

**Submission Id:** 3510

**Title**

*Improving Clinical Pathways for Cancer Diagnosis by Understanding Physicians' Mental Models*

**Priority 1 (Research Category)**

Dissemination and implementation research

**Presenters**

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**Abstract**

Context: The Alberta Cancer Strategic Clinical Network (C-SCN), a unit of Alberta Health Services, created province-wide diagnosis and referral pathways for rectal bleeding (RB), iron-deficiency anemia (IDA), and lymphadenopathy (LA). Historically such initiatives have met with limited uptake.

Objective: Apply cognitive engineering principles to improve design and implementation.

Study Design and Analysis: Cross-sectional Cognitive Task Analysis study, using our previously published framework-guided qualitative analytic approach.

Setting: Community primary care in Alberta.

Population Studied: 8 community family physicians in Alberta, purposively sampled to exclude early adopters and opinion leaders. Range < 10 to > 30 years in practice; 6 women; none rural.

Intervention/Instrument: Cognitive Task Analysis (mental simulation method) and "Think Aloud" protocol. Findings presented to C-SCN Leadership for revision of pathway content and implementation plan.

Outcome Measures: Fit of pathways with the mental models and cognitive strategies of family physicians. Suggestions for improving fit. C-SCN actions in response to findings.

Results: Physicians do not maintain detailed mental models for LA, and used the pathway for sensemaking. Physicians had well developed mental models for RB and IDA. They did not use the pathways for diagnosis, instead abstracting a few key points for sensemaking in the referral process and validating their decision making. The pathways' direction for referral for endoscopy did not fit with physicians' mental models. Suggestions provided to the C-SCN: not to attempt to change physicians' mental models, but instead change the triage process for incoming referrals. Physicians did not follow any of the pathways as algorithms, but sought key cues from them to use in System 1-based (rapid, intuitive) cognitive strategies. C-SCN was advised to change the format to cluster those key cues and

make them easy to find, and to avoid forcing physicians into slower System 2 thinking (potentially disrupting busy clinic workflow). Specific usability feedback was catalogued at the level of wording and format details, for use by the C-SCN pathway designers. The C-SCN team made major changes based on these recommendations.

Conclusions: A cognitive engineering approach can provide a perspective on care/diagnostic pathways that results in substantially different design and implementation choices.