Management of Antiplatelet Therapy in Patients with Arterial Stents Around the Time of Surgeries and Procedures

- Stopping antiplatelet therapy in a patient with an arterial stent can be catastrophic. Thrombosis occurs in up to 25% of coronary artery stents when antiplatelet therapy is discontinued early. If thrombosis is symptomatic, the mortality rate can be as high as 45%.
- Platelet function testing may be used in select settings, but has not been shown to be a reliable indicator of in-vivo clotting.
- Before stopping antiplatelet therapy, even temporarily in a patient with an arterial stent, follow the guidelines below. If you are uncertain about how to instruct the patient, then consult the Ross Clinical Specialty Pharmacists at PharmacyRossClinicalStaff@osumc.edu or 614-293-8900, or the OPAC / PREOP Clinic at 614-366-7590.

1. Assess the Risks
   - Risk of thrombosis if the antiplatelet is stopped
   - Risk of bleeding if the antiplatelet is not stopped

2. Proceed to an Emergent Procedure
   - Notify the physician who placed the stent
   - Consider contacting Benign Hematology (614-293-9441) for recommendations on hemostasis

3. Postpone an Elective Procedure
   - Postpone elective procedures until the patient completes a full course of antiplatelet therapy. (See next page for antiplatelet therapy regimens.)

4. Always Continue Low-Dose Aspirin
   - Possible exceptions to continuing low-dose aspirin:
     - Intracranial surgery
     - Spinal canal surgery
     - Posterior chamber of eye surgery
     - Certain urologic procedures
   - Because of the potential dire consequences of bleeding and the difficulty of compressing these surgical sites, the surgeon, the patient, and the prescribing physician may decide to hold aspirin for 3-5 days prior to the surgery.
   - Document why aspirin is being held, when it can be resumed, and the discussion with patient. For documentation responsibilities please see Appendix.
   - For patients with an aspirin allergy consider consulting Allergy/Immunology to evaluate for aspirin desensitization.

5. Decide About Non-Aspirin Antiplatelet Therapy
   - Determine the plan for non-aspirin antiplatelet therapy by obtaining the information below and in the next column for every stent.
     - Type of stent: bare metal or drug eluting
     - Date stent was placed
     - Contact information for the physician who placed the stent
     - Precise location of the stent
     - Current medications, history of allergy / adverse medication reaction especially to antiplatelet agents
   - If the bleeding risks are thought to outweigh the thrombosis risks then consider the following pre-procedure holding times:

<table>
<thead>
<tr>
<th>Antiplatelet</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clopidogrel (Plavix®)</td>
<td>5-7</td>
</tr>
<tr>
<td>Prasugrel (Effient®)</td>
<td>7</td>
</tr>
<tr>
<td>Ticagrelor (Brilinta®)</td>
<td>5</td>
</tr>
<tr>
<td>Ticlopidine (Ticlid®)</td>
<td>10-14</td>
</tr>
</tbody>
</table>

   - Document why the non-aspirin antiplatelet therapy is being held, when it can be resumed, and the discussion with the patient. For documentation responsibilities please see Appendix A.

   NOTE: Consider perioperative ECG and/or biomarker monitoring for cardiac ischemia in high-risk patients who must temporarily hold antiplatelet therapy.

6. Educate the Patient
   - Inform the patient of the risks and consequences of both stent thrombosis and bleeding.
   - Provide the patient specific written instructions about continuing or holding and resuming antiplatelet therapy.

7. Resume Antiplatelet Therapy ASAP after Procedure
   - Assess the risks of bleeding and of stent thrombosis.
   - Ideally, resume full antiplatelet therapy as soon as hemostasis is achieved.
   - For some patients, it may be appropriate to restart with a loading dose (e.g., 300-600 mg of clopidogrel).

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Common Antiplatelet Regimens for Patients after Stent Implantation

- **Coronary Artery: Bare Metal Stents or Drug-Eluting Stents for Acute Coronary Syndrome (ACS) Indication**
  - Aspirin 81 mg daily life-long plus Clopidogrel 75 mg daily or prasugrel 10 mg daily or ticagrelor 90 mg twice daily for at least 12 months

- **Coronary Artery: Bare Metal Stents for Non-ACS Indication**
  - Aspirin 81 mg daily life-long plus Clopidogrel 75 mg daily for a minimum of 1 month, and ideally up to 12 months*

- **Coronary Artery: Drug-Eluting Stents for Non-ACS Indication**
  - Aspirin 81 mg daily life-long plus Clopidogrel 75 mg daily for at least 12 months

- **Neurosurgery: Bare Metal Stent-Assisted Coilings**
  - Clopidogrel 75 mg daily for 6 weeks-6 months, and then aspirin 81-325 mg daily life-long

- **Neurosurgery: Pipeline Stents**
  - Clopidogrel 75 mg daily for 3 months, plus aspirin 81-325 mg daily life-long

- **Peripheral / Carotid: Bare Metal Stents**
  - Clopidogrel 75 mg daily for 1 month, and then aspirin 81-325 mg life-long

- **Renal: Bare Metal Stents**
  - Clopidogrel 75 mg daily for 1-12 months, and then aspirin 81-325 mg daily life-long

*1 month is usually preferred; but if the patient is at high bleeding risk, then 2 weeks can be considered with cardiology consult.

Risk Factors for Stent Thrombosis

- **Anatomic Risks**
  - Small diameter stent (<3 mm)
  - Long (>18 mm) stent
  - Multiple stents
  - Left main stenting
  - Ostial stenting
  - Bifurcation stenting
  - Coils in the vessel lumen

- **Clinical Risks**
  - Previous stent thrombosis
  - High-risk indication for stent
  - Low ejection fraction
  - Diabetes
  - Renal impairment
  - Advanced age (>80 years)
  - Exposed coil/stent

References

- Management of Antithrombotic Therapy in Patients Undergoing Invasive Procedures. NEJM 2013;368:2113-2124

Quality Measures

- Number of unique reports of stent thrombosis due to discontinuation of antiplatelet therapy per month.
  - This includes formal and informal, solicited and spontaneous reports. Reports will be verified by IHIS patient record review. The goal is to decrease the number of incidents per month.
- Spot surveys of preoperative clinics for written instructions to patients with stents regarding peri-procedural management of antiplatelet therapy. Clinics include the OPAC, surgeons’ clinics and proceduralists’ clinics.
  - The first measure is that there are written instructions. The instructions must be in IHIS and must be part of the After Visit Summary.
  - The second measure is that the instructions conform to the guidelines.
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Guideline Approved

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Disclaimer

Clinical practice guidelines and algorithms at The Ohio State University Wexner Medical Center (OSUWMC) are standards that are intended to provide general guidance to clinicians. Patient choice and clinician judgment must remain central to the selection of diagnostic tests and therapy. OSUWMC’s guidelines and algorithms are reviewed periodically for consistency with new evidence; however, new developments may not be represented.
## Appendix

### Healthcare Provider Responsibilities for Discontinuation of All Antiplatelet Therapy in Patients with Arterial Stents Prior to Surgeries or Procedures

<table>
<thead>
<tr>
<th>Healthcare Provider</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Surgeon / Proceduralist</strong></td>
<td><strong>In addition to usual preoperative H&amp;P and patient preparation:</strong></td>
</tr>
<tr>
<td></td>
<td>1. Determine the benefits and risks of the procedure with and without antiplatelet therapy.</td>
</tr>
<tr>
<td></td>
<td>2. Determine the benefits and risks of alternatives that would enable the patient to continue antiplatelet therapy, including not doing the procedure.</td>
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<tr>
<td></td>
<td>3. Discuss the above with the patient and document the discussion and the patient’s understanding in IHIS.</td>
</tr>
<tr>
<td></td>
<td>4. Obtain an outpatient consultation with an OSUWMC <strong>interventional</strong>, not a general cardiologist.*</td>
</tr>
<tr>
<td></td>
<td>5. Obtain an outpatient consultation at the OPAC on a date after the visit with the <strong>interventional</strong> cardiologist.*</td>
</tr>
<tr>
<td><strong>OSUWMC Interventional Cardiologist</strong></td>
<td>1. Determine the risks of stopping antiplatelet therapy that are specific to the patient’s stents and the time since stenting.</td>
</tr>
<tr>
<td></td>
<td>2. Coordinate with the surgeon / proceduralist to develop a patient-specific plan, including when antiplatelet therapy would be discontinued prior to the procedure, when antiplatelet therapy would be resumed afterwards, and any other aspects of care deemed important by the cardiologist.*</td>
</tr>
<tr>
<td></td>
<td>3. Discuss the above with the patient and document that discussion and the patient’s understanding in IHIS.</td>
</tr>
<tr>
<td><strong>OPAC Physician</strong></td>
<td><strong>In addition to usual OPAC visit activities:</strong></td>
</tr>
<tr>
<td></td>
<td>1. Ensure that the above discussions are adequately documented in IHIS.</td>
</tr>
<tr>
<td></td>
<td>2. Discuss the plan with the patient, including the risks and benefits already documented by the surgeon / proceduralist and cardiologist,* and document the discussion and the patient’s understanding in IHIS.</td>
</tr>
</tbody>
</table>

* For a patient with a non-coronary intra-arterial stent, consult the OSUWMC specialist who places similar stents. This might be an interventional radiologist, a neurosurgeon, a vascular surgeon, or some other specialist.