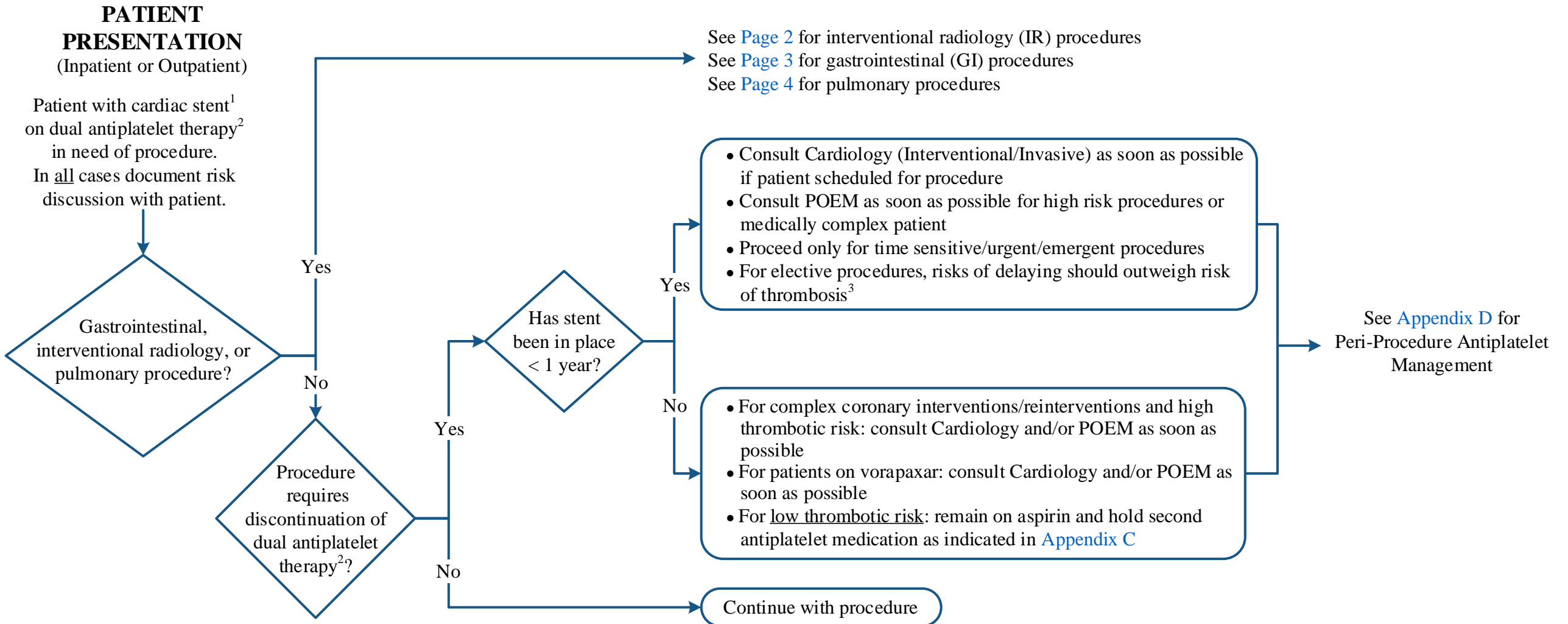


# Management of Antiplatelet Therapy in Patients with Cardiac Stents Undergoing Procedures

Disclaimer: This algorithm has been developed for MD Anderson using a multidisciplinary approach considering circumstances particular to MD Anderson's specific patient population, services and structure, and clinical information. This is not intended to replace the independent medical or professional judgment of physicians or other health care providers in the context of individual clinical circumstances to determine a patient's care. This algorithm should not be used to treat pregnant women.



POEM = Peri-operative Evaluation and Management Center

<sup>1</sup> Includes bare metal and drug eluting stents; see [Appendix A](#) for FDA approved drug eluting stents

<sup>2</sup> Dual antiplatelet therapy: aspirin plus one of the second antiplatelet agents listed in [Appendix B](#)

**Note:** The proceduralist determines whether the procedure can be performed safely while on dual antiplatelet therapy with risk of acceptable bleeding

<sup>3</sup> Risk of thrombosis: 6% risk of perioperative stent thrombosis and 45% mortality for perioperative myocardial infarction secondary to stent thrombosis

# Management of Antiplatelet Therapy in Patients with Cardiac Stents Undergoing Procedures

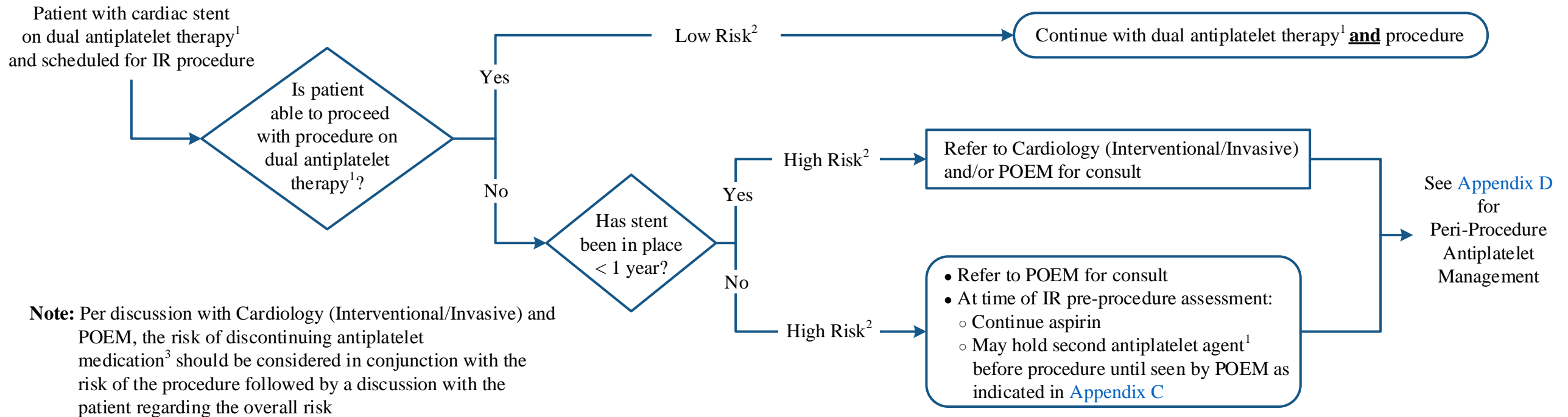
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## IR Procedures

**PATIENT PRESENTATION**  
 (Inpatient or Outpatient)

**PROCEDURE RISK**

**TREATMENT**



<sup>1</sup> Dual antiplatelet therapy: aspirin plus one of the second antiplatelet agents listed in [Appendix B](#)

<sup>2</sup> IR Procedural Bleeding Risks – see [Appendix E](#)

<sup>3</sup> Risk of discontinuing antiplatelet medication will be evaluated by the Interventional/Invasive Cardiology group based on:

- Type of stent
- Size of vessel and location
- Pressure deployed
- Comorbidities (*i.e.*, diabetes, renal insufficiency)
- Imaging modality – optical coherence tomography (OCT) or intravascular ultrasound (IVUS) at end of procedure
- Acute or chronic setting of initial stent implantation

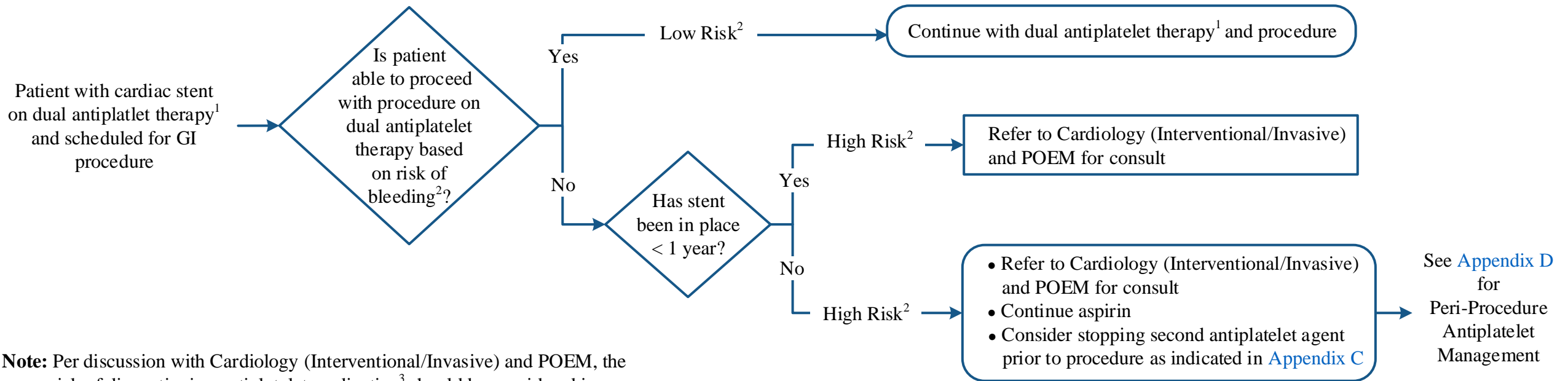
# Management of Antiplatelet Therapy in Patients with Cardiac Stents Undergoing Procedures

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## GI Procedures

**PATIENT PRESENTATION**  
 (Inpatient or Outpatient)

**TREATMENT**



**Note:** Per discussion with Cardiology (Interventional/Invasive) and POEM, the risk of discontinuing antiplatelet medication<sup>3</sup> should be considered in conjunction with the risk of the procedure followed by a discussion with the patient regarding the overall risk

<sup>1</sup> Dual antiplatelet therapy: aspirin plus one of the second antiplatelet agents listed in [Appendix B](#)

<sup>2</sup> GI Procedural Bleeding Risks – see [Appendix F](#)

<sup>3</sup> Risk of discontinuing antiplatelet medication will be evaluated by the Interventional/Invasive Cardiology group based on:

- Type of stent
- Comorbidities (*i.e.*, diabetes, renal insufficiency)
- Pressure deployed
- Size of vessel and location
- Imaging modality - OCT or IVUS at end of procedure
- Acute or chronic setting of initial stent implantation

# Management of Antiplatelet Therapy in Patients with Cardiac Stents Undergoing Procedures

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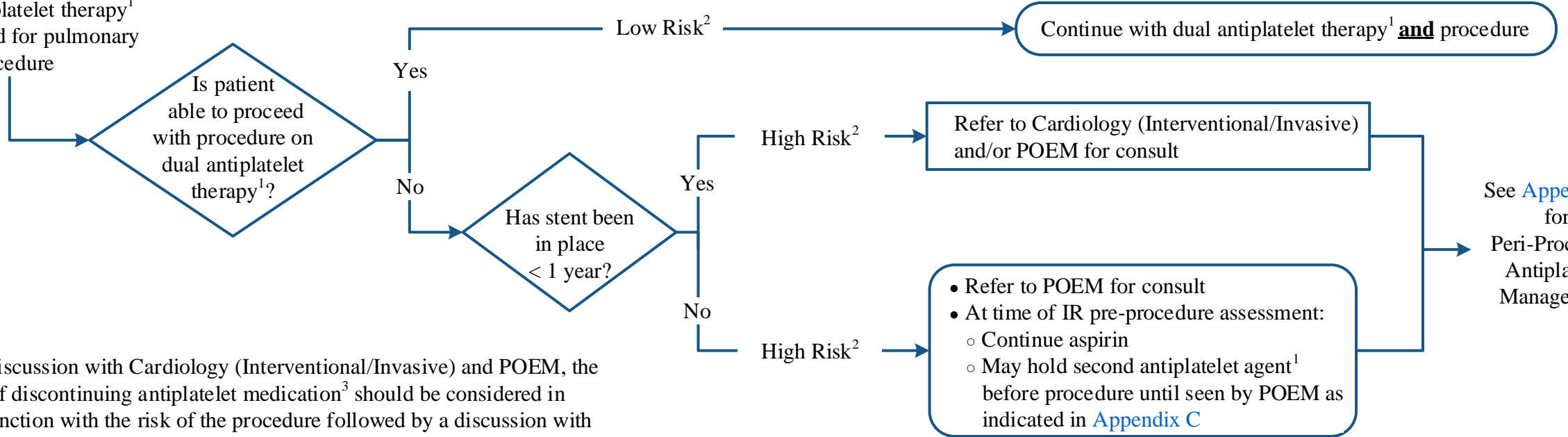
## Pulmonary Procedures

**PATIENT PRESENTATION**  
 (Inpatient or Outpatient)

**PROCEDURE RISK**

**TREATMENT**

Patient with cardiac stent on dual antiplatelet therapy<sup>1</sup> and scheduled for pulmonary procedure



**Note:** Per discussion with Cardiology (Interventional/Invasive) and POEM, the risk of discontinuing antiplatelet medication<sup>3</sup> should be considered in conjunction with the risk of the procedure followed by a discussion with the patient regarding the overall risk

<sup>1</sup> Dual antiplatelet therapy: aspirin plus one of the second antiplatelet agents listed in [Appendix B](#)  
<sup>2</sup> Pulmonary Procedural Bleeding Risks – see [Appendix G](#)  
<sup>3</sup> Risk of discontinuing antiplatelet medication will be evaluated by the Interventional/Invasive Cardiology group based on:

- Type of stent
- Comorbidities (i.e., diabetes, renal insufficiency)
- Size of vessel and location
- Imaging modality – OCT or IVUS at end of procedure
- Pressure deployed
- Acute or chronic setting of initial stent implantation

# Management of Antiplatelet Therapy in Patients with Cardiac Stents Undergoing Procedures

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## APPENDIX A: FDA Approved Drug Eluting Stents

Stent	Company	Date Approved
• Sirolimus		
○ Cypher™	J&J/Cordis	3/2003
• Paclitaxel		
○ Taxus®	Boston Scientific	3/2004
○ Taxus Liberte®	Boston Scientific	10/2008
○ ION™	Boston Scientific	4/2011
• Zotarolimus		
○ Endeavor®	Medtronic	2/2008
○ Resolute Integrity™	Medtronic	2/2012
○ Resolute Onyx™	Medtronic	2/2018
• Everolimus		
○ XIENCE V®	Guidant/Abbott	7/2008
○ Promus®	Boston Scientific	7/2008
○ Promus Element™ Plus	Boston Scientific	11/2011
○ Synergy™	Boston Scientific	10/2015
○ Xience Sierra™	Abbott	5/2018

## APPENDIX B: Antiplatelet Agents

Dual antiplatelet therapy consists of aspirin and one of the second antiplatelet agents
<ul style="list-style-type: none"> <li>• Aspirin</li> </ul>
<b>Second antiplatelet agent:</b>
<ul style="list-style-type: none"> <li>• Clopidogrel (Plavix®)</li> <li>• Ticagrelor (Brilinta™)</li> <li>• Prasugrel (Effient®)<sup>1</sup></li> <li>• Vorapaxar (Zontivity®)<sup>1</sup></li> </ul>
<b>Short-term agents administered parenterally:</b>
<ul style="list-style-type: none"> <li>• Glycoprotein IIb/IIIa inhibitors</li> <li>• Abciximab (ReoPro®)<sup>1</sup></li> <li>• Eptifibatide (Integrilin®)</li> <li>• Tirofiban (Aggrastat®)<sup>1</sup></li> </ul>

## APPENDIX C: Recommended Hold Days for Second Antiplatelet Agents

Second Antiplatelet	Recommended Hold Days
Clopidogrel (Plavix®)	5
Ticagrelor (Brilinta™)	5
Prasugrel (Effient®) <sup>1</sup>	5
Vorapaxar (Zontivity®) <sup>1</sup>	8

<sup>1</sup> Not currently on UT MD Anderson Cancer Center formulary

# Management of Antiplatelet Therapy in Patients with Cardiac Stents Undergoing Procedures

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## APPENDIX D: Peri-Procedure Antiplatelet Management

- Aspirin 81 mg throughout peri-procedure period unless risk of peri-procedure bleeding outweighs risk of stent thrombosis
- If on dual anti-platelet therapy, hold second agent prior to procedure as indicated in [Appendix C](#)
- After procedure: administer second agent<sup>1</sup> with a one-time loading dose if recommended by Cardiology (Interventional/Invasive)/POEM:
  - Clopidogrel loading dose 300 mg **or**
  - Ticagrelor loading dose 180 mg **or**
  - Prasugrel<sup>2</sup> loading dose 60 mg
- Resume maintenance dose on the following day after the loading dose<sup>1</sup>:
  - Clopidogrel maintenance dose 75 mg daily **or**
  - Ticagrelor maintenance dose 90 mg twice daily to start 12 hours after loading dose **or**
  - Prasugrel<sup>2</sup> maintenance dose 10 mg once daily

## APPENDIX E: IR Procedural Bleeding Risks

Low Risk of Bleeding	High Risk of Bleeding
<ul style="list-style-type: none"> <li>• Non-tunneled venous access</li> <li>• Central line removal (non-tunneled)</li> <li>• IVC filter placement or retrieval</li> <li>• Drainage catheter exchange greater than 6 weeks (biliary, nephrostomy, abscess)</li> <li>• Thoracentesis</li> <li>• Non-tunneled chest tube placement (pleural space)</li> <li>• Paracentesis</li> <li>• Intraperitoneal catheter placement</li> <li>• Superficial (e.g., lymph nodes) or palpable mass biopsies</li> <li>• Superficial abscess drainage</li> </ul>	<ul style="list-style-type: none"> <li>• Transjugular liver biopsy</li> <li>• Tunneled central venous catheter placement or removal</li> <li>• Angiography, arterial intervention with access size up to 6 French</li> <li>• Trans-arterial embolotherapy</li> <li>• Venous interventions</li> <li>• Portal vein embolization and stenting</li> <li>• Non-organ biopsy (e.g., retroperitoneal, vertebral, intra-abdominal)</li> <li>• Non-organ drainage (e.g., abdominal or retroperitoneal abscess)</li> <li>• Drainage catheter exchange less than 6 weeks (biliary, nephrostomy, abscess)</li> <li>• Gastrostomy tube placement</li> <li>• Spine procedures: vertebroplasty, kyphoplasty</li> <li>• Tunneled drainage catheter placement (e.g., Denver catheter)</li> </ul>

<sup>1</sup> Consult Cardiology (Interventional/Invasive) and/or POEM for post procedure management of vorapaxar

<sup>2</sup> Not currently on UT MD Anderson Cancer Center formulary

# Management of Antiplatelet Therapy in Patients with Cardiac Stents Undergoing Procedures

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## APPENDIX F: GI Procedural Bleeding Risks

### Low Risk of Bleeding:

- Diagnostic procedures with or without biopsy
- Biliary or pancreatic stenting
- Diagnostic endoscopic ultrasound
- ERCP without sphincterotomy (to be further individualized based on discussion with endoscopist)
- Endoscopic ultrasound without fine needle aspiration (to be further individualized based on discussion with endoscopist)
- Capsule endoscopy

### High Risk of Bleeding:

- Colonoscopic polypectomy
- ERCP with sphincterotomy
- Endoscopic mucosal resection or endoscopic submucosal dissection
- Endoscopic dilatation of strictures on the upper or lower GI tract
- Endoscopic therapy of varices
- Percutaneous gastrostomy
- Treatment of varices
- Endoscopy hemostasis
- Endoscopic ultrasound with fine needle aspiration (to be further individualized based on discussion with endoscopist)
- Endoscopic ablative therapies (Barrx ablation or cryotherapy for Barrett's and/or tumor ablation with argon plasma coagulator)

ERCP = endoscopic retrograde cholangiopancreatography

## APPENDIX G: Pulmonary Procedural Bleeding Risks

### Low Risk of Bleeding:

- Diagnostic bronchoscopy airway exam
- Diagnostic bronchoscopy with BAL
- Thoracentesis

### High Risk of Bleeding:

- Diagnostic bronchoscopy with EBUS TBNA
- Tunneled pleural catheter placement or removal
- Diagnostic bronchoscopy with transbronchial biopsy
- Diagnostic bronchoscopy with endobronchial biopsy
- Therapeutic bronchoscopy with endobronchial tumor destruction, stenosis relief, management of hemoptysis
- Pleuroscopy, pleural biopsy

BAL = bronchial alveolar lavage

EBUS TBNA= endobronchial ultrasound-guided needle aspiration

# Management of Antiplatelet Therapy in Patients with Cardiac Stents Undergoing Procedures

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# Management of Antiplatelet Therapy in Patients with Cardiac Stents Undergoing Procedures

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## DEVELOPMENT CREDITS

This practice consensus statement is based on majority opinion of the Management of Antiplatelet Therapy in Patients with Cardiac Stents Undergoing Procedures work group at the University of Texas MD Anderson Cancer Center for the patient population. These experts included:

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