Aspirin Resistance: Significance, Detection and clinical management of this real Phenomenon
• Define Aspirin Resistance, Incidence and Prevalence in the Population

• Describe the Mechanisms for Aspirin Resistance and Reduced Platelet Inhibition

• Understand the Importance of Aspirin Resistance Testing, Methods of Detection

• Understand Clinical Implication and Clinical Decisions in Aspirin Resistant Patients
• **Steven Steinhubl, M.D.**

  Director of Cardiovascular Research and Education

  Associate Professor of Medicine

  University of Kentucky, Lexington, Kentucky

• **Daniel I. Simon, M.D.**

  Associate Professor of Medicine

  Harvard Medical School

  Associate Director, Interventional Cardiology
Aspirin in Cardiovascular Disease

Christopher Cannon, M.D.
Brigham and Women’s Hospital
Boston, MA
TIA = transient ischemic attack. ACS = acute coronary syndrome. PAD = peripheral arterial disease.

**American Heart Association. 2004 Heart Disease and Stroke Statistics.**
Number of Patients (Millions)

Heart disease
Coronary Heart disease
Stroke
Hypertensive disease
Congestive heart failure
Total CVD

Billions

0
$100
$200
$300
$400
$500
$600

$214
$111.8
$49.4
$47.2
$23.2
$329.2

1 2002 estimates (USA)
2 American Heart Association. 2002 Heart and Stroke Statistical Update. 2001
3 CVD = cardiovascular disease
Aspirin Usage In the US

Percentage of Use

- Heart Disease: 37.8%
- Arthritis: 23.3%
- Headache: 13.8%
- Body Ache: 12.2%
- Other: 14.1%

26,000,000 Americans receive chronic aspirin therapy for cardioprotection.
## Antithrombotic Trialists' Collaboration

<table>
<thead>
<tr>
<th>Category</th>
<th>% Odds Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute myocardial infarction</td>
<td>1.0</td>
</tr>
<tr>
<td>Acute stroke</td>
<td>0.5</td>
</tr>
<tr>
<td>Prior myocardial infarction</td>
<td>0.0</td>
</tr>
<tr>
<td>Acute stroke</td>
<td>1.5</td>
</tr>
<tr>
<td>Prior stroke/transient ischemic attack</td>
<td>2.0</td>
</tr>
<tr>
<td>Other high risk</td>
<td>Antiplatelet better</td>
</tr>
<tr>
<td>Coronary artery disease</td>
<td>Control better</td>
</tr>
<tr>
<td>(e.g. unstable angina, heart failure)</td>
<td></td>
</tr>
<tr>
<td>Peripheral arterial disease</td>
<td></td>
</tr>
<tr>
<td>(e.g. intermittent claudication)</td>
<td></td>
</tr>
<tr>
<td>High risk of embolism</td>
<td></td>
</tr>
<tr>
<td>(e.g. atrial fibrillation)</td>
<td></td>
</tr>
<tr>
<td>Other (e.g. diabetes mellitus)</td>
<td></td>
</tr>
<tr>
<td>All trials</td>
<td></td>
</tr>
</tbody>
</table>

*Vascular events = myocardial infarction, stroke or vascular death

Unstable Angina

Acute Myocardial Infarction


% of Patients

Primary Prevention
Plac. ASA

Stable Angina
Plac. ASA

Unstable Angina
Plac. ASA

PHS. *NEJM* 1989;321:129-35
Odds reduction.
Treatment effect $P < 0.001$.
ASA, acetylsalicylic acid.

Adapted with permission from BMJ Publishing Group. Antithrombotic Trialists’ Collaboration. BMJ. 2002;324:71-86.
<table>
<thead>
<tr>
<th>ASA Dose</th>
<th>ASA (N=6303)</th>
<th>Clopidogrel + ASA (N=6259)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;100 mg</td>
<td>1.9%</td>
<td>3.0%</td>
<td>0.53</td>
</tr>
<tr>
<td>100-200 mg</td>
<td>2.8%</td>
<td>3.4%</td>
<td></td>
</tr>
<tr>
<td>&gt;200 mg</td>
<td>3.7%</td>
<td>4.9%</td>
<td></td>
</tr>
</tbody>
</table>

Outcomes by Aspirin Dose in Placebo Study Drug Patients

<table>
<thead>
<tr>
<th>Dose Range</th>
<th>Number of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Dose, 75-162 mg/d</td>
<td>2410</td>
</tr>
<tr>
<td>Higher Dose, 162-326 mg/d</td>
<td>2179</td>
</tr>
</tbody>
</table>

**Primary end point** 16.4 18.6
Death, MI, stroke 6.2 6.1
Death 2.8 1.7
MI 2.0 2.1
Stroke 2.1 2.8

**Internal bleeding** 2.4 3.3
**Any bleeding** 11.1 15.4
**Transfusion** 1.0 2.0

• Aspirin is proven to reduce death, MI, stroke in patients with all types of cardiovascular disease

• Inexpensive, widely available

• Dosing now focused on low-dose (75-81 mg) for optimal efficacy / safety balance

• However…
  • Does one dose fit all?