participation of the coagulation cascade whatsoever. Thus, COSEAL can be effective even in the face of marked deficiencies in the patient’s intrinsic coagulation mechanism. COSEAL remains at the anastomotic suture lines for multiple days after application allowing the body time to conduct its own internal hemostatic processes.

I’ve heard COSEAL is expensive.
The cost of COSEAL is similar to other sprayable, hydrogel sealants. If one considers the potential costs associated with excessive bleeding, lengthy hospital stay, or reoperation, the cost of COSEAL is not significant by comparison. In addition, COSEAL may confer considerable economic benefits to hospital and health service budgets by reducing both the use of blood products and overall operative time.

Tips for Success
- Work with staff to find what the focus of the surgeon is and what are their current challenges.
- Prepare and demo product with surgeon and staff prior to case. Use the COSEAL Application SpraySheet as a good tool to train the surgeon on ideal application. Explain the advantages and disadvantages between the various applicator options: standard applicator vs. spray applicator.
- Explain proper application to surgeon and staff
  - Apply to a mainly dry surface with the clamps on.
  - Plan on the pathway for anastomotic application. If using the standard applicator remind the surgeon to apply quickly at 3-6 cm from the vessel, and not to pause for a long period of time because the applicator can clog. If there are many anastomoses to perform:
    - Allow 60 seconds for COSEAL to polymerize before touching the anastomosis.
    - If there is still active bleeding after COSEAL application, reclamp and apply more COSEAL. If re-clamping is not possible, use FLOSEAL to achieve a dry surface and irrigate it away, and then apply COSEAL to provide an enduring seal for postoperative protection.
- Discuss precautions before surgery regarding COSEAL. Refer to the Instructions for Use.

Marketing Materials

Vascular Specific Reference Overview

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<tr>
<th>Article Title</th>
<th>Reference</th>
<th>Key Finding</th>
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</thead>
</table>

References
Cardiovascular Procedures

Abbreviation Key:
- AAA: abdominal aortic aneurysm
- CABG: coronary artery bypass graft
- CEA: carotid endarterectomy
- Cross-fem: cross femoral graft
- Fem-fem: femorofemoral graft
- Fem-pop: femoropopliteal graft

Ascending aortic reconstruction
Descending aortic reconstruction

Fem-pop
Cross-fem
Fem-fem
Aortobifemoral
AAA
CEA