

Navigating the Complexity of Cancer Diagnosis

A Clinical System Perspective of Pan-Canadian Cancer Diagnosis

The Clinical Process of Canadian Cancer Pre-Diagnosis synthesis map represents the complex practices of diagnosis typical in Canadian healthcare for patients living within three geographic regions. Three cancer sites are represented – Colon, Non-Hodgkin Lymphoma, and Lung – as a range of types to indicate for the wider variety of all cancers. The companion map, Patient Experience in Cancer Pre-Diagnosis also presents cancer diagnosis "journeys" for the same three cancer types, as experienced in the steps reported by patient advisors and studies for these cancers.

A complete cancer lifecycle from clinical suspicion to diagnosis is shown in both the clinical and patient maps, as the interval between a patient's initial concern to receiving a confirmed diagnosis from a cancer specialist. The Clinical process map presents the relative complexity of cancer diagnosis as understood by clinicians, showing variances in access to care in known geographies across Canada, and presents system interventions that might resolve barriers and access issues. Interventions are drawn from emerging models of diagnostic practice for improving cancer outcomes in Canadian provinces and territories, as well as established leading practices currently adopted in other countries.

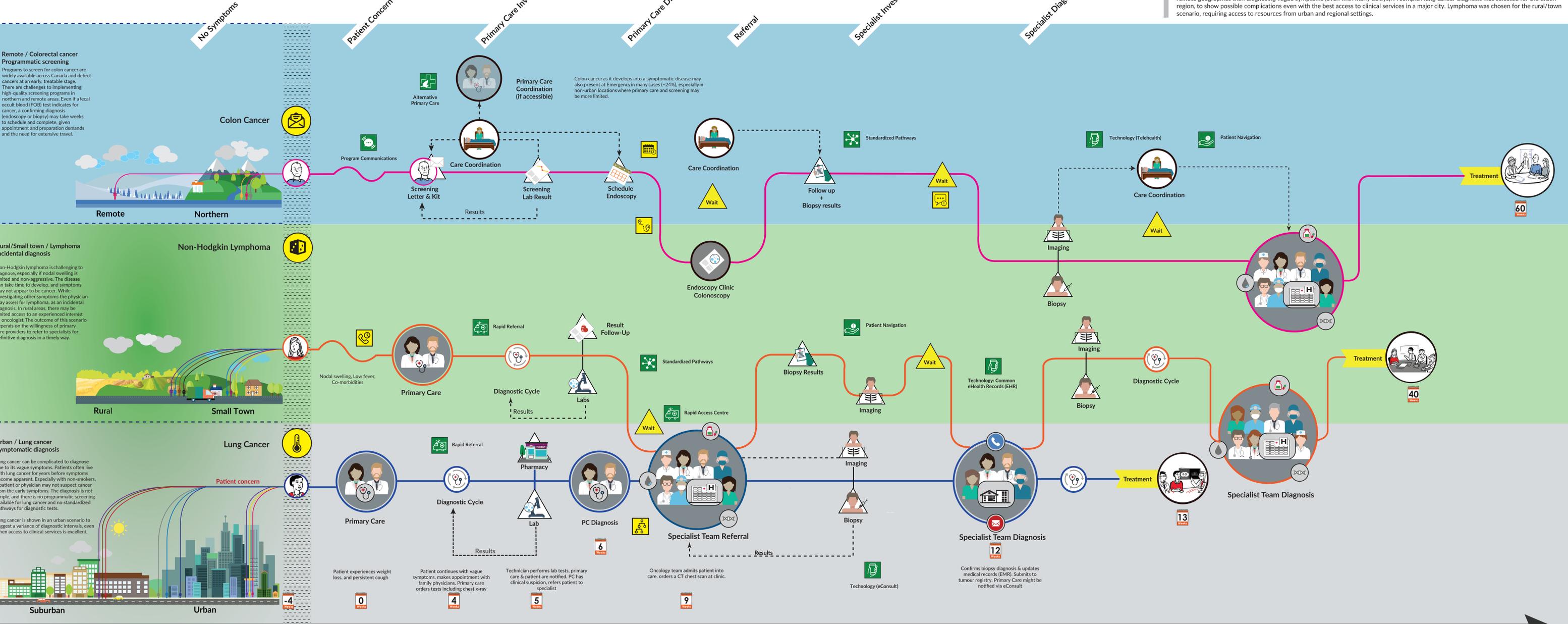
Three clinical scenarios are illustrated to show how different cancer sites might be diagnosed across the different resources generally accessible across three broad geographic bands: Urban, Rural/Small town, and Remote/Northern. The selected cancers portray the access and inequities of medical resources in these geographies, irrespective of province/territory. The cancer sites were chosen to highlight the trajectories from different diagnostic entry points. For colon cancer, programmatic screening has a better chance of a timely diagnosis in remote geographies than diagnosing vague symptoms (even with many delays). A complex lung cancer diagnosis was selected for the urban region, to show possible complications even with the best access to clinical services in a major city. Lymphoma was chosen for the rural/town scenario, requiring access to resources from urban and regional settings.

Distribution of Cancer in Pre-Diagnosis

The left side of the map visualizes the relative distribution of undiagnosed cancer across the three broad geographic regions of Canada, showing progressively more cases in more populated regions. The line colours indicate a type of cancer, and as symptoms form, patients enter into diagnosis via one of the four entry points (yellow icons) three of which are shown. Each flow represents one selected cancer type from suspicion to diagnosis, but similar patient flows through the cancer system are suggested in this process.

Stages of Pre-Diagnosis

While pre-diagnosis often shows as a single, complex stage in the cancer treatment cycle, a regular series of clinical encounters take place that reveal six stages within the cycle from suspicion (or symptom) to confirmed diagnosis. Listed across the top, these stages show signposts for the processes in the care pathway.



Levels of Care



3x3x4 Framework

3 cancer sites: Colorectal, Lung, Lymphoma
3 geographic regions: Urban, Rural/Small town, and Remote
4 entry points: Programmatic screening, Symptomatic, Opportunistic, Incidental

Entry Points

- PROGRAMMATIC SCREENING**
Diagnostic programs for common cancer types coordinated by provincial health agencies. Current programs include: Breast, Colorectal, Cervical, Prostate.
- OPPORTUNISTIC SCREENING**
Opportunistic screening is conducted on an individual basis as a result of an individual patient or health care provider's request or suggestion.
- SYMPTOMATIC**
Investigation of suspicious symptoms is initiated by physicians when patients present with symptoms that may indicate the presence of cancer.
- INCIDENTAL DIAGNOSIS**
Incidental diagnosis involves identifying cancer when investigating other issues in the course of clinical suspicion.

Delays and Barriers

- Vague Symptoms, Patient Uncertainty.**
Patients often ignore vague symptoms or put off consultations until symptoms are intrusive or painful. Some cancers can develop to Stage 4 without serious symptoms.
- Distance/Transportation.**
Transportation time and costs are an issue for remote residents. Arranging & taking medical transportation takes time & long-distance travel is a daunting expense. Work conflicts or other appointments needing travel can delay the diagnosis process.
- Access to Care.**
In remote areas there will be poor access to all levels of care. In small town/rural areas there may be excellent primary care, (long-term relationships, doctors know each other) but less access to specialist care.
- Pre-Diagnosis is not Urgent.**
Delays arise in early diagnosis due to a lack of perceived urgency, taking time off from work (when its not yet a cancer suspicion), time and expense to travel to clinics or testing (remote & rural), and family support for travel.
- Communication Issues.**
There is a notable lack of care continuity in the cancer system. Multiple consultations & referrals are common; physicians use outdated tools for sharing patient data.
- Transition / Handoff Delays**
1. Time from symptom/suspicion to definitive diagnosis
2. Time from abnormal screening/specialist referral to definitive diagnosis
3. Time from symptom to provider evaluation
4. Time from screening test to diagnostic resolution
5. Time from diagnostic confirmation to patient notification

Interventions & Solutions

- Program Communications.**
Screening can provide proactive reminders and help build health literacy. Regular primary care visits (annual exams) can build a series of lab measures as a baseline, to increase options for learning & health promotion.
- Alternative Primary Care Resources.**
In remote areas alternatives to typical family practice are needed. Town health centres, Indigenous community centres, pharmacies, mobile checkup and testing and mobile "locum" clinicians can be coordinated in a local ecology of support. Telehealth services should be considered.
- Navigation.**
Patient Navigator programs, clinical staff, even resource nurses can assist patients in managing appointments, understanding their diagnostic procedures, & with transitions from screening and primary care to cancer diagnosis.
- Technology (eConsult).**
eConsult email, Telehealth, & open EHRs have great promise. Diagnostic informatics & point-of-care diagnostic references are emerging tools. Patient communication & medication apps are helpful patient-facing technologies.
- Rapid Referral & Rapid Access Centres**
can provide faster treatment for clinically suspicious diagnoses early in the diagnostic cycle. RACs are specialized cancer clinics, often focused on a major cancer site, to provide responsive regional service for patients referred as urgent.
- Standardized Pathways**
Several pathway models are recommended:
 - Benchmark throughput/wait times for a jurisdiction
 - Standard pathways for well-known & problematic cancers
 - Urgent Referral Pathways for clear cancer symptoms
 - Coordinated or centralized regional diagnostic services

Legend

