Do Standardized Reporting Templates with Mandatory Reporting Fields and "Pick-List" Options Improve Use of Prostate Imaging and Data Reporting System (PI-RADS) Version 2 In Clinical Practice? A Plan-Do-Study-Act (PDSA) Analysis

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Objective

To improve the utilization of PI-RADS version 2 assessment category use in prostate multi-parametric MRI reports at a single institution tertiary care referral center for prostate.

Intervention → PLAN DO STUDY ACT CYCLE

1. **PLAN** – Improve utilization of PI-RADS v2 assessment categories

2. **DO** – Educate and institute means to improve utilization
    1. Distribute educational materials highlighting the importance of PI-RADS version 2 including evidence based literature
    2. Create standardized reporting templates including mandatory "pick-list" fields for PI-RADS version 2 assessment categories

3. **STUDY** – Evaluate the utilization of templates and PI-RADS v2

4. **ACT** – Provide feedback on use including Urologist satisfaction

Materials and Methods
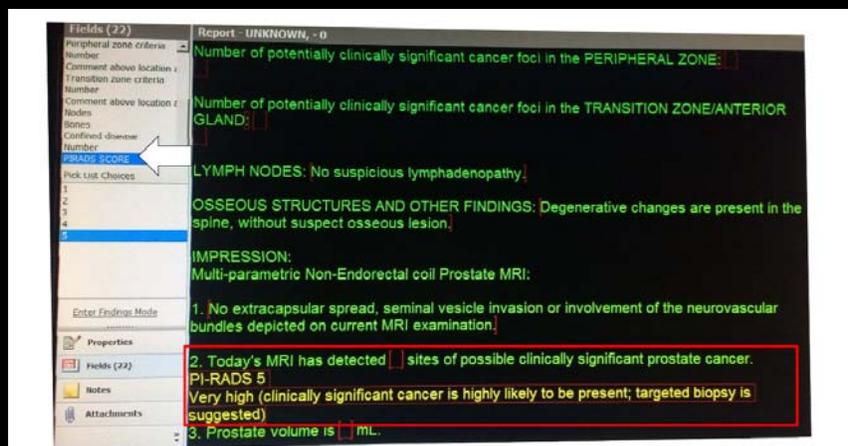
Figure 1. Illustration of standardized reporting template instituted for prostate MRI to improve utilization of PI-RADS version 2. A mandatory field under the "IMPRESSION" heading was created (RED BOX) where radiologists were required to populate a PI-RADS template field assigning the appropriate PI-RADS version 2 assessment category with a "pick-list" tool (white arrow). PI-RADS assessment category included definition of term and clinical recommendation.

Results

- Template Use – There was a significant improvement in template use using our P-D-S-A intervention (p<0.001), Figure 2.
  - Time period 1 (No template instituted) – 0% (0/115)
  - Time period 2 (Post template creation) – 38.2% (44/115)
  - Time period 3 (Post intervention 2) – 60.7% (51/84)

- PI-RADS v2 Assessment Category Use – There was a significant improvement in Assessment Category use using our P-D-S-A intervention (p<0.001), Figure 3.
  - Time period 1 (Pre-intervention) – 4.3% (5/115)
  - Time period 2 (Post template creation) – 43.5% (50/115)
 - Time period 3 (Post intervention 2) – 59.5% (50/84)
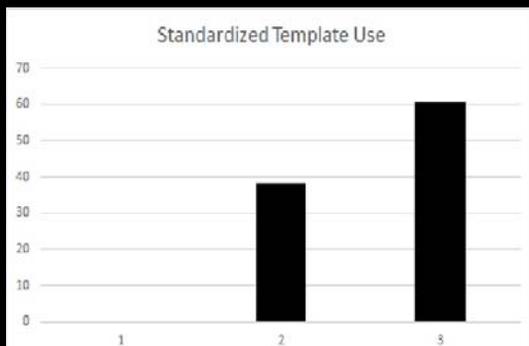
Figure 2. Bar graph plots illustrating the increased use of standardized reporting templates throughout the study period. 1=Time period 1 (pre-intervention), 2=Time period 2 (post-intervention) and 3=Time period 3 (post-feedback)

Figure 3. Bar graph plots illustrating the increased use of PI-RADS v2 assessment categories throughout the study period. 1=Time period 1 (pre-intervention), 2=Time period 2 (post-intervention) and 3=Time period 3 (post-feedback)
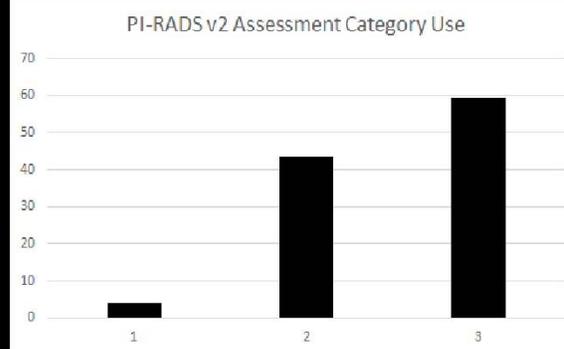
Results

- Does template use (with mandatory fields and "pick-list" options) improve use of PI-RADS v2 Assessment Categories?
  - The improved use of Assessment Categories in our study could have simply been related to increased awareness and education in our study.
  - We performed an analysis of PI-RADS v2 assessment category use and standardized Template Use and demonstrated a significant association ($p<0.001$).
  - Assessment category use increased from 32.7% (n=34/104) (when no template was used) to 60.5% (n=66/95) (when the standardized template was used).

Results

- Did the number of targeted biopsies increase?
  - 38.9% (n=122/314) of patients underwent targeted biopsy in this study, across all three time periods.
  - There was no difference in the number of targeted biopsies performed in the three time periods ($p=0.799$)
    - Time period 1 (Pre-intervention) – 46/115 had targeted biopsy (out of a possible 79 lesions).
    - Time period 2 (Post intervention 1) – 44/115 had targeted biopsy (out of a possible 79 lesions).
    - Time period 3 (Post intervention 2) – 32/84 had targeted biopsy (out of a possible 61 lesions).

Results

- Did the time to targeted biopsies decrease?
  - 38.9% (n=122/314) of patients underwent targeted biopsy in this study, across all three time periods → there was no difference in patient access to targeted biopsy throughout the study period.

  - There was a significant decrease in time interval between "positive" mp-MRI and biopsy comparing the three time periods (p=0.028), Figure 4
    - Time period 1 (Pre-intervention) – 101.7 ± 103.6 days
    - Time period 2 (Post intervention 1) – 83.6 ± 52.8 days
    - Time period 3 (Post intervention 2) – 62.2 ± 32.5 days

Clinical Relevance

- Our study demonstrates that education, the use of standardized reporting templates with mandatory fields for PI-RADS v2 assessment categories and user feedback from Urologists improves the use of PI-RADS v2 in practice.

- PI-RADS v2 assessment categories did not improve the number of targeted biopsies performed; however, were associated with significantly reduced time intervals between MRI and biopsy without differences in patient access to biopsy. This suggests improved communication between Radiologists and Urologists regarding management decisions with positive MRI exams when PI-RADS v2 assessment categories are used.