ADVANCED PROTOCOL PLANNING FOR NUCLEAR CARDIOLOGY STUDIES ‘PROTOCOLLING’

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Introduction

Cardiovascular imaging is growing and increasing in complexity

Imaging advances present
- New opportunities
- Challenges for referring physicians

Inappropriate imaging studies may lead to excessive downstream investigations and cost
Objectives of ASNC’s Choosing Wisely® Challenge

Implementation of appropriate use
Patient-centered care
Optimization of radiation dose
Enhanced communication with referring clinicians
Our Proposal:

Advanced protocol planning for nuclear cardiology studies: “protocolling”
Protocolling

Standard practice in radiology departments

Review orders and assign specific protocol instructions

Enhances appropriateness and safety

Aided by increasing implementation of electronic medical records

KHORASANI R, 2011. JOURNAL OF AMERICAN COLLEGE OF RADIOLOGY
BASSIGNANI, M.J. ET AL., 2010. JOURNAL OF DIGITAL IMAGING.
MEDVERD, J.R. ET AL., 2013. JOURNAL OF DIGITAL IMAGING.
SACHS, P.B. ET AL., 2013. JOURNAL OF AMERICAN COLLEGE OF RADIOLOGY.
Our department

EMR system (EPIC)
- Integrates ordering, scheduling, and protocoling
- Electronic order for all patients

Outpatient studies:
- Protocolled at least 1 day in advance

Inpatient studies:
- Protocol maybe assigned on day of test
Protocol considerations

Indications for the test

Clinical history

Body habitus

Possible contraindications for the study
  - Contraindications to pharmaceutical stress agents

Dose of radionuclide to be administered

Potential for stress-only imaging

Study must have a protocol assigned prior to the injection of a radionuclide

Referring physicians are contacted if questions arise

Each protocolling takes approximately 3-5 minutes*
Protocol Work List: 1 Day Nuclear,

Patient Info
- Patient: [Name]
- Allergies: [List of allergies]
- Medications: [List of medications]

Reason For Exam
- Reason: [Description of reason for exam]

Nuclear Cardiology Protocol
- Study Protocol:
  - Rest AND Stress MIBI

Please do stress first
Results

Pilot study: prospectively collected data from 6/6/17-6/28/17

All Studies by Referral: 228
<table>
<thead>
<tr>
<th>Demographics</th>
<th>Male (n=119)</th>
<th>Female (n=94)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>65 (+/- 12)</td>
<td>67 (+/- 12)</td>
</tr>
<tr>
<td>Indication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chest pain/ equivalent</td>
<td>63 %</td>
<td>70 %</td>
</tr>
<tr>
<td>Pre-op</td>
<td>16 %</td>
<td>9 %</td>
</tr>
<tr>
<td>Heart Failure</td>
<td>8 %</td>
<td>4 %</td>
</tr>
<tr>
<td>Risk Factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>78 %</td>
<td>79 %</td>
</tr>
<tr>
<td>Dyslipidemia</td>
<td>71 %</td>
<td>70 %</td>
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<tr>
<td>Diabetes Mellitus</td>
<td>23 %</td>
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<tr>
<td>CAD</td>
<td>53 %</td>
<td>22 %</td>
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<tr>
<td>PCI</td>
<td>32 %</td>
<td>13 %</td>
</tr>
<tr>
<td>CABG</td>
<td>17 %</td>
<td>7 %</td>
</tr>
</tbody>
</table>
Impact of Protocolling

- No Change: 94%
- Cancelled: 2%
- Postponed: 3%
- SPECT to PET: 1%
- SPECT to ETT: 1
- SPECT to CTCA: 1
- PET to CTCA: 3
- Sarcoid F-18 FDG PET to MRI: 2
Maybe appropriate (Uncertain):
Known Chronic Stable CAD, New or Worsening symptoms, Normal prior stress imaging study

Rarely appropriate (Inappropriate):
Preoperative Evaluation, Intermediate risk surgery, functional capacity ≥ 4 METS (50%)
Learning opportunities

Contribute to clinical care before the study has even started
- Appropriateness of study
- Possible better and/or safer options

Discussion of relative benefits and weaknesses of investigations
- With the expert imaging attending physicians
- With the referring physicians

Enhanced communication with the referring physicians
Challenges

Referring physicians’ preference for a particular test
Insurance preauthorization for a different test
Inability to contact the referring clinician in timely manner
Time consuming

External generalizability of our model
Translation to other departments

Advance protocoling can be scaled to other institutions and practices.

Widespread adoption of EMR and access to multimodality imaging makes this feasible in many settings.

Potential for training other medical professionals:
- Physiologists, nurses, nurse practitioners, physician assistants

Help ensure compliance with PAMA regulations:
- Documentation of consultation of AUC
Transform Nuclear Cardiology

Enhance appropriate use of nuclear cardiology tests
Optimize radiation dose
Educate referring providers
  ◦ On the latest advances in imaging
Educate the next generation of leaders in cardiovascular imaging
  ◦ In appropriate test selection and dissemination of best practice
Increase the diagnostic yield of the test
Minimize downstream testing
Limitations

Single center pilot study with small numbers over short time frame

No comparative group

No clinical outcomes

Underestimate impact

- Academic center- majority of referring physicians are cardiologists
- Future multi-center studies may better assess impact and cost effectiveness of this approach in nuclear cardiology
Conclusions

Advance protocoling of each nuclear cardiology study

◦ Facilitates a patient-centered approach
◦ Ensures delivery of higher quality of care
◦ Reduces radiation and stress-risk
◦ Offers potential to minimize layered testing and reduce costs
Thank you