Cardiac CT in the ED – From a Payer Perspective

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Chairman of Radiology and Director of Cardiac Imaging
Baptist Health of South Florida and Miami Cardiac and Vascular Institute
Disclosure Information

- Research grant – GE Healthcare
- Consultant – GE Healthcare and Novartis
Goals of Triage

• Identify patients with AMI
• Identify patients with unstable angina
• Identify patients at high risk of cardiovascular complications
  – resource utilization in hospital
    • CCU vs. monitored vs. floor beds
• Identify patients safe for ED release
  – need for treatment
Perspective

- Cardiologist
- Primary Care Physician
- Emergency Physician
- Radiologist
- Payor
- Patient
- Lawyers
- Society
Why Do More?

- The missed AMI rate is inversely proportional to the admission rate for ED chest pain patients

Kontos MC & Jesse RL. *Am J Cardiol* 2000;85:32B-39B
Initial Impression = “Noncardiac Pain”

- itrACS
- 17,737 patients enrolled
- Conclusion: Even patients thought to have noncardiac pain can suffer adverse cardiac events, especially if risk factors are present

2.8% had adverse cardiac events (infarction, revascularization, or death) within 30 days

How can coronary CTA reduce costs?

- Faster diagnosis
- Reducing ER length of stay
- Reducing unnecessary admissions and ICA
- Reducing complementary tests in 30 day follow up
## CTA IN THE ED – RANDOMIZED TRIALS

<table>
<thead>
<tr>
<th>CENTERS</th>
<th>TIMI Risk</th>
<th>N</th>
<th>LOS/ Time to Diagnosis</th>
<th>30-days MACE</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CT – STAT(^1)</strong></td>
<td>TIMI 0 to 4</td>
<td>699 (1:1)</td>
<td>2.9h vs 6.3h</td>
<td>0.8% vs 0.4%</td>
<td>$2,137 vs $3,458</td>
</tr>
<tr>
<td><strong>ACRIN-PA(^2)</strong></td>
<td>TIMI 0 to 2</td>
<td>1370 (2:1)</td>
<td>18 vs 24.8h (p&lt;0.001)</td>
<td>Zero</td>
<td></td>
</tr>
<tr>
<td><strong>ROMICAT 2(^3)</strong></td>
<td>Low/int.risk</td>
<td>985 (1:1)</td>
<td>23 vs 30.8h (p=0.0002)</td>
<td>0.4% vs 1.2%</td>
<td>Cost savings of 10 to 20%</td>
</tr>
<tr>
<td><strong>CT-COMPARE(^4)</strong></td>
<td>Low/int.risk</td>
<td>562</td>
<td>13.5 vs 19.7h (p&lt;0.001)</td>
<td>Zero</td>
<td>$2,193 vs $2,704</td>
</tr>
</tbody>
</table>

➢ Coronary CTA is faster, cheaper and safe!

1- Goldstein JA et al. JACC 2011 Sept;27;58:1414-22
4- Hamilton-Craig C et al. – Int J Cardiol 2014 Dec;177(3):867-73
<table>
<thead>
<tr>
<th></th>
<th>CTA</th>
<th>SOC</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time to Dx (hrs)</td>
<td>2.9</td>
<td>6.2</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Cost of care ($)</td>
<td>2,137</td>
<td>3,458</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Radiation (mSv)</td>
<td>10.8</td>
<td>15</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Coronary CTA is cheaper and faster than SOC (nuclear medicine)!

Prospective, Randomized Trial of Coronary CT Angiography and Exercise ECG in Emergency Department Chest Pain (CT-COMPARE)

Christian Hamilton-Craig MBBS, PhD, FSCCT\textsuperscript{1,2,3}, Mark Hansen FRANZCR\textsuperscript{1}, Allison Fifoot FACEM\textsuperscript{1}, Matthew Pincus MBBS, FRACP\textsuperscript{1}, Kathryn Arnett\textsuperscript{1}, Darren L. Walters MBBS, FRACP\textsuperscript{1,2}, Kelley R. Branch MD, MSc, FACC\textsuperscript{3}

1. Prince Charles Hospital, Heart & Lung Institute, Brisbane, Australia,
2. University of Queensland, Brisbane, Australia
3. University of Washington, Seattle, WA, USA
CT-COMPARE

<table>
<thead>
<tr>
<th></th>
<th>CTA</th>
<th>EX EKG</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of Stay (hrs)</td>
<td>13.5</td>
<td>19.7</td>
<td>0.003</td>
</tr>
<tr>
<td>Cost of care ($) - total</td>
<td>2193</td>
<td>2704</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Cost of care ($) - ED</td>
<td>1669</td>
<td>2459</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Coronary CT angiography is faster and less expensive.
Length of Stay (hours)

- CTCA: 13.5 (11.2-15.7) Median: 7.6
- ExECG: 20.5 (17.9-23.1) Median: 16.5

P < 0.001
Total Hospital Cost ($AUD)

- CTCA: $2,193 ($1997,2389)
- ExECG: $2,704 ($2555,2853)

P<0.001

*$AUD=0.92 $USD
### CT COMPARE – IJC 2014

- Mean radiation exposure for CCTA was 3.8 mSv

<table>
<thead>
<tr>
<th>Trial arm</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
<th>PPV (%)</th>
<th>NPV (%)</th>
<th>ROC AUC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ExECG</td>
<td>83% (36,100)</td>
<td>91% (86,94)</td>
<td>19% (6,38)</td>
<td>100% (97,100)</td>
<td>0.87 (0.70, 100)</td>
</tr>
<tr>
<td>CTCA&gt;50% stenosis</td>
<td>100% (82,100)</td>
<td>94% (91,97)</td>
<td>51% (34,69)</td>
<td>100% (99,100)</td>
<td>0.97† (0.96, 0.99)</td>
</tr>
<tr>
<td>CTCA&gt;70% stenosis</td>
<td>94% (73,100)</td>
<td>99% (98,100)</td>
<td>90% (67,99)</td>
<td>100% (98,100)</td>
<td>0.97* (0.92, 100)</td>
</tr>
</tbody>
</table>

†p=0.22, *p=0.26 compared to ExECG.  
All data are expressed as % (95% CI)
## CTA IN THE ED – IMPLEMENTATION IN CLINICAL PRACTICE

<table>
<thead>
<tr>
<th>CENTERS</th>
<th>TIMI Risk</th>
<th>N</th>
<th>LOS/ Time to Diagnosis</th>
<th>30-days MACE</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baptist Health of South Florida¹</td>
<td>4 Hospitals</td>
<td>529</td>
<td>14 vs 28.8h (p&lt;0.001)</td>
<td>0.2%</td>
<td>&gt; $500 Reduction per patient</td>
</tr>
<tr>
<td>Stony Brook Univ. Medical Center²</td>
<td>1 Hospital</td>
<td>1788 (1:1)</td>
<td>7.7 vs 11.5h (p&lt;0.001)</td>
<td>0.33% vs 0.67%</td>
<td>1.3% vs 3.6% ED return</td>
</tr>
<tr>
<td>San Antonio Military Medical Center³</td>
<td>1 Hospital</td>
<td>367</td>
<td>5.8 vs 25h (p&lt;0.001)</td>
<td>Low</td>
<td>$182K vs $685K</td>
</tr>
</tbody>
</table>

> Coronary CTA is faster, cheaper and safe!

1- Cury RC et al. – AJR 2013 Jan;200-57-65  
2- Poon M et al. JACC 2013 May  
3- Jones RL et al. JCCT 2014 Sep-Oct;8(5):375-83
## CTA REDUCES HEALTHCARE RESOURCE UTILIZATION

<table>
<thead>
<tr>
<th></th>
<th>CTA (N=894)</th>
<th>Standard of Care (N=894)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission Rate to the Hospital</td>
<td>14%</td>
<td>40%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Length of Stay in the ED</td>
<td>7.7 hours</td>
<td>11.5 hours</td>
<td>0.001</td>
</tr>
<tr>
<td>30 days MACE</td>
<td>0.3%</td>
<td>0.7%</td>
<td>0.316</td>
</tr>
<tr>
<td>Returning to the ED in 30 days with CP</td>
<td>5 (1%)</td>
<td>20 (2%)</td>
<td>0.003</td>
</tr>
<tr>
<td>Cardiac cath without revascularization</td>
<td>8 (1%)</td>
<td>27 (3%)</td>
<td>0.001</td>
</tr>
</tbody>
</table>
Current Evidence

Trials: | N= |
---|---|
CT-STAT | Goldstein JACC 2011 | 699 |
ACRIN-PA | Litt NEJM 2012 | 1,370 |
ROMICAT | Hoffmann NEJM 2012 | 1,000 |

Efficiency: 3,069

- Time to Diagnosis Reduced 44-77% (-7.7 h; -12.7 to 2.7 h)
- Cost Savings (-$680; -$1,060 to -$270)
- National Health Service Systematic Review - Cost-effective strategy for Troponin-neg pts

Outcomes:

- Near-Term - ACS Re-Admission OR: 1.2 (0.7-2.2)
- Long-Term (~4 y follow-up) of 506 D/C pts:
  - 1% readmitted for CP AND 0% Revascularization, ACS, or Death

IMPLEMENTATION IN CLINICAL PRACTICE
VALUE IN RADIOLOGY

Value = Patient Activation + Clinical Accuracy + Coordinated Care

- **Patient safety**
- **Understanding of scan objective**
- **Delivery of results**
- **Quality of image**
- **Accuracy of reads**
- **Referrer comprehension**
- **Seamless downstream care**
- **Overall cost, outcomes**
### Five Levels for Chest Pain

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>STEMI or new LBBB with ischemic symptoms</td>
</tr>
<tr>
<td>2</td>
<td>Non-STEMI or unstable angina, typical anginal symptoms with ST-segment depression, ischemic T-wave inversion, CHF or hemodynamic instability with chest pain</td>
</tr>
<tr>
<td>3</td>
<td>Moderate to high risk of ACS (TIMI &gt; 2): anginal pain lasting &lt; 20 minutes or atypical chest pain. ECG normal or nondiagnostic; cardiac enzymes negative.</td>
</tr>
<tr>
<td>4</td>
<td>Low risk of ACS (TIMI ≤ 2): anginal pain lasting &lt; 20 minutes or atypical chest pain. ECG normal or nondiagnostic; cardiac enzymes negative.</td>
</tr>
<tr>
<td>5</td>
<td>Non-cardiac chest pain</td>
</tr>
</tbody>
</table>
CASE – ED 33 TIMI ZERO

41 y/o male presenting with CP and left arm pain/ Two negative Trop/ NI EKG
<table>
<thead>
<tr>
<th>Category</th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>317</td>
<td>59.9%</td>
</tr>
<tr>
<td>1-49%</td>
<td>151</td>
<td>28.5%</td>
</tr>
<tr>
<td>50-69%</td>
<td>25</td>
<td>4.7%</td>
</tr>
<tr>
<td>&gt;70%</td>
<td>36</td>
<td>6.8%</td>
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Cury RC et al. – AJR 2013 Jan;200:57-65
CTA  N=529

0  N=317  (59.9%)

1-49%  N=151  (28.5%)

50-69%  N=25  (4.7%)

>70%  N=36  (6.8%)

MIBI  Cath

N = 8  N = 0

MACE = 0

Cury RC et al. – AJR 2013 Jan;200:57-65
CTA  \( N=529 \)

<table>
<thead>
<tr>
<th>Percentile</th>
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<td>36</td>
<td>(6.8%)</td>
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</tbody>
</table>

MIBI

- Cath
  - N = 8
  - MACE = 0
  - <50%: 8
  - 50-70%: 1

Cury RC et al. – AJR 2013 Jan;200:57-65
### CTA N=529

<table>
<thead>
<tr>
<th>Category</th>
<th>MIBI</th>
<th>Cath</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>N=8</td>
<td>N=0</td>
<td>8</td>
</tr>
<tr>
<td>1-49%</td>
<td>N=6</td>
<td>N=3</td>
<td>6</td>
</tr>
<tr>
<td>50-69%</td>
<td>N=9</td>
<td>N=7</td>
<td>9</td>
</tr>
<tr>
<td>&gt;70%</td>
<td>N=36</td>
<td>N=36</td>
<td>36</td>
</tr>
</tbody>
</table>

#### MIBI Cath

- **MACE = 0**
- **MACE = 1**
- **5 PCIs**

Cury RC et al. – AJR 2013 Jan;200:57-65
CTA  N=529

0  
N=317  
(59.9%)

1-49%  
N=151  
(28.5%)

50-69%  
N=25  
(4.7%)

>70%  
N=36  
(6.8%)

MIBI  Cath

N = 8  N = 0

— 8
+ 0

MACE = 0

N = 6  N = 3

— 6
+ 0
+ 1
50 - 70%

MACE = 1

N = 9  N = 7

— 9
+ 0
+ 6
>50 %

5 PCIs

N = 23

— 2
+ 7
+ 21
50-70%
>70 %

MACE = 3

6 Cath > 70%

Cury RC et al. – AJR 2013 Jan;200:57-65
DO – Monitor LOS

Length of stay (LOS)

2009

28.8h

2010

14.0h

51%

Cury RC et al. – AJR 2013 Jan;200:57-65
SCCT guidelines on the use of coronary computed tomographic angiography for patients presenting with acute chest pain to the emergency department: A Report of the Society of Cardiovascular Computed Tomography Guidelines Committee

Gilbert L. Raff MD\textsuperscript{a,*}, Kavitha M. Chinnaiyan MD\textsuperscript{a}, Ricardo C. Cury MD\textsuperscript{b}, Mario T. Garcia MD\textsuperscript{c}, Harvey S. Hecht MD\textsuperscript{d}, Judd E. Hollander MD\textsuperscript{e}, Brian O’Neil MD\textsuperscript{f}, Allen J. Taylor MD\textsuperscript{g}, Udo Hoffmann MD\textsuperscript{h}

<table>
<thead>
<tr>
<th>Risk category</th>
<th>Suspected diagnosis</th>
<th>Appropriate diagnostic strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 5</td>
<td>STEMI</td>
<td>ICA</td>
</tr>
<tr>
<td>Level 4</td>
<td>NSTEMI, UAP</td>
<td>ICA</td>
</tr>
<tr>
<td>Level 3</td>
<td>High Risk (e.g., TIMI &gt;4)</td>
<td>Functional assessment and/or admission</td>
</tr>
<tr>
<td>Level 1–2</td>
<td>Low-intermediate risk (e.g., TIMI 0–4)</td>
<td>Coronary CTA or functional assessment</td>
</tr>
<tr>
<td>Level 0</td>
<td>Non-cardiac chest pain</td>
<td>CXR, chest CTA (PE, aortic dissection), GI work-up, and so forth</td>
</tr>
</tbody>
</table>

CTA, CT angiography; CXR, chest radiography; GI, gastrointestinal; ICA, invasive coronary angiography; NSTEMI, non-ST segment elevation myocardial infarction; PE, pulmonary embolism; STEMI, ST elevation myocardial infarction; TIMI, thrombolysis in myocardial infarction risk score.
Coronary CTA – Reporting and Management

Degree of coronary stenosis

- 0%
- 40-50%
- 70%
- 100%

Discharge from ED

- Mild

- Moderate

- Severe

Discharge from ED and OP consult with Cardiologist

Stress Myocardial Perfusion (NM) + FFR

Cardiac Cath Lab

Cury RC et al. JNC 2011:18;331-41
SCCT guidelines on the use of coronary computed
tomographic angiography for patients presenting
with acute chest pain to the emergency
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Mario T. Garcia MD, Harvey S. Hecht MD, Judd E. Hollander MD,
Brian O’Neil MD, Allen J. Taylor MD, Udo Hoffmann MD

| Table 10 — Sample management recommendations to ED physicians. |
|-----------------|---------------------------------------------------------------|
| Degree of maximal coronary stenosis | Management recommendation |
| 0%–25% | ACS unlikely; discharge is reasonable. Follow-up for minimal CAD at physician discretion |
| 26%–49% | ACS unlikely; discharge is reasonable. Outpatient follow-up recommended for preventive measures |
| 50%–69% | ACS possible; further evaluation indicated before discharge |
| >70% | ACS likely; admit for further evaluation |

ACS, acute coronary syndrome, CAD, coronary artery disease.
GOAL: Standardized reporting system for CCTA to improve communication to referring physicians

Collaboration of SCCT, ACR, ACC and NASCI

Classification should be applied on a per-patient basis for the highest grade stenosis

Specific recommendations are provided to guide patient management in a clear and consistent fashion

CAD-RADS will provide the framework to standardize education, research, peer-review, quality assurance and ultimately result in improvement in patient care
CAD RADS - STENOSIS SEVERITY

Table 1 - SCCT grading scale for stenosis severity:

<table>
<thead>
<tr>
<th>Stenosis</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>No visible stenosis</td>
</tr>
<tr>
<td>1-24%</td>
<td>Minimal stenosis</td>
</tr>
<tr>
<td>25-49%</td>
<td>Mild stenosis</td>
</tr>
<tr>
<td>50-69%</td>
<td>Moderate stenosis</td>
</tr>
<tr>
<td>70-99%</td>
<td>Severe stenosis</td>
</tr>
<tr>
<td>100%</td>
<td>Occluded</td>
</tr>
</tbody>
</table>

* All vessels greater than 1.5mm in diameter should be graded for stenosis severity and CAD-RADS classification will apply for these vessels. Conversely, CAD-RADS will not apply for smaller vessels (<1.5mm in diameter).

* CAD-RADS classification should be applied on a per-patient basis for the highest-grade stenosis.
### CAD RADS - STABLE CHEST PAIN

<table>
<thead>
<tr>
<th>CAD-RADS</th>
<th>Degree of maximal coronary stenosis</th>
<th>Interpretation</th>
<th>Further Cardiac Investigation</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAD-RADS 0</td>
<td>0% (No plaque or stenosis)</td>
<td>Documented absence of CAD*</td>
<td>None</td>
<td>- Reassurance. Consider other non-atherosclerotic causes of chest pain</td>
</tr>
<tr>
<td>CAD-RADS 1</td>
<td>1-24% - Minimal stenosis or plaque with no stenosis**</td>
<td>Minimal non-obstructive CAD</td>
<td>None</td>
<td>- Consider preventive therapy and risk factors modification per guideline-directed care***</td>
</tr>
<tr>
<td>CAD-RADS 2</td>
<td>25-49% - Mild stenosis</td>
<td>Mild non-obstructive CAD</td>
<td>None</td>
<td>- Consider more aggressive preventive therapy and risk factors modification, particularly for patients with non-obstructive plaque in multiple segments.</td>
</tr>
<tr>
<td>CAD-RADS 3</td>
<td>50-69% stenosis</td>
<td>Moderate stenosis</td>
<td>Consider functional assessment</td>
<td>- Consider symptom-guided anti-ischemic and preventive pharmacotherapy as well as risk factors modification per guideline-directed care***</td>
</tr>
<tr>
<td>CAD-RADS 4</td>
<td>A - 70-99% stenosis or B - Left main &gt;50% or 3-vessel obstructive disease</td>
<td>Severe stenosis</td>
<td>A: Consider ICA**** or functional assessment</td>
<td>- Consider symptom-guided anti-ischemic and preventive pharmacotherapy as well as risk factors modification per guideline-directed care***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>B: ICA is recommended</td>
<td>- Other treatments should be considered per guideline-directed care***</td>
</tr>
<tr>
<td>CAD-RADS 5</td>
<td>100% (total occlusion)</td>
<td>Total coronary occlusion</td>
<td>Consider ICA or functional/ viability assessment</td>
<td>- Consider symptom-guided anti-ischemic and preventive pharmacotherapy as well as risk factors modification per guideline-directed care***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Other treatments (including options of revascularization) should be considered per guideline-directed care***</td>
</tr>
<tr>
<td>CAD-RADS N</td>
<td>Non-diagnostic study</td>
<td>Obstructive CAD cannot be excluded</td>
<td>Additional or alternative evaluation may be needed</td>
<td>- Consider symptom-guided anti-ischemic and preventive pharmacotherapy as well as risk factors modification per guideline-directed care***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Other treatments (including options of revascularization) should be considered per guideline-directed care***</td>
</tr>
</tbody>
</table>
CAD RADS - ACUTE CHEST PAIN

Table 3. CAD-RADS Reporting and Data System for patients presenting with acute chest pain, negative first troponin, negative or non-diagnostic electrocardiogram and low to intermediate risk (TIMI risk score < 4) (emergency department or hospital setting).

<table>
<thead>
<tr>
<th>CAD-RADS</th>
<th>Degree of maximal coronary stenosis</th>
<th>Interpretation</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>ACS* highly unlikely</td>
<td>- No further evaluation of ACS is required. Consider other etiologies.</td>
<td></td>
</tr>
<tr>
<td>1-24%**</td>
<td>ACS highly unlikely</td>
<td>- Consider evaluation of non-ACS etiology, if normal troponin and no ECG change. - Consider referral for out-patient follow-up for preventive management of coronary atherosclerosis and risk factors modification.</td>
<td></td>
</tr>
<tr>
<td>25-49%***</td>
<td>ACS unlikely</td>
<td>- Consider evaluation of non-ACS etiology, if normal troponin and no ECG change. - Consider referral for out-patient follow-up for preventive management of coronary atherosclerosis and risk factors modification. - If clinical suspicion of ACS is high or if high-risk plaque features are noted in the stenosis, consider hospital admission with cardiology consultation.</td>
<td></td>
</tr>
<tr>
<td>50-69%</td>
<td>ACS possible</td>
<td>- Consider hospital admission with cardiology consultation, functional testing and/or ICA**** for evaluation and management. - Recommendation for anti-ischemic and preventive management should be considered as well as risk factor modifications. Other treatments should be considered if presence of hemodynamic significant lesion.</td>
<td></td>
</tr>
<tr>
<td>A - 70-99% or B - Left main &gt;50% or 3-vessel obstructive disease</td>
<td>ACS likely</td>
<td>- Consider hospital admission with cardiology consultation and further evaluation with ICA and revascularization is appropriate. - Recommendation for anti-ischemic and preventive management should be considered as well as risk factor modifications.</td>
<td></td>
</tr>
<tr>
<td>100% (Total occlusion)</td>
<td>ACS very likely</td>
<td>- Consider expedited ICA on a timely basis and revascularization if appropriate. - Recommendation for anti-ischemic and preventive management should be considered as well as risk factor modifications.</td>
<td></td>
</tr>
<tr>
<td>Non-diagnostic study</td>
<td>ACS cannot be excluded</td>
<td>Additional or alternative evaluation for ACS is needed</td>
<td></td>
</tr>
</tbody>
</table>
CAD-RADS classification should be applied on a per-patient basis for the highest-grade stenosis

* CAD – coronary artery disease

** CAD-RADS 1 – This category should also include the presence of plaque with positive remodeling and no evidence of stenosis

*** Guideline-directed care per ACC Stable Ischemic Heart Disease Guidelines (Fihn et al. JACC 2012)

**** ICA – invasive coronary angiography. ICA is recommended for CAD-RADS 4B.

**MODIFIERS:** If more than one modifier is present, the symbol "/" (slash) should follow each modifier in the following order:

i. First: modifier S (stent)
ii. Second: modifier G (graft)
iii. Third: modifier V (vulnerability)
NO EVIDENCE OF PLAQUE OR STENOSIS
MINIMAL NON-OBSTRUCTIVE STENOSIS = 1-24%
MILD NON-OBSTRUCTIVE STENOSIS = 25-49%
MODERATE STENOSIS = 50-69%
SEVERE STENOSIS = 70-99%

1VD - Single-vessel Disease
TRIPLE-VEssel SEVERE STENOSIS = 70-99%
LEFT MAIN STENOSIS >50%
TOTAL OCCLUSION = 100%
NON-DIAGNOSTIC – MOTION ARTIFACTS
Conclusions

- Coronary CTA is faster when compared to SOC and decreases LOS
- CCTA leads to less admissions to the Hospital and decrease complementary tests in 30 days
- Most studies demonstrate a decrease in cost with a CCTA Strategy in the ED
- Value in Radiology: Clinical Pathway + Accurate Readings + Guide management in care
THANK YOU!
55 y/o male with CP + HPT + History of TIA

CASE – ED 13 TIMI ZERO

CTA – Mid RCA = 90%

CTA – Mid LCX = 50-70%
53 y/o Male with CP and prior history of smoking. Normal ECG and Troponin
59 y/o Female with CP to the ED, worse while climbing the stairs

CASE – Bonus 14 TIMI ZERO

CTA - LAD subtotal occlusion

ICA - LAD subtotal occlusion

Anomalous RCA

ICA – After LAD stent placement