

**Cancer Care Ontario**

**Action Cancer Ontario**

# Best Practices and Performance Measures for Systemic Treatment Computerized Prescriber Order Entry Systems (ST CPOE) in Chemotherapy Delivery

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Cancer Care Ontario

# Objectives

Describe a provincial strategic plan for safety improvement in chemotherapy delivery based on guidelines development

Describe the importance of guidelines in evaluating technology solutions in healthcare

# Chemotherapy Medication Errors

## Unique Medication Class

- often prone to errors due to complex protocols
  - dosing, monitoring and administration
- Narrow therapeutic index

## High-risk alert medication (ISMP)

In a study of adverse drug events conducted by Leape (1995), 39% of errors occurred in the physician order phase with drug dosing accounting for 28% of all errors.

Specific to chemotherapy, Gandhi (2005) revealed that the most common source of error was within the order phase and these were 48% more likely to be serious in nature as compared to non-chemotherapy medication errors.

# Why ST CPOE?

Organizations such as the Canada Health Infoway, IOM, the Leapfrog Group, and Certification Commission for Health Information Technology (CCHIT) have advocated increased use of technology to improve patient safety.

## Benefits

- Standardization of ordering practices
- Legibility of information
- Changes are recorded
- Ability to transfer ordering information

## Challenges

- May lengthen ordering time
- May not match users' preferred workflows
- Interfacing of systems may be problematic
- Lack of engagement of end users

# Cancer Care Ontario

## Vision

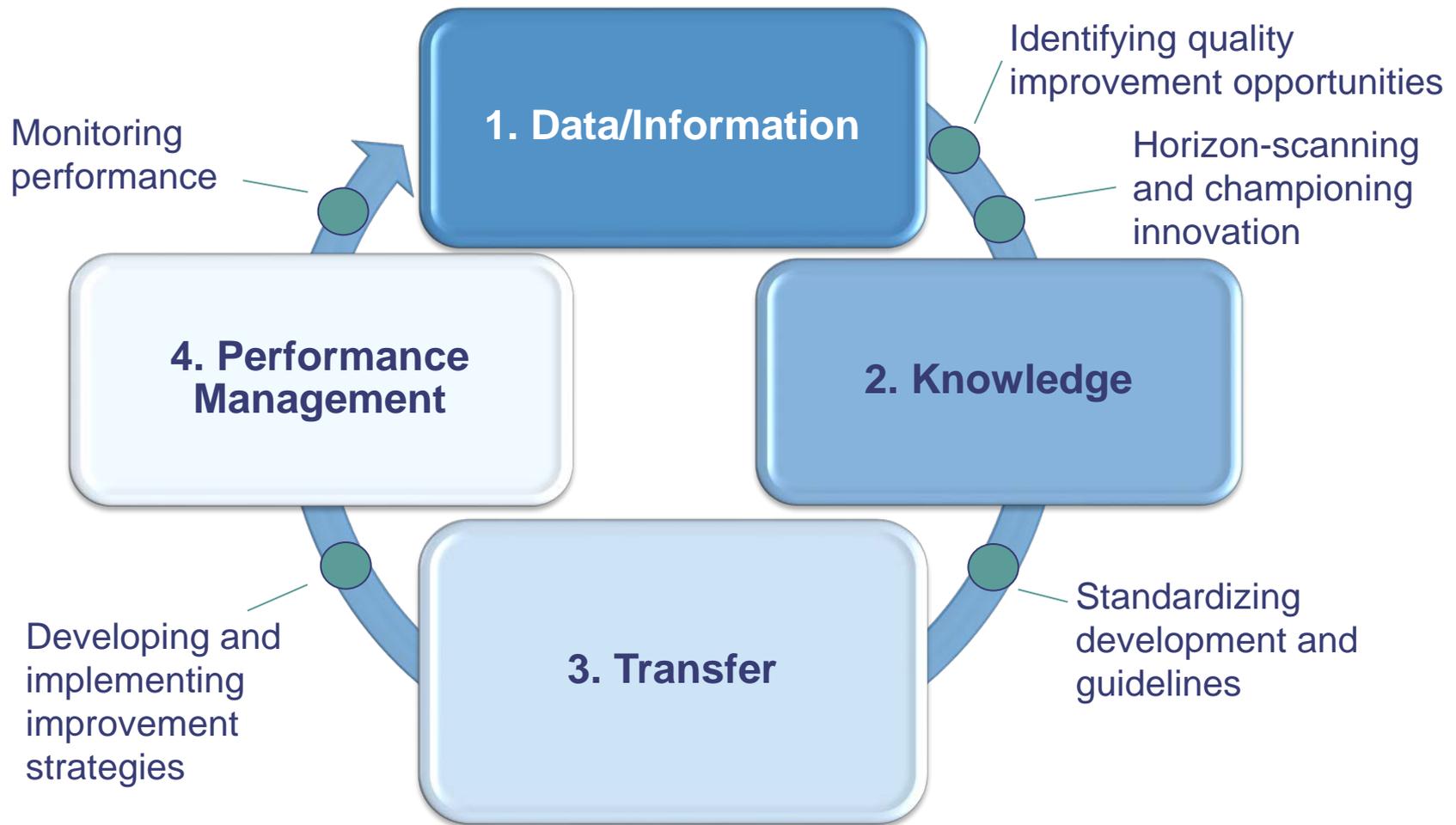
**Working together to create  
the best health system in the world**

## Mission

**Together, we will improve the performance of  
our health systems by driving quality,  
accountability, innovation and value**

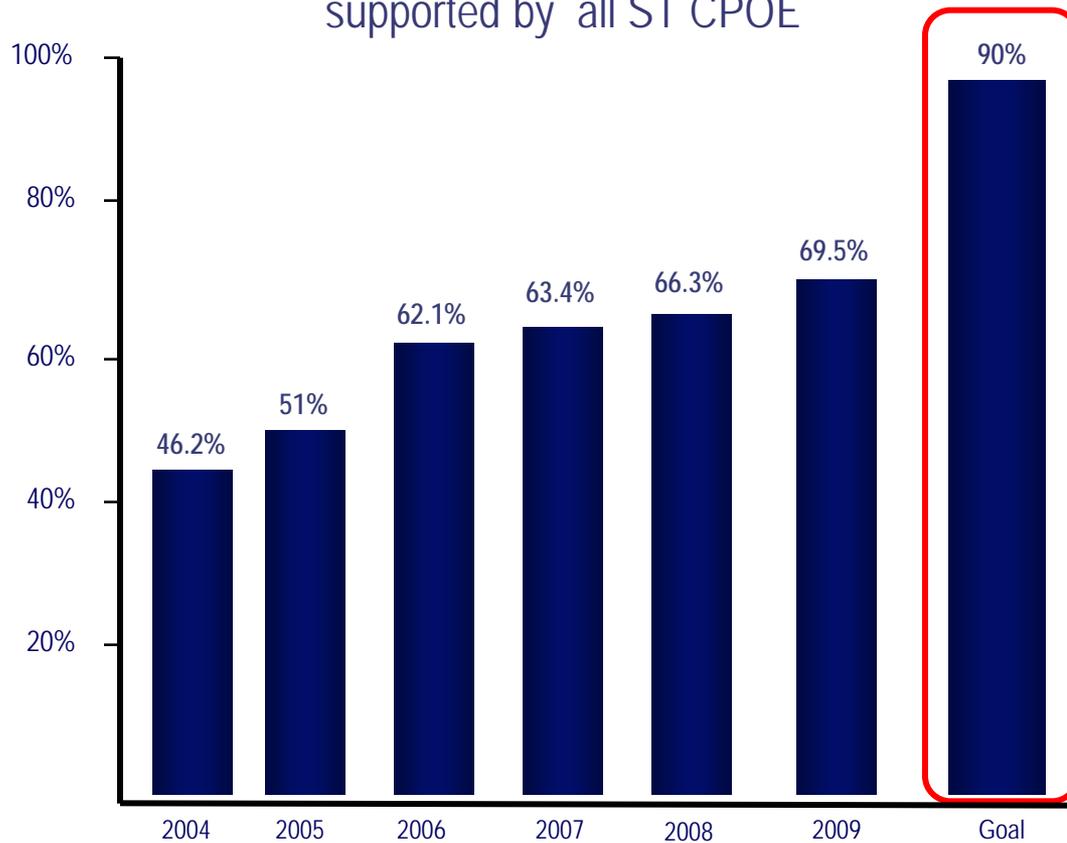
# Performance Improvement Cycle

Clinicians engaged in all components



# CCO's Goal of 90% ST CPOE Adoption Achieved

Percentage of systemic treatments visits supported by all ST CPOE



- CCO aim to achieve the goal of **90%** systemic treatment (out-patient) visits supported by Systemic Treatment Computerized Prescriber Order Entry (ST CPOE) across Ontario was achieved in March 2013

Source: National Ambulatory Care Reporting System (CIHI), self reported CPOE use

# Benefits of Developing Guidelines for Systemic Treatment Computerized Prescriber Order Entry

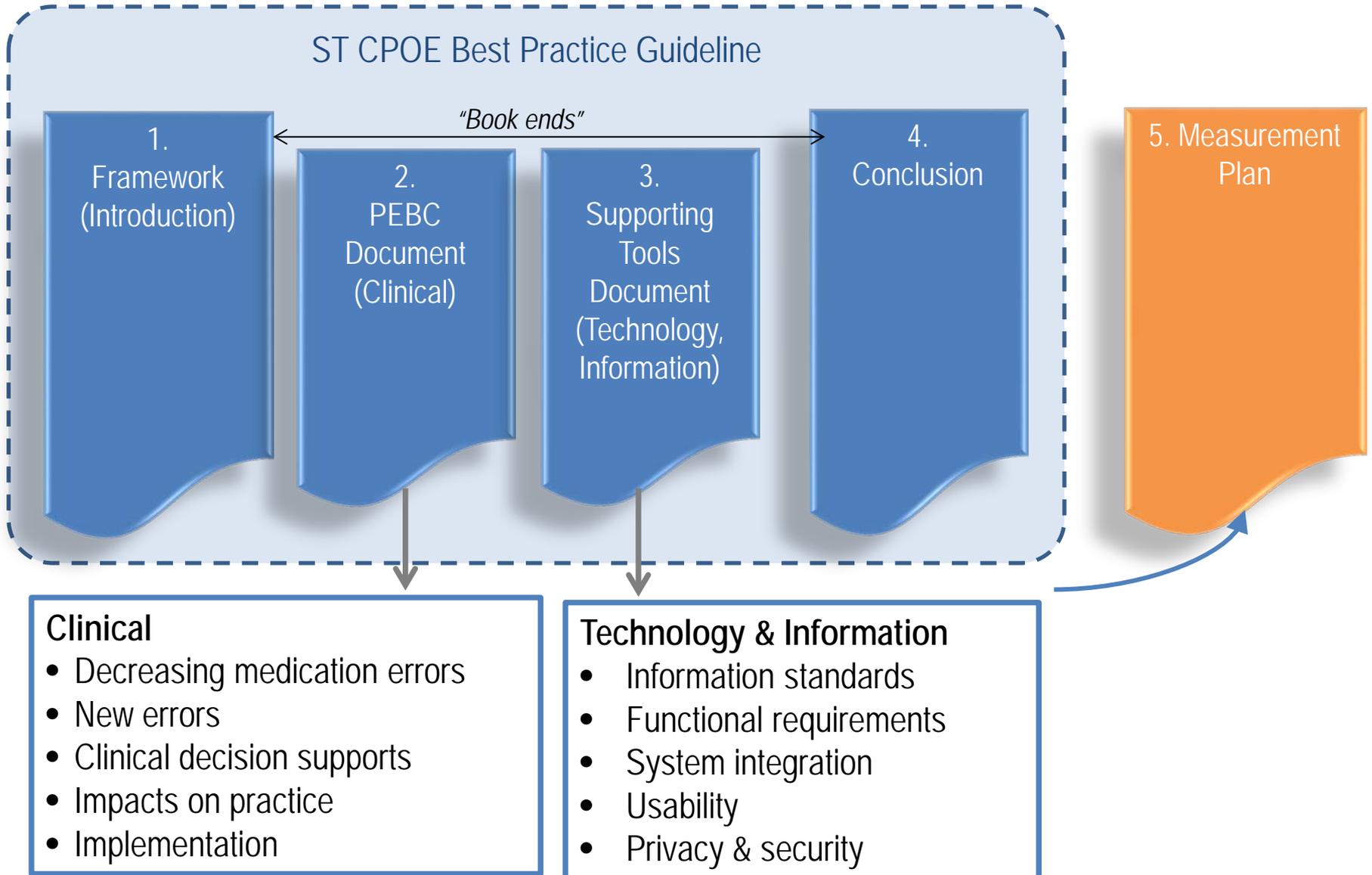
- Enable adherence to best practices to ensure benefits realization associated with ST CPOE systems
- Support planning, resource management and decision-support in the implementation and maintenance of ST CPOE systems
- Provide mechanism for monitoring guideline concordance and associated clinical outcomes

# Guideline Development: Overarching Research Question

## Overall research question:

What are the features, functionalities and components of a ST CPOE system which are required to ensure safe, high quality systemic treatment?

# ST CPOE BPG Project Deliverables

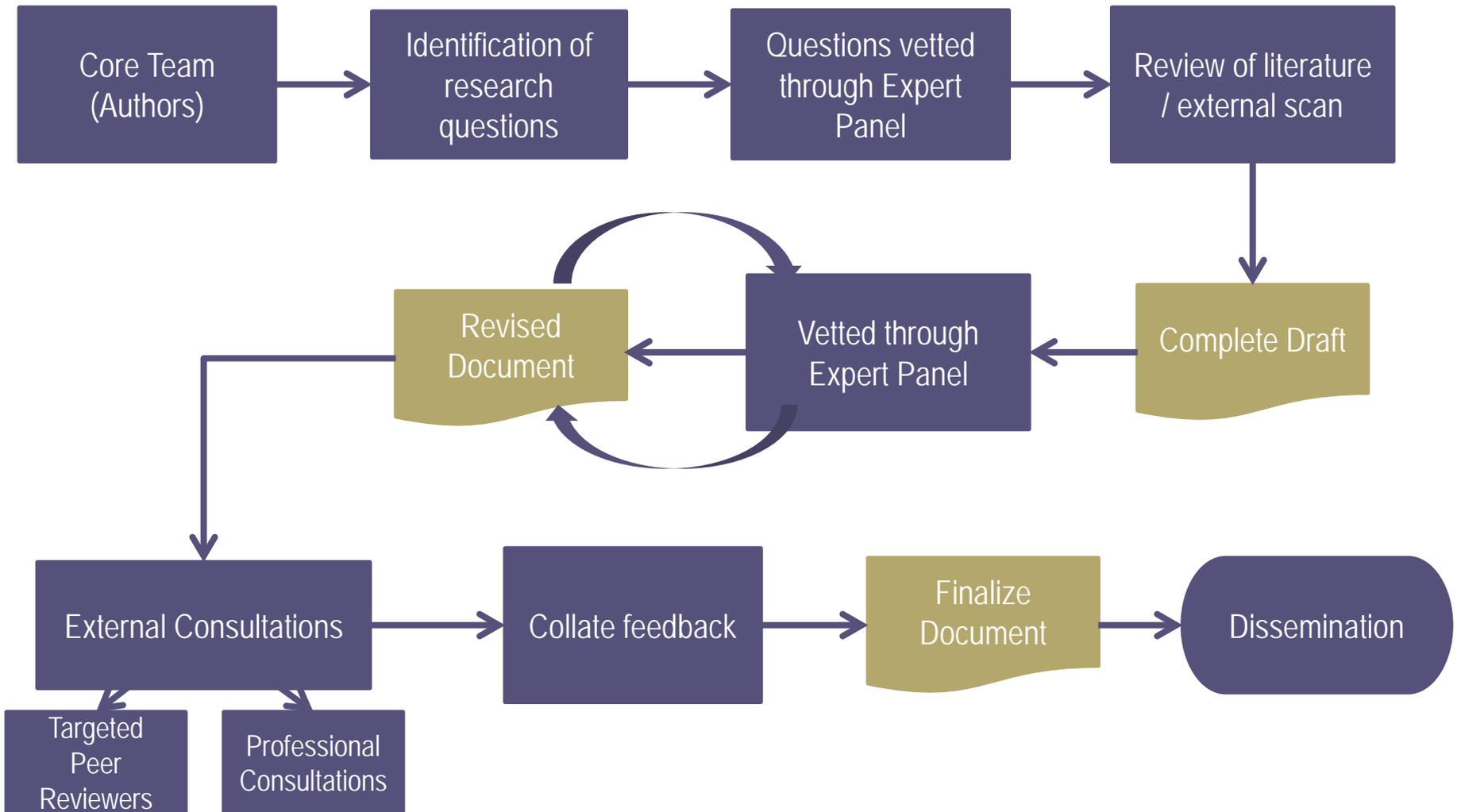


# Methodologies Used to Support Guideline and Indicator Development

1. Review of the literature
2. Environmental Scan : Industry and professional reports
3. Cancer Centre Consultations
4. Engagement of Content Experts\*
  - a) Expert Panels
  - b) Targeted Peer Reviewers
  - c) Professional Consultations
  - d) Modified Delphi exercises: Indicator review

\*Content experts included physicians, nurses, pharmacists, IT, human factors engineering representing various geographical areas in the province and different vendor users

# Guideline Development Process



# PEBC (Clinical) Conclusions

1. ST CPOE systems should be used in outpatient chemotherapy delivery to decrease chemotherapy related medication errors.
2. Clinical, technical and leadership champions need to be identified to support the use of ST CPOE within the organization.
3. A multi-disciplinary team approach in the design, selection, workflow evaluation, implementation and/or evaluation and ongoing monitoring of the ST CPOE system should be used.
4. ST CPOE processes that complement current practice and work flow processes to enhance adoption by clinicians should be ensured.
5. The development and implementation of a risk assessment process to identify actual / potential unanticipated consequences and new errors generated, and the development of strategies to modify the system accordingly, are warranted.

# Supporting Tools Recommendations

- Recommendations have been categorized as:

## Essential

Must be included in the design/ implementation of the CPOE system in order to achieve desired quality, patient safety and user satisfaction.

## Desired

Not absolutely necessary for success, but inclusion would increase the likelihood of success and/ or achieving significant gains in quality and patient safety.

# Key Recommendations: Pre-Implementation Phase

Pre-Implementation Phase	
Category	Recommendation (Sample)
Usability	<ul style="list-style-type: none"><li>• Incorporate a human centered approach in the design, implementation and evaluation of CPOE systems.</li><li>• Involvement of key stakeholders and end users in system design (e.g. physicians, pharmacists, nurses, information technology professionals, decision support, clinical informatics).</li></ul>
Functionality	<ul style="list-style-type: none"><li>• The system must contain functionality to support the medication ordering, verification, dispensing and administration process.</li><li>• Functionality must include the ability to monitor patient entrance/exit screening processes; set minimum and maximum dose levels, dose ceilings and rounding values.</li></ul>
System Integration	<ul style="list-style-type: none"><li>• Allows the patient to be uniquely identified across the continuum of care.</li><li>• Allows access, management and storage of patient laboratory orders and results through a jurisdictional Laboratory Information system.</li><li>• Provides clinicians with an improved ability to manage complete medication profiles through a jurisdictional drug information system.</li></ul>

# Measurement Plan

*Measurement of ST CPOE adoption will be addressed in two distinct components, each consisting of indicators, a data collection plan, and a reporting plan:*

## 1. Guideline Concordance

- **Key Question:** Is my ST CPOE in concordance with best practice guidelines?
- **Audience:** Intended to be used by ST CPOE system owners to evaluate their solution's functionality versus the guideline recommendations
- **Main Source:** Categorized as "Essential" or "Desired" functionality based on literature recommendations

## 2. Clinical Practice Outcomes

- **Key Question:** Is the use of my ST CPOE resulting in safe, effective, efficient, and integrated care?
- **Audience:** Intended to be used at the facility, regional, and provincial levels to measure the outcomes relating to the use of ST CPOE systems
- **Main Source:** Clinical outcome indicators cited in ST CPOE literature

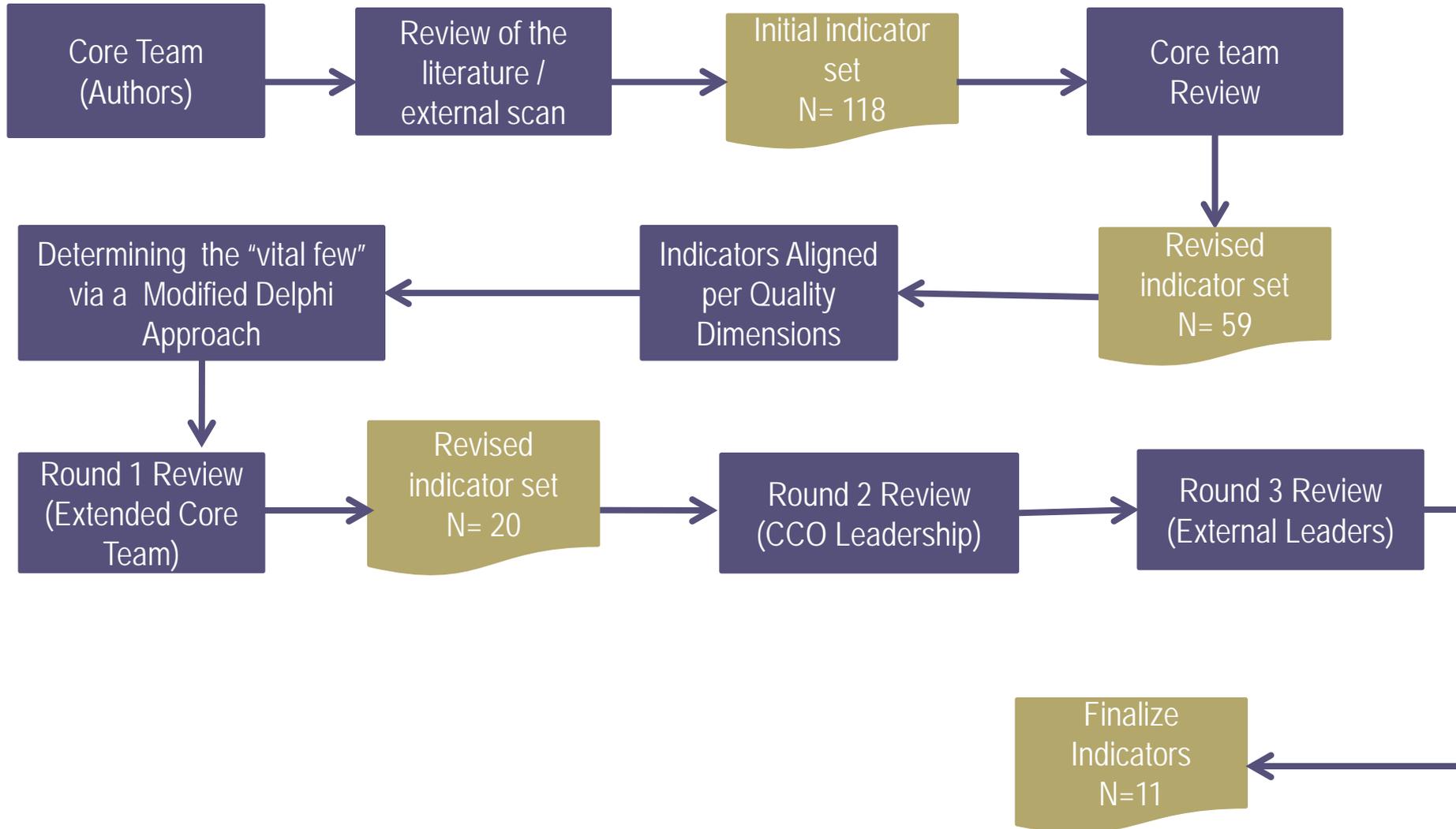
# Quality Dimensions for ST CPOE Measurement

*ST CPOE indicators are aligned to the Cancer System Quality Index (CSQI) Quality Dimensions*



Quality Dimension	CSQI definition	ST CPOE-related definition
Safe	Avoiding, preventing, and ameliorating adverse outcomes or injuries caused by healthcare management.	Avoiding, preventing, and detecting adverse events related to the prescribing of chemotherapy.
Effective	Providing services based on scientific knowledge to all who could benefit.	Containing all the essential features, functions and components to enable safe delivery of chemotherapy.
Efficient	Optimally using resources to achieve desired outcomes.	Enabling optimal and complete chemotherapy workflow through CPOE implementation and usability.
Integrated	Coordinating health services across the various functions, activities and operating units of a system.	Linking information and decision support systems relevant to the prescribing of chemotherapy.

# Clinical Practice Indicator Development Process



# Clinical Practice Indicators : Final List of indicators (N= 11) ; Subset of reporting indicators (N=4)

<b>Reporting priorities</b>	<b>Final Indicator Set / Subset of Reporting Indicators</b>	<b>Quality Dimension</b>
Future	Triggered Alert Rate (per order, per visit, per patient)	Safety
Future	Override Rate	Safety
Future	Adjusted Order Rate (per order)	Safety
Future	Unsigned Order Rate (per order)	Efficient
Future	Order Set Rate (per order)	Effective
Future	Free Text Rate (per order)	Effective
Future	Protocol-Consistent Order Rate (per order)	Effective
Near to Midterm	Intercepted Order Rate (per order) / Proxy for Near Miss Rate	Safety
Near to Midterm	Utilization Rate (per order) / Utilization Rate (per prescriber)	Effectiveness
Near to Midterm	Chemotherapy Medication Error Rate (per order)	Safety
Near to Midterm	Adverse Drug Event Rate – related to Chemotherapy	Safety

# ST CPOE Self Assessment Concordance Exercise – Supporting Tools Requirements

Subcategory	Number of items
Regimen and Protocols	4
Functionality	22
Useful Alerts	10
Audit logs	1
System Integration	10
Usability	5
Total	52

# Conclusions – “Clinicians Driving Technology and Not the Other Way Around”

Ability to create guidelines merging clinical practice and information technology

Guidelines have highlighted the importance of clinical practice driving IT solutions

In Ontario

Start of a provincial program to evaluate ST CPOE systems, how they are used and are they effective

Guidelines provide basis for IT solution enhancements and product development

Better accountability of the quality of IT solutions like ST CPOE systems for chemotherapy delivery

# Systemic Treatment Computerized Prescriber Order Entry Best Practice Guideline

[www.cancercare.on.ca/stcpoe](http://www.cancercare.on.ca/stcpoe)