Safer Care Victoria

100,000 LIVES

Institute for Healthcare Improvement

Improvement Toolkit

Postpartum Haemorrhage

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OFFICIAL

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Contents

Who is the Postpartum Haemorrhage Improvement Toolkit for?

This resource is for maternity services who are working to reduce the rate of postpartum haemorrhage during childbirth.

What is the toolkit?

This toolkit contains quality improvement foundations and the change package improvement theory developed for the Postpartum Haemorrhage (PPH) Collaborative. This toolkit is based on the PPH bundle of care from the California Maternal Health Quality Care Collaborative Obstetric Haemorrhage toolkit V3.0 (2022) < https://www.cmqcc.org/ > with an additional bundle element for partnering with consumers.

Part A of the change package is the first step of the minimum care bundle. It provides a resource for maternity services to collaborate with consumers to identify meaningful areas of improvement and to implement Quantified Blood Loss Measurement (QBL). The Collaborative has demonstrated that the level of QBL required for stable measurement is at least 85 per cent. Therefore, to establish a stable baseline, a consistent method of measuring PPH must be in place for at least 6 months. This enables one PPH data point to be collected per month for a total of six months to demonstrate the implementation of QBL at 85 per cent of all vaginal births in an ongoing manner.

Once **Part A** has been implemented at a minimum of 85 per cent of all vaginal births and this implementation has been sustained over a 6-month period, work on Part B of the change package and minimum care bundle can commence.

Part B of the change package contains minimum care bundle elements for PPH protocol and adherence, timely medication administration and escalation of care.

Our theory for improvement is an approach used to visualise how you will work in your system to achieve your aim, i.e., the structures, processes, and norms you will influence; the places and moments in time you will focus on; and the change ideas you will test. In the toolkit, the driver diagram is broken down into smaller, easy to use parts, with links to resources you may wish to use and space for you and your team to record your own ideas.

The toolkit includes:

- brief background information on the Postpartum Haemorrhage Collaborative
- your step-by-step guide to getting started with reducing PPH.
- Part A and Part B of the PPH change package including:
    - driver diagram,
    - change ideas,
    - links to resources to support your work.
- Extra resources available online include:

Background: The PPH story

What is the Postpartum Haemorrhage collaborative?

Postpartum Haemorrhage (PPH) is a leading cause of maternal mortality both within Australia[1] and worldwide[2] In Victoria, PPH is the most common condition requiring intensive care unit (ICU) management, contributing to 37 per cent of all severe acute maternal morbidity reported in 2019 [3]. Delays in diagnosis and treatment, and deviation from protocols have been identified as significant contributors to severe PPH.

From 2021 until 2023 Safer Care Victoria and the Institute for Healthcare Improvement partnered with 33 health services who chose to participate and test change ideas as part of the PPH Collaborative. The Collaborative aimed to reduce preventable severe PPH in participating services through the introduction of an evidence-based bundle of care.

Partnering with consumers and encouraging participation and collaboration in care can help improve the safety and quality of care. The PPH Collaborative used the 'Partnering in healthcare' framework <https://www.safercare.vic.gov.au/sites/default/files/2019-02/Partnering%20in%20healthcare%20framework%202019_WEB.pdf> to elevate the consumer voice by engaging broadly with consumers in leadership roles within Safter Care Victoria and across the participating teams.

What did we set out to achieve in the postpartum haemorrhage project?

The aim of the PPH Collaborative was to reduce the incidence of primary PPH greater than 1500ml following vaginal birth by 50 per cent in participating health services by December 2023. However, this aim was not feasible in the context of services not having a stable QBL baseline.

The PPH collaborative also aimed to reduce harm to people giving birth, their partners, and to health professionals, by standardising and improving the response to PPH across participating Victorian health services.

What did we accomplish?

The PPH Collaborative changed the way PPH is identified and responded to in participating services, resulting in significant improvements in obstetric safety. The implementation of quantitative measurement of blood loss (QBL) was an important cultural transition from visual estimation of blood loss, which has long been identified as inaccurate within the scientific literature.

Imprecision in blood loss estimation has serious consequences with delayed clinical intervention contributing to maternal morbidity and mortality. Visual estimation significantly underestimates large volumes of blood by 33-50 per cent.[4] Embedding QBL measurement led to improved diagnosis of PPH and with increased diagnosis,

more women and birthing parents now receive the treatment and follow up they require.
Rapid administration of medication is paramount in the treatment of PPH to stem blood flow and prevent ongoing blood loss. As a result of the Collaborative, 17 of the participating 33 teams have reduced the mean response time from identification of PPH to the administration of medication from 6.2 minutes to 3.7 minutes at the end of the Collaborative. Considerable improvement science capability uplift within the maternity sector is another powerful impact of the PPH Collaborative. Our analysis identified a relative capability uplift of 143 per cent within the participating collaborative teams.
To find out more about the findings of the PPH project, please see the Postpartum Haemorrhage Collaborative Evaluation Report.

Health service stories

West Gippsland Hospital (Warragul)

West Gippsland Hospital and SCV have established a robust partnership aimed at enhancing the quality of maternity care in West Gippsland. The regional hospital has previously partnered with SCV in the Safer Babies Collaborative to reduce stillbirth.

In 2022, West Gippsland PPH Collaborative Team Lead AMUM Emma McManus took part in the SCV Fellows (improvement) program. The Fellows program was established to support health services in delivering on SCV's 2022/23 improvement program and to foster collaboration across health service partnerships. Fellows were seconded part-time (0.2EFT) for 12-months, supporting the delivery of the 100,000 lives initiatives and engaging in improvement science training and learning activities to develop skills in system change and improvement methods.

Leveraging their knowledge of improvement science, the team introduced changes to care with the goal of reducing the rate of severe PPH by 50 per cent. The process was slow and steady, testing out interventions until they were refined enough to scale and spread, and thus be sustainable. The team launched the project in the hospital in April 2022, engaging staff with a launch event, eye-catching PPH Collaborative shirts, and a cake shaped like a placenta!

The team improved their processes and managed to achieve accurate QBL measurement for 99 per cent of all vaginal births. This improved measurement led to better recognition and early identification of potential issues. The team also worked on improving their escalation processes by introducing the term "Imminent PPH" for staff to use to trigger early treatment and prevent severe PPH.

Despite the challenging nature of the project, the team achieved fantastic results, reducing the severe PPH rate by an impressive 63 per cent.

Swan Hill Hospital

Improve patient experience by asking patients 'what matters in you?' in PPH.

The team at Swan Hill set up a process to capture data from women and birthing parents who experienced a PPH in their service. To encourage engagement, consumers were advised to anticipate a patient satisfaction survey via a text message. To increase participation, a reminder text was sent the day before the survey was circulated. This is managed by a media messenger service.

The survey questions are direct and comprehensive. The information is gathered in a quarterly report and presented to the team, shared within the department, and displayed. The data is maintained in a dashboard which displays it for ease of comparison. Action plans are made following results and PDSAs tested.

The team implemented:

- PPH information brochures for consumers.
- Debrief for every woman who has experienced a PPH and their family prior to discharge.
- PPH risk assessment.
- Information listing physiological and psychological responses to PPH and support services available.

Consumer Story

"A PPH is so much more than ml - I've experienced two and the impacts of each were like night and day, and I have the work of the Collaborative to thank for that.

My first birth resulted in a large PPH that was treated quickly by the team, which I'm thankful for - but no consideration was given to our emotional health, and I did not receive adequate supportive care for my blood loss. We went home alive, but without the proper tools to thrive as a new family.

For my second birth I elected to have a caesarean to avoid the risk of repeating the trauma. While I had another PPH, the whole process was smooth and calm for both myself, and my partner. We were able to be fully present and enjoy the birth and first moments with our daughter. It was so healing. Because I had appropriate support during my PPH and after, we went home and thrived."

Alana Donaldson
Consumer Faculty PPH

"We need to think differently about PPH - how can we ensure this family is sent home to really thrive after a PPH?".

By listening to lived experience experts, we learned that harm from PPH amounts to more than mls of blood loss. They shared how frightening their experiences were and spoke about the about the lasting psychological impacts, which can lead to families being less likely to have another child. This was incredibly impactful and motivated clinicians to generate change informed by lived experience.

The 'Consumer wall' at the Collaborative Showcase event exhibited 85 implemented improvements informed by lived experience whereby services took a patient-centred approach, prioritising communication, and psychological support. This was incredibly impactful and motivated clinicians to generate change informed by lived experience.

Lived Experience Representatives: Kristin Earles, Allison Roberts, Gemma Purdy, Ellie Goss standing in front of the 'Consumer wall' at the Collaborative Showcase, 2023.

Using the model for improvement

This guide brings together foundational quality improvement methods, the Model for Improvement, and information from the postpartum haemorrhage project. Guided by simple but effective improvement science principles, the Model for Improvement helps us deliver results-based outcomes and support improvement in healthcare.

The Model for Improvement asks you to respond to three questions as you plan and undertake improvement work and it includes the plan-do-study-act (PDSA) cycle as the engine for developing, testing, and implementing change in your system.

Thoughtful, collaborative consideration of the three questions enables deep understanding of the problem or opportunity for improvement, identification of high-quality change ideas, and construction of an effective measurement strategy to capture learning and track progress. For more information on Quality Improvement training and tools visit Quality improvement | Safer Care Victoria <https://www.safercare.vic.gov.au/best-practice-improvement/quality-improvement>.

Your step-by-step guide to applying the model.

1. Build your team.

Improvement teams

Effective improvement in our complex healthcare system requires a team approach to share the work and to provide diverse knowledge and experience. Ideally, your team will include:

- a team leader who will be responsible for coordinating and driving the work
- at least one consumer with lived experience of your health service
- someone with quality improvement knowledge and experience with training in improvement science
- multidisciplinary representation with strong clinical leadership including medical (obstetricians, obstetric registrars, GPs) and midwifery staff.
- a senior sponsor.

Executive sponsor

Support from your health service leadership is critical to enable your access to time, resources, and organisational commitment. Your Executive sponsor is also essential in championing your work and helping you sustain will and energy throughout the work. Sites that were the most successful during the PPH collaborative were those who had executive support. These sites were able to overcome barriers sooner and had protected time to undertake the quality improvement work.

Partnering with consumers

Involving consumers in the redesign of the systems of care and the care they receive can improve outcomes. When patients, caregivers and families contribute to the design and development of interventions, local solutions to local problems are created based on their needs. If you are unsure where to start with consumer recruitment, reach out to the Consumer liaison service in your health service or see further guidance from Safer Care Victoria for partnering with consumers <https://www.safercare.vic.gov.au/best-practice-improvement/partnering-with-consumers> Or Partnering For QI. <https://www.safercare.vic.gov.au/sites/default/files/2023-11/partnering_for_qi.pdf>

Applying an equity lens

When forming your team, it is important to understand the people and populations that you are providing care for and consider how you will include diverse perspectives and experiences reflective of this. For example, the view of Aboriginal and Torres Strait Islander people, people who are culturally and linguistically diverse, women and LGBTQI+, and others who may be experiencing disadvantage.

Including a diverse range of people can ensure solutions work across the population.
Helpful tools:

- SCV Partnering in healthcare framework <https://www.safercare.vic.gov.au/best-practice-improvement/partnering-with-consumers>
- Cultural responsiveness framework – Guidelines for Victorian health services <https://www.health.vic.gov.au/publications/cultural-responsiveness-framework-guidelines-for-victorian-health-services>
- SCV training opportunities for quality improvement <https://www.safercare.vic.gov.au/best-practice-improvement/quality-improvement/learn-about-quality-improvement>
- Designing for Diversity<https://www.health.vic.gov.au/populations/designing-for-diversity>
- Institute for Healthcare Improvement (IHI) Achieving health equity<https://www.ihi.org/resources/white-papers/achieving-health-equity-guide-health-care-organizations>

2. Explore your opportunity for improvement.

What does the data tell you?

Data is key to understanding how many PPHs happen at your service, and the consistency and reliability of care in key areas of clinical practice connected to PPH. Some potential measures are set out in table 1 below. You may wish to use these to understand your system's current performance, collecting data across all measures to form a baseline before beginning to test changes.
Remember the equity lens: the segmentation of data can help target improvement efforts to those who may be most at risk of poor health outcomes.

Table 1. PPH Improvement Program Measures for Part A

Ongoing measures	Numerator/Denominator
OUTCOME MEASURES	
Percentage of women or birthing parents with a primary postpartum haemorrhage 1500 ml and greater following vaginal birth	**Numerator:** Number of women or birthing parents who meet the denominator criteria who have a blood loss of 1500 ml and greater at the time of birth, or in the following 24 hours **Denominator:** Number of women with a vaginal birth
Percentage of women or birthing parents with a primary postpartum haemorrhage 1000 to 1499 ml following vaginal birth	**Numerator:** Number of women or birthing parents who meet the denominator criteria who have a blood loss of 1000 to 1499 ml at the time of birth, or in the following 24 hours **Denominator:** Number of women with a vaginal birth

Percentage of women or birthing parents with a primary postpartum haemorrhage 500 to 999 ml following vaginal birth	**Numerator:** Number of women or birthing parents who meet the denominator criteria who have a blood loss of 500 to 999 ml at the time of birth, or in the following 24 hours **Denominator:** Number of women with a vaginal birth
PROCESS MEASURE	
Bundle element	
Percentage of women or birthing parents who have evidence in their care record of quantitative blood loss measurement following vaginal birth	**Numerator**: Number of women or birthing parents who meet the denominator criteria who have evidence in their care record of the quantitative assessment of blood loss **Denominator**: Number of women with a vaginal birth
Percentage of women or birthing parents with postpartum haemorrhage following vaginal birth who have evidence in their pregnancy care record of a clinical debrief and provision of information on available support	**Numerator:** Number of women or birthing parents who meet the denominator criteria who have evidence in their pregnancy care record of a clinical debrief and provision of information on available support **Denominator**: Number of women or birthing parents with postpartum haemorrhage following vaginal birth (or records sampled from this cohort)
BALANCING MEASURES	
Number of women or birthing parents requiring an ICU stay/ higher-level care following primary postpartum haemorrhage and vaginal birth	**Numerator:** Number of women or birthing parents requiring an ICU stay/ higher-level care following primary postpartum haemorrhage and vaginal birth
Percentage of women or birthing parents receiving a blood transfusion following postpartum haemorrhage and vaginal birth	**Numerator:** Number of women or birthing parents who meet the denominator criteria who receive a blood transfusion following postpartum haemorrhage **Denominator**: Number of women with a vaginal birth

Table 2. PPH Improvement Program Measures for Part B (PPH Protocol, Timely Medication, Escalation). See Family of Measures <https://www.safercare.vic.gov.au/sites/default/files/2023-11/family_of_measures.pdf>

Targeted measures	Numerator/Denominator
PROCESS MEASURES	
Percentage of women or birthing parents who birth vaginally and have evidence in their care record of a postpartum haemorrhage risk assessment	**Numerator:** Number of women or birthing parents who meet the denominator criteria who have evidence in their care record of a completed postpartum haemorrhage risk assessment **Denominator:** Number of women or birthing parents with a vaginal birth
Bundle element	
Compliance to the PPH Protocol within the PPH emergency response	**Numerator:** Of women or birthing parents who meet the denominator criteria, compliance to PPH Protocol within the emergency response. **Denominator:** Number of women or birthing parents with postpartum haemorrhage following vaginal birth (or records sampled from this cohort)
Average length of time in minutes between initiating postpartum haemorrhage protocol and administration of medication	**Numerator:** Of women or birthing parents who meet the denominator criteria, the average recorded total time between initiating postpartum haemorrhage protocol and administration of medication **Denominator:** Number of women or birthing parents with postpartum haemorrhage following vaginal birth (or records sampled from this cohort)
Measure of escalation to be developed with expert working group	**Numerator:** Of women or birthing parents who meet the denominator criteria. **Denominator:** Number of women or birthing parents with postpartum haemorrhage following vaginal birth (or records sampled from this cohort)

What do you know about the processes driving current practice?
Understanding your system involves knowing all the steps in the process and the factors affecting experiences and outcomes. Detailed understanding of this will help you and the team identify where there are inconsistencies, gaps, duplications, or delays.

Helpful tools/activities:
- Deep Dive Case Studies to capture your current state.
- Process mapping or patient journey map Flowchart <https://www.ihi.org/resources/tools/flowchart>
- Affinity mapping What Is an Affinity Map? <https://careerfoundry.com/en/blog/ux-design/affinity-map/>
- Cause and effect (fishbone/Ishikawa) analysis Cause and Effect Diagram <https://www.ihi.org/resources/tools/cause-and-effect-diagram>

What are the people telling you?
Change is an integral part of improvement work, but this is not always embraced by individuals or teams. It can be challenging to build and maintain momentum in the face of the resistance that change can provoke.
What do you know about the culture, communication, and teamwork in your context? Do you know who might be your champions for change?
Helpful tool:
- IHI Psychology of change framework <https://www.ihi.org/resources/white-papers/ihi-psychology-change-framework>

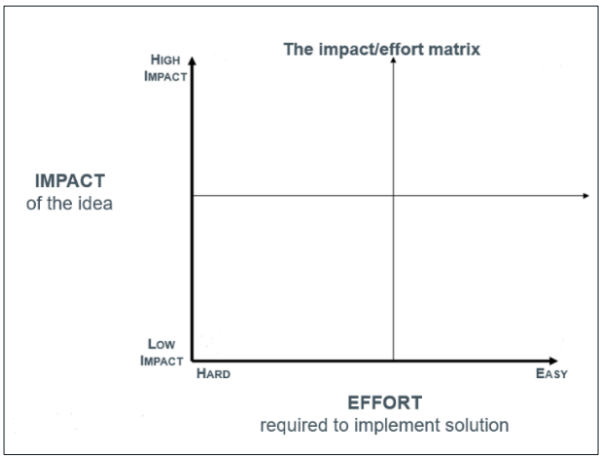
3. What will you try to accomplish?
What are the specific, measurable, achievable, relevant, and timely (SMART) goals for your team? How much do you want to improve by? How can you set a goal that will energise and motivate, without seeming too far out of reach or too easy?
What is your timeframe? Is it a realistic match for how much you want to improve by and the complexity of your system? Is there a particular part of your service you want to focus on? For example, your aim might be: By December 2024, we aim for 25 per cent reduction in severe primary PPH (>1500 ml blood loss) in vaginal births.
Helpful tool:
- IHI Setting Aims <https://www.ihi.org/how-improve-model-improvement-setting-aims>

4. What will you focus on?
In quality improvement work, the ideas, and potential solutions we want to test in our system are known as change ideas. A change idea is an actionable, specific idea for changing a process. It can come from research, best practice, or from other organisations that have recognised a problem and have demonstrated improvement on a specific issue.

Change ideas can be tested to determine whether they will result in improvement and are often revised because of these tests. In the PPH project driver diagram shown in Figure 4 below, you will see change ideas down the right-hand side. A driver diagram is a visual representation of the theory of change and the relationship between the aim of the project and the change ideas. Change ideas in the Collaborative came from research work undertaken and services participating in the collaborative.

It is important to start with Part A of the bundle first and test change ideas aimed at embedding QBL prior to moving on to Part B

Figure 1. Impact vs effect



No team is expected to test all the change ideas included in this toolkit. Consider a menu of options from which you can choose. Your data, understanding of current practice and organisational priorities will guide how you prioritise ideas. Some teams may start with one driver. Others may choose to start by tackling one idea across all three drivers. Many teams find it helpful to start with easy wins to build belief in the work.

Helpful tools:

- IHI Changes for improvement <https://www.ihi.org/how-improve-model-improvement-selecting-changes >
- Prioritising change ideas: impact/effort matrix (Figure 1). <https://www.youtube.com/watch?v=PtEMrYVGGgI >

5. How will you know that change is an improvement?

Communication

Measurement is essential to help learn about the impact you are having as you test changes in a wide range of conditions, whether changes are leading to improvement and what the next steps could be. You and your team will collect and learn from data in real time, using annotated charts to understand your impact, adjust your hypotheses along the way, and see progress towards your aim.

A family of measures

A small family of measures will help track your progress:

- one or two outcome measures aligned to your aim.
- up to five process measures aligned to activities or practices logically connected to your aim.
- one or two balancing measures to monitor potential indirect impacts in your system.

You may wish to use measures from the collaborative (Table 1) or develop measures to suit your context.

Collecting data: when and how much?

The focus of data collection for improvement is specificity and frequency: is your data directly connected to your project and are you collecting it frequently enough to learn and respond quickly?

Frequency of data collection may look like:

- outcome measures –monthly
- process measures – weekly
- balance measures – monthly.

You will need to collect just enough data to learn whether your changes are having an impact on your system. Too much and all your time will be taken up with data collection. Too little and you won't learn effectively. A good place to start is to sample 10 patient records per week which can be increased to 20 files per week, noting that your data collection opportunities will vary depending on your service size.

Making sense of your data

Displaying your data on run charts will help you understand the impact of your changes, assess progress, and communicate progress with stakeholders. A run chart is a line graph of data over time, demonstrating performance of a process and enabling you to determine between expected (common cause) and unexpected (special cause) variation. Annotating your run charts to show when tests of change happen will increase your understanding of how these changes are influencing practice.

Helpful tools:

- Run Chart Tool <https://www.ihi.org/resources/tools/run-chart-tool>

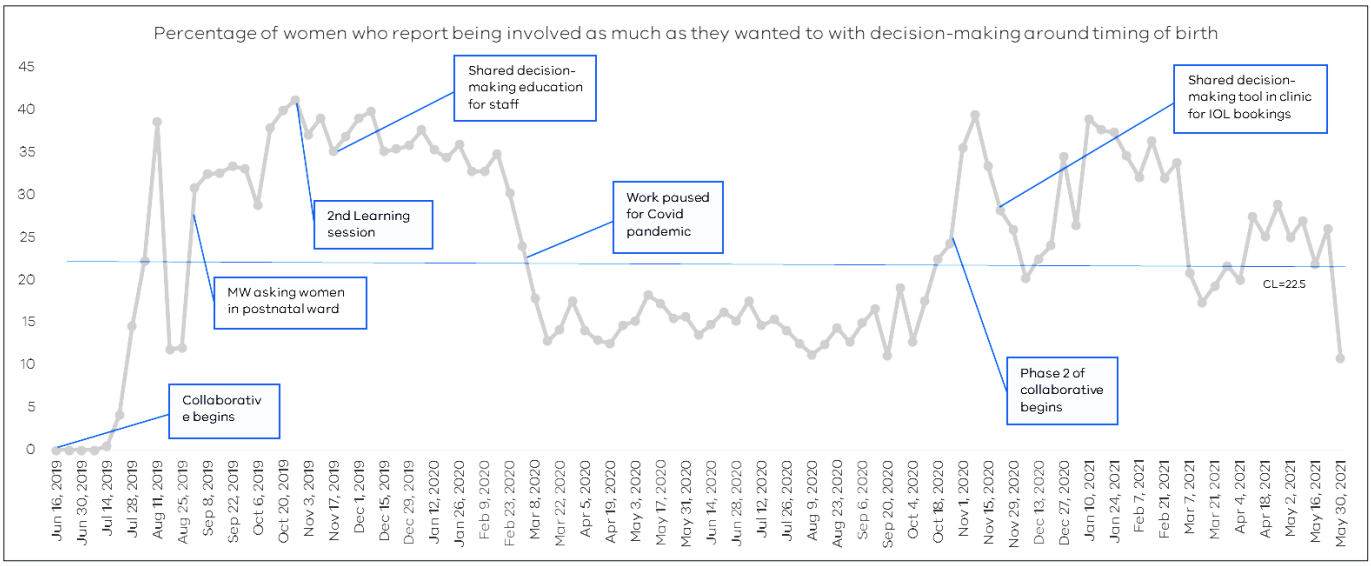


Figure 2. Run chart example: Process measure.

Introducing changes into your system

Testing change using PDSA enables teams to learn what works and what does not in their efforts to improve processes. Initially, cycles are conducted on a small scale to see if they result in improvement, e.g., one patient on one day. Teams then expand tests and gradually incorporate larger and larger samples until they are confident that changes will result in sustained improvement.

It is important to attend rigorously to each of the four stages of a PDSA cycle:

- **Plan** – be clear about what you are trying to learn with this PDSA cycle, note the questions you have and make predictions about what will happen, and document details of the test (who, what, when where and how).
- **Do** – conduct the plan, observe and measure (that is, collect data) what happens. Take notes of what went well and what didn't.
- **Study** – analyse and compare data, check your observations against your predictions, summarise learnings.
- **Act** – decide on what will happen next: will you adapt the change and test again, adopt the change, or abandon it and try something different with your next PDSA cycle?

Helpful tool:

- PDSA Toolkit <https://www.safercare.vic.gov.au/sites/default/files/2023-11/plan_do_study_act_cycle.pdf>

6. Communication

Throughout your improvement initiative, communication is critical for:

- supporting effective teamwork
- collaborating productively with your team's senior sponsor
- building and sustaining will through consumer stories
- connecting with others on the same mission.

In this section, we suggest ideas and pose questions to address these needs.

Supporting effective teamwork

Your team will need to connect frequently. What modes of communication do you already use which could support frequent contact? What modes of communication are accessible for consumers or other non-clinical members of your team?

These might include:

- email
- Microsoft Teams chat or similar
- regular phone calls
- shared documents for asynchronous development
- physical message boards
- face-to-face or video-chat huddles
- regular face-to-face or virtual team meetings.

Collaborating with your senior sponsor

To best support your work, remove barriers, and champion your cause, your team's sponsor needs to be up to date with your improvement plans, successes, and challenges.

Keeping up to date can be achieved by:

- inviting your sponsor to team meetings regularly
- inviting your sponsor to all key project events
- sharing improvement stories and data that your sponsor can share more widely
- reaching out when you encounter barriers to your work progressing.

Building and sustaining engagement through stories

Narrative is highly effective at engaging the head and the heart. Great stories teach us not only how we ought to act but motivate us to act. Stories can be collected and shared from both a patient and staff/health service perspective. Consumer stories in particular are powerful tools to help us learn, improve, and build engagement across health service teams. Public narrative is composed of three elements: a story of self, a story of us, and a story of now. A story of self-communicates *who I am* – my values, my experience, why I do what I do. A story of us communicates *who we are* – our shared values, our shared experience, and why we do what we do. And a story of now transforms the present into a moment of challenge, hope, and choice.

We strongly recommend taking the time to capture consumer and staff stories as you go.

This could be by:

- taking photos
- recording observations
- creating brief video interviews or audio recordings
- writing blog posts
- sharing social media posts

- presenting at conferences and forums.

Connecting with others who have the same goals.
Having the opportunity to connect with other people undertaking improvement work, to learn from their successes and failures, and to share your own so others can benefit from your experience, is an important factor in sustaining motivation, gathering ideas, and strengthening your improvement approach. This could be within your service, your community, across the state or even nationally.
Consider:
- asking your manager what other improvement work is happening at your service.
- reaching out to your professional college
- starting or joining a community of practice
- connecting with the team at SCV: maternityandnewbornlhn@safercare.vic.gov.au

7. Sustainability

It is important to plan for the long-term sustainability from the start of a project, this will help to set your project up for success.
Consider using the MOCHA tool to help guide these discussions:
- Measurement
- Ownership
- Communication & training
- Hardwiring the change
- Assessment of workload

Helpful tool:
- Sustainability Planning Worksheet
  <https://www.ihi.org/resources/tools/sustainability-planning-worksheet>

Change Package

This change package is based on the PPH bundle from the California Maternal Health Quality Care Collaborative Obstetric Haemorrhage toolkit V3.0 (2022)[5], <https://www.cmqcc.org/resources-tool-kits/toolkits/ob-hemorrhage-toolkit> feedback from the PPH Collaborative Faculty, and an expert working group of sector clinicians and consumers.
The change package can be broken down into two parts, Part A and Part B.

Part A of the change package is the first step of the minimum care bundle. It provides a resource for maternity services to collaborate with consumers to identify meaningful areas of improvement and to implement Quantified Blood Loss Measurement (QBL)
It is recommended that once **Part A** has been implemented at a minimum of 85 per cent of all vaginal births and this implementation has been sustained over a 6-

month period, work on **Part B** of the change package and minimum care bundle can commence.
Part B of the change package contains minimum care bundle elements for PPH protocol and adherence, timely medication administration and escalation of care.

Driver diagram and change ideas.

A driver diagram is a visual representation of a team's or organisation's theory of how an improvement goal will be achieved. It outlines which areas or parts of a system need to change and in what way and includes ideas of how to make it happen. The primary drivers are the key components of the system that need to change to deliver the aim. The secondary drivers are the processes that influence the primary drivers and consider the where and when. The change ideas are the specific practical changes the project team can make to alter the secondary drivers. As previously stated, this package was established based on the California PPH bundle and feedback from participants and experts as part of the collaborative. However, the change ideas contained within are not an exhaustive list and project teams can generate their own change ideas that will help drive change in the secondary drivers considering the local context.

PPH - Driver Diagram

This driver diagram was developed in partnership with the Collaborative Faculty which included clinicians and consumers. Updates occurred at the completion of the collaborative in line with stakeholder feedback.

- Begin with **Part A** of the change package of the minimum care bundle. This will ensure consumers are consulted when planning improvement work and Quantified Blood Loss Measurement (QBL) is implemented to ensure a stable baseline for your improvement work.
- Once **Part A** has been implemented at a **minimum of 85 per cent of all vaginal births** and this implementation has been sustained, work on Part B can commence.
- **Part B** contains minimum care bundle elements for PPH protocol and adherence, timely medication administration and escalation of care.

Postpartum Haemorrhage - Driver Diagram

AIM	PRIMARY DRIVERS (Structures, processes)	SECONDARY DRIVERS (Where and when?)	CHANGE IDEAS (How?)
By April 2023, reduce primary PPH greater than 1500ml following vaginal birth by 50 per cent. ***At participating sites.**	**PART A – BEGIN HERE** **P1: Partnering with consumers**	**S1: During pregnancy**	› Implement a shared decision-making approach to creating a third-stage management plan. › Educating and encouraging women and birthing parents to plan for active management of third stage. › Empower partners and support people in education to support women and birthing parents in PPH management. › Establish or strengthen shared decision making with women, birthing parent, and support people around blood transfusion.
		S2: During Birth	› Shared ongoing risk assessment and decision making. › Test and implement processes to maximise bonding time between parents and baby during PPH management.
		S3: After Birth	› Review experiences of women and birthing parents and support people. › Develop, test, and implement a support program for women, birthing parents and support people following PPH that offers multiple opportunities for debriefing. › Develop, test, and implement a discharge checklist that ensures women and birthing parents receive and understand key information and where to access additional support. › Implement a process that provides information and contacts for parents and support people who may require additional support following PPH.
		S4: Promoting Equity	› Identify groups disproportionately affected by PPH through data segmentation and take action to address disparities.
	PART A – BEGIN HERE **P2: Readiness**	**S5: Staff capability**	› Establish team roles and responsibilities during PPH management: allocate roles on a per shift basis. › Establish or review simulation training programs: deliver the right training to the right people at the right time.
		S6: Environmental preparedness	› Implement or review a PPH kit, with a standard checking protocol. › Test and implement risk assessment process to identify PPH development antenatally, perinatally, and postnatally. › Establish a service specific PPH protocol including a clinical decision tool or checklist
	PART B **P3: Recognition**	**S7: Assessment of blood loss**	› Establish a standard process for blood loss measurement by weight following every birth. › Establish a standard process for assessing blood loss where it cannot be weighed
		S8: Decision to treat PPH	› Establish a 'trigger for treatment'. › Establish a process for communicating the decision to treat PPH within the team
	PART B **P4: Response**	**S9: Management of PPH**	› Build service capability for the implementation of the PPH protocol, every time for every birth. › Build service capability for standardised, timely medication management. › Build capability and culture for timely transfer of severe cases to Operating Theatres. › Review initiation and enactment of massive transfusion protocol. › Review of standardised and management of blood transfusion when clinically indicated
	PART B **P5: Review**	**S10: Review and debriefing of all involved in PPH**	› Review experiences and learning from debriefing of staff and consumers involved in real-time following PPH › Strengthen or implement a multidisciplinary, systems focused review for PPH cases. › Implement a system for learning and reflection with staff following a PPH that feeds back for continual improvement. › Review and evaluate real-time use of the clinical decision tool or checklist

Part A

Primary Driver 1: Partner with consumers to identify meaningful improvement strategies.

Primary Driver 2: Implement QBL.

Part A- Primary Driver 1– Partnering with consumers.

This component of the change package considers the experiences of women and their families across the secondary drivers of:

- S1 Pregnancy
- S2 Birth
- S3 After birth
- S4 Promoting equity.

Some key considerations and learnings from the Collaborative include:

- Providing women with one-on-one support during the PPH response.
- Ensure women, birthing parents and support people are aware of PPH. This includes education around PPH, what it is, risk factors for PPH, how it might be managed, and the physiological effects should be part of antenatal conversations and women and their support people should be informed about having had a PPH, ongoing care/management, how they might feel as a result and how this may impact caring for and feeding their newborn.
- Develop, test, and implement a support program for women, birthing parents and support people following PPH that offers multiple opportunities for debriefing and reviews the experiences of women/birthing parents and support people.
- Develop, test, and implement a discharge checklist that ensures women and birthing parents receive recognition that they have had a PPH and understand key information and how to access additional support if required.

Secondary driver	Change ideas	Explanation	Resources/ References	Your team's ideas
S1: During pregnancy	Implement a shared decision-making approach to creating a third-stage management plan	Design and test a shared decision-making process during the antenatal period to develop a third-stage labour management plan.	-Partnering in healthcare framework [10] -Informational, Emotional & Physical Health Needs Among Women (And Their Families) Who Experience Maternal Haemorrhage overview table[11] (page 131) -Example from Australian Commission for safety and quality in healthcare [12] -Guidelines -NICE (UK)[13] Latrobe University shared decision- making webpage [14]. Evidence level 2 [7,8,9,10]	
	Educating and encouraging birthing parents to plan for active management of third stage	Design and test supporting resources that are written in an accessible format to support parents from a wide variety of health literacy backgrounds.		
	Empower partners and support people in education to support birthing parents in PPH management.	Redesign antenatal education, to ensure the engagement of persons with a support role is fully utilised in the process. Ensuring support people are engaged in discussions,		

		including PPH risks and management and they are given opportunities to ask questions is part of this process. Processes should include identification of parents who may have objections to receipt of blood products and agreed management strategies.		
	Establish/strengthen shared decision making with birthing parent and their support people and blood transfusion	Discuss the possibility of blood transfusion, risks, and benefits. This should be done before the onset of labour to support informed decision making and to reduce potential delays and confusion in an emergency.	Patient Blood Management guidelines – module 5 – Obstetric and Maternity [15] Evidence level 3	
S2: During Birth	Shared ongoing risk assessment and decision making	Involve birthing parents and partners/ support persons as active members of the team during birth.		
	Test and implement processes to maximise bonding time between parents and baby during PPH management	Parents report that spending time away from their baby after a traumatic birth event is one of the things that can cause distress.		
S3: After Birth	Review experiences of birthing parents and support people	Establish feedback mechanisms to learn from consumer experiences of PPH and develop mechanisms to incorporate the learnings into organisational processes.	Example consumer info from Ontario Midwives Association [16]	

	Develop, test, and implement a support program for parents and support people following PPH that offers multiple opportunities for debriefing, postnatal discussion, and support provision	The support needs following a traumatic event varies between individuals and therefore our system needs to be able to offer support in different ways. Non-birthing parents can also be affected and should be included in conversations.	Home – Birth Trauma [17]	
	Develop, test, and implement a discharge checklist that ensures birthing parents receive and understand key information and where to access additional support	The psychological harm from PPH can be significant for both birthing parents and partners and is associated with postnatal depression and other longer-term impacts. Test and establish processes and partnerships to support people impacted by PPH.		
S4: Promoting Equity	Identify groups disproportionately affected by PPH through data segmentation and take appropriate action to address disparities	The complexity of the interaction between social determinants of health and the healthcare system can result in unexpected outcomes differences between groups. Identifying and acting on disparities not only benefits disadvantaged groups but creates ideas as to how the overall system can be changed for the benefit of all stakeholders.	Article from NEJM on aspects of health equity [18]	

Part A-Primary Driver 2: Recognition

This component of the change package covers the secondary drivers of

- S5 Assessment of blood loss
- S6 Decision to treat.

Key considerations and learnings from the collaborative:

Quantitative blood loss measurement should be implemented as best practice by all services. Without measurement, recognition and escalation of care can be delayed. We recommend implementing a standard Quantitative Blood Loss (QBL) measurement process as the first step in evaluating the incidence of PPH within any health service. This will provide an accurate baseline measurement from which to establish whether the changes you are making are an improvement.

According to the California Maternal Quality Care Collaborative Obstetric Haemorrhage Toolkit, QBL is the best clinical method of calculating cumulative blood loss.[5]

Quantitative cumulative blood loss is the determination of blood loss over time. QBL should be used as the trigger for clinical intervention.

This ongoing total should include all losses before, during and after birth. Totals should be regularly communicated with all members of the care team.

Embed measurement of blood loss by standardising quantitative blood loss (QBL) techniques for every woman. Whilst there will be cases where this is not possible, such as in water births, the procedure for estimating blood loss in these instances must also be standardised as much as possible.

Exploration of what system level changes need to be done to make QBL standard practice.

QBL data should be collected to monitor progress (utilise the audit tool) and made visible to staff.

The development of clear criteria and a standard language for the recognition and escalation of PPH. For example, some services have developed a Code Pink procedure. Ideally, this language would be standardised between services to allow for the mobility of staff.

As this component of the change package is applicable across all health services regardless of local context, additional guidance on how to implement QBL is provided below in addition to the driver diagram and change ideas.

Secondary driver	Change ideas	Explanation	Resources/ References	Your team's ideas
S5: Assessment of blood loss	Standard process for quantified measurement of blood loss measurement following every birth	Direct measurement of cumulative blood loss (under-buttock drapes, calibrated canisters, gravimetric method). Provide scales in each birth room to measure weighing drapes and linen. Have a standard process in place for when it cannot be weighed, (for example gravimetric drapes while suturing). Have a plan for what you will do during water birth.	-Improving Health Care Response to Obstetric Hemorrhage Version 2.0 -A California Quality Improvement Toolkit [19] inc. best practice statement on quantification of blood loss pgs. 80-82 -Improving Health Care Response to Obstetric Hemorrhage, Version 3.0. A California Maternal Quality Care Collaborative Toolkit, 2022 [20] -Appendix N: Techniques for Quantitative Assessment of Blood Loss (QBL) [20] Florida Obstetric Haemorrhage Initiative (OHI) Toolkit: A Quality Improvement Initiative for Obstetric Haemorrhage Management [21] -Quantification of actual blood loss –see pages 14-16 and Appendix J, page 57 [21.] Evidence level 2 [31]	

Secondary driver	Change ideas	Explanation	Resources	Your team's ideas
S6: Decision to treat PPH	Establish a trigger for treatment	Staff respond to an agreed trigger for invoking PPH procedures. Note that this should ideally be before a loss constituting a PPH has occurred.		
	Establish a process for communicating this to the team.	There is a clear, documented process for communicating the decision to treat a PPH to all members of the PPH response team. This will be tested in simulation training (S1.).	-IHI Open School PS104 – Teamwork and communication. [22] -SBAR Tool: Situation-Background-Assessment-Recommendation | IHI - Institute for Healthcare Improvement [23]	

How to Implement QBL

Step by step guide to QBL:

- After vaginal birth immediately replace bluey/linen and discard (do not weigh this as it will include the weight of liquor).
- All blood loss to be weighed/measured after the replacement of this bluey/linen.
- Placenta birthed on the replaced bluey/linen and all pads/blueys/linen are weighed in real time as they are changed. Weighed blood loss is documented contemporaneously as pads/blueys/linen are changed.

Recommended timeframes for weighing:

No concern for bleeding:

- Third stage QBL assessment continues for 2 hours.
- Weigh all pads/blueys/linen as changed in real time and document.

Recommended timeframe on time to weigh:

- If the placenta has not been birthed.
- All blood to be weighed 5 – 15 minutely until stable.
- After the placenta has been birthed, commence third stage QBL assessment for 2 hours.

If there is concern for bleeding:

- All blood to be weighed 5 – 15 minutely until stable.
- PPH observation commenced- Blood to be weighed every 30 mins for 4 hours.

Elements of QBL:

- Estimation activities with staff - to build will.
- Communication and execution strategy.
- Standardising linen and disposable products, establishing dry weights and producing signage.
- Establishing a standardised process for measuring QBL in normal birth, water birth, whilst suturing (gravimetric drape).
- Education program to educate all staff.
- Leadership team support – to roll out program.
- Audit and monitoring (meetings, review, reporting).

Tools required:

- Scales- PPH collaborative teams used kitchen scales, Kmart, Wedderburn Tanita scale.
- Weights of linen.
- Template for identifying linen weights.
- Gravimetric drapes- (teams have trialled Medline product).
- Standardising linen and disposable products, establishing dry weights and producing signage.
- Calculator.
- PPH Trolleys (to store the tools you will need for doing QBL).

Part B

Primary Driver 3: Readiness

Primary Driver 4: Response

Primary Driver 5: Review

Part B- Primary Driver: Readiness

This component of the change package covers the secondary drivers of

- S7 Staff capability
- S8 Environmental preparedness

Key considerations and learnings from the Collaborative:

- Focusing on what can be done before the event to increase the chances of a successful response to a postpartum haemorrhage:
- A contemporary evidence based PPH protocol that has been locally designed for your service will provide clear steps on what to do next to ensure best outcomes for patients experiencing a PPH.
- A local up to date PPH protocol which staff routinely followed was the most effective component of the collaborative's PPH care bundle in reducing the likelihood of a severe PPH occurring.
- With the support of hospital leadership, define, refine, and implement a local, current, evidence-based protocol for the management of PPH.
- The current Safer Care Victoria recommended protocol is available to support you in this, and can be found here.[6]

Secondary driver	Change Idea	Explanation	Resources	Your team's ideas
S7: Staff capability	Establish team roles and responsibilities during PPH management	Defining team roles appropriate for service context will support team members to have a clear understanding of their allocated role for every shift. Ensure that staff members assigned roles have had appropriate training, including simulation. An agreed communication mechanism will be in place to communicate team roles.	-Teamwork and communication - Save Mothers [24.] -IHI Open School PS104 -Teamwork and communication. [22] Evidence level 2 [34]	
	Establish/review multidisciplinary simulation training programs: deliver the right training to the right people at the right time	Review scope and frequency of simulation training. Ensure that scenarios address actual management issues that have/could occur within the service context. Review training needs of the healthcare team and develop a sustainable schedule to keep updated.	PROMPT Maternity Foundation [25] Evidence level 2 [37]	
S8: Environmental preparedness	Establish a service specific PPH protocol including a clinical decision tool/checklist	Statewide guidelines for PPH are adapted to take account of local context and to provide clarity to staff.	SCV primary PPH management flowchart [27] Evidence level 3 [27]	
	Implement/review standard PPH kit, with a standard checking protocol	Design and test the use of a standardised PPH kit with a supporting protocol to ensure the contents remain stocked and in date. Research suggests having required supplies available reduces preventable delays to responding to PPH.	Evidence level 2 [6,28,33]	

	Test and implement risk assessment process to identify PPH development antenatally, perinatally, and postnatally	Design and test a PPH risk assessment process that is used for every birth parent (prenatal, on admission, and at other appropriate times) to identify risk factors and to document a plan for ongoing care.	Evidence level 3 [6,19,24,32,27]	

Part B- Primary Driver: Response

This component of the change package covers the secondary driver:

- S9 Management of PPH

Key considerations and learnings from the Collaborative:

Despite best practice preparation and early recognition of PPH, some PPH's will continue to occur. This driver focuses on the response of the system when a PPH is identified.

- Ensuring one coordinated team: clinicians, patients, families, and carers working together.
- Ensuring that resources are available when needed.
- The development of a system that learns from both successes and failures.

Secondary driver	Change ideas	Explanation	Resources
S9: Management of PPH	Build service capability for the implementation of the PPH protocol, every time for every birth	Barriers to implementation can include staff awareness, logistical issues, previous practice.	• 5 Steps for Creating Value Through Process Mapping and Observation (ihi.org) [28] • Quality Improvement Essentials Toolkit | IHI - Institute for Healthcare Improvement [29]
	Build service capability for standardised, timely medication management	Barriers can include availability of medication, uncertainty around preparation, and administration and IV access.	• 5 Steps for Creating Value Through Process Mapping and Observation (ihi.org) [28]. • Quality Improvement Essentials Toolkit | IHI - Institute for Healthcare Improvement [29] • Evidence level [10]
	Ensure timely transfer of severe cases to operating theatres	Establish a standard protocol to minimise delays in transfer to operating theatre.	• SBAR Tool: Situation-Background-Assessment-Recommendation | IHI - Institute for Healthcare Improvement[30]

Part B – Primary Driver: Review

This component of the change package covers the secondary driver:

- S10 Review and debriefing of all involved in PPH.

Key considerations and lessons from the Collaborative:

Supporting the birth parent, support person and clinical team following a postpartum haemorrhage.

Use of reporting, review, and debrief to promote continuous improvement.

Secondary driver	Change ideas	Explanation	Resources	Your team's ideas
S10: Review and debriefing of all involved in PPH.	Review lessons learned in real time through debriefing following PPH	Capture lessons learned as soon as possible after the event, agree points for immediate action and agree process for further review.	Example debriefing tool- see page 166. [11]	
	Strengthen/implement multidisciplinary, systems focused review of all PPH cases	Ensure that data, review, and clinical learning systems support learning from not only the most serious PPH cases but also 'near-miss' situations.		
	Implement a system for learning and reflection with staff following PPH that supports continual improvement	Consolidate lessons learned across teams to identify opportunities for system and staff development.	Simulation training in PPH. [37] Evidence level 2	
	Review and evaluate use of real time clinical decision tool/ checklist	Establish an audit process identify barriers to use of the tool.	Checklist for management of PPH. [38]	

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Appendices

Appendix A: Definition of Levels of Evidence

Evidence to support the driver diagram for reducing PPH is drawn from a variety of sources that provide strong empirical support for the primary and secondary drivers. Due to the range of definitions of what constitutes evidence for health care actions, the following are used with this work:

LEVEL 3: Highest level of evidence – very effective

- Published literature that provides a clear description of actions and results within or across sites.
- Publication in healthcare journals or expert resources.
- Experience with application in the field, demonstrated results, studied over time, with sustained results.

LEVEL 2: Indications of evidence – moderately effective

- Experience with application in the field, demonstrated results, sustained over time.
- May have a shorter period of sustained results than Level 3
- May show strong evidence for alternate outcomes or processes e.g., processes for other disease states.
- No major publication of this work

LEVEL 1: Emerging ideas worthy of trial by others - promising

- Early adaptors showing positive results.
- Shorter trial in the field

LEVEL 0: No evidence

- A potentially good hypothesis worthy of testing

Appendix B: Strategies to reduce PPH.

Key strategies to reduce harm caused by postpartum haemorrhage

Postpartum haemorrhage (PPH) can have both physiological and psychological effects and is the most common cause of preventable perinatal morbidity internationally. The PPH Collaborative, delivered by Safer Care Victoria in partnership with The Institute for Healthcare Improvement worked with health services and consumers to reduce the incidence of severe PPH and improve the care provided to those who experience PPH.

COMMUNICATE

Communication and support

Partner with consumers to minimise trauma from a PPH. Provide support within the emergency response, clear communication, opportunities for debrief and access to follow up services.

RECOGNISE

Improve recognition with accurate blood loss measurement

Implement a standardised process for accurate quantified blood loss measurement following every birth to recognise excessive bleeding after birth.

RESPOND

Standardised response

Rapidly enact standard evidence-based PPH protocol that addresses escalation pathways, trigger for treatment and strategies for timely medication administration.

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Appendix C: How to implement QBL.

Quantitative blood loss measurement for postpartum haemorrhage

Historically, many maternity services visually estimated blood loss rather than measuring it in a standardised manner.

Without measurement, recognition and escalation of postpartum haemorrhage can be delayed leading to poorer outcomes for consumers.

How to get started with quantitative blood loss measurement:

GAMIFICATION

Build the will for change amongst the team with estimation exercises such as guessing the volume of liquid on sheets.

PREPARE

Source scales and a calculator for each birthing room.

Provide a chart of dry weights for linen and disposable products to simplify the calculation of blood loss when weighed.

WEIGH

When second stage is complete, remove linen and disposable products and do not weigh (including liquor in weighing process can lead to overestimation).

Weigh linen from now as it is changed.

SUTURING

Use gravimetric drapes for accurate measurement and visualisation of blood loss during suturing.

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Appendix D: PPH Audit tool

The PPH audit tool provides a way of recording and graphing monthly data for data monitoring and measuring.

The audit tool is a step-by-step guide on how to identify files for review for process measure audits, so they are randomised.

It provides a guide for anyone who is not familiar on producing a BOS report for data management.

Any clinician on the floor using this tool should be able to walk through an audit of outcome and process measures without any previous experience.

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