Perceived Effects of Decision Support

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<th>AT BASELINE</th>
<th>AT MIDPOINT</th>
<th>AT CONCLUSION</th>
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<tbody>
<tr>
<td>Ordering better DI tests</td>
<td>10/15 (66%)</td>
<td>9/19 (47%)</td>
<td>10/19 (52%)</td>
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<tr>
<td>Participation detrimental to practice efficiency</td>
<td>6/15 (40%)</td>
<td>13/19 (68%)</td>
<td>3/19 (16%)</td>
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<tr>
<td>Commitment to using DI decision support</td>
<td>11/15 (73%)</td>
<td>10/19 (52%)</td>
<td>9/19 (47%)</td>
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**RATIONALE**
- Evidence has mounted over the past decade that between 10 and 20% of imaging studies are unnecessary, amounting to millions in wasteful spending annually.
- Because all medical procedures involve risk, inappropriate diagnostic imaging (DI) is also a patient safety issue.
- Unnecessary exposure to radiation is particularly troubling in children who are the most vulnerable to radiation-induced cancers.
- Clinical guidelines can significantly reduce inappropriate imaging if clinicians follow the guidelines.
- The highest probability of guideline effectiveness in clinical decision support is a specific reminder delivered to the clinician about best practice relevant to a specific patient at the time of consultation with that patient.
- Computer-based order entry (CPOE) systems are well suited to providing decision support to clinicians in real-time during their regular work flow.

**APPROACH**
- Set up and training = 10 weeks at the Steinbach Family Medicine Clinic (16 physicians) in rural Manitoba.
- 28 weeks data collection.
- Medicalis software systems: CPOE SmartReg™ Decision Support Server™; the latter incorporated the CAR Diagnostic Imaging Referral Guidelines.
- All details of each DI order were saved within the software and made available for analysis.
- Individual interviews were conducted with participating physicians at baseline, halfway through the project and at project conclusion.

**RESEARCH QUESTIONS**
1. Will physicians incorporate decision support technology into their clinical routines?
2. Will physicians follow clinical advice when provided?

**METHODS**
1. There was significant variation across physicians in decision support participation.
2. 904 DI orders were placed through the CPOE and decision support.
3. The CAR guidelines addressed 524 (58%) of the orders.
4. Of those DI orders with relevant guidelines, 401 (76%) initially placed orders were appropriate.
5. The decision support system identified 123 (24%) orders as inappropriate and supplied a best practice prompt.
6. Physicians followed the decision support advice in 31 (25%) cases for which they were presented prompt information.

**RESULTS**
- There was significant variation among physicians in their willingness to change DI orders on receiving a prompt.
- The largest challenge identified was perceived interference with usual work flows, specifically the interactivity between EMR and the CPOE decision support.
- Half of the physicians initially questioned the validity of the CAR guidelines.
- Anonymized performance summaries delivered by email were rated as of moderate benefit.
- Perceived effects of project participation changed during the project.

**QUALITATIVE RESULTS**
- There was perceived disruption of clinical work flow. Even as actual disruption diminished with the intervention, the perception remained and may have prevented effective use of decision support.
- There was significant variation across physicians in their willingness and capability to modify software to suit user groups.
- There was significant variation among physicians in their willingness to change DI orders on receiving a prompt.

**LESSONS LEARNED**
1. Acceptance of decision support technology was primarily affected by the perceived disruption of clinical work flow. Even as actual disruption diminished with improvements in software function and presentation, the perception remained and may have prevented effective use of decision support.
2. Improving the interface between decision support software and clinicians is a continuous process requiring regular review with users, willingness and capability to modify software to suit user groups.
3. Passive interventions such as those used in this study (individual performance information and CME on demand) are not effective in improving physician compliance with best practice guidelines.
4. The Medicalis decision support software with the CAR Guidelines is well suited to clinical decision support.
5. Adequate time is required to assess the computer readiness of physician participants and to identify early adopters.
6. Effective decision support requires physician acceptance of oversight into clinical decision making. Effective medical leadership requires continual quality improvement in health care delivery.
7. Further studies should investigate methods to optimize the utility of the detailed information produced by decision support software coupled with evidence-based guidelines for quality improvement at practitioner, group and systems levels.

**REFERENCES**