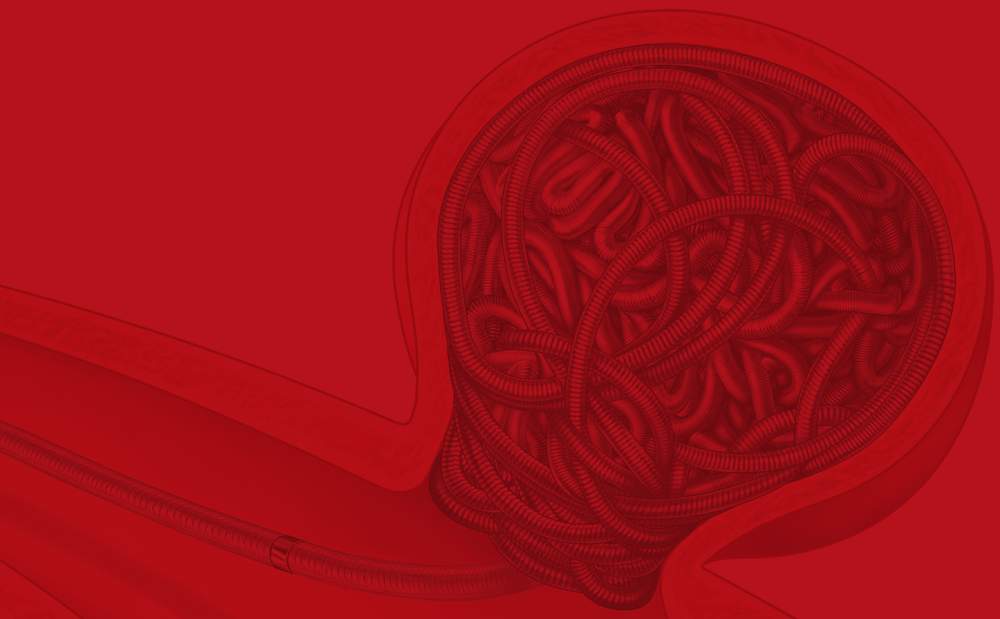
Penumbra



Peripheral

Embolization System

Volume Advantage

30 cm Large Volume Penumbra Coil[a]

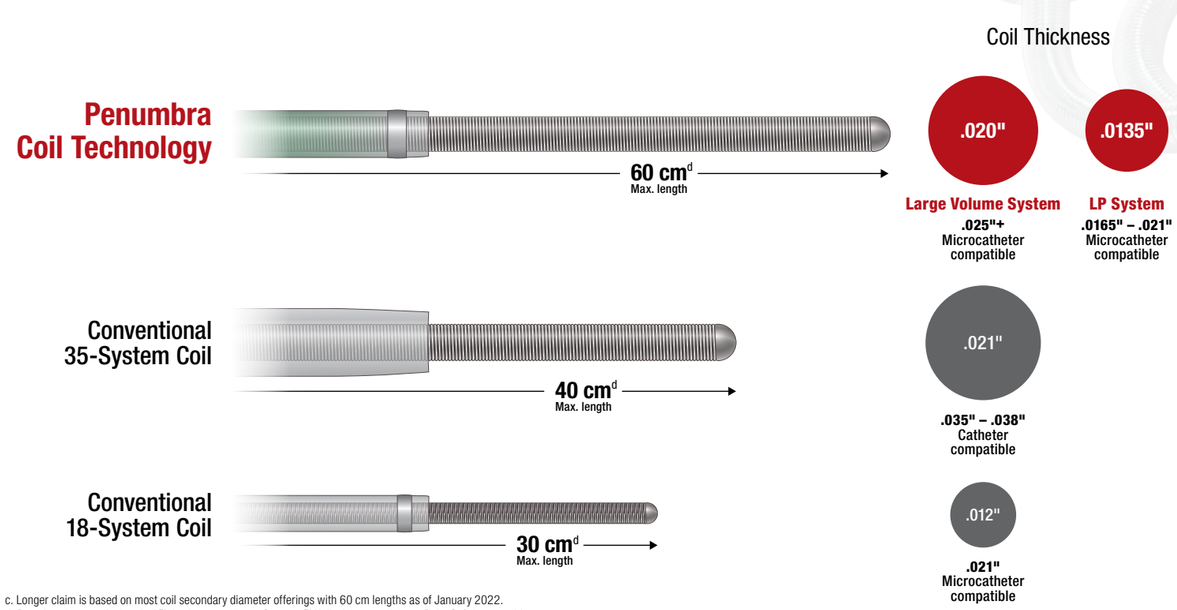
27%
Packing

30 cm Conventional Detachable Coil[b]

12%
Packing

a. Ruby Standard 9 mm × 30 cm.
b. Concerto™ 3D Coil 8 mm × 30 cm.
7.5 mm glass aneurysm. Photographs taken by and on file at Penumbra, Inc. Tests performed and data on file at Penumbra, Inc.
Bench test results may not be indicative of clinical performance. Calculated using AngioSuite packing density calculation tool.

Longer, Larger Coils Deliverable Through High-Flow & Low Profile Microcatheters[c]

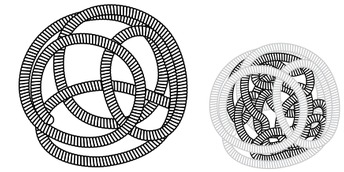


c. Longer claim is based on most coil secondary diameter offerings with 60 cm lengths as of January 2022.
d. Based on 8 mm coils: Interlock™-35 8 mm × 40 cm, Concerto™ Helical 8 mm × 30 cm, Ruby Soft 8 mm × 60.
Renderings for illustrative purposes only.

A Complete Embolization Platform

Ruby® Coil

Frame and Fill Aneurysms and Vessels

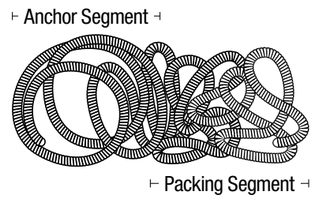


Versatile Soft Coils with 3D Shape

Large Volume Platform • 2 mm × 1 cm – 40 mm × 60 cm
Low Profile Platform • 1 mm × 2 cm – 8 mm × 60 cm

POD®

High-Flow Vessel Sacrifice

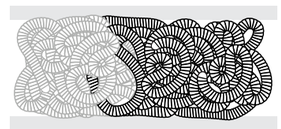


Anchoring and Packing Segment for High-Flow

Large Volume Platform • 3 – 14 mm Devices

Packing Coil

Pack Behind Ruby or POD Backstop



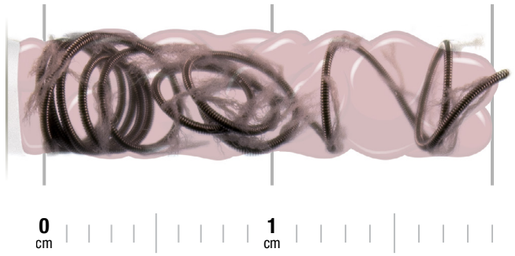
“Liquid Metal” Coil

Large Volume Platform • 5 – 60 cm Lengths
Low Profile Platform • 3 – 60 cm Lengths

Renderings for illustrative purposes only. Individual results may vary depending on patient-specific attributes and other factors.

Softness Advantage

15 cm 18-System Fibered Coil in glass model[e]



Embolization with fibered coils: **~69% thrombus**[1]

1. n = 6 sheep, 7 day mean follow-up

30 cm Large Volume Penumbra Coil in glass model[f]

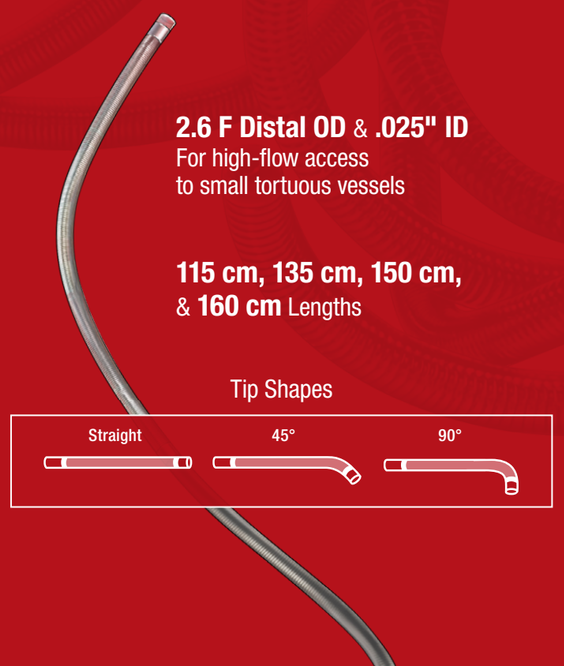
Engineered to pack densely, reducing reliance on thrombus formation[2]

Soft coils pack, forming dense metal occlusion

e. Boston Scientific® Interlock™ 2D Helical Coil 4 mm × 15 cm delivered through Terumo® Progreat® Microcatheter into 4 mm glass tube.
f. 30 cm Packing Coil delivered through Penumbra LANTERN® High-Flow Microcatheter into 4 mm glass tube.
1. Fohlen A, Namur J, Ghegediban H, et al. Peripheral embolization using hydrogel-coated coils versus fibered coils: short-term results in an animal model. *Cardiovasc Intervent Radiol.* 2018;41(2):305-312.
2. Vogler J, Gemender M, Samoilov D. Packing density and long-term occlusion after transcatheter vessel embolization with soft, bare-platinum detachable coils. *Am J Interv Radiol.* 2020;4(2). doi:10.25259/AJIR_31_2019.
Photographs taken by and on file at Penumbra, Inc. Bench test results may not be indicative of clinical performance. Renderings for illustrative purposes only.

LANTERN Microcatheter

Facilitates Precise Coil Detachment

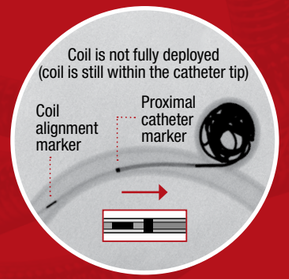


2.6 F Distal OD & **.025" ID**
For high-flow access to small tortuous vessels

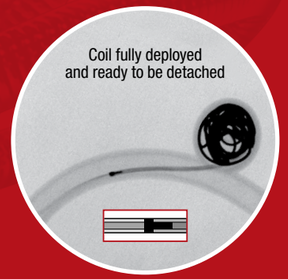
115 cm, 135 cm, 150 cm, & **160 cm** Lengths

Tip Shapes

Ruby Standard deployed from LANTERN High-Flow Microcatheter



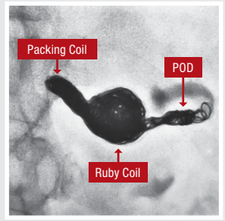
Penumbra Coils are fully retractable and resheathable, enabling user to achieve ideal placement in the target vessel.



Coil alignment marker passes proximal catheter marker to form "T," indicating that the coil can now be detached.

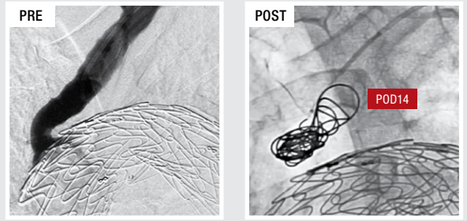
Embolization System Cases

Splenic Artery Embolization



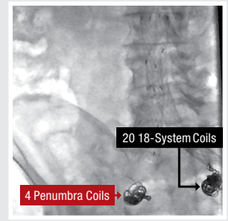
Dr. Thomas Aquisto
Evanston Hospital, IL

Left Subclavian Embolization



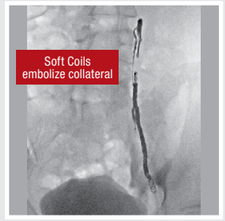
Dr. Frank Arko
Atrium Health, NC

Bilateral Iliac Embolization



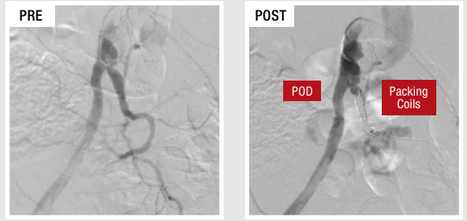
Dr. Herbert Cordero
St. Rose Dominican Siena Campus, NV

Pelvic Congestion Syndrome



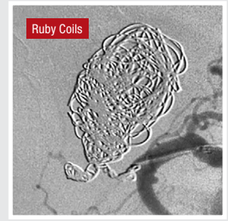
Dr. Parag J. Patel
Medical College of Wisconsin, WI

Hypogastric Artery Embolization



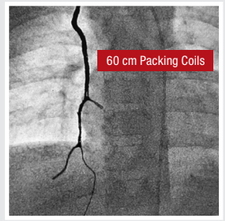
Dr. Naiem Nassiri
Yale University School of Medicine, CT

Hepatic Artery Aneurysm



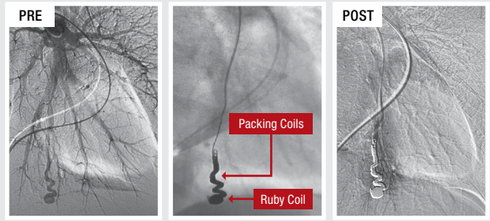
Dr. Abindra Sigdel
University of Louisville Health, KY

Pre Fontan Embolization



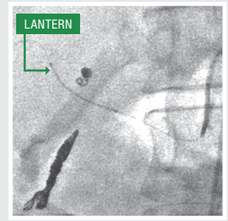
Dr. Saar Danon
Cardinal Glennon Children's Hospital, MO

Pulmonary AVM



Dr. Justin McWilliams
UCLA Medical Center, CA

GDA & Gastric Embolization



Dr. Dmitri Samoilov
Medical Center Radiologists, VA

Large Volume System

.025"+ High-Flow Microcatheter Compatible

Ruby® Coil

Ruby Standard | Frame

Catalog Number	Secondary Diameter (mm)	Length (cm)
RBY2C0305	3	5
RBY2C0312		12
RBY2C0320		20
RBY2C0410	4	10
RBY2C0420		20
RBY2C0435		35
RBY2C0512	5	12
RBY2C0530		30
RBY2C0620	6	20
RBY2C0630		30
RBY2C0725	7	25
RBY2C0825	8	25
RBY2C0840		40
RBY2C1035	10	35
RBY2C1260	12	60
RBY2C1460	14	60
RBY2C1660	16	60
RBY2C1857	18	60
RBY2C2060	20	60
RBY2C2457	24	60
RBY2C2860	28	60
RBY2C3260	32	60
RBY2C3660	36	60
RBY2C4060	40	60

Ruby Soft | Fill

Catalog Number	Secondary Diameter (mm)	Length (cm)
RBY4C0201	2	1
RBY4C0202		2
RBY4C0204		4
RBY4C0305	3	5
RBY4C0315		15
RBY4C0406	4	6
RBY4C0415		15
RBY4C0620	6	20
RBY4C0630		30
RBY4C0835	8	35
RBY4C0860		60
RBY4C1650	16	50
RBY4C2060	20	60

POD®

High-Flow Vessel Sacrifice

Catalog Number	Product	Target Vessel (mm)	Length (cm)
RBYPOD3	POD3	3	20
RBYPOD4	POD4	3.25–4	30
RBYPOD5	POD5	4–5	30
RBYPOD6	POD6	5–6	50
RBYPOD8	POD8	6–8	60
RBYPOD10	POD10	8–10	60
RBYPOD12	POD12	10–12	60
RBYPOD14	POD14	12–14	60

LANTERN® Microcatheter

High-Flow | Optimized for Coil Delivery

Catalog Number	Tip Shape	Length (cm)	ID (in.)
PXSLIMLAN115STR	Straight	115	.025
PXSLIMLAN115T45	45°		
PXSLIMLAN115T90	90°		
PXSLIMLAN135STR	Straight	135	.025
PXSLIMLAN135T45	45°		
PXSLIMLAN135T90	90°		
PXSLIMLAN150STR	Straight	150	.025
PXSLIMLAN150T45	45°		
PXSLIMLAN150T90	90°		
PXSLIMLAN160STR	Straight	160	.025
PXSLIMLAN160T45	45°		
PXSLIMLAN160T90	90°		

Packing Coil

Pack Behind Ruby or POD Backstop

Catalog Number	Product	Length (cm)
RBYPODJ5	Packing Coil 5 cm	5
RBYPODJ15	Packing Coil 15 cm	15
RBYPODJ30	Packing Coil 30 cm	30
RBYPODJ45	Packing Coil 45 cm	45
RBYPODJ60	Packing Coil 60 cm	60

Large Volume System Detachment Handle

Catalog Number	Product
RH1	Detachment Handle

LP System

.0165" – .021" Low Profile Microcatheter Compatible

Ruby Coil LP

Catalog Number	Secondary Diameter (mm)	Length (cm)
RBYLP0102	1	2
RBYLP0105		5
RBYLP0202	2	2
RBYLP0204		4
RBYLP0210		10
RBYLP0304	3	4
RBYLP0310		10
RBYLP0315		15
RBYLP0406	4	6
RBYLP0415		15
RBYLP0430		30
RBYLP0510	5	10
RBYLP0530		30
RBYLP0610	6	10
RBYLP0630		30
RBYLP0740	7	40
RBYLP0860	8	60

Packing Coil LP

Catalog Number	Product	Length (cm)
RBYPCLP03	Packing Coil LP 3 cm	3
RBYPCLP06	Packing Coil LP 6 cm	6
RBYPCLP10	Packing Coil LP 10 cm	10
RBYPCLP15	Packing Coil LP 15 cm	15
RBYPCLP30	Packing Coil LP 30 cm	30
RBYPCLP45	Packing Coil LP 45 cm	45
RBYPCLP60	Packing Coil LP 60 cm	60

LP System Detachment Handle

Catalog Number	Product
RLPH1	LP System Detachment Handle

Ruby Coil System – Indication for Use
The RUBY Coil System is indicated for arterial and venous embolizations in the peripheral vasculature.
Contraindications There are no known contraindications.
Warnings The RUBY Coil System should only be used by physicians who have received appropriate training in interventional techniques.
Precautions • The device is intended for single use only. Do not resterilize or reuse. Resterilization and/or reuse may compromise the structural integrity of the device or increase the risk of contamination or infection leading to device failure and/or cross-infection and potential patient injury, illness, or death. • Do not use kinked or damaged devices. Do not use opened or damaged packages. Return all damaged devices and packaging to the manufacturer/distributor. • Use prior to the "Use By" date. • Use device in conjunction with fluoroscopic guidance. • Do not advance or retract the device against resistance without careful assessment of the cause using fluoroscopy. • Moving or torquing the device against resistance may result in damage to the vessel or device. • Maintain a constant infusion of an appropriate flush solution.
Potential Adverse Events Potential complications include but are not limited to: acute occlusion; air embolism; allergic reaction and anaphylaxis from contrast media; aneurysm rupture; arteriovenous fistula; coagulopathy; coil herniation into parent vessel; death; device malfunction; distal embolization; emboli; embolic stroke and other cerebral ischemic events; false aneurysm formation; hematoma or hemorrhage at access site of entry; incomplete aneurysm occlusion; infection; intima dissection; intracranial hemorrhage; ischemia; myocardial infarction; neurological deficits including stroke; parent artery occlusion; peripheral thromboembolic events; post-embolization syndrome; premature device detachment; recanalization; renal failure; respiratory failure; revascularization; thromboembolic episodes; vessel spasm, thrombosis, dissection, or perforation.

POD System – Indication for Use
For POD Coils with nominal sizes ≤ 6 mm The POD System is indicated for the embolization of: • Intracranial aneurysms. • Other neurovascular abnormalities such as arteriovenous malformations and arteriovenous fistulae. • Arterial and venous embolizations in the peripheral vasculature. For POD Coils with nominal sizes > 6 mm The POD System is indicated for arterial and venous embolizations in the peripheral vasculature.
Contraindications There are no known contraindications.
Warnings The POD System should only be used by physicians who have received appropriate training in interventional techniques.
Precautions • The device is intended for single use only. Do not resterilize or reuse. Resterilization and/or reuse may compromise the structural integrity of the device or increase the risk of contamination or infection leading to device failure and/or cross-infection and potential patient injury, illness, or death. • Do not use kinked or damaged devices. Do not use opened or damaged packages. Return all damaged devices and packaging to the manufacturer/distributor. • Use prior to the "Use By" date. • Use device in conjunction with fluoroscopic guidance. • Do not advance or retract the device against resistance without careful assessment of the cause using fluoroscopy. If POD cannot be advanced or retracted, withdraw the device as a unit with the microcatheter. • Moving or torquing the device against resistance may result in damage to the vessel or device. • Maintain a constant infusion of an appropriate flush solution.
Potential Adverse Events Possible complications include, but are not limited to, the following: acute occlusion; air embolism; allergic reaction and anaphylaxis from contrast media; aneurysm rupture; arteriovenous fistula; coagulopathy; coil herniation into parent vessel; death; device malfunction; distal embolization; emboli; embolic stroke and other cerebral ischemic events; false aneurysm formation; hematoma or hemorrhage at access site of entry; incomplete aneurysm occlusion; infection; intima dissection; intracranial hemorrhage; ischemia; myocardial infarction; neurological deficits including stroke; parent artery occlusion; peripheral thromboembolic events; post-embolization syndrome; premature device detachment; recanalization; renal failure; respiratory failure; revascularization; thromboembolic episodes; vessel spasm, thrombosis, dissection, or perforation.

Penumbra LP Coil System – Indication for Use
The Penumbra LP Coil System is indicated for the embolization of: • Intracranial aneurysms. • Other neurovascular abnormalities such as arteriovenous malformations and arteriovenous fistulae. • Arterial and venous embolizations in the peripheral vasculature.
Contraindications There are no known contraindications.
Warnings • The Penumbra LP Coil System should only be used by physicians who have received appropriate training in interventional techniques. • Do not use kinked or damaged devices. Do not use opened or damaged packages. Return damaged devices and packaging to the manufacturer/ distributor. • Do not advance or withdraw the device against resistance without careful assessment of the cause using fluoroscopy. • If resistance is encountered when withdrawing the coil, withdraw the microcatheter until the resistance subsides. • Do not rotate the delivery pusher during use. Rotating the delivery pusher may result in premature detachment, which could lead to coil damage, incorrect positioning, or vessel damage. • Verify repeatedly that the microcatheter is not under stress before coil detachment. Stored forces in the microcatheter could cause the tip to move during detachment, which could lead to lesion rupture. • Advancing the delivery pusher beyond the microcatheter tip could lead to lesion rupture.
Precautions • The device is intended for single use only. Do not resterilize or reuse. Resterilization and/or reuse may compromise the structural integrity of the device or increase the risk of contamination or infection leading to device failure and/or cross-infection and potential patient injury, illness or death. • Use prior to the "Use By" date. • Use device in conjunction with fluoroscopic guidance. • As in all fluoroscopy procedures, consider all necessary precautions to limit patient radiation exposure by using sufficient shielding, reducing fluoroscopy times and modifying radiation technical factors whenever possible. • Moving or torquing the device against resistance may result in damage to the vessel or device. • Maintain a constant infusion of an appropriate flush solution. • The device may create local field inhomogeneity and susceptibility artifacts during magnetic resonance angiography (MRA), which may degrade the diagnostic quality to assess effective lesion treatment.
Potential Adverse Events Potential complications include but are not limited to: acute occlusion; air embolism; allergic reaction and anaphylaxis from contrast media; aneurysm rupture; arteriovenous fistula; coagulopathy; coil herniation into parent vessel; death; device malfunction; distal embolization; emboli; embolic stroke and other cerebral ischemic events; false aneurysm formation; hematoma or hemorrhage at access site of entry; incomplete aneurysm occlusion; infection; intima dissection; intracranial hemorrhage; ischemia; myocardial infarction; neurological deficits including stroke; parent artery occlusion; peripheral thromboembolic events; post-embolization syndrome; premature device detachment; radiation exposure that may lead to cataracts, skin reddening, burns, alopecia, or neoplasia from x-ray exposure; recanalization; renal failure; respiratory failure; revascularization; thromboembolic episodes; vessel spasm, thrombosis, dissection, or perforation.

Penumbra Delivery Microcatheters – Indication for Use
The Penumbra Delivery Microcatheters are intended to assist in the delivery of diagnostic agents, such as contrast media, and therapeutic devices, such as occlusion coils to the peripheral and neuro vasculature.
Contraindications There are no known contraindications.
Warnings The Penumbra Delivery Microcatheters should only be used by physicians who have received appropriate training in interventional techniques.
Precautions • The devices are intended for single use only. Do not resterilize or reuse. Resterilization and/or reuse may result in ineffective catheter coating lubrication, which may result in high friction and the inability to access the target location. • Do not use kinked or damaged devices. Do not use open or damaged packages. Return all damaged devices and packaging to the manufacturer/distributor. • Use prior to the "Use By" date. • Use the Penumbra Delivery Microcatheters in conjunction with fluoroscopic visualization. • Do not advance or withdraw the Penumbra Delivery Microcatheters against resistance without careful assessment of the cause using fluoroscopy. If the cause cannot be determined, withdraw the device. Moving or torquing the device against resistance may result in damage to the vessel or device. • Maintain a constant infusion of an appropriate flush solution. • If flow through the device becomes restricted, do not attempt to clear the lumen by infusion. Remove and replace the device.
Potential Adverse Events Possible complications include, but are not limited to, the following: acute occlusion; hematoma or hemorrhage at access site; death; intracranial hemorrhage; hemorrhage; infection (at access site); distal embolization; ischemia (cardiac and/or cerebral); embolus (air, foreign body, thrombus, plaque); aneurysm perforation; false aneurysm formation; neurological deficits including stroke; vessel spasm, thrombosis, dissection, perforation or rupture; air embolism; emboli.

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Penumbra™

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Caution: Federal (USA) law restricts these devices to sale by or on the order of a physician. Prior to use, please refer to the Instructions for Use for complete product indications, contraindications, warnings, precautions, potential adverse events, and detailed instructions for use. Please contact your local Penumbra representative for more information.