

## Model of Thrombosis & Hemostasis SSC Protocol

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Revision History		
Version No.	Effective Date (D/M/Y)	Description
1	05/07/2026	Initial Draft

**Drafted By:** Steven Grover

**Date:** 05/07/2026

**Approved By:** Steven Grover

**Date:** 05/07/2026

### Purpose

Provides a protocol to induce venous thrombosis in mice by stenosis, partial ligation, of the infrarenal inferior vena cava.

### Scope

This document provides a step-by-step protocol for the mouse inferior vena cava stenosis procedure for preclinical surgeons.

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### Materials

Item	Supplier / Manufacturer	Catalog No.
S&T Suture Tying Forceps (x2)	Fine Science Tools	00272-13
Dumont Medical #7 Forceps (x1)	Fine Science Tools	11273-20
Iris Scissors (x1)	Fine Science Tools	14558-09
Halsey Needle Holder (x1)	Fine Science Tools	12501-13
Operating Microscope	AmScope	SM-3NTPZ-144
Rodent Warmer X1	Stoelting	53800R
Clippers	Wahl	88420
Autoclave	MSE Supplies	LS1368
Isoflurane Vaporizer	EZ Systems	EZ-SA800
Waste Gas Canister	EZ Systems	EZ-258
Isoflurane Inhalation Anesthetic	Patterson Veterinary	07-894-8943
Ethiq XR Bupropion	Patterson Veterinary	07-894-7617
Normal Saline	Patterson Veterinary	07-869-6640
Woven Cotton Gauze Sponges 2 x 2 Inch	Medline	NON25212H
Povidone-Iodine Swabsticks	Medline	MDS093901ZZ
Cotton-Tipped Wood Applicators	Medline	MDS202055H
Drape 18W X 26L Inch	Dynarex	4410
70% Ethanol	Sigma-Aldrich	EX0281
Silk Suture, 5-0	Ethicon	682G
Prolene Suture, 5-0	Ethicon	8661G
Nylon Suture, 5-0	Ethicon	661G
Surgical Gloves	Cardinal Health	2D73DP75
Surgical Scrub	Hibiclens	57516

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### Procedure

#### 1.1 Surgical Preparation

- Autoclave all instruments and non-sterile surgical consumables
- Clean the surgical area by wiping down with 70% Ethanol
- Prepare the surgical area with sterile drapes and all necessary instruments and consumables

#### 1.2 Mouse Preparation

- Anesthetize mouse by inhalation of isoflurane gas (1.5%-3%, 1 L/min O<sub>2</sub>) and maintain for the duration of the procedure
- Administer Ethiqo XR
- Remove hair from abdomen with clippers
- Sterilize the surgical site with three alternating applications of povidine and 70% ethanol
- Transfer the mouse to the surgical area
- Ensure an appropriate depth of anesthesia by checking the toe pinch reflex
- Drape the mouse with a small fenestration over the abdomen

#### 1.3 Surgeon Preparation

- Wash hands thoroughly with surgical scrub
- Don a sterile surgical gown
- Put on sterile surgical gloves
- NOTE: Maintain sterility for the duration of the procedure

#### 1.4 Surgical Procedure

- Make a midline laparotomy and externalize the bowel, wrapping in saline wetted gauze
- Mobilize the IVC and adjacent aorta by blunt dissection
- Ligate lateral IVC side branches with 5-0 silk suture
- Separate the IVC and aorta by sharp dissection just distal to the confluence of the left renal vein and the IVC
- Sling a piece of 5-0 silk suture material around the IVC
- Place a length of 5-0 prolene suture on the ventral surface of the IVC as a spacer
- Ligate the 5-0 silk suture tightly around the IVC with inclusion of the spacer
- Remove the spacer
- Return the bowels to the abdominal cavity
- Close the peritoneal layer with 5-0 nylon suture using a continuous stitch
- Close the Skin layer with 5-0 nylon suture using interrupted stitches

#### 1.5 Mouse Recovery

- Place the mouse in an empty cage on a wypall, to prevent aspiration of bedding

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- Monitor the mouse until it regains consciousness
- Thereafter, monitor the mouse every 12 hours until the experiment endpoint checking the incision site and the condition of the mouse

### References

1. Grover SP, Olson TM, Cooley BC and Mackman N. Model-dependent contributions of FXII and FXI to venous thrombosis in mice. *J Thromb Haemost.* 2020;18:2899-2909. (PMID: [33094904](#))
2. Grover SP, Kawano T, Wan J, Tanratana P, Polai Z, Shim YJ, Snir O, Brækkan S, Dhrolia S, Kasthuri RR, Bendapudi PK, McCrae KR, Wolberg AS, Hansen JB, Farkas H, Mackman N. C1 inhibitor deficiency enhances contact pathway mediated activation of coagulation and venous thrombosis. *Blood.* 2023; 141(19):2390-2401(PMID: [36701760](#))

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