Essential Imaging Getting Started Kit

A Getting Started Kit to Accelerate Appropriate Medical Imaging

Essential Imaging
BC PATIENT SAFETY & QUALITY COUNCIL

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About the Essential Imaging Getting Started Kit

This Getting Started Kit aims to help care providers, team leaders and staff members partner with patients to successfully initiate, test, implement and spread evidence-based best practices for appropriate medical imaging in five common areas in primary and emergency care.[1]

These five areas are:
- Uncomplicated headache
- Minor head injuries
- Suspected pulmonary embolism
- Low back pain
- Moderate to severe osteoarthritis in hip or knee joints

Although this kit was developed for teams enrolled in the BC Patient Safety & Quality Council's (the Council) 'Essential Imaging Initiative'* it can be used by anyone working to accelerate appropriate medical imaging. Informed by clinical practice, experience and subject matter expert contributions, the kit provides evidence-based and locally tested ideas and resources designed to accelerate change.

The purpose of the Essential Imaging initiative is to:

> *Accelerate the spread and implementation of the BC Guidelines for Appropriate Medical Imaging and improve care provider's access to evidence-based tools and change ideas that inform appropriate imaging requisition practices via a campaign and Action Series by March 2021.*

We include recommended evidence-informed practices using provincial guidelines (Appendix A), other resources and information (Appendix B) and point-of-care clinical decision tools (Appendix C) on appropriate medical imaging. As every setting is unique, we encourage you to adapt and build on these resources to best suit your local context.

We welcome feedback and suggestions to this document, as well as content posted on our **website (bcpsqc.ca/imaging)**, just email us at **imaging@bcpsqc.ca**.

*Co-led by the BC Patient Safety & Quality Council (BCPSQC) and the Ministry of Health (MoH)

Why is it Important?

> *Canadian studies suggest that up to 20% of medical imaging is inappropriate or non-essential.[2]*

For patients, inappropriate tests and treatments have limited value and potentially expose them to harm from additional testing, unnecessary radiation exposure, and unnecessary anxiety caused by the investigation of false positives. In some cases, practitioners may order imaging in response to patient expectations, or 'just in case' situations; sometimes imaging is ordered out of fear of potential liability or while waiting for a more appropriate treatment or imaging modality. Imaging can also be ordered if practitioners do not have point-of-care clinical decision support tools or resources to guide them in their work.

The BC Guidelines for Imaging in Common Situations in Primary and Emergency Care

The provincial Guidelines and Protocols Advisory Committee (GPAC) has created guidelines for medical imaging in common situations. The purpose of these guidelines is to communicate best practice for imaging in common situations in primary and emergency care, in order to promote appropriate use of imaging resources in BC.

The following five recommendations were agreed to by a provincial expert advisory group on medical imaging in BC (**https://bit.ly/3jJzIAf**):

- Imaging is not recommended for uncomplicated headache unless red flags are present;
- CT head scans are not recommended in adults and children who have suffered minor head injuries unless positive for a head injury clinical decision rule;
- Chest CT for suspected pulmonary embolism is not recommended in low-risk patients with a normal D-dimer result;
- Imaging is not recommended for low back pain unless red flags are present; and
- MRIs of hip or knee joints are not recommended in patients with co-existent pain and moderate to severe osteoarthritis unless red flags are present.

Practitioners are encouraged to consult a radiologist if they have any concerns or questions regarding which imaging test is appropriate to choose for a given problem.

Key Definitions

Medical imaging appropriateness:

> *"Medical imaging exams are deemed appropriate when health benefits exceed any potential negative consequences or adverse effects."*

Appropriate medical imaging contributes towards improved patient care and patient safety by enabling quicker diagnosis and the right medical management.

Inappropriate medical imaging:

> *"An imaging test that does not meet the clinical indication criteria, or one that is repeated in an unjustified short period of time."[3]*

This includes duplicate ordering, incorrect modality usage, absent or poor supporting clinical information, unneeded repeated examinations and exams ordered before the patient is assessed.
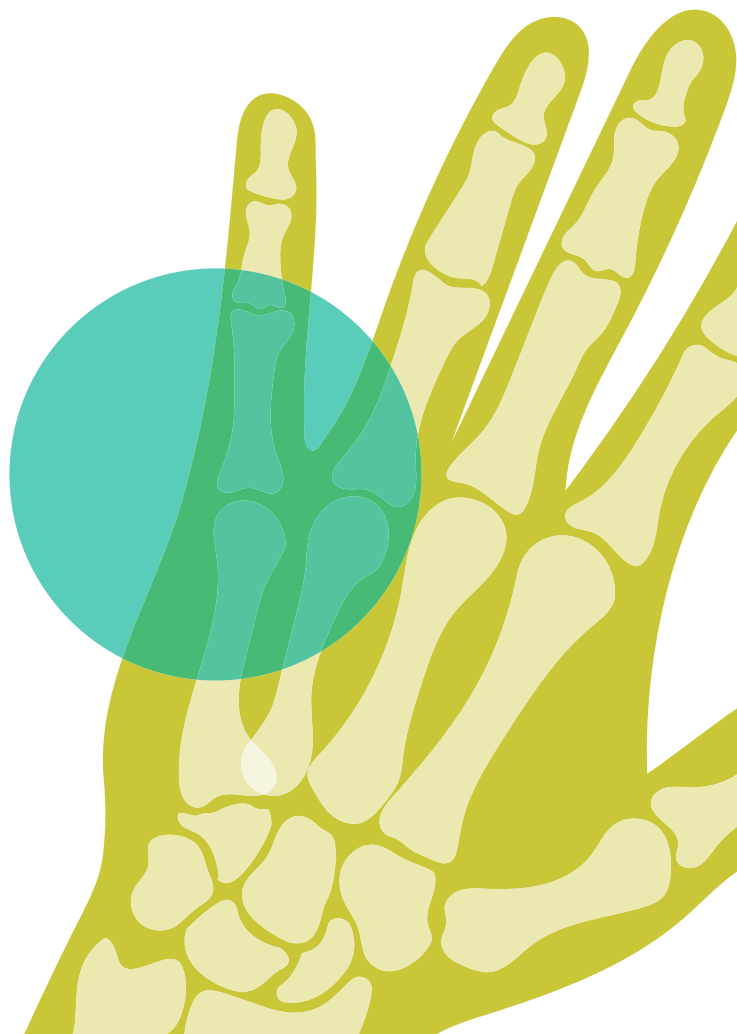
When Imaging is Ordered and Used Appropriately

- Wait lists for imaging are shorter;
- Patients undergo the right tests and experience less harm;
- Emergency departments become less congested;
- Critical imaging tests are available when we most need them;
- Coordination of care is improved; and
- Patients are exposed to less radiation.[†]

There is no benefit to inappropriate imaging, as it fails to provide any meaningful insight into treatment options. There are, however, benefits to quality of care when appropriate imaging becomes the norm and is hardwired into everyday work.

The ability to develop, test, and implement changes is essential for any individual, group or organization that wants to accelerate appropriate medical imaging. This kit was created by clinical experts to outline improvement ideas based on evidence, research and the experience of others. We've included a menu of strategies and ideas for you to adopt and tweak to your local context. To help choose the most appropriate strategy we recommend you learn and address the main drivers that create inappropriate imaging in your practice setting or institution.

[†]X-rays and CT scans expose patients to radiation, which can increase cancer risk. Back x-rays deliver 75 times more radiation than a chest x-ray. For men and women of childbearing age this is worrisome, as x-rays and CT scans of the lower back can expose testicles and ovaries to radiation.

Getting Started

Sustaining change takes work, but there are approaches that can help you be more successful! Following the steps below will help you introduce and spread successful, sustainable change.

Six Key Components to Getting Started

1. Co-create and establish shared vision and intent – from senior leadership to point-of-care clinicians – with an attitude and shared values that support implementing and sustaining change in your setting.

2. Establish a multi-disciplinary team that agrees on the importance of continuous quality improvement.

3. Set an aim and define your scope.

   - This might include a focus on one or more of the BC Guidelines.

4. Identify strategies to increase appropriate medical imaging in your clinic, department or facility.

   - Refer to the 'Strategies and Ideas' section for an array of change ideas you can choose and test in your environment.

   - Leverage the ready-made resources we've provided for you to use with care providers and patients.

5. Choose, test and measure your strategies in real time using quality improvement methodologies to drive and hardwire change into everyday work.

6. Measure your performance and establish evaluation metrics that become part of everyday conversation in your clinical setting.

1.
Co-Create a Shared Vision

Having a shared vision for appropriate imaging is key to the success of any project. Prior to launching this initiative, senior leaders within your organization must agree that reducing inappropriate imaging is a priority area of work for you and your team. Given the complexity of the current health system, a shared vision will be important to support the work.

Your organization will need to support point-of-care clinicians to lead quality improvement initiatives in medical imaging. This includes incorporating the knowledge and experience of care providers and patient partners at different level of the organization; identifying everyday leaders in your clinic or department to lead or co-lead this initiative and removing any disconnects between point-of-care, managers and executive staff.

Connect with Others on a Similar Path

Changing practice is not easy. Learning what has worked well from other teams' experiences and tapping into expert knowledge can help avoid common challenges and pitfalls. By joining our Action Series, you are provided learning content from speakers and experts, and can connect with other teams across BC that all work on the same problem at the same time.

You can also find information at bcpsqc.ca/imaging. This website is a place to connect and learn alongside others working to increase appropriate medical imaging across BC.

Plan for Engaging Stakeholders

Engaging stakeholders is critical. Stakeholders are those people who are impacted by the change. When identifying your stakeholders, consider who needs to be aware of the work and who needs to be involved in co-creating efforts to advance medical imaging appropriateness. Communicating early and often with key stakeholders is vital and should be part of guiding and creating the change. A written stakeholder engagement plan will help you stay on track.

Stakeholder Engagement Plan

As a team, who will you need to engage to make this improvement strategy successful?

Key Leader	Roles and Responsibilities	How Can We Engage with Them?	What Are We Asking Them to Commit To?
Senior executive/ director level	• Provide executive leader sponsorship of the initiative • Maintain forward momentum, especially when confronted with barriers • Not intended to find and fix problems, but to support identified areas for improvement and implementation of new ways to support best practice		
Administrative leadership/ manager level	• Allocate resources to ensure data acquisition and analytics • Champion for improvement initiative • Ensure project aim aligns with clinic and/or institution's strategic priorities • Remove systemic barriers to initiative success		
Administration decision support/ IT expertise	• Provide additional resources or ideas where existing systems do not provide relevant data or do not allow for the integration of decision support into order entry processes		
Quality improvement specialist leadership	• Provide baseline data or an audit of appropriateness in ordering practices to identify potential areas for improvement		
Point-of-care clinicians and staff	• Provide direct input into quality improvement initiatives that address processes and practices		

2.

Establish a Multi-Disciplinary Team

Don't try and go it alone! This kind of initiative requires the support of a team of people to be successful and sustainable. When you're forming your team, remember that diversity is key: include people with different skill sets, knowledge areas and perspectives. Involving a diverse group increases the quality of decisions, processes or tools, and helps staff become champions of the changes they've helped to create. You'll want to consider content experts, patient partners, quality improvement consultants and those whose work might be affected by the changes you will make.

Don't forget to recruit a project sponsor - someone with executive authority who can provide approval for changes, facilitate access to resources, and help overcome barriers. Work with your team to agree on meeting schedules, communication, timelines, actions, and roles and responsibilities.

Ideally, a multi-disciplinary improvement team includes individuals specific to your local context such as:

- Care provider leads – general practitioners (GPs), emergency physicians, specialists or nurse practitioners (NPs) – or a combination of these
- Quality lead
- Emergency medicine physicians
- Radiologists
- Technologists and support staff – clerical support
- Patient partners (ensure they represent the population served)
- Physiotherapists

Note that where existing resources are in place, your project should leverage those resources rather than duplicate work, e.g., leverage hospital or community-level quality committees or teams ran than starting anew.

Principles for Working Together

Once a team is formed, it is essential for the team to agree on their roles and responsibilities and define how they will work together in the coming months. Some examples of 'group norms' are listed below. You can use these to create your own statements for your team or you can create your own.

- Build on the work established from the BC Guidelines (**https://bit.ly/3jJzIAf**) and this kit and adapt to local context;
- Active participation – everyone has a voice and will contribute ideas;
- Everybody teaches, everybody learns; and
- Roles and plans will evolve over time (iterative, sequential building of knowledge).

Need help with engaging and developing your improvement team? Find general teamwork and communication resources at **https://bcpsqc.ca/resources/teamwork-communication/**

3.

Set an Aim and Define Your Scope

What Are We Trying to Accomplish?

A written plan, sometimes called an improvement charter, is a documented plan to guide the work of your team. Charters are useful for projects because they:

- Clarify purpose
- Limit the tendency to get off track
- Outline roles of various team members
- Show where to start
- Determine when the project is finished

Think about your purpose: a good aim statement should be specific and include a target and a time frame. An example might be:

> *'By December 31, 2021 we will be utilizing point-of-care decision support in our assessment process for lower back pain in the emergency department 95% of the time.'*

Essential Imaging Improvement Charter

Organization, Facility or Site:	**Executive Sponsor:**
Team Lead(s):	**Team Members:**
What Are We Trying to Accomplish? Aim statement – what will improve? By when? By how much?	**How Will We Know That a Change is an Improvement?** Measures – what can we track to show us how we are doing?
What Changes Can We Make That Will Result in Improvement? Change ideas – what changes can we test to improve care?	**How Will We Manage the Improvement Project?**

Agree on Appropriateness Criteria

An important step to reducing inappropriate imaging is achieving team consensus on appropriate imaging relevant to your context. Consider the scope of what you are trying to achieve:

☐ Will you begin with one area or all five areas?

☐ Are there related projects to build from?

☐ Will you look at similar change projects that were successful and mimic their implementation plan?

☐ Any specific populations you will target first?

☐ Any constraints such as policies or guidelines that need to be considered?

☐ Are there staffing or financial resources to tap into?

☐ Will the changes you are implementing affect existing processes or workflows in your organization?

4.

Identify Strategies and Ideas

There are many evidence-based strategies and ideas you can adapt to support appropriate imaging. Strategies and ideas listed in this kit are not all-inclusive and you may discover others that would be ideal in your context. Stay open to innovative ideas to improve patient care and safety.

Explore Your Problem and Implement Best Practice

A driver diagram is a visual framework that helps us to achieve our goal of reducing inappropriate medical imaging. It breaks down the overall aim into primary drivers, secondary drivers and tangible ideas that are ready for testing and implementation.

This section is organised by:

1. A description of the components of the driver diagram; and

2. An outline of ideas under each of the components for supporting appropriate imaging. Learning 'how-to' test your chosen ideas will be dependent on your local context. Find out more on how to test ideas in Section 6: Begin Testing and Implementing Changes.

Primary driver: Improvement areas that need to be addressed to achieve the outcome.

Secondary driver: Specific interventions necessary to achieve the primary driver.

Key change ideas: Specific ideas that will support or achieve the secondary driver.

Essential Imaging Initiative Driver Diagram

The provincial Guidelines and Protocols Advisory Committee (GPAC) has created guidelines for appropriate medical imaging. The purpose is to communicate best practice for imaging in five common situations:

- "Imaging is not recommended for uncomplicated headache unless red flags are present;

- CT head scans are not recommended in adults and children who have suffered minor head injuries unless positive for a head injury clinical decision rule;

- Chest CT for suspected pulmonary embolism is not recommended in low-risk patients with a normal D-dimer result;

- Imaging is not recommended for low back pain unless red flags are present; and

- MRIs of hip or knee joints are not recommended in patients with co-existent pain and moderate to severe osteoarthritis unless red flags are present".[1]

To support implementation of these guidelines and help ensure that patients have access to essential imaging when they need it most, the BC Patient Safety & Quality Council (the Council) is leading the Essential Imaging initiative.

IMPROVEMENT STRATEGIES AND IDEAS (DRIVER DIAGRAM)

There are many evidence-based strategies and ideas you can adapt to support appropriate medical imaging. This driver diagram is a framework that can help us achieve our goal of increasing appropriate imaging. Strategies and ideas listed in this kit are not all-inclusive and you may discover others that would be ideal in your context. Stay open to innovative ideas to improve patient care and safety.

[1]Guidelines and Protocols Advisory Committee. Appropriate Imaging for Common Situations in Primary and Emergency Care. BC Guidelines; 2019. Available from: **https://bit.ly/3jJzIAf**

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HOW DOES THIS DIAGRAM WORK?

A driver diagram is a visual framework that helps us to achieve our goal of reducing inappropriate medical imaging. It breaks down the overall aim into primary drivers, secondary drivers and tangible ideas that are ready for testing and implementation.

Primary driver: Improvement areas that need to be addressed to achieve the outcome.
Secondary driver: Specific interventions necessary to achieve the primary driver.
Key change ideas: Specific ideas that will support or achieve the secondary driver.

You can see how one level flows into the next. These are ideas that help us reach our goal by breaking down into manageable pieces.

Want to know a bit more about how driver diagrams work? Check out a helpful video from the Institute for Healthcare Improvement at **https://bit.ly/3gS7LVR.**

Driver Diagram

GOAL	PRIMARY DRIVERS	SECONDARY DRIVERS
Accelerate the spread and implementation of the BC Guidelines for Appropriate Medical Imaging and improve care provider's access to evidence-based tools and change ideas that inform appropriate imaging requisition practices via a campaign and Action Series by March 2021.	Ensure clinicians have access to appropriate just-in-time decision support	• Advance medical imaging point-of-care clinical decision tools that support existing workflow • Enable enhanced clinician decision-making on appropriate imaging by making information available • Support the clinician's ability to consult expertise for additional decision-making support
	Provide patients and families with choice and alternatives to medical imaging	• Decrease patient demand and influence preferences for appropriate testing • Increase referral to, and application of, alternative testing or treatment for patients
	Support provider education and training	• Ensure practitioners are knowledgeable and confident on appropriate medical imaging for five common situations • Support continuous learning on medical imaging appropriateness in the practice setting
	Increase awareness and accessibility of medical imaging data for continuous system improvement	• Institute learning feedback and accountability systems

Ensure Clinicians Have Access to Appropriate Just-in-Time Decision Support

SECONDARY DRIVER	CHANGE IDEAS
Advance medical imaging point-of-care clinical decision tools that support existing workflow	• Find where your medical imaging screening tool, requisition and decision support guidelines are stored and amalgamate into a bundle • Develop a process to prompt practitioners to consider previous interventions and imaging results[1] • Ensure a point-of-care checklist of accepted red flags is built into manual or electronic order entry for a chosen key area • Adapt the Lower Mainland MRI Appropriateness Checklist (**https://bit.ly/3f98i30**) for medical imaging modalities
Enable enhanced clinician decision-making on appropriate imaging by making information available	• Identify alternative treatment options that are available at your site/within your community. Create an alternative list to share with practitioners • Link supportive websites or applications that inform order entry to your workstations[1] • Download the free UBC Radiology Teaching App (**https://bit.ly/2ulbmBM**) to help increase confidence in ordering the most appropriate imaging test. Share your experience on how the app influenced your practice at local rounds or education sessions[2]
Support the clinician's ability to consult expertise for additional decision-making support	• Consult radiology clinicians for feedback when certain imaging – such as ultrasound or CT scan – resources are not available at your site, or when questioning appropriateness of ordering an imaging test • Consult the RACE (**https://bit.ly/2Gv53Eq**) line if site that does not have radiology staff in-house • Identify and develop practitioner appropriateness champions – in particular, non-radiology department heads – who advocate for medical imaging appropriateness with staff and colleagues

[2]Vanderby S, Badea A, Sanchez JNP et al. A day in the life of MRI: The Variety and Appropriateness of Exams Being Performed in Canada. Canadian Association of Radiologists Journal 2018; 69: 151-161.

Provide Patients and Families with Choice and Alternatives to Medical Imaging

SECONDARY DRIVER	CHANGE IDEAS
Decrease patient demand and influence preferences for appropriate testing	- Distribute medical imaging appropriateness material found at **bcpsqc.ca/imaging** and adapt to: - Include patient partners when designing/adopting brochures for local context; ensure content is written so it is easily understood by the public - Include brochures in other languages pertinent to your geography - Include alternatives to testing information in the patient brochures; and - Include follow-up exam timing, when necessary - Encourage using the medical imaging conversation guide resource (**bcpsqc.ca/imaging**) when addressing medical imaging demand with patients - Increase and promote a public and/or clinician web presence for information on medical imaging appropriateness, including links to HealthLink BC (**https://bit.ly/31aPtHt**) for patients and clinicians
Increase referral to, and application of, alternative testing or treatment for patients	- Provide patients with information on the risks of radiation exposure. Ensure resources include information on the balance between benefit of testing and radiation exposure when referral is appropriate - Implement ways to decrease patient dose exposure for both individual imaging examinations as well as on a cumulative basis. Possibilities include: - Reduce the administered activity to the lowest amount possible that does not affect imaging quality (ALARA or 'as low as reasonably achievable' **https://bit.ly/2RYcwkF**) - Apply appropriateness criteria and practice guidelines that help practitioners choose the right imaging test to answer the clinical question - Imbed alternative practitioner referral processes and alternative treatment options into the assessment/review process, e.g., Encourage patients to follow-up with a Registered Massage Therapist (RMT) or Registered Physiotherapist (PT) - Ensure patients and families are aware they can use 8-1-1 for additional support from practitioners such as RMT or PT

Support Provider Education and Training

SECONDARY DRIVER	CHANGE IDEAS
Ensure practitioners are knowledgeable and confident on appropriate medical imaging for five key areas	• Develop appropriateness training curriculum to include in your local orientation processes2 • Include education on physical exam assessments that have potential to result in increased inappropriate medical imaging ordering (e.g., brain, spine, and musculoskeletal) and common reasons during rounds, staff in-service or education sessions[1] • For physicians: complete the 'Confronting Unnecessary Care' online CME module to gain CME credits • Include education on ordering medical imaging during orientation for new clinicians[1]
Support continuous learning on medical imaging appropriateness in the practice setting	• Join a network that supports medical imaging appropriateness, such as the BC Emergency Medicine Network , for up to date clinical guidelines and practice resources • Stay up to date on Choosing Wisely Canada events and other happenings by joining their mailing list (**https://bit.ly/31dV53J**) • Introduce monthly 'appropriateness rounds' in which cases that may have slipped through the cracks are discussed

Increase Awareness and Accessibility of Medical Imaging Data for Continuous System Improvement

SECONDARY DRIVER	CHANGE IDEAS

Institute learning feedback and accountability systems	• Email/mail targeted reminders promoting evidence-based imaging practices attached to reports sent to practitioners
	• Implement a 'lessons learned' case study into your department or clinic's team meetings on a regular basis
	• Create a medical imaging appropriateness quality improvement dashboard; review data with people on your direct team who help improve care (e.g., leaders, administration and staff members)
	• Ensure timely follow-up with staff members and closing the loop of medical imaging-related patient safety incidents
	• Introduce ordering practitioner peer review processes as a quality improvement initiative to learn from each other. Anonymized data can be obtained from measuring the rate of indicated CT/MRI excluding red flags[2]
	• Build capacity for clinical radiology departments to complete frequent audits. Ideas for audit and feedback include:
	   • Provide data to department heads on events associated with significant risk;
	   • Track tests daily to provide monthly practitioner and ordering team feedback in a standardized report; and
	   • Implement real-time feedback for referring practitioners with results

5.
Identify your Measures

The purpose of improvement data is to better understand current performance and whether changes are making an improvement. This section identifies potential outcome, process and balancing measures that will guide your improvement team's efforts during the testing and implementation process.

Outcome Measures

Tell us if what we are trying to improve is really getting better.

Examples:
- Total number of imaging exams ordered (inpatient and outpatient) per month
- Percent of inappropriate medical imaging tests for chosen area (e.g., low back pain, minor head injury)
- Practitioner variation in medical imaging orders
- Percent of patients who rate their interaction with their care provider as "definitely helping them feel better and able to manage their issue"

Process Measures

Tells us if we are consistently doing the things we said we where going to do.

Examples:
- Number of practitioners who received education about inappropriate imaging and options
- Number of patients who received written materials and/or a conversation about inappropriate imaging
- Number of MRI requisitions for inappropriate imaging declined

Balancing Measures

Tells us if there is anything else that has changed, or is different, because of the change we introduced.

Have we impacted anyone positively or negatively through the changes we are making?

Examples:
- Number of patients discharged from ED or outpatient clinic that returned within 30 days for the same imaging request
- Number of patients who requested imaging at another clinic after being declined
- Referring practitioner (Physician, NP) experience
- Number of serious diagnoses missed

As a guideline, try to include between 3-8 measures per project, including at least one outcome measure and one process measure.

Once measures have been finalized, they need to be clearly defined, shared and agreed to by all that are collecting and using them. Common and understood measures are key to facilitating clear communication between team members and external stakeholders.

Your team should consider obtaining a baseline measurement early to be able to demonstrate the impact of your change initiatives later. Consider measurements today that you are hoping will be influenced in a few weeks or months with the implementation of your changes. For example, think about the following questions:

- How often are CT or MRI tests ordered in your clinic or emergency department now (e.g., tests per day/week/month/year)? What proportion of these are for the five key areas identified in this initiative?

- Do patients receive imaging that is recognized as best practice? What proportion of patients receiving imaging related to these five key areas have an appropriateness criteria added to the requisition form?

- Is there a known process to ask for radiology support when unsure whether to order an image? How often do clinicians request radiology support to make a medical imaging decision now?

- Do you have the right brochures within arm's distance to help inform your conversation between yourself and the patient if you choose to not image their lower back pain? What volume of resource materials are currently available for patients at your facility/clinic related to these five key areas?

- What is your current performance related to missed diagnosis in these five key areas?

Knowing where you are starting from will make it easier to determine where and when you are seeing improvement as changes are being tested. Data will help you know how close you are achieving your aim, learn what is and is not working, visualize the impact of your changes, and share your progress with others.

Key Tips:

- Collect data as close to real time as possible and display important variables over time.
- Continue collecting data throughout your interventions and changes.
- Review data frequently with your team to learn about and adjust your change initiatives as required.
- Track patient outcomes and consider gathering feedback from staff who are making changes to their workflow and practices.

The short-term goal is to bring awareness to medical imaging appropriateness and change attitudes of practitioners regarding stewardship. In the long run, we aim to change practitioner behaviour, increase patient knowledge and decrease inappropriate medical imaging. Measuring the impact of our efforts requires collection of thoughtful data elements.

A Word on Audits and Real-Time Feedback

Feedback systems for ordering practitioners embedded in decision support tools are essential. There is evidence that real-time feedback improves communication between radiologists and ordering physicians and may also contribute to a reduction in unnecessary imaging. These have been reflected in the driver diagram as follows:

- Adding screening forms into your ordering process;

- Targeted reminders to ordering practitioners;

- Exam ordering evaluations; and

- Feedback to providers on ordering behaviour; data obtained from measuring the rate of indicated CT/ MRI excluding red flags.

A learning environment can best be supported by anonymizing data and providing relevant comparisons (e.g., across sites). The evidence shows that providing data to an individual about their performance, relative to anonymized data for their peers, is the most useful for influencing performance improvement.

Measurements of variation within the system are also important. For example, variation should be reduced where patient groups are similar (among physicians in the same or similar practice group). However, there may be substantial variations in practice based on differences in the patient cohort: two physicians with patient groups of seniors may have substantial variations in practice if one serves seniors in care facilities, while the other provides care to independent seniors. Similarly, an ED physician in a major metropolitan area may have significantly different image ordering practices compared to an ED physician in a smaller urban area that also serves surrounding rural areas.

The key is to balance performance standards, consistent application of appropriateness criteria, and conformity to quality performance expectations, while providing flexibility to respond to local area needs.
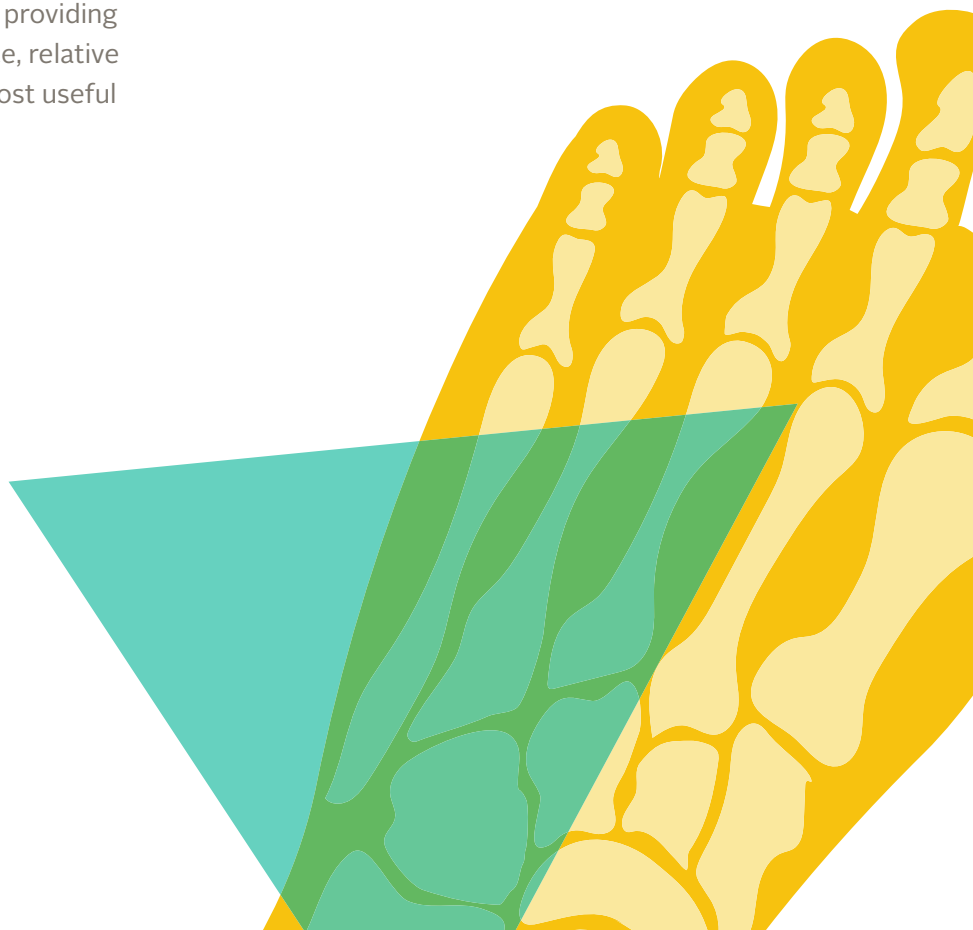
6.
Begin Testing and Implementing Changes

There is no power for change greater than a community discovering what it cares about.
— Margaret J. Wheatley.

The Plan – Do – Study – Act (PDSA) Cycle provides a simple, structured approach to develop, test, learn, adapt, and improve. New ideas can be tested, preferably on a small scale and under multiple conditions, before they are spread broadly.

Changes can be tested by planning the details of the test including predictions and theories (**PLAN**).

Determine what you want to learn and how you can learn it (**DO**).

Test and measure to find out if your prediction was right (**STUDY**).

Compare your prediction to the actual result and decide what to do next (**ACT**).

Be careful not to get hung up on planning, just try something! It may fail, and you can learn from that for your next PDSA cycle.

PDSA Cycle Example

Primary driver: Provide patient and families with information on choices and alternatives to medical imaging.
Change idea: Distribute medical imaging appropriateness education material in your clinic office.

Plan

Deciding what you want to learn about your idea and how you can learn it. The team should predict what will happen.

Assemble a team (patient partner, radiologist, ordering prescriber, radiology technologist, nurse, educator) to review current practices and patient-education materials (**https://bit.ly/3jUYUE7**). As a team, you decide to develop your own brochure based on the evidence noted in the online resources. The assumption is that providing a brochure on lower back pain will address their anxiety over not having an image completed. The theory is that patients are unaware of risks and potential alternatives to imaging. Review the education materials with one physician and one patient on Monday to get feedback on the content and design. Use teach-back to validate educational materials.

Do

Doing the test and small measurement that will tell you whether your prediction was right.

Review the brochure with one physician and one patient. Each agreed that the brochure was useful, but the patient thought that the information could be presented in more plain language. Colorful graphics could be utilized more to convey key points. The patient thought they might have more questions after they received the brochure and wanted to know how they would get their questions answered after the initial visit – should they phone? Make another appointment? Call Healthlink? The physician asked when it was best to give out the brochure.

Study

| Comparing the prediction to the actual result and documenting what you learned from this cycle.

Synthesize the feedback from the clinic. Determine what modifications need to be made to your brochure based on patient, physician and staff feedback. Feedback can easily be incorporated into version two of the brochure. Your team may start to think about how patients from different cultural backgrounds will react to the graphics and how to integrate this brochure into the workflow of the clinic. There is also a need to add a section on "How to get more information."

Act

| Deciding what to do next. You may decide to do another test of the same idea with a different twist.

Adapt the brochure and make revisions as recommended by the study analysis from the clinic. Test again with two more physicians on Tuesday and Wednesday and a patient from a different cultural background.

After a few different cycles, you may have decided that a test worked and that you are ready to implement it. Or you might decide to completely abandon this idea and so some tests with a different idea.

There are many ways to design useful small-scale PDSA Cycles such as:

- Simulating the change (role play within your team).
- Having others review the change for feasibility (patient reviewing a brochure, clinician reviewing a decision support tool).
- Conducting the test over a short period of time: instead of saying "We need two weeks to run the test" ask, "What could we do by next Tuesday?
- Using the 1:1:1 rule: Conduct the test in one location with one clinician and one patient. Scale down each test into manageable cycles and then expand conditions as knowledge about the change builds. For example, try a change during the day shift first.
- Recruiting a small group of volunteers. Use the improvement team as the initial sample or identify 'early adopters' - those who like change and will try anything. Delay consensus or buy-in until later stages.
- Breaking the change into smaller pieces.
- Using temporary support systems for testing, such as manual or temporary forms.

Address Concerns

While there are concerns about the potential impact of reduced testing on patient care and the risk of missing a diagnosis, evidence suggests that these risks are not clinically significant.[4] The five medical imaging recommendations are evidence-based and are not associated with patient harm when implemented according to decision-rules. Furthermore, there is no benefit to inappropriate imaging, as it fails to provide any meaningful insight into treatment options. There are, however, benefits to quality of care when appropriate imaging becomes the norm and is hardwired into everyday work.[1]

How Do I Spread the Word?

So, you've decided you want to help advance medical imaging appropriateness – now what? We want to make it easy for you to participate so we have created a wealth of resources and tools to help you on your appropriateness journey.

Here are some tips and tools for spreading the word and promoting participation with your organization and/or team.
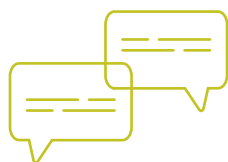
Talk it Up

Talk to your colleagues about medical imaging appropriateness! We know that you don't always have time to plan what you want to tell others, so we've tried to make it easy for you!

Ready-Made Messages and Spread Resources, Just For You

A quick way to spread the word is to get on meeting agendas, send out newsletters and share information through postcards, posters and presentations! Consider others you think would be interested in hearing about appropriateness and connect with them.

We've even done the work for you! Check out below and more resources at **bcpsqc.ca/imaging** to download.

Elevator Pitches and Quick Fact Postcards

Whether you are connecting with a patient or care providers, knowing some key talking points can help you start the conversation about Essential Imaging. The messages below will help you to share ideas and inspire others to join you in advancing medical imaging appropriateness.

Elevator Pitch – For Patients

Quick Facts Postcard For Patients

Quick Facts Postcard for Providers

Newsletter Templates

Newsletters are a fantastic way to connect with your audience – whether it is colleagues or patients. We've drafted up newsletter articles for both audiences. All you need to do is take and tweak them to make them your own!

Newsletter Template - for Care Providers

Newsletter Template - for Patients

Appendix A: BC Guidelines: Appropriate Imaging for Common Situations in Primary and Emergency Care

BC Guidelines - Appropriate Imaging for Common Situations in Primary and Emergency Care

- This guideline provides recommendations to primary and emergency care providers on how to assess the need for diagnostic imaging in five common situations: low-back pain, minor head injuries, uncomplicated headache, hip and knee pain, and suspected pulmonary embolism.

- Management of these conditions is beyond the scope of this guideline. However, in some cases, notes and alternatives to imaging are provided for additional clinical context.

Click here to access the guidelines!

Appendix B: Conversation Guides for Care Providers and Patients

Essential Imaging Information Sheets for Care Providers and Patients are intended to support and guide conversation on when to image and when not to image.

These information sheets can be spread and disseminated through a variety of channels such as linked to your department or clinic website or printed for distribution.

Conversation Guides for Care Providers

Meaningful dialogue with patients helps to align goals, increases trust and understanding, and ultimately leads to better person- and family-centered care. We developed the Essential Imaging Conversation Guides for Care Providers to support discussion with patients based on the **BC Guidelines for Appropriate Imaging.** We also encourage you to share them with your colleagues to inform, spark conversations and help spread the word that when it comes to imaging, more is not always better.

Download the following guides for:

Low Back Pain   **Minor Head Injury**   **Uncomplicated Headache**

Hip and Knee Pain   **Suspected Pulmonary Embolism**

Conversation Guides for Patients

To ensure patients have access to imaging tests when they need them most, we want to help patients make an informed decision.

Essential Imaging Conversation Guides for Patients are intended to support and guide conversation between patients and care providers on when to image and when not to image. These guides can help patients learn about the medical imaging tests in question, when they are appropriate and alternative management to imaging that can help improve their health and wellbeing.

Information regarding key messages and advice to support patient-centered decision making, can be found in the guides:

Low Back Pain   **Minor Head Injury**   **Uncomplicated Headache**

Hip and Knee Pain   **Minor Head Injury**   **Conversation Guides for Patients**

Appendix C: Point-of-Care Clinical Decision Tools

Sometimes, patients request imaging in order to find a solution to their health issue (e.g., headache or low back pain). Unless there are considerable concerns, those who receive imaging fair no better than those who don't, and results do not affect management or the rate of recovery.

If imaging is not indicated, inform patients on alternative treatment and management that support their recovery. Alternatives may include medication, a referral to physiotherapy or other therapeutic and evidence-based options specific to their issue. For example, stress reduction strategies may benefit patients with either chronic low back pain or headaches.

Below are several clinical tools to support essential imaging!

Low Back Pain

- Appropriateness criteria for MRI lumbar spine
- MRI appropriateness checklist
- CORE Back Tool
- Information sheets for Care Providers
- Information sheets for Patients

Minor Head Injury

- Canadian CT head injury/trauma rule
- PECARN pediatric head injury decision-aid
- Information sheets for Care Providers
- Information sheets for Patients

CT Scans for Uncomplicated Headaches in Adults

- MRI appropriateness checklist
- Information sheets for Care Providers
- Information sheets for Patients

MRI for Hip and Knee Pain

- MRI appropriateness checklist
- Appropriateness criteria for MRI knee and hip

CT for Suspected PE in the Non-Pregnant Adult

- Wells' criteria for pulmonary embolism
- PERC rule for pulmonary embolism
- Information sheets for Care Providers
- Information sheets for Patients

RACE Line: raceconnect.ca

- RACE is a telephone consultation line for select specialty services for physicians, nurse practitioners and medical residents. Contact your local RACE line for the list of available specialty areas.
- **RACE connect information**
- **RACE phone lines in BC**

Pathways

- **Pathways** is an online resource that allows GPs and nurse practitioners and their office staff to quickly access current and accurate referral information and wait times for specialists and specialty clinics.

BC Emergency Medicine Network

- **The BC Emergency Medicine Network** is our one-stop shop for all resources
- Includes practitioner resources and patient handouts.

Ultrasound Prioritization BC Guideline

- **The Ultrasound Prioritization BC Guideline** summarizes suggested wait times for common indications where ultrasound is the recommended first imaging test.
- The purpose is to inform primary care practitioners of how referrals are prioritized by radiologists, radiology departments and community imaging clinics across the province.

Lower Mainland Medical Imaging MRI Central Intake

- **The Lower Mainland Medical Imaging MRI Central Intake** office can be used to direct outpatient MRI referrals for 11 MRI sites across the lower mainland.
- Central intake allows patients to be booked at the most appropriate lower mainland MRI site with the shortest wait time.
- Referring clinicians can indicate a preferred MRI site on the requisition if desired.
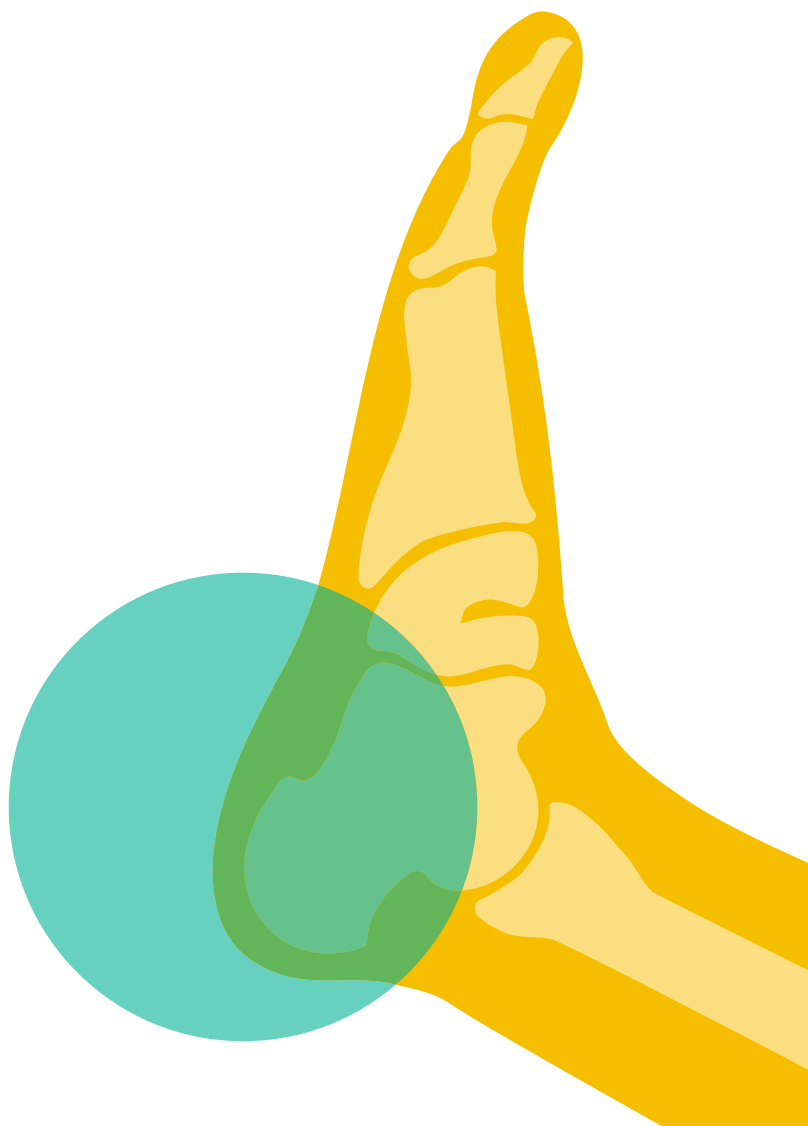
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The BC Patient Safety & Quality Council is a driving force for high-quality health care in British Columbia. We deliver the latest knowledge from home and abroad to champion and support the best care possible for every person in our province.

System-wide impact requires creativity and innovative thinking. Using evidence-informed strategies, we shift culture, improve clinical practice and advance person- and family-centred care.

We understand that meaningful change comes from working together. We are uniquely positioned to build strong relationships with patients, care providers, health leaders, policymakers, senior executives, academics and others. These connections enable us to nurture networks, recognize the needs of our health care system and build capacity where it is needed the most.

If you want to improve BC's health care system, visit BCPSQC.ca to access programs and resources that can help you start today.

BCPSQC.ca

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