Point-of-Order Consultation Reduces Rarely Appropriate Testing & Allows For Test-Independent CV Risk Reduction

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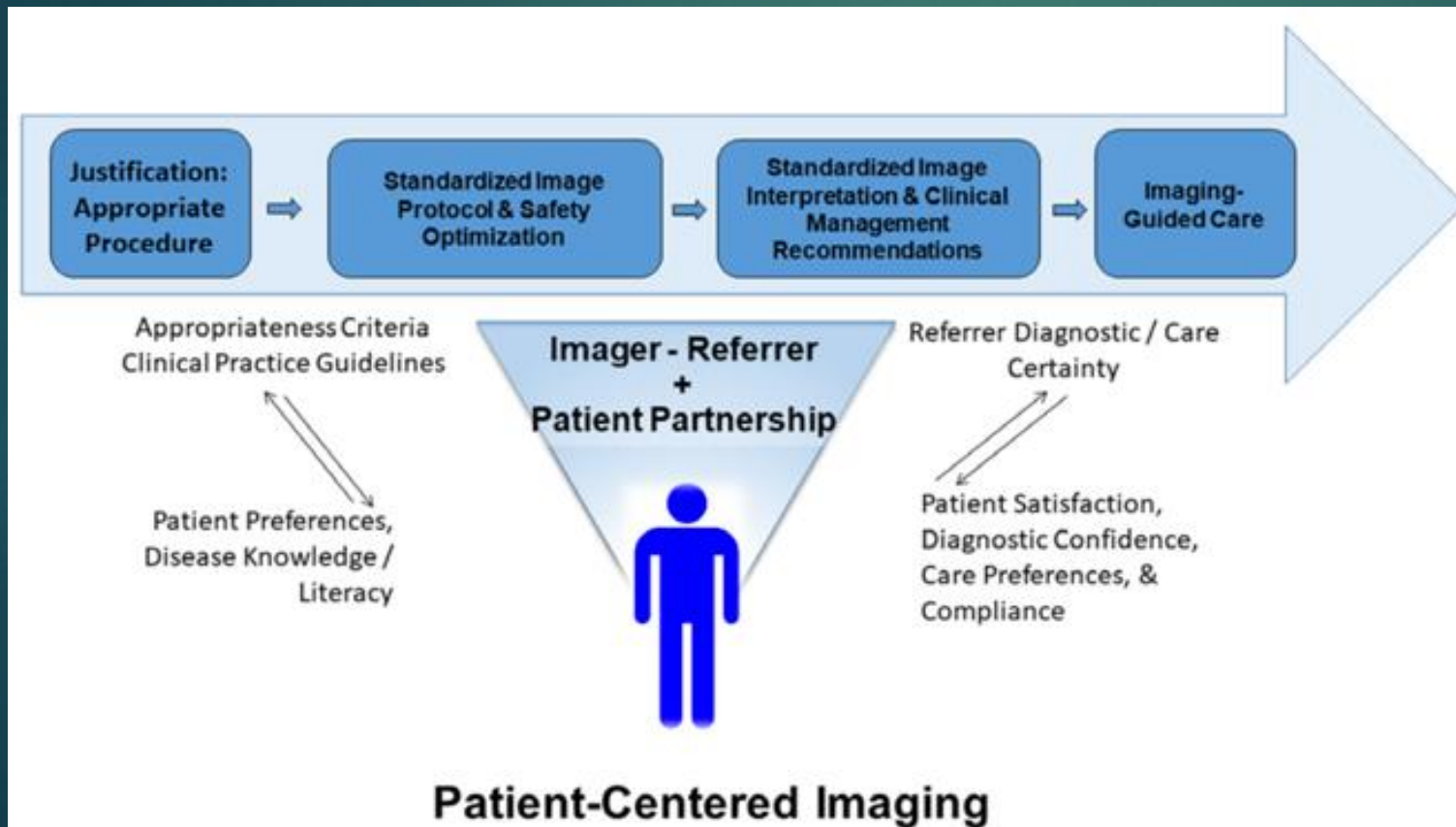
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Background

▶ Consultation of AUC is a critical 1st step in performing high-quality, patient-centered cardiac testing.

Shaw LJ et al. Circ Cardiovasc Imaging. 2017 Dec.

Background

- 10-20% of cardiac tests performed within the VA are rarely appropriate.

- Winchester DE et al. JNC. 2015 Feb.
- Winchester DE et al. JAMA Internal Med. 2013 Jul.

Background

- System-wide VA data suggest that statins are underutilized in patients with or at increased risk of atherosclerotic CV disease.

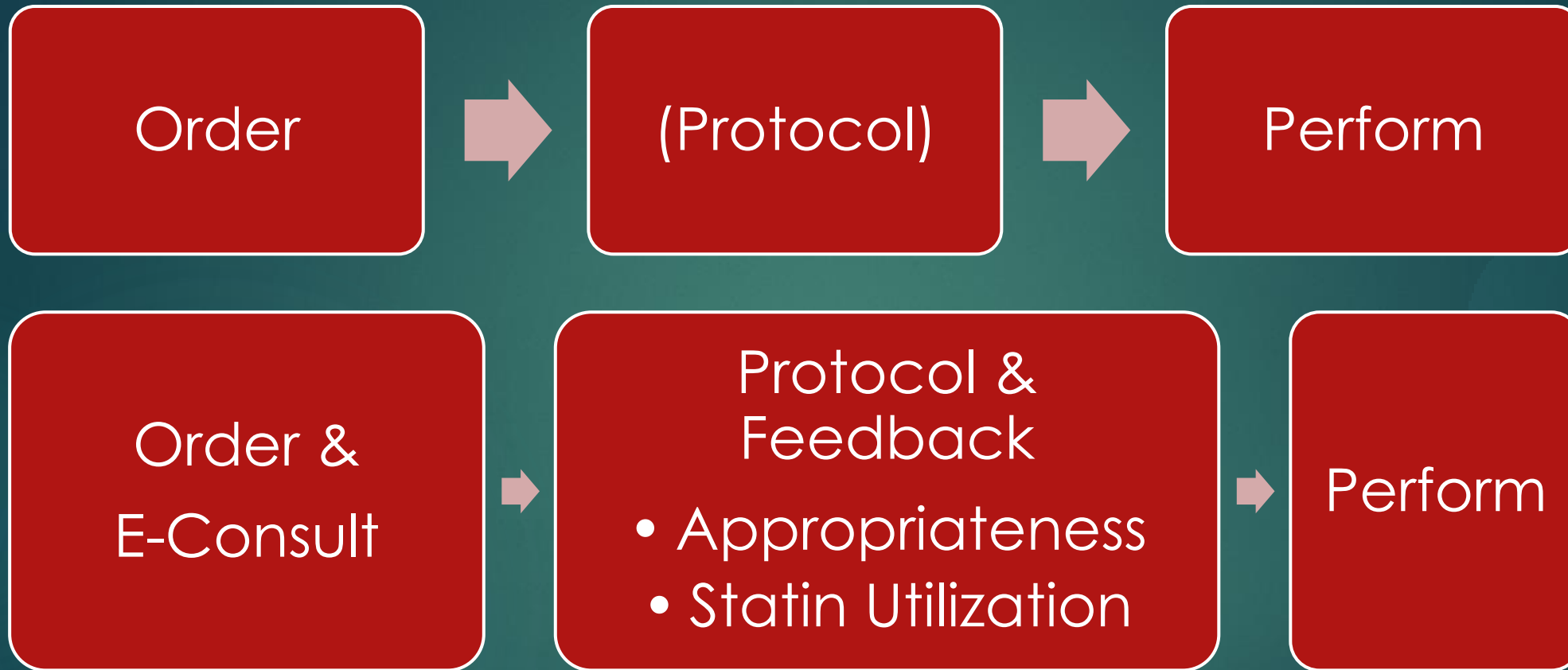- Pokharel et al. JACC. 2016.
- Clement et al. Clin Infect Dis. 2016.

Objectives

- Quantify
  - Appropriateness of cardiac test orders (ETT, exercise stress SPECT, pharmacologic stress SPECT, exercise stress echocardiography, pharmacologic stress echocardiography) at the Providence VAMC
  - Statin utilization relative to guideline-recommendations in patients referred for cardiac testing
- Intervention Goals
  - Reduce/eliminate rarely appropriate testing
  - Provide feedback to referring providers re: order appropriateness and statin utilization

Methods

| Order | → | (Protocol) | → | Perform |

| Order & E-Consult | → | Protocol & Feedback
 • Appropriateness
 • Statin Utilization | → | Perform |

Inclusion: Age 40-79 years referred for outpatient cardiac testing by a non-cardiology provider between April-May 2018

Is nuclear stress testing being ordered for pre-operative cardiac risk assessment?
⇒ Yes

    Is the patient undergoing renal or liver transplantation?
    ⇒ Yes (Generally appropriate.)
    ⇒ No

        Does the patient have a known history of any of the following: (1) PCI or CABG, (2) heart failure, (3) diabetes mellitus, (4) renal insufficiency or (5) stroke or TIA?
        ⇒ Yes

            Is the operation associated with <1% cardiovascular risk (e.g., superficial, endoscopic, cataract, breast, ambulatory)?
            ⇒ Yes (Rarely appropriate – Indication 73.)
            ⇒ No (Generally appropriate.)
        ⇒ No (Rarely appropriate – Indication 71.)

⇒ No

    Has the patient previously undergone PCI or CABG?
    ⇒ Yes

        Is the patient currently symptomatic?
        ⇒ Yes (Generally appropriate.)
        ⇒ No

            PCI (most recent procedure) < 2 years ago?
            ⇒ Yes (Rarely appropriate – Indication 69)
            ⇒ No (Generally appropriate.)
            CABG (most recent procedure) < 5 years ago?
            ⇒ Yes (Rarely appropriate – Indication 67)
            ⇒ No (Generally appropriate.)

    ⇒ No

        Is the patient currently symptomatic?
        ⇒ Yes (Generally appropriate.)
        ⇒ No

            Has the patient had an ischemic evaluation in the past 2 years?
            ⇒ Yes (Rarely appropriate - multiple Indications.)
            ⇒ No

                Does the patient have low global cardiovascular risk?
                ⇒ Yes (Rarely appropriate – Indication 7)
                ⇒ No (Generally appropriate.)

Hierarchical, Response-Adaptive Consult Algorithm

Provider Time For E-Consult Completion & Response

- Ordering Provider: < 30 seconds for completion
  - Questionnaire designed in conjunction with primary care providers
  - Free text only required to briefly describe symptoms or to justify rarely appropriate test order
- Responding Provider: < 5 minutes for response
  - Response provided by cardiologist with multimodality CV imaging expertise
  - Typically less time than traditional protocoling because questionnaire design derived from AUC

Representative E-Consult Response (Appropriate)

- ▶ Test Ordered: Exercise stress SPECT.

- ▶ Appropriateness: Appropriate.

- ▶ Rationale: According to the 2013 Multimodality AUC, this patient falls under indication #5 (symptomatic – atypical chest pain, high pre-test probability of CAD – current 10-year ASCVD risk 27.5%, able to exercise, interpretable ECG). Under this indication, exercise stress SPECT is appropriate.

Representative E-Consult Response (Statin Utilization)

▶ Regardless of the outcome of stress testing, this patient's current 10-year ASCVD risk warrants high intensity statin therapy. Increasing this patient's atorvastatin from 20 to 40 mg PO daily to meet this recommendation could reduce this patient's 10-year ASCVD risk to 20.6%. Accordingly, a discussion between you and the patient regarding the risks/benefits of such an increase is reasonable to consider.

Cohort Characteristics

- 70 patients
- 63.1 +/- 8.4 years
- 87% men, 13% women
- 87% white, 7% African-American, 1% other, 4% unknown
- 5 prior PCI, 2 prior CABG
  - 10-year ASCVD risk in others: 19% +/- 13%
- 34% diabetes
- LVEF 60 +/- 7 % (n=21)
- 20% current tobacco, 31% former, 49% never

Cohort Characteristics (Cont.)

- SBP: 130 +/- 12 mm Hg, 54% on anti-hypertensives
- Total cholesterol: 181 +/- 39 mg/dL
- LDL cholesterol: 109 +/- 38 mg/dL
- 50% on statin
  - 2 low intensity, 15 moderate,18 high
- 40% on aspirin
- eGFR (n=68): 57 +/- 9 mL/min/1.73 m^2
- A1c (n=49): 6.3 +/- 1.2 %

Order Appropriateness

▶ Overall (n=53): 81% appropriate, 13%, maybe appropriate, 8% rarely appropriate

▶ No Study Ordered – 16 Total (23%)
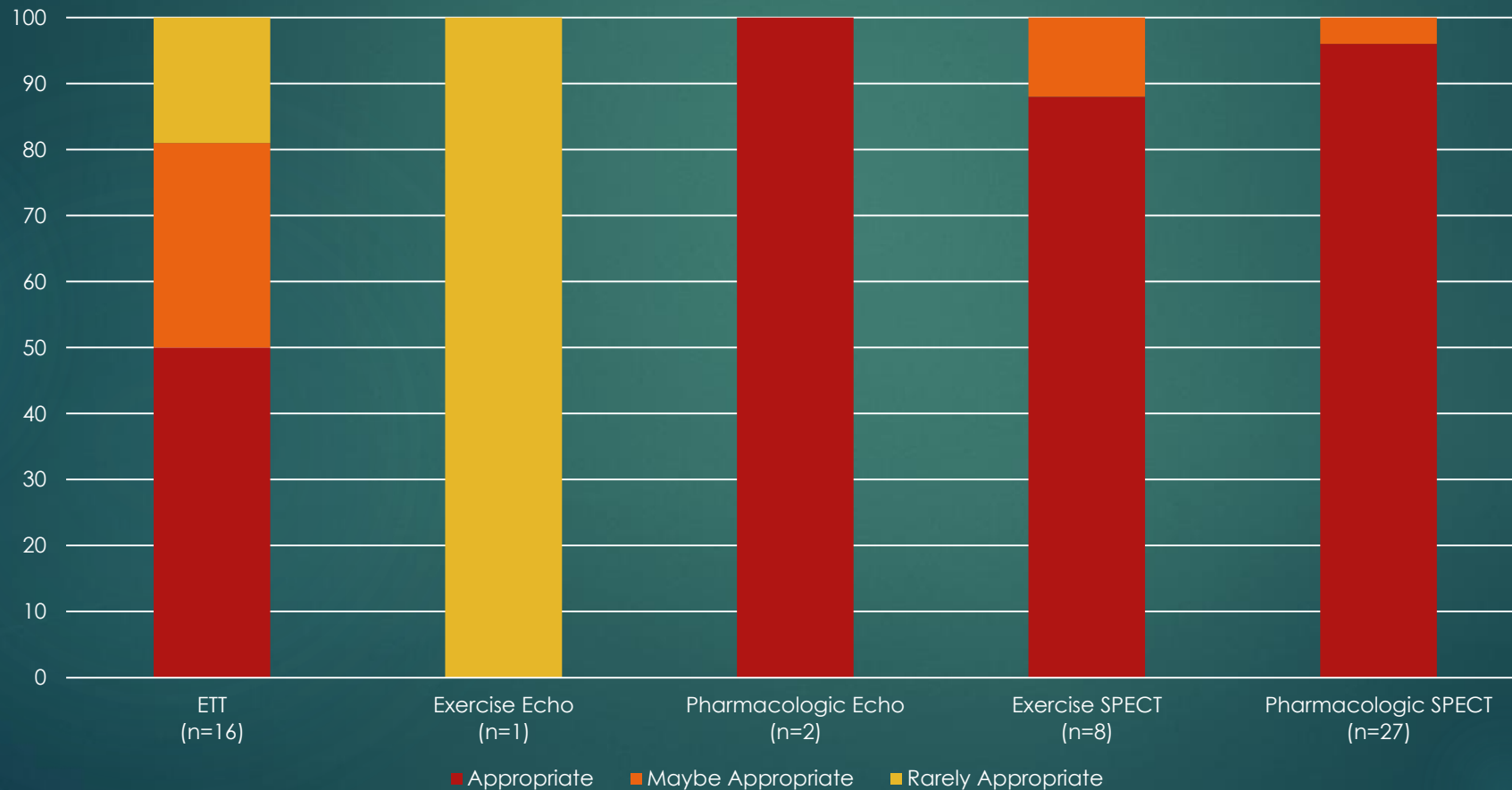
Consult Impact: Appropriateness

- Study Changes (n=53) – 9 (17%)

- 4 - ETT (maybe appropriate) --- Exercise stress SPECT (appropriate)

- 2 - ETT (maybe appropriate) --- Pharmacologic stress SPECT (appropriate)

- 1 - ETT (rarely appropriate) --- Coronary CTA (appropriate)

- 1 - ETT (maybe appropriate) --- No cardiac testing

- 1 - Exercise stress echocardiography (rarely appropriate) --- ETT (appropriate)

- Only 1 of 59 (2%) studies ultimately performed after our intervention was rarely appropriate.

- Baseline (pre-intervention) appropriateness at the PVAMC still needs to be quantified.

Statin Utilization At Referral

- Guideline Recommendation - No Statin: 7
  - Pre-Consult: 6 no statin, 1 moderate intensity (14%)
- Guideline Recommendation – Moderate-High Intensity: 35
  - Pre-Consult: 22 no statin (63%), 13 moderate or high intensity
- Guideline Recommendation - High Intensity: 28
  - Pre-Consult: 17 no statin, low or moderate intensity (61%), 11 high intensity

Consult-Based Statin Change Recommendations

- Total # of changes recommended: 36/70 (51%)
- Average 10-year ASCVD risk reduction associated with changes recommended in patients without prior PCI/CABG (n=33):

    4.9 +/- 3.2 %

Consult Impact: Statin Utilization Within 3 Months After Change Recommendation (n=36)

- No Change: 26/36 (72%)

- No Statin to Low Intensity: 2/36 (6%)

- No Statin to Moderate Intensity: 1/36 (3%)

- No Statin to High Intensity: 5/36 (14%)

- Low Intensity to High Intensity: 1/36 (3%)

- Moderate Intensity to High Intensity: 1/36 (3%)

Roadblocks/Challenges

- 2-step process (e-consult + order) – education required to make sure ordering providers completed both steps

- Statin change recommendations not immediately being implemented

  - Require written response from PCPs?

  - Direct communication with patients?

  - Behavioral change more effective with images than with risk stratification alone (e.g., SCOT-HEART)?

Scalability

▶ Easily implementable at any other VAMC (standardized EMR)

▶ Feasible in any other health system with customizable e-consultation capabilities within the EMR

▶ E-consultation format potentially allows for off-site response

  ▶ Relatively rarity of multimodality CV imaging experts

Conclusions

- Point-of-order e-consultation in conjunction with cardiac test ordering:
  - can facilitate and streamline test protocoling with the potential to nearly eliminate rarely appropriate cardiac testing in any health system;
  - represents an opportunity to educate ordering providers about appropriateness/AUC literature;
  - offers a novel, test-independent, individualized opportunity to correct statin underutilization and therefore optimize patients' cardiovascular care.

Collaborator Acknowledgement

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Thank You & Questions

Please rank this presenter based on the criteria noted:

1. Poor
2. Questionable
3. Average
4. Good
5. Excellent