Supplementary Appendix A

Joint Design with Providers of Clinical Decision Support for Value-Based Advanced Shoulder Imaging: Provider Interview Protocol

Materials
Copy of Information Sheet (IRB exempt)
Digital recorder, extra batteries
Notepad
Interview guide forms
Business cards

WAVE 1 Interview Guide: Primary Care Provider
Note: review information sheet’s provisions regarding confidentiality protection and voluntary nature of interview before beginning. Provider identity should remain anonymous in reports. Obtain verbal consent/permission to tape and take notes. Leave a copy of information sheet.

Background and Context
1. Please describe your current position and background (prompts: training, specialty, credentials, experience as a health care provider and at the VA).
2. What is your role in referring patients for imaging studies within the VA?
3. About how often do you see patients with shoulder injuries or pain? Please estimate the number per month.
4. What diagnostic procedures do you prefer to use for patients with shoulder injuries or pain? (prompts: use of arthrography, CT, MRI, X-ray, ultrasound)

Exposure to Initial Provider Education
5. Have you seen recent communications within the VA about the use of musculoskeletal ultrasound instead of other imaging approaches for patients with shoulder pain (Sociotechnical Model – People)?
   If no, has not seen: skip to question 8
   If yes, has seen: proceed to question 6
6. What did you learn? What is your perception of the evidence regarding the use of musculoskeletal ultrasound versus MRI in patients with shoulder pain? (Sociotechnical Model – People)

Impact of Provider Education on Ordering Decisions
7. Has this information affected your decisions about what type of imaging to order for patients with shoulder imaging or pain? If so, how?
   A. If no change to ordering decisions:
      i. What are the reasons you have not changed your approach?
      ii. What would convince you to change the type of imaging you order?
   B. If changed ordering decisions:
      i. What convinced you to change the type of imaging you order?
      ii. What feedback have you received from patients, specialty providers, and others regarding results from changing the type of imaging you order (Sociotechnical Model – Clinical Context)

Thoughts on Clinical Decision Support Tools
“Clinical Decision Support Tools” are contextual messages reminding you of evidence-based decisions in patient care.
8. How do you react to clinical decision support tools within the electronic health record? (Sociotechnical Model – Human–Computer Interface – Workflow and Communication)
9. How could clinical decision support tools be made more effective? (prompts: describe challenges/barriers such as clinical content, steps and processes, and workflow, and how they could be overcome) (Sociotechnical Model – Human–Computer Interface – Workflow and Communication)
10. What education, outreach, and/or features of clinical decision support tools would you recommend to improve the efficiency of imaging orders? How do you think these changes would affect provider orders? (Sociotechnical Model – Human–Computer Interface – Workflow and Communication – People – Internal Organizational Policies, Procedures, Culture, Environment)
Impact of Cost and Availability on Ordering Decisions

11. Assuming you can still obtain a reasonable time to appointment, how does cost or limited availability of a diagnostic study affect your ordering decisions? (Sociotechnical Model – External Rules, Regulations, Pressures – Measurement and Monitoring)

Other Thoughts and Feedback

12. Is there anything else you would like to share that might help our quality improvement efforts in this area? Thank you for your time!

Supplementary Appendix B

Joint Design with Providers of Clinical Decision Support for Value-Based Advanced Shoulder Imaging: Provider Interview Protocol

Materials

Copy of Information Sheet (IRB exempt)
- Digital recorder, extra batteries
- Notepad
- Interview guide forms
- Business cards

"May be revised after the wave 1 interviews and CDS design are complete"

Note: review information sheet’s provisions regarding confidentiality protection and voluntary nature of interview before beginning. Provider identity should remain anonymous in reports. Obtain verbal consent/permission to tape and take notes. Leave a copy of information sheet.

Background and Context

[Note: Numbering begins at 13 for tracking of providers who are interviewed in both phases]

13. Please describe your current position and background (prompts: training, specialty, credentials, experience as a health care provider and at the VA)

14. What is your role in referring patients for imaging studies within the VA?

15. About how often do you see patients with shoulder injuries or pain? Please estimate the number per month.

16. What diagnostic procedures do you prefer to use for patients with shoulder injuries or pain? (prompts: use of arthrography, CT, MRI, X-ray, ultrasound)

Exposure to Clinical Decision Support

17. Have you encountered clinical decision supports within the electronic health record regarding the use of musculoskeletal ultrasound for patients with shoulder pain? (Sociotechnical Model – Human-Computer Interface – People)

If no, has not seen: skip to question 8
If yes, has seen: proceed to question 6

18. What did you learn from the clinical decision support tool? What is your perception of the evidence regarding the use of musculoskeletal ultrasound versus MRI in patients with shoulder pain? (Sociotechnical Model – People)

Impact of Clinical Decision Support on Ordering Decisions

19. Has the information provided in the clinical decision support tool affected your decisions about what type of imaging to order for patients with shoulder imaging or pain? If so, how?

A. If no change to ordering decisions:
   i. What are the reasons you have not changed your approach?
   ii. What would convince you to change the type of imaging you order?

B. If changed ordering decisions:
   i. What convinced you to change the type of imaging you order?
   ii. What feedback have you received from patients, specialty providers, and others regarding results from changing the type of imaging you order? (Sociotechnical Model – Clinical Context)
Thoughts on Clinical Decision Support Tools
“Clinical Decision Support Tools” are contextual messages reminding you of evidence-based decisions in patient care.

20. How do you react to clinical decision support tools within the electronic health record? (Sociotechnical Model – Human-Computer Interface – Workflow and Communication)

21. In general, how could clinical decision support tools be made more effective? (prompts: describe challenges/barriers such as clinical content, steps and processes, and workflow, and how they could be overcome) (Sociotechnical Model – Human-Computer Interface – Workflow and Communication)

22. Specifically, how could the clinical decision support tool regarding the use of musculoskeletal ultrasound be made more effective? (Sociotechnical Model – Human–Computer Interface – Workflow and Communication)

23. What education, outreach, and/or features of clinical decision support tools would you recommend to improve the efficiency of imaging orders? How do you think these changes would affect provider orders? (Sociotechnical Model – Human–Computer Interface – Workflow and Communication – People – Internal Organizational Policies, Procedures, Culture, Environment)

Impact of Cost and Availability on Ordering Decisions
24. Assuming you can still obtain a reasonable time to appointment, how does cost or limited availability of a diagnostic study affect your ordering decisions? (Sociotechnical Model – External Rules, Regulations, Pressures – Measurement and Monitoring)

Other Thoughts and Feedback
25. Is there anything else you would like to share that might help our quality improvement efforts in this area?

Thank you for your time!