

Supplementary File #1 – Further description of the MEER approach used in the Epworth study

Introduction

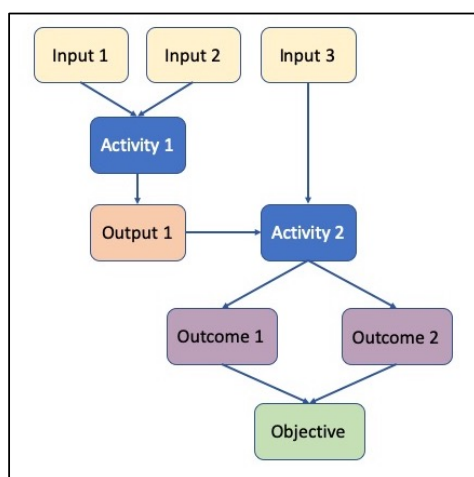
This Supplementary File provides a detailed description of the MEER approach and specific information on how this technique was applied in the Epworth study. The document includes two sections and a set of Appendices. The first section describes the MEER approach and explains how the four steps of the approach can be implemented in practical terms in any organisation. Further detail about the four steps can be found in the following article:

Cohen DR, Cohen PJ, Anderson V. Map-enabled experiential review: A novel approach to engaging healthcare staff in quality improvement. *Manag Healthc*. 2018;3(2):187–98.

The second section explains how the MEER approach was implemented in the Epworth study using an online application available for that purpose (MEERQAT; see <https://meergat.com.au>). The Appendices present detailed resources that would enable any healthcare organisation to assess their own process pathways relating to *Patient ID and procedure matching*, as described in the accompanying article by Curtin *et al*.

Section 1: Overview of the MEER approach

Map-enabled experiential review – or MEER – is a technique that re-purposes tools commonly used in process management and evaluation for use in a quality improvement context. MEER uses graphical models, or *maps*, of process systems to enable structured conversations amongst teams of staff. A generic process model is illustrated in the following diagram.



By using a map that explicitly sets out key components of process pathways, this ensures the team takes a systematic approach to reviewing how well the pathways depicted in the map are being implemented, drawing on knowledge and experiences of staff. The outcomes of these structured conversations then

serve as an evidence base for a quality improvement action plan. The MEER approach comprises four steps, which are summarised below.

Step 1: Model development

This involves developing the process model for the process system(s) the team wishes to review and comprises two main tasks. The first task is to create a graphical model that depicts the relationship between the inputs, activities and outputs of a given process (or system of processes) and how these give rise to the expected outcomes and objectives of the process(es). The model can initially be drawn on paper or a whiteboard and should then be translated into an electronic format to create a more permanent version that can easily be updated, shared and displayed.

The second task is to create content that will be used in the structured conversations. For each input, activity, output, outcome and objective in the map (termed 'nodes'), this content always includes a rating question and rating options that will be considered by the group, and may also include information about the node (key characteristics; how or why the node is important to the overall outcomes; etc) that can be used in the course of the assessment activity (see Step 2 below) to educate or remind staff about important aspects of daily practice.

Each node's rating question and rating scale generally reflect an aspect of that component of the process pathway that is central to its successful implementation. Rating questions are framed in a way that can be answered by individuals, so that team members can nominate a rating that reflects their own experiences. Rating scales can be anything from a two-point 'yes/no' scale, to a three-, four- or five-point scale and should include a 'not applicable' rating option, to allow for circumstances where certain nodes (or whole process pathways) are not relevant to the team conducting the assessment. Some examples of rating questions and rating scales (excluding the *Not applicable* option) are provided in the following table:

Node rating question	Node rating scale
Is patient identity always confirmed during clinical handover?	1. Yes 2. No
How up-to-date are your health service policies on patient identification, procedure matching and clinical alerts?	1. Policies are up to date and relevant 2. Policies require updating 3. Policies do not exist
How often do staff consult policies?	1. Regularly 2. Occasionally 3. Rarely 4. Never
Overall, how would you rate the process of creating patient ID bands?	1. Very good 2. Good 3. Neither good nor poor 4. Poor 5. Very poor

Nodes can be designated as 'not rateable' if the node represents a component of the system that cannot – or should not – be rated. One example is a node for an external framework or standard, which is an important input to an organisation's process pathway, but is simply a fact of life for the organisation and cannot be changed. Another example is individual team members, who are an essential input to various process pathways, but should not be rated through the MEER approach.

Node content can be created and stored in any convenient electronic format, such as a table prepared in Word or Excel. This tabulated information can be used as a template for recording team members' input during the assessment step. The table should include fields documenting the node title, node description and rating question. There should also be blank fields under each rating option to allow the number of staff nominating that rating option to be recorded, as well as a blank field for recording comments, a blank field for recording the consensus rating of the group and a field for recording whether any tasks should be added to the action plan to address any of the issues raised during discussion (see Steps 2 and 3 below).

Step 2: Assessment

This involves using the process model to guide the team through discussions about how those process systems are working in the context of routine practice. In our experience, assessment sessions of 30–45 minutes duration work well, although longer sessions are possible if time and resources permit. Each session is a structured conversation between team members about what they do in the course of routine practice, why they do it that way and how they can address any issues they identify. The graphical map provides the structure for the conversation, with the node content providing contextual information and a specific focus for rating each node.

Although other methods are possible, in our experience, the sessions work best with the graphical map projected onto a wall or screen that is visible to all team members participating in the session. One member of the team acts as facilitator for the session and this role can be rotated amongst team members.

For each node in turn, team members review node content including the rating question and rating options. The facilitator asks individual team members for their view on the most appropriate rating based on their own experiences and records the number of individuals that nominate each rating option using the template table created in Step 1. Comments made by the group in the course of the discussion can also be recorded by the facilitator in the template table.

Once discussion for a particular node has been completed, the group decides on their consensus rating for the node and this is recorded for that node in the template table. The consensus can also be recorded graphically using an agreed schema. For example, on a printed copy of the map, the facilitator might draw a

tick mark on or next to the node to indicate an above-average consensus rating; a hazard icon for an average or below-average consensus rating; 'n/a' for 'not applicable'. This graphical record is quite useful since, when the map is completed, the team has an instant snapshot of where issues have been identified in process pathways.

In the course of rating each node, the group also considers whether the node should be included in the quality improvement action plan and records this in the template table.

Depending on the number of nodes in a process model, the length of assessment sessions and the amount of time spent discussing individual nodes, a team may take several sessions to rate an entire map. However, the goal is not simply to complete the map as quickly as possible, since the discussion component of the MEER assessment is central to the usefulness of the approach.

Step 3: Action plan development

As noted above in Step 2, development of an improvement action plan commences during the assessment sessions, when teams identify problematic nodes during their rating discussions and decide whether to include those nodes in the action plan. In our experience, the rating discussions often yield valuable suggestions for improvement, which can be recorded by the facilitator in the template table for later reference. Direct linking of the assessment step into action plan development helps ensure that useful discussions in the context of issue diagnosis are translated into actions to address any issues identified. Likewise, by linking the action plan to the issues discussed during the assessment, this helps staff understand why particular remedial activities are being implemented and encourages more buy-in from staff to those quality improvement initiatives.

Once assessment for the whole map has been completed, the team (or designated individuals) can review all areas identified as needing improvement, grouping together related nodes and identifying activities that are most likely to address underlying issues or resolve superficial problems, as appropriate. It is usually also important to prioritise tasks, set realistic due dates for completion and assign responsibility for tasks in a way that shares the workload between team members.

Step 4: Action plan implementation

This step involves team members (and others) undertaking the tasks in the improvement action plan. Completion of action plan tasks can be tracked in the template table used during the assessment or using a Kanban board, with columns labelled 'To do', 'In progress' and 'Done' and a separate index card for each node included in the action plan. Individual tasks can be written on the index cards, together with due dates and responsible team member(s). The action plan can be set up on a wall in a team workspace or

meeting room, with tasks being marked off on the index cards as they are completed. This provides a visible, collective record of the progress being made on improvement activities.

The MEER approach is based on a plan–do–review quality improvement cycle and steps 2–4 are intended to be repeated periodically. By using the same process model as the basis for assessments at different time points, or as the basis of assessments conducted by different teams, this ensures consistency in the way each assessment is conducted and thereby enables both longitudinal comparisons (i.e. comparisons over time for a single team) and cross-sectional comparisons (i.e. comparisons between different teams).

Section 2: How the MEER approach was implemented during the Epworth study

Model development

We used graphical models available in the online application MEERQAT (<https://meergat.com.au>) for this study. Not only did this obviate the need for graphical models to be developed as part of the study, but the application presents maps in an interactive format, allowing all information captured during the assessment step to be recorded against its corresponding node in the map. The application also automates other aspects of the MEER approach described earlier, including presenting the consensus rating of the team graphically on the map and placing editable cards representing nodes nominated for inclusion in the action plan onto an electronic Kanban board.

At the time of commencing this study, the first edition of the National Safety and Quality Health Service (NSQHS) Standards were in use across Australia. Consequently, the template maps (termed ‘basemaps’ in the application) available in MEERQAT for each standard corresponded to the 1st Edition standards. [Note: The 2nd Edition of the NSQHS Standards, which were published in 2017 and implemented nationally in 2019, have been reconfigured such that *Patient ID and Procedure Matching* is no longer a stand-alone standard and is now part of a larger *Standard 6 – Communicating for Safety*.]

The details of the graphical model used in the Epworth study for teams to assess their processes associated with patient identification are presented in three appendices:

- **Appendix S1.1** presents *NSQHS Standard 5 – Patient ID and Procedure Matching*, as published by the Australian Commission on Safety and Quality in Health Care (ACSQHC) in 2012.
- **Appendix S1.2** shows the MEERQAT basemap (i.e. graphical process model) based on that standard. The map shows the process pathways that frontline staff might routinely undertake to deliver the desired outcomes and objectives of the standard.
- **Appendix S1.3** shows the corresponding node content for that basemap.

While the MEERQAT application allows users to create their own copy of each basemap and tailor the map and node content to the particular circumstances of the user's organisation, this option was not used in the Epworth study and the application's map templates were used unaltered throughout the project.

Assessment

The two clinical units participating in the study (ED and 4Gray) assessed themselves against NSQHS Standard 5 (1st Edition) twice over the course of the project, with four months elapsing between the completion of their first assessment and the commencement of their second assessment. The basemap for NSQHS Standard 5 (1st Edition) includes a total of 51 rateable nodes; for both their first and their second assessments, the ED team required a total of 4 x 35 minute sessions to complete their assessment for the whole map, whereas the 4Gray team required 3 x 35 minute sessions.

Appendix S1.4 summarises how the MEER technique was implemented using the MEERQAT application. Briefly, for each assessment session, the facilitator logged into the application and opened the team's assessment created using the NSQHS Standard 5 (1st Edition) basemap. The facilitator's computer was connected to a data projector so the map was visible to all session participants. When the facilitator clicked on a node on the map's interactive interface, that node's rating panel opened to reveal the node title, type, description, rating question and rating options. As the group discussed the node, the facilitator typed comments directly into the comments interface and as team members nominated their individual ratings, these were tallied using the clickable interface for the rating options. When the group had determined the appropriate consensus rating for the node, this was recorded using the clickable interface and the team's consensus rating was then automatically displayed on the map node, allowing team members to readily visualise which nodes and process pathways had been assessed by the group as requiring improvement.

The final step of the assessment process involved deciding whether to add the node into the action plan; if so, the node was automatically added into the 'To Do' column on the map's Kanban board for later editing.

Action plan development and implementation

The two participating clinical units varied over the course of the project in their approach to action plan development. During some assessment sessions, the teams would add nodes into their action plan and immediately decide which tasks they would undertake to address the issues identified. They might also set due dates and nominate responsible individuals for each task at that time. On other occasions, the teams would add nodes into their action plan, but return at a later stage to identify specific tasks, assign tasks to individuals and set due dates.

In the case of NSQHS Standard 5 (1st Edition), the second assessment against the standard took place late in the project and therefore the teams did not have time to undertake tasks in their second action plan for

this standard before the project concluded. Thus, the following analysis is focussed on the action plan developed by each team after their first assessment against this standard.

- The ED team added 23 of the 51 rateable nodes in the NSQHS Standard 5 (1st Edition) map to their action plan after the first assessment; the 4Gray team added 14 nodes to their action plan after the first assessment.
- There were nine nodes added to action plans that were in common between the two teams; however, the tasks identified to address issues were similar between the ED and 4Gray for only two of those nine nodes.

Taken together, these data suggest the two participating clinical units identified issues with different aspects of the process pathways for patient ID and, even when they had issues with the same nodes, their issues were expected to be resolved through different actions. This is not a surprising outcome, given that one of the participating units was the ED and the other unit was an inpatient oncology ward.

- For 4Gray, all 14 nodes added to the first Standard 5 action plan had a consensus rating of *average* or *below average* in the assessment step; for ED, their first Standard 5 action plan included 19 nodes that had a consensus rating of *average* or *below average* in the assessment step, as well as four nodes that had a consensus rating of *above average*.
- For both teams, not all nodes with a consensus rating of *average* or *below average* during the first assessment were included in action plans.

In terms of completion of action plan tasks, by the end of data collection for the project, the ED team had completed the action plan tasks for 11 of the 23 nodes in their plan and tasks were in progress for one other node, while the 4Gray team had completed the tasks for 10 of the 14 nodes in their action plan and tasks were in progress for another two nodes. Thus, by the end of the project, tasks had been completed or were in progress for 65% of the total collection of nodes included in action plans by either team.

Re-assessment

When the teams assessed their practices against the Standard 5 basemap for the second time, their second assessment consensus rating had improved compared to their first assessment consensus rating for 26% (4Gray) to 33% (ED) of basemap nodes (29% overall). Interestingly, for 46% of nodes where the second consensus rating was improved compared to the first, those nodes had not been specifically included in the relevant team's action plan. This suggests that some aspects of routine practice with respect to patient ID had improved as a result of mechanisms other than completion of action plan tasks. Possible mechanisms could include staff becoming aware – or being reminded – of correct procedures through the team-based discussions about each map node, or enhanced reflective practice resulting from participation in the structured MEER sessions. However, the data collected during the project did not permit any definitive

conclusions to be drawn about the mechanisms that could have contributed to improvements in routine practice.

Based on the comparison of the second assessment consensus ratings to the first assessment consensus ratings, the areas where staff perceived an improvement in routine practice included:

- Staff awareness of relevant hospital policies and protocols, including staff reading policies and relevant updates, staff consulting policies/protocols more regularly and inclusion of patient ID policies and protocols in staff induction/orientation.
- Keeping patient records up-to-date, particularly with clinical alert and other clinically relevant information.
- Confirming patient ID throughout procedures, as well as at transfer and discharge.
- Monitoring patient ID processes and following up on issues when they occur.

It should be noted that this list of improved aspects of practice reflects staff perceptions of improvement and no independent audit data was collected that could quantify improvements in these aspects of routine practice.

Appendix S1.1

This is an extract from:

Australian Commission on Safety and Quality in Health Care, National Safety and Quality Health Service Standards (September 2012). Sydney. ACSQHC, 2012.

Standard 5 – Patient Identification and Procedure Matching

The Patient Identification and Procedure Matching Standard:

Clinical leaders and senior managers of a health service organisation establish systems to ensure the correct identification of patients and correct matching of patients with their intended treatment. Clinicians and other members of the workforce use the patient identification and procedure matching systems.

The intention of this Standard is to:

Correctly identify all patients whenever care is provided and correctly match patients to their intended treatment.

Context:

It is expected that this Standard will be applied in conjunction with Standard 1, 'Governance for Safety and Quality in Health Service Organisations' and Standard 2, 'Partnering with Consumers'.

Criteria to achieve the Patient Identification and Procedure Matching Standard:

Identification of individual patients

At least three approved patient identifiers are used when providing care, therapy or services.

Processes to transfer care

A patient's identity is confirmed using three approved patient identifiers when transferring responsibility for care.

Processes to match patients and their care

Health service organisations have explicit processes to correctly match patients with their intended care.

Explanatory notes

Patient identification and the matching of a patient to an intended treatment is an activity that is performed routinely in all care settings. Risks to patient safety occur when there is a mismatch between a given patient and components of their care, whether those components are diagnostic, therapeutic or supportive.

Much of the information about the number of patient mismatching events comes from incident reporting systems. In 2008–09 there were eleven events in Australia with procedures involving the wrong patient or body part resulting in a death or major permanent loss of function.³² When less serious events from nonsurgical areas – such as pathology and radiology – are included in reporting systems the number of reported events can rise considerably.⁴⁹

Since patient identification is an activity that is performed frequently, it can often be seen as a relatively unimportant task. Taking human factors into account when planning patient safety emphasises the design of systems to consider human capabilities, limitations and characteristics.⁵⁰ This approach suggests that the development of safety routines for common tasks (such as patient identification) provides a powerful defence against simple mistakes that may progress and cause harm. These routines allow the workforce to focus their attention on those activities that require more cognitive processing and judgement, such as the provision of clinical care.⁵¹ The use of tools such as the World Health Organization Surgical Safety Checklist⁵² and Ensuring Correct Patient, Correct Site, Correct Procedure protocols⁵³ provide a basis for the development of such routines.

Identification of individual patients

At least three approved patient identifiers are used when providing care, therapy or services.

This criterion will be achieved by:	Actions required:
5.1 Developing, implementing and regularly reviewing the effectiveness of a patient identification system including the associated policies, procedures and/or protocols that: <ul style="list-style-type: none"> define approved patient identifiers require at least three approved patient identifiers on registration or admission require at least three approved patient identifiers when care, therapy or other services are provided require at least three approved patient identifiers whenever clinical handover, patient transfer or discharge documentation is generated 	5.1.1 Use of an organisation-wide patient identification system is regularly monitored
	5.1.2 Action is taken to improve compliance with the patient identification matching system
5.2 Implementing a robust organisation-wide system of reporting, investigation and change management to respond to any patient care mismatching events	5.2.1 The system for reporting, investigating and analysis of patient care mismatching events is regularly monitored
	5.2.2 Action is taken to reduce mismatching events
5.3 Ensuring that when a patient identification band is used, it meets the national specifications for patient identification bands ⁵⁴	5.3.1 Inpatient bands are used that meet the national specifications for patient identification bands

Processes to transfer care

A patient's identity is confirmed using three approved patient identifiers when transferring responsibility for care.

This criterion will be achieved by:	Actions required:
5.4 Developing, implementing and regularly reviewing the effectiveness of the patient identification and matching system at patient handover, transfer and discharge	5.4.1 A patient identification and matching system is implemented and regularly reviewed as part of structured clinical handover, transfer and discharge processes

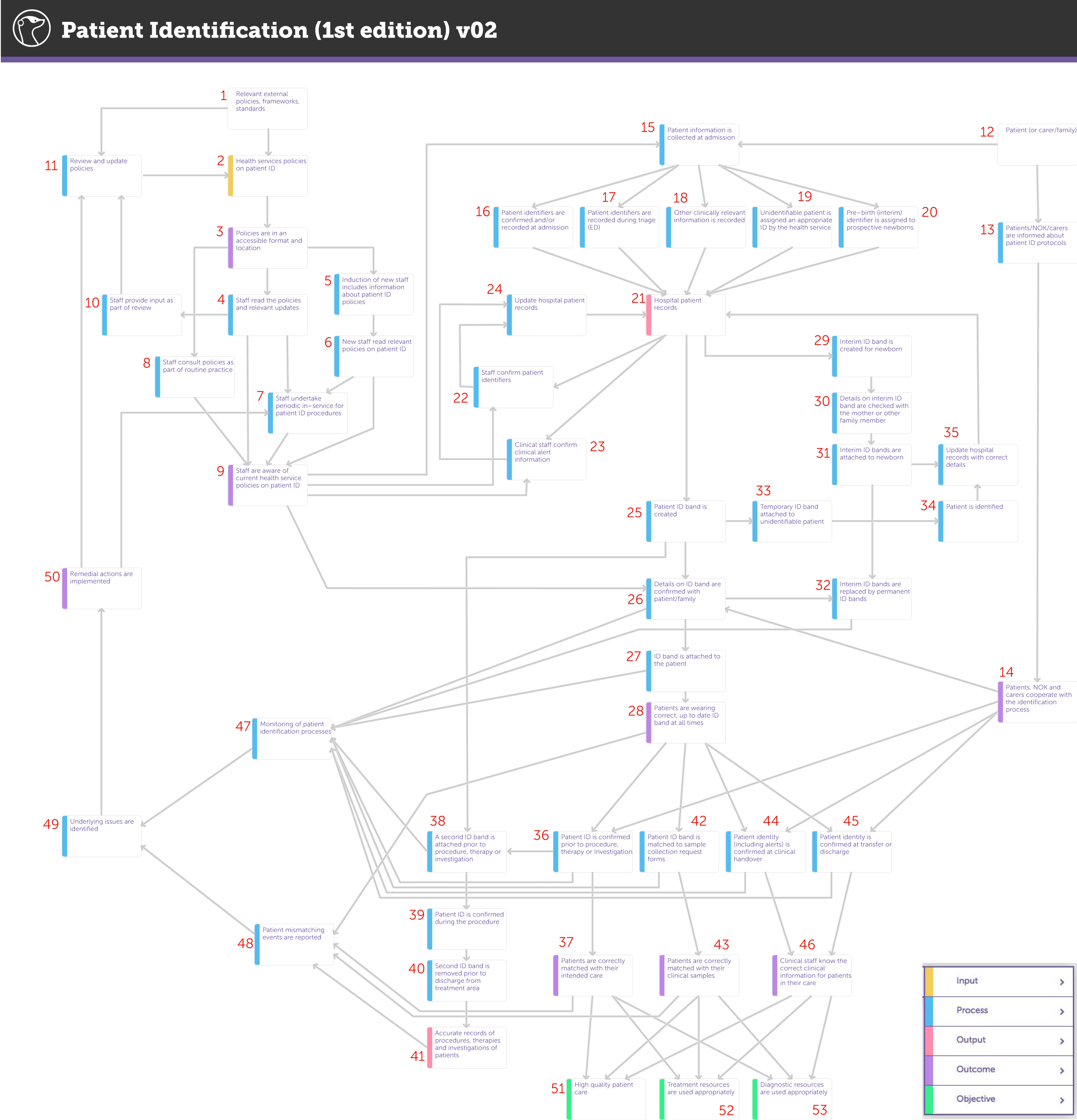
Processes to match patients and their care

Health service organisations have explicit processes to correctly match patients with their intended care.

This criterion will be achieved by:	Actions required:
5.5 Developing and implementing a documented process to match patients to their intended procedure, treatment or investigation and implementing the consistent national guidelines for patient procedure matching protocol or other relevant protocols ⁵³	5.5.1 A documented process to match patients and their intended treatment is in use
	5.5.2 The process to match patients to any intended procedure, treatment or investigation is regularly monitored
	5.5.3 Action is taken to improve the effectiveness of the process for matching patients to their intended procedure, treatment or investigation

Appendix S1.2 – MLERQAT basemap NSQHS Standard 5 (1st Edition): Patient ID and Procedure Matching

Note: The red numbers next to each node correspond to the Node # in Appendix S1.3.



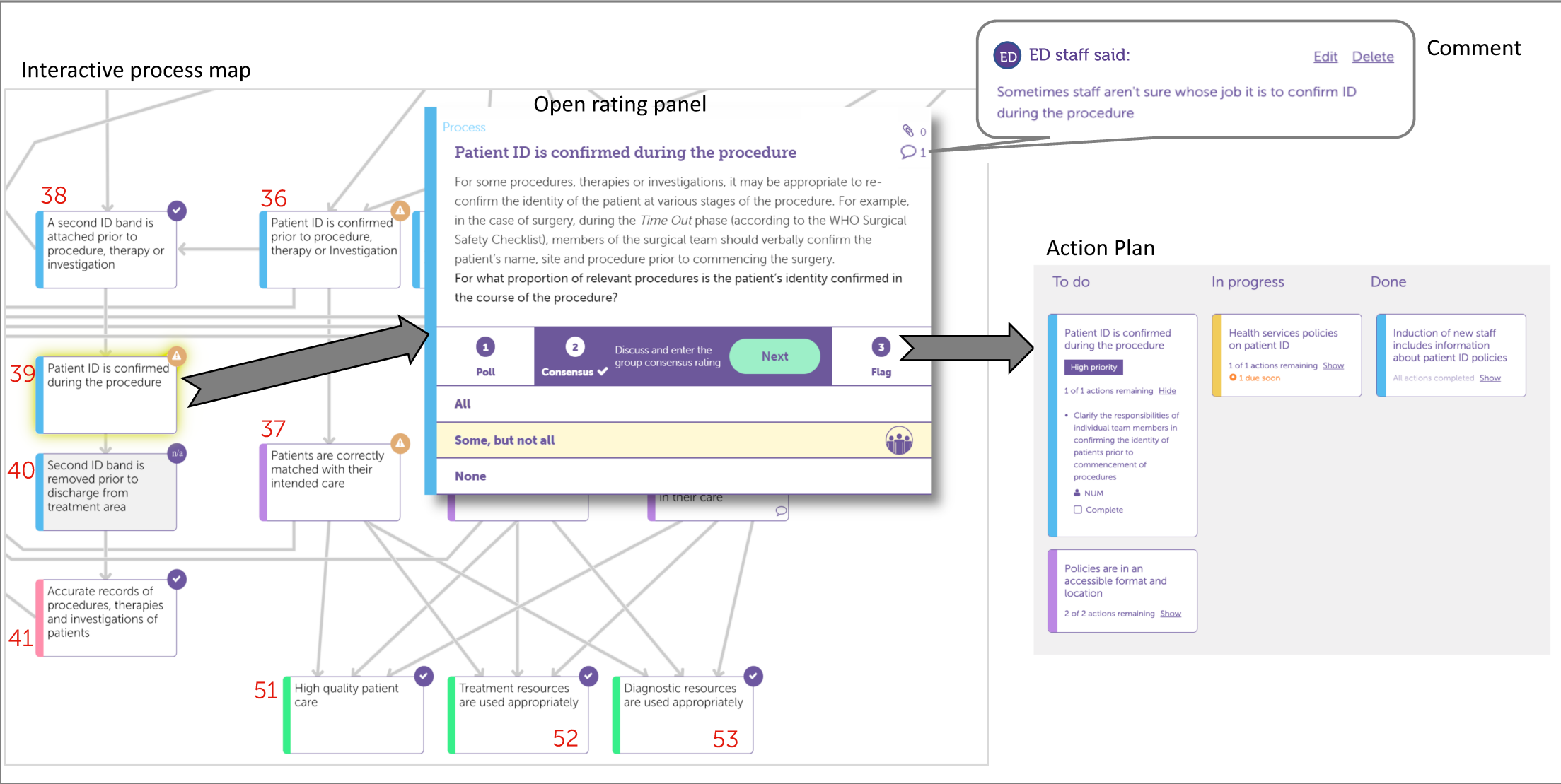
Appendix S1.3 – Node content for MEERQAT basemap *NSQHS Standard 5 (1st Edition): Patient ID and Procedure Matching*

Node #	Node title	Type	Description	Rating question	Rating options
1	Relevant external policies, frameworks, standards	Not rateable	This input is not rateable in the context of this assessment. Continue to the next node.		
2	Health services policies on patient ID	Input	Policies should outline the systems and processes in place to accurately collect and apply a minimum of three approved patient identifiers at registration, admission or birth and to correctly match each patient to their intended treatment, procedure or investigation. Clinical alerts also need to be recorded on admission to the health service. Other policies are required to outline the process, responsibilities and expectations with respect to patient identification and procedure matching for all patients in the care of the health service. Having up-to-date and relevant policies is a foundation for ensuring that clinical practice reflects best practice.	How up-to-date are your health service policies on patient identification, procedure matching and clinical alerts?	Policies are up to date and relevant Polices require updating Polices do not exist
3	Policies are in an accessible format and location	Outcome	Policies should be presented in a format that is accessible (i.e. appropriate language with consistent and clear document formatting) and should be easily located by staff (e.g. on computers or in hard copy in known locations throughout the health service) and should be read by staff.	What proportion of policies relating to patient identification, procedure matching and clinical alerts are accessible?	All Most About half Some None
4	Staff read the policies and relevant updates	Process	It is important that staff are familiar with the content of relevant policies, not just their existence, so they can implement those policies as part of routine practice. Staff should read policies relevant to them when they first join the health service and re-read the policies periodically to refresh their knowledge of the policies and to become acquainted with any amendments or updates.	Once staff have been informed about new or updated health service policies relating to patient identification, to what extent do they read those new/updated policies?	Always Mostly About half the time Sometimes Never
5	Induction of new staff includes information about patient ID policies	Process	Induction at the both the health service level and at the ward/unit level should include information about relevant health service policies and how these can be accessed.	To what extent are new staff informed about these health service policies during induction?	Always Mostly About half the time Rarely Never
6	New staff read relevant policies on patient ID	Process	It is important that new staff are aware of the content of relevant policies, not just their existence, so they can implement those policies as part of routine practice.	Do new staff read health service policies on patient identification and procedure matching?	Yes No Not sure
7	Staff undertake periodic in-service for patient ID procedures	Process	Health services should provide periodic training on patient identification policies and procedures for all staff, to assist them in maintaining their competency and improving their proficiency in this activity. Ideally, staff should participate in annual training sessions focussed on patient identification and procedure matching.	How often do staff undertake training in patient identification?	More than once per year Once per year Once every 2-3 years Can't recall Never
8	Staff consult policies as part of routine practice	Process	Staff should be consulting relevant policies on a regular basis, to refresh their awareness of the policy detail and ensure their routine practice remains compliant with those policies.	How often do staff consult policies?	Regularly Occasionally Rarely Never
9	Staff are aware of current health service policies on patient ID	Outcome	For health service policies to be effective in achieving the desired objectives, all staff must be aware of and actively implementing policies relevant to them.	To what extent are staff aware of the current health service policies in relation to patient identification, including procedure matching and notification of clinical alerts?	Thoroughly aware Reasonably well aware Somewhat aware Not at all aware
10	Staff provide input as part of review	Process	Policy review should take account of staff feedback on the content and implementation of policies. Collecting staff input as part of review of policies should be a formal, structured process.	To what extent are relevant staff asked for input as part of policy review processes?	Always Mostly About half the time Rarely Never
11	Review and update policies	Process	Policies should be reviewed regularly to ensure they reflect current statutory requirements, as well as best available evidence and current health service circumstances.	How often are the relevant policies on patient identification, procedure matching and recording of clinical alerts reviewed?	Policies are reviewed in a regular and timely manner Not sure whether policies are reviewed Policies are not reviewed
12	Patient (or carer/family)	Not rateable	This input is not rateable in the context of this assessment. Continue to the next node.		
13	Patients/NOK/carers are informed about patient ID protocols	Process	Patient identification is repetitive in nature. Patients, next of kin (NOK) and carers should be informed that, in the interest of patient safety, all patients (when able to) will be asked by staff to identify themselves by name and DOB at all handovers, prior to any procedures or treatments and before any transfers from the health service. It should be clearly communicated to patients, NOK and carers that staff will check the name and DOB and medical record number on the patient's ID band against the patient's medical notes to ensure they correspond.	How would you rate the communication by clinicians to patients, NOK and carers in relation to explaining the patient identification process?	Very good Good Neither good nor poor Poor Very poor
14	Patients, NOK and carers cooperate with the identification process	Outcome	This outcome reflects the efforts of clinicians to communicate directly with patients, next-of-kin and carers about the repetitive steps involved in the patient identification process.	Overall, what proportion of patients, next-of-kin or carers (as appropriate) cooperate fully with the patient's identification process?	All Most Some Few None
15	Patient information is collected at admission	Process	The organisation should have systems and processes that enable and ensure all relevant and appropriate patient information is collected at the time of admission to the health service. These systems and processes should be accessible, user-friendly and efficient to use.	Overall, how would you rate the systems and processes for collecting patient information at admission?	Very good Good Neither good nor poor Poor Very poor
16	Patient identifiers are confirmed and/or recorded at admission	Process	For planned admissions to the health service, patients may have completed a pre-admission booking form and their details (including items that are acceptable for use as identifiers) may have already have been entered into the patient administration system. Therefore, at the time of admission, the first step is to search the patient administration system to find an existing record. If such a record is found, the details should be confirmed with the patient and/or carer and amended as required. If a patient record is not found, a new record should be created and all patient information recorded. The patient/carers should be asked to state their full name, date of birth and address, to allow matching to the recorded information.	Is the correct protocol for recording and confirming patient identifiers at the time of admission followed for all patients?	Yes Unsure No
17	Patient identifiers are recorded during triage (ED)	Process	For patients presenting to the Emergency Department, their first contact is likely to be with the Triage Nurse, who should collect and record a minimum of three approved identifiers, usually full name, date of birth and address. This information may be obtained from the patient and/or carer.	Is the correct protocol for recording patient identifiers at triage followed for all patients?	Yes Unsure No
18	Other clinically relevant information is recorded	Process	To ensure patients are given the appropriate ID band, information about clinically relevant conditions should be collected when the patient is admitted or triaged. Clinically relevant information includes information about known allergies, current medications, implants, devices, lymphoma and infections.	Do all patients have their clinical alert status checked on admission to the health service?	Yes Unsure No
19	Unidentifiable patient is assigned an appropriate ID by the health service	Process	In circumstances where a patient's identity cannot be confirmed, a patient record should be created that reflects the unknown identifiers. For example, "UNKNOWN" should be entered in the patient name fields and the default unknown date of birth should be entered.	Is the correct protocol for handling initial patient identification followed for all unidentifiable patients?	Yes Unsure No

Node #	Node title	Type	Description	Rating question	Rating options
20	Pre-birth (interim) identifier is assigned to prospective newborns	Process	Prior to birth, an interim record should be created for prospective newborns in the patient administration system, to allow ID bands to be generated that can be attached to the newborn prior to separation from the mother. The interim record should include the following identifiers: * "baby of" and the mother's name * a unique record number for that baby * the default unknown date of birth for newborns * unknown gender In the case of twins (or other multiple births), an interim record should be created for each prospective newborn.	Are appropriate interim patient records created for all prospective newborns?	Yes Unsure No
21	Hospital patient records	Output	Individual patient records within the health service's patient administration system are the foundation on which all patient identification protocols are based. If the records are incomplete or incorrect, no other aspect of patient identification policy can be expected to operate as intended. One system for patient identification should be used across the whole organisation.	Overall, how would you rate hospital patient records in terms of whether they are complete, correct and up-to-date?	Very good Good Neither good nor poor Poor Very poor
22	Staff confirm patient identifiers	Process	After a patient record is created in the patient administration system and prior to generating ID bands and other identification materials, a staff member (clerical/administrative or clinical) should confirm at least three approved patient identifiers with the patient/carer.	Are patient identifiers always confirmed after admission and prior to generating ID bands etc?	Yes Unsure No
23	Clinical staff confirm clinical alert information	Process	To ensure patients are given an ID band that accurately reflects any allergies or other relevant clinical alerts, clinical alert information recorded when the patient is admitted to the health service should be re-confirmed by clinical staff. If clinical alert information included in the patient record is incorrect or incomplete, the clinician should collect the relevant information to allow the patient record to be updated accordingly.	Is the clinical alert status of all patients confirmed after their admission to the health service?	Yes Unsure No
24	Update hospital patient records	Process	If the information in a patient record is found to be incomplete or incorrect, the record should be updated with correct information as soon as practicable.	Overall, how would you rate the updating of patient records, in terms of whether corrections and updates are recorded in a timely manner?	Very good Good Neither good nor poor Poor Very poor
25	Patient ID band is created	Process	The health service should have policies and protocols that reflect how it will meet accepted standards for identification bands, in terms of colour, size, comfort, usability, method for recording patient identifiers, information presentation and incorporation of new technologies to assist patient identification. Whether patient identifiers are printed or handwritten, the process of creating the ID band should be straightforward and result in an ID band that is legible and easy to read following exposure to the range of fluids and preparations the band may come into contact with.	Overall, how would you rate the process of creating patient ID bands?	Very good Good Neither good nor poor Poor Very poor
26	Details on ID band are confirmed with patient/family	Process	Before the ID band is attached to the patient by a clinician, that clinician should obtain verbal confirmation from the patient (or family/carer) of the patient identifiers included on the ID band. The UR number on the ID band should also be checked against the patient's medical record.	Is the correct process always used to confirm identify before attaching a patient ID band?	Yes Unsure No
27	ID band is attached to the patient	Process	Once the patient identifiers on the ID band have been confirmed, the ID band should be attached to the patient by the clinician caring for that patient. The clinician should check the band is securely fastened and the fit of the band should ensure the band is neither too tight to be comfortably worn, nor loose enough to fall off.	Are patient ID bands always fitted appropriately?	Yes Unsure No
28	Patients are wearing correct, up-to-date ID band at all times	Outcome	The patient ID band is an important mechanism to ensure patients are correctly matched to all components of their intended care, including diagnostic, therapeutic and supportive components. The primary purpose of the ID band is to identify the patient wearing the band and therefore all patients should be wearing at least one ID band at all times and the details on any bands worn by patients should be correct, complete and up-to-date. These outcomes will be achieved through correct implementation of health service policies on creating, updating and attaching patient ID bands.	What proportion of patients are wearing the appropriate number of correct, complete, up-to-date patient ID bands at all times during their stay in the health service?	All More than half Half or less
29	Interim ID band is created for newborn	Process	Health service policies and protocols for creating identification bands that meet accepted standards should include reference to any special provisions that apply to newborns and the creation of newborn patient ID bands should conform to those protocols. The process of creating the interim newborn ID band should be straightforward and result in the correct number and format of ID band. Additionally, the process should be completed in a timely manner, to ensure that interim newborn ID bands can be attached prior to separation of the newborn from its mother.	Overall, how would you rate the process of creating interim ID bands for newborns?	Very good Good Neither good nor poor Poor Very poor
30	Details on interim ID band are checked with the mother or other family member	Process	Once the interim ID band has been created, but prior to attaching the band to the newborn, all details on the interim ID band should be checked with the mother or other family members. If any details are found to be incorrect, a new interim ID band should be created.	Are the details on the interim ID band always checked before the band is attached to the newborn?	Yes Unsure No
31	Interim ID bands are attached to newborn	Process	ID bands that include interim patient identifiers for the newborn should be attached to the newborn by an appropriate clinician prior to separation of the newborn from the mother. If the relevant health service policy stipulates that newborns should have two ID bands, both bands should be attached at the same time.	Is the correct number of interim ID bands attached to all newborns prior to separation from the mother?	Yes Unsure No
32	Interim ID bands are replaced by permanent ID bands	Process	Once the correct date of birth and gender of the newborn are known, the interim ID band should be replaced as soon as practicable with a permanent ID band that includes the updated information. Health service policies relating to newborns may stipulate a timeframe for this ID band replacement to occur (e.g. within the first 60 minutes after birth or before the newborn leaves the birthing suite). In the course of replacing the ID bands, the new bands should be checked against the existing bands before the existing bands are removed.	Is the correct procedure for replacing interim newborn ID bands with permanent ID bands always used?	Yes Unsure No
33	Temporary ID band attached to unidentifiable patient	Process	The temporary ID band should be attached to an unidentifiable patient by a clinician.	What proportion of unidentifiable patients have an appropriate temporary ID band attached?	All Some, but not all None
34	Patient is identified	Process	Although determination of a patient's true identity is often beyond the control of the health service, staff may be involved in obtaining information about the correct identity of the patient from a number of sources (the patient; other individuals accompanying the patient). Where staff receive information about a patient's identity, they should be aware of health service policies and protocols for disseminating that information and ensuring the patient record is updated.	Overall, how would you rate the health service in terms of determining the identity of unidentifiable patients?	Very good Good Neither good nor poor Poor Very poor
35	Update hospital records with correct details	Process	In circumstances where a patient record has been created with details that are known to be temporary or incomplete (for example, an unidentified patient or a newborn with interim patient identifiers), updates to patient identifiers should be made to the patient record as soon as practicable. For unidentified patients, this includes verified information about the patient's name, date of birth or address. For newborns, this includes correct date of birth and correct gender.	Overall, how would you rate the updating of temporary or incomplete patient records once correct patient identifier information has been obtained?	Very good Good Neither good nor poor Poor Very poor
36	Patient ID is confirmed prior to procedure, therapy or Investigation	Process	Prior to commencing any procedure, therapy or investigation, the patient's identity should be verbally confirmed with the patient (or carer/family). At the same time, the patient should be asked to confirm the nature of the procedure (and site of procedure, if relevant) and their consent for the procedure. If the procedure involves surgery, this confirmation process will take place during the 'Sign In' phase (according to the WHO Surgical Safety Checklist) prior to induction of anaesthesia. As part of this ID confirmation process, clinical staff should also confirm any known allergies or other relevant clinical alert information for the patient.	For what proportion of patients is the patient's identity confirmed prior to commencement of every procedure, therapy or investigation?	All More than half Half or less

Node #	Node title	Type	Description	Rating question	Rating options
37	Patients are correctly matched with their intended care	Outcome	This outcome reflects the organisation's efforts to correctly match each patient with the care provided, through routine conscientious confirmation of the identity of each patient.	How often are patients correctly matched with their intended care?	Always Most of the time Less than half the time
38	A second ID band is attached prior to procedure, therapy or investigation	Process	Where health services have a policy requiring a second ID band be attached to a patient undergoing particular procedures (e.g. surgery), the second ID band should be attached to the patient during their preparation for the procedure. The second band should be checked against the existing band before being attached.	What proportion of patients have a second ID band attached prior to procedures for which the health service requires a second ID band?	All More than half Half or less
39	Patient ID is confirmed during the procedure	Process	For some procedures, therapies or investigations, it may be appropriate to re-confirm the identity of the patient at various stages of the procedure. For example, in the case of surgery, during the 'Time Out' phase (according to the WHO Surgical Safety Checklist), members of the surgical team should verbally confirm the patient's name, site and procedure prior to commencing the surgery.	For what proportion of relevant procedures is the patient's identity confirmed in the course of the procedure?	All More than half Half or less
40	Second ID band is removed prior to discharge from treatment area	Process	Where health services have a policy requiring a second ID band be attached to a patient undergoing particular procedures (e.g. surgery), the second ID band should be removed from the patient after the procedure has been completed. The second band should be removed prior to the patient leaving the treatment area.	What proportion of relevant patients have their second ID band removed prior to departure from the treatment area?	All Most About half Less than half None
41	Accurate records of procedures, therapies and investigations of patients	Output	Records of procedures, therapies and investigations conducted on patients should include a minimum of three approved patient identifiers. This outcome will be achieved through correct implementation of patient identification protocols prior to, during and at the completion of procedures, therapies and investigations.	Do the records of procedures, therapies and investigations conducted on patients always include a minimum of three patient identifiers?	Yes Unsure No
42	Patient ID band is matched to sample collection request forms	Process	When a patient is having clinical samples taken, the attending clinicians must ensure the request form is matched with the sample, which is then further checked against the patient ID band.	Are clinical samples taken from patients always checked against the request form and the patient ID band, to ensure the correct labelling of specimens?	Yes Unsure No
43	Patients are correctly matched with their clinical samples	Outcome	This outcome reflects the organisation's efforts to correctly match each patient with their clinical samples, through routine conscientious confirmation of the identity of each patient and appropriate labelling of samples.	How often are patients correctly matched with their clinical samples?	Always Most of the time Less than half the time
44	Patient identity (including alerts) is confirmed at clinical handover	Process	During clinical handover, a patient's identity should always be confirmed using a minimum of three identifiers, even if the clinician knows the patient. The patient should be asked to state their name and DOB and staff then check the UR number on the ID band with the medical record.	Is patient identity always confirmed during clinical handover?	Yes Unsure No
45	Patient identity is confirmed at transfer or discharge	Process	Whenever a patient is transferred from one part of the health service to another, or discharged from the health service, their identity should be confirmed using a minimum of three identifiers, as part of a structured transfer or discharge process.	Is patient identity always confirmed during transfer and discharge processes?	Yes Unsure No
46	Clinical staff know the correct clinical information for patients in their care	Outcome	The risk of introducing mismatches between a given patient and components of their care is highest at those points in the patient journey where care is transferred between one clinician and another. Therefore, this outcome reflects the efforts of the organisation to minimise these risks by confirming patient identity during all clinical handover, transfer and discharge processes.	Do clinical staff know the correct clinical information for all patients in their care?	Yes Unsure No
47	Monitoring of patient identification processes	Process	The organisation should have mechanisms for monitoring the various processes of patient identification. This might include direct observation of ID-related processes; collecting feedback from clinicians, patients (and/or their carers/next-of-kin); regular review of documentation.	To what extent are patient ID and procedure matching processes monitored?	Patient ID processes are closely and regularly monitored Monitoring is generally good, but could be improved Monitoring needs significant improvement There is no monitoring of patient ID processes
48	Patient mismatching events are reported	Process	The organisation should have systems in place for reporting adverse incidents and near misses relating to patient ID and procedure matching. This is unlikely to be a separate system from that used for reporting other incidents and near misses, but there should be provision in the reporting system for noting when an incident relates to patient identification. While incidents are most likely to be reported when an expected output or outcome is not achieved, it is also important to record incidents relating to flawed processes, as this can focus attention on issues before they become adverse incidents involving patient harm.	To what extent are incidents and near misses relating to patient ID reported?	Incidents and near misses are always reported Incidents are always reported, but near misses are not always reported Incidents and near misses are not always reported Incidents and near misses are rarely reported Don't know
49	Underlying issues are identified	Process	Once data has been collected through monitoring activities and incident reporting systems, there should be an explicit process of identifying the underlying issues that require attention. In some cases, this may necessitate further data collection and analysis to understand the nature of the problem.	How would you rate the process for identifying issues needing attention?	The process is thorough and timely The process needs to be improved There is no process
50	Remedial actions are implemented	Outcome	Once a plan for remedial action has been developed, it is important for there to be a deliberate process of implementing the actions in the plan. This step is critical, but is often the point at which momentum is lost in the plan-do-review improvement cycle. Assigning responsibility for oversight and/or conduct of specific tasks to individuals can help to avoid a situation where solutions to issues have been identified but never implemented.	What proportion of tasks in remedial action plans are implemented?	All Most, including the high priority tasks Half or less None Don't know
51	High quality patient care	Objective	Mismatches between patients and components of their care pose a significant risk to patient safety. Therefore, effective implementation of patient identification and procedure matching protocols is essential to achieving the objective of high quality patient care.	Overall, how well is this objective being achieved through patient identification and procedure matching processes in your area?	Very well Reasonably well Neither well nor poorly Poorly Very poorly
52	Treatment resources are used appropriately	Objective	Patients being correctly matched to all components of their care is important to ensuring the organisation's treatment resources (personnel, materials and equipment) are used only when and where needed and with minimal preventable waste.	Overall, how well do patient ID processes in your area contribute to the effective and appropriate use of health service treatment resources?	Very well Reasonably well Neither well nor poorly Poorly Very poorly
53	Diagnostic resources are used appropriately	Objective	Patients being correctly matched to all components of their care is important to ensuring the organisation's diagnostic resources (personnel, materials and equipment) are used only when and where needed and with minimal preventable waste.	Overall, how well do patient ID processes in your area contribute to the effective and appropriate use of health service diagnostic resources?	Very well Reasonably well Neither well nor poorly Poorly Very poorly

Appendix S1.4



Appendix S1.4

This figure displays a portion of the MEERQAT process map used for Standard 5 MEER assessment sessions, which is shown in its entirety in Appendix S1.2. Each node has a coloured left-side edge indicating its type: green for objectives, purple for outcomes, pink for outputs, blue for processes and gold for inputs. The red number next to each node corresponds to the *Node #* in Appendix S1.3. The figure also displays an open rating panel for the node highlighted by the yellow halo, superimposed on the map image. The rating process entails three sequential steps: 1) polling participants for their initial views on how the node should be rated, including capturing comments; 2) entering a group consensus rating for the node; 3) deciding whether to flag the node for action plan tasks. The open rating panel shown in the figure is displaying the second step in the rating process. A comment made by participants during the discussion is shown in the callout at the top right hand corner of the figure. The corresponding card added to the action plan is also shown. The icon displayed in the top right corner of each node in the map signifies the group consensus rating: a purple check mark denotes an above-average consensus rating, an orange hazard icon denotes an average or below-average consensus rating and n/a denotes a node that was identified as not applicable to the group completing the assessment.