Reducing Patient Identification Errors
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This guide was published in April 2010 and will be reviewed in April 2012. The latest version will always be available online at www.1000livesplus.wales.nhs.uk

The purpose of this guide
This guide has been produced to enable healthcare organisations and their teams to successfully implement a series of interventions to improve the safety and quality of care that their patients receive.
This guide must be read in conjunction with the following:

- Leading the Way to Safety and Quality Improvement
- How to Improve

Further guides are also available to support you in your improvement work:

- How to Use the Extranet
- A Guide to Measuring Mortality
- Improving Clinical Communication using SBAR
- Learning to use Patient Stories
- Using Trigger Tools

These are available from the 1000 Lives Plus office, or online at www.1000livesplus.wales.nhs.uk

We are grateful to The Health Foundation for their support in the production of this guide.
Improving care, delivering quality

The 1000 Lives Campaign has shown what is possible when we are united in pursuit of a single aim: the avoidance of unnecessary harm for the patients we serve. The enthusiasm, energy and commitment of teams to improve patient safety by following a systematic, evidence-based approach has resulted in many examples of demonstrable safety improvement.

However, as we move forward with 1000 Lives Plus, we know that harm and error continue to be a fact of life and that this applies to health systems across the world. We know that much of this harm is avoidable and that we can make changes that reduce the risk of harm occurring. Safety problems can’t be solved by using the same kind of thinking that created them in the first place.

To make the changes we need, we must build on our learning and make the following commitments:

- Acknowledge the scope of the problem and make a clear commitment to change systems.
- Recognise that most harm is caused by bad systems and not bad people.
- Acknowledge that improving patient safety requires everyone on the care team to work in partnership with one another and with patients and families.

The national vision for NHS Wales is to create a world-class health service by 2015: one which minimises avoidable death, pain, delays, helplessness and waste. This guide will help you to take a systematic approach and implement practical interventions that can bring that about. The guide is grounded in practical experience and builds on learning from organisations across Wales during the 1000 Lives Campaign and also on the experience of other Campaigns and improvement work supported by the Institute for Healthcare Improvement (IHI).
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Reducing harm caused by Patient Identification Errors

The National Patient Safety Agency (NPSA) has identified two key areas involving patient identification where patient safety can be improved. They are:

- The presence of duplicate patient records on trust IT systems is recognised as one of the single biggest risks to patient safety.\(^1\) Therefore, minimising the presence of duplicate records and eliminating the opportunity for creating new duplicate records is essential in the provision of safer patient care.

- Over the 12 month period February 2006 to January 2007, the NPSA received 24,382 reports of patients being mismatched to their care.\(^2\) Hence, it is imperative that patients are identified correctly and their identity is easily established at all times throughout their treatment.

**How have these issues arisen? And what is required to reduce their prevalence?**

Advancements in medical knowledge and technology have resulted in the development of new procedures and services in health care. As procedures have changed so has the organisation of the treatment process. The treatment of a patient requires the involvement of various medical specialists and other health care professionals.\(^3\)

Many departments use separate clinical systems resulting in patient records being held in multiple systems. This poses a clinical risk as each system might contain information that could influence the care the patient receives and there is no one system that contains a complete record of care.

More recently in Wales, trust mergers have introduced an additional level of complexity as each trust has its own set of clinical systems. With the amalgamation of services across the new organisations, patients can be offered care at any of the locations within the new organisation. Therefore clinicians will require access to previous treatment and patient information from systems held in all the former trusts’ systems.

This issue is compounded by the fact that it is difficult to match records between clinical systems as the demographic records often contain incomplete or poor quality data. In addition, duplicate records for the same patient can also be found within each system, arising from poor operational processes for patient registration and poor information governance, policies and procedures.

\(^1\) *National Patient Safety Agency (2009) Risk to patient safety of not using the NHS Number as the national identifier for all patients*

\(^2\) *National Patient Safety Agency (2007) Standardising wristbands improves patient safety*

\(^3\) *The Tayside Master Patient Index October 1978*
To minimise clinical risk any member of staff involved in a patient’s care needs to access all relevant information. With systems in their current configuration this is often impossible as patient information is spread across multiple records and multiple clinical systems. Figure 1 demonstrates this significant problem.

![Diagram of Patient Information Segregated by Multiple Clinical Systems](image)

*Figure 1: Patient information segregated by multiple clinical systems*

On admission to hospital a patient’s identity needs to be determined. This information should be clearly and concisely indicated at all times. The National Patient Safety Agency endorses the use of standardised wristbands for each patient so that all clinicians and other members of staff can quickly establish the patient’s identity.

The Patient Search and Registration processes are also critical to the success of providing safer patient care. Sometimes, records of individuals who have already received treatment in a hospital setting cannot be found on the hospital systems at subsequent visits.

These failures can have a significant impact on a patient’s care. This can be a result of poor data entry in previous episodes of care, for example, patients having a common name or using a name other than their first name. In addition, if patient searches are not performed logically and methodically and in accordance to local and/or national procedures then the patient record can be missed. This will result in a duplicate being created in the system with the consequent risk of not retrieving information the next time a patient receives care.

Therefore all members of staff who undertake patient searches and patient registrations need to be made aware of the importance of data quality and the requirement for effective searching of patient records.
Studying the work on the Tayside Master Patient Index, four issues were identified relating to traditional records systems:

- **Duplication** - a multiplicity of records held for one person;
- **Incompatibility** - the difficulty of linking together records relating to one individual;
- **Inconsistency** - differences in the data held in two records relating to the same person.
- **Unidirectional** - the difficulty in determining the services that hold records for a specified individual.

This Guide will provide advice on these issues and assist clinicians, health records and information staff to consolidate their patient information across multiple clinical systems, allowing clinicians and other health care professionals to make decisions based on all the relevant facts.

It should be noted that the work necessary to complete this crucial undertaking can be extremely labour intensive. Hospital systems have hundreds of thousands of patient records, so to perform each task would be very onerous. This guide suggests that an electronic solution is used to perform and manage the process. Informing Healthcare is leading a project to facilitate Health Boards in the implementation of an electronic system which will support staff.

This guide cannot be too prescriptive as the configuration of IT systems and availability of funds and resources differs from organisation to organisation. The process and outcome measures included in this guide will also help to set local priorities - “what is actually going wrong in our system?” Therefore, the guiding principles will be discussed, leaving the technicalities of delivery down to the individual organisation to implement most appropriately.

Good practice examples of administrative processes are provided which should be studied to help review current procedures within organisations. During the improvement work more robust or efficient processes may be developed and shared, so organisations will be able refine their systems and incorporate these processes.

The format of the recommendations follows the Driver Diagram (page 8). This is split into two main drivers, the front office (patient-facing function) and the back office function.
Reducing Patient Identification Errors

Driver Diagram

Content Area

Drivers

Interventions

1. Support front-line staff to reduce the opportunity for patient identification errors

1.1 Redesign patient searching process

1.2 Redesign patient registration process

1.3 Redesign birth and death notification processes

1.4 Promote the use of NHS Number as unique patient identifier

1.5 Identify all patients using standardised bar-coded wristbands

1.6 Use NHS Number when requesting tests and other services

Reduce harm caused by patient identification errors

2. Develop ‘back-room’ functions to reduce the risk of patient identification errors and provide clinical staff with a more complete record of care

2.1 Implement an Enterprise Master patient Index

2.2 Identify and resolve potential duplicate patient records

2.3 Amalgamate duplicate records

2.4 Link disparate systems

2.5 Batch trace NHS Number for existing records

2.6 Provide a patient-centric view of information

2.7 Maintain ‘Gold Standard’ in patient identification
**Have you set up your team?**

You need to consider three different dimensions:

- Organisational level leadership
- Clinical or technical expertise
- Frontline leadership and team membership

*See the ‘Leading the Way to Safety and Quality Improvement’ How to Guide; and Appendix B for further information.*

**Do you know how you will measure outcomes?**

For this content area, you should use the following outcome measures:

- Number of cases of harm due to patient misidentification errors
- Number of cases of harm where critical information is missed as patient information is unlinked across systems

*See Appendix A for further information.*

**Do you and your team understand how to apply the Model for Improvement?**

The Model for Improvement is a fundamental building block for change and you need to understand how to use it to test, implement and spread the interventions in this guide.

*See the ‘How to Improve’ Tools for Improvement guide and Appendix C for further information.*

**How are you going to measure process reliability?**

In order to improve outcomes for your patients you need to demonstrate you are using these interventions reliably. This means that all the elements of the interventions are performed correctly on 95% or more of the occasions when they are appropriate. You need to do this by using the process measures in this guide.

*See the ‘How to Improve’ guide and Appendix A for a summary of all process measures.*

**How will you share your learning?**

Contact 1000 Lives Plus for details of mini-collaboratives and other ways to share your learning and to learn about the progress of other teams.
Drivers and Interventions

This section details the interventions highlighted in the driver diagram which evidence has shown to be effective in this content area. You should use the Model for Improvement to test, implement and spread each intervention, using the listed process to monitor progress.

Please note that tools suggested for use will, where possible, be linked directly from this document using hyperlinks. They will also be available, in addition to tools developed locally by frontline teams, on the WHAIP website www.wales.nhs.uk/WHAIP

Driver 1: Support front-line staff to reduce the opportunity for patient identification errors

Goal: Reduce the number of cases of harm due to patient misidentification errors

There are six interventions:
1. Redesign patient searching process
2. Redesign patient registration process
3. Redesign birth and death notification processes
4. Promote the use of NHS Number as unique patient identifier
5. Identify all patients using standardised bar-coded wristbands
6. Use NHS Number when requesting tests and other services

The presence of duplicate patient records on Health Board IT systems is recognised as one of the single biggest risks to patient safety. Duplicate patient records are created during the patient registration process. If a patient is not identified during a search then staff will register the patient details as a new record on a system.

Patient searches can be unsuccessful due to poor data quality in previous episodes of care, a recent change of details, insufficient methods to locate a patient’s details on a system, or failure by staff to adhere to local and/or national search procedures.

* National Patient Safety Agency (2009) Risk to patient safety of not using the NHS Number as the national identifier for all patients
The development of robust guidance and policies on patient search and registration will assist staff to reduce the generation of these duplicates. These new guidelines should be implemented with the support of a training programme, promoting awareness of the new policies and providing clear and concise information on how the procedures affect operational practices. Robust monitoring mechanisms and routine audit processes must also be put in place to ensure that high standards of data entry are maintained.

Patient contacts can occur at a multitude of access points, for an outpatient appointment, for surgery through an inpatient stay or day case procedure, for urgent care at an Emergency Department or Assessment Unit, for tests at Pathology or Radiology. To minimise the opportunity for creating duplicate patient records an organisation needs to restrict the number of staff members responsible for patient administration (searches and registration).

For all planned attendances it might be suitable to have a central administration team responsible for new referrals and patient registrations. This reduces the number of staff members required to be informed of new guidance, policies and operational practices. Where services are provided in a more ad-hoc manner, for example in an Emergency Department, patient administration functions would be limited to certain staff members identified to enter patients’ details on systems. These individuals need to be trained in the new guidelines.

Finally, a culture of data quality should be encouraged, raising the awareness of its importance. Every member of staff needs to understand their role in ensuring data quality since it has been shown to help drive up the quality of data recorded at source. An organisational mentality that incorrect data is unacceptable is required and investigation and learning from errors must be actively encouraged.

1.1 Redesign patient searching process

To reduce the risk of creating new duplicate records, an organisation must redesign their patient registration processes and keep tight control on systems. The first step, and one of the most important, is Patient Search. If Patient Search procedures are not robust then existing patients will not be located and as a consequence duplicate records will be produced.

Some development has taken place in this arena and an example of a robust system of six patient searches is illustrated in Figure 2. Staff execute a logical process, commencing their search with the patient’s NHS Number or Hospital Number and then complete subsequent searches until the patient information is found. Figure 2 demonstrates the order in which the staff must perform the searches.

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5 Corporate Health Information Programme: Preparing for the Implementation of an EMPI
Reducing Patient Identification Errors

Figure 2 patient search process
Only when all patient searches have been completed and no current record is found should an individual be registered on the system as a new patient. The introduction of this approach has helped organisations ensure that the creation of duplicate records has been reduced to a minimum, with one organisation citing the figure of only four duplicates being created per day.

Importantly, such a small number of records is easily manageable in a real-time environment, ensuring newly presenting patients (e.g. via A&E) can be linked to their correct records quickly, thus reducing the potential for clinical errors such as the administration of drugs to which the patient is allergic.

**Measure**

For this intervention, use the following process measure:

Compliance to searching process

### 1.2 Redesign patient registration process

If the registration of a new patient is required staff must be made aware of the importance of complete and accurate information. Therefore staff must be provided with guidance on the minimum data required to register a patient successfully. To ensure the quality of data during the registration process, clinical systems need to have in-built validation rules, preventing the entry of invalid data such as invalid dates or leaving a mandatory field blank.

The Welsh Demographic Service provides access to NHS Numbers, demographic details (full names, addresses etc.) and the patient’s registered GP Practice. Therefore, staff must be given appropriate access to the Welsh Demographic Service to obtain complete information for patients on their systems.

**Measure**

For this intervention, use the following process measure:

Compliance to registration process
Figure 3 (below) demonstrates an example of good practice in the registration of patients.
1.3 Redesign birth and death notification processes

For those organisations offering maternity services, staff can register newborn babies directly onto their clinical systems. This process should be treated like any new registration, ensuring all mandatory fields are entered and the request to allocate an NHS Number can be made.

Organisations are notified of deaths in several different ways:

- A death in a hospital within the organisation
- Registrar lists
- GP Notification
- Patient Demographics Service (PDS)

Whichever way the organisation is informed, strict policies and procedures are required to support staff in maintaining the accuracy of patient information and identifying these patients correctly:

1. **Verification** - Patient details need to be verified within clinical systems so that the correct patient record can be located;

2. **Update Systems** - Flag the patient as deceased, updating the date of death or date of notification if the actual date is unknown. All future appointments with the organisation should be automatically cancelled to release the resource to another patient.

3. **Mark Case Notes** - Health records staff must retrieve the case notes for these patients, mark them as deceased and then re-file them appropriately.

4. **Retain Information** - Any ‘deceased lists’ should be stored for a period of time to support future audit.

These processes should ensure that every deceased patient is identified correctly with their information and notes are filed appropriately.

<table>
<thead>
<tr>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>For this intervention, use the following process measures:</td>
</tr>
<tr>
<td>Compliance to Birth Registration Process</td>
</tr>
<tr>
<td>Compliance to Death Notification Process</td>
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</tbody>
</table>
1.4 Promote the use of NHS Number as a unique patient identifier

The NHS Number is a unique identifier for the majority of patients requiring health care. Any patient who has registered in a GP Practice will have an NHS Number. Newborn babies will be allocated an NHS Number at birth if they are delivered in hospital, or when the birth is registered if the birth took place elsewhere. If an individual does not have an NHS Number then they should be encouraged to register with a local GP Practice, triggering the creation of an NHS Number which can be provided at subsequent episodes of care.

For this reason the NHS Number is an ideal identifier to aid patient searches, registration and identification during treatment. It can also quickly highlight any duplicate records across electronic clinical systems.

The National Patient Safety Agency (NPSA) issued a Safer Patient Notice in 2009, alerting the NHS to the risk of not using the NHS number as the national identifier for all patients. It further advised all NHS organisations to use the NHS Number, in conjunction with a local identifier if required, as their means of uniquely identifying their patients.

**Measures**

For this intervention, use the following process measure:

Proportion of patient records with verified NHS Number

1.5 Identify all patients using standardised bar-coded wristbands

The National Patient Safety Agency (NPSA) issued a Safer Patient Notice based on the evidence that standardising wristbands improves patient safety. Detailed in the advice are the following recommendations:

1. Only use patient wristbands that meet the NPSA’s design requirements.
   See www.npsa.nhs.uk
2. Only include the following core patient identifiers on wristbands:
   - last name;
   - first name;
   - date of birth;
   - NHS Number (if the NHS Number is not immediately available, a temporary number should be used until it is);
   - first line of address (this only applies to Wales, where this is required by a Welsh Health Circular - WHC 2007 042).

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6 NPSA: Safer Patient Notice, Risk to patient safety of not using the NHS Number as the national identifier for all patients, Ref: NPSA/2009/SPN002

7 NPSA: Safer Practice Notice, Standardising wristbands improves patient safety 7th March 2007
If any additional identifiers are thought to be necessary, these should be formally risk assessed, e.g. trusts may also add the Hospital Number in order to aid the retrieval of clinical notes.

3. Develop clear and consistent processes, set out in trust protocols, specifying which staff can produce, apply and check patient wristbands, how they should do it and what information sources they should use.

4. Only use a white wristband with black text. If you wish to have a system for identifying a known risk (for example, an allergy or where a patient does not want to receive blood or blood products), the wristband should be red with patient identifiers in black text on a white panel on the wristband.

It is imperative that these guidelines are adhered to and all in-patients are given a standard wristband as soon as possible in their patient journey. If feasible, all patients attending the Emergency Department would also require a standard wristband to aid identification. Safer Practice Notice (14) recommends the use of photo identification cards for all patients who undergo regular blood transfusions. Implementing all these recommendations would mean that the majority of patients attending hospital would have one form of identification to minimise the risk of errors.

**Measures**
For this intervention, use the following process measure:
Proportion of patients with standardised bar-coded wristbands

### 1.6 Use NHS Number when requesting tests and other services

As the NHS Number is the most appropriate unique patient identifier, GPs and any other services are encouraged to use this when requesting tests for patients. This will minimise the misidentification of results.

Ideally a barcode would be generated for every patient so that all results and notes can be labelled with the barcode and traced back to the correct patient. This eradicates the need for manual data entry for demographic information and thus reduces the risk of error.

**Measures**
For this intervention, use the following process measure:
Proportion of requests for tests and other services with NHS Number identified

\(^8\) *NPSA: Safer Practice Notice, Right Patient, Right Blood, 9th November 2006*
Driver 2: Develop ‘back room’ functions to reduce the risk of patient identification errors

There are seven interventions:

1. Implement an Enterprise Master Patient Index (EMPI)
2. Identify and resolve potential duplicate and duplicate patient records
3. Amalgamate duplicate records
4. Link disparate systems
5. Batch trace NHS Number for existing records
6. Provide a patient-centric view of information
7. Maintain ‘Gold Standard’ in patient identification

The processes detailed in Driver 1 need to be supported by ‘back room’ functions to assist staff in patient searching and registration. These functions can also help in providing clinicians with all the relevant patient information to allow them to make informed decisions about their care.

Informing Healthcare is leading a project to facilitate Health Boards in the implementation of an EMPI, which will hold a definitive source of patient demographic data for each patient (name address, date of birth, sex). It will help to maintain consistency of patient information across various systems and will provide signposts to the location of clinical information in those systems.

2.1 Implement an Enterprise Master Patient Index (EMPI)

An Enterprise Master Patient Index (EMPI) uses key criteria such as name, address, date of birth and sex to collect all the data relating to every patient registered across an organisation to create a single “gold standard” patient demographic record. When a clinician then searches for a patient on a linked IT system they will be provided with the most up-to-date patient demographic information for that patient and alerted to the presence of records on all of the linked systems.
Figure 4 illustrates the new arrangement with the Master Patient Index. This Figure can be compared to Figure 1 showing the segregation of multiple clinical systems.

![Diagram of the Master Patient Index]

*Figure 4: The Master Patient Index*

An important element introduced into this configuration is the link to the Welsh Demographic Service. This provides access to patient demographic information so that staff can confirm patient demographic details and verify their NHS Number.

Essentially, the Index consists of a central file of identifying particulars relating to each member of the population covered together with a unique cipher and pointers to records. This is illustrated in Figure 5.

![Central Master Patient Index File]

*Figure 5: The Central Master Patient Index File*
If the organisation has an electronic solution for their MPI then signposts to other systems can be ‘live’ and automatic. This architecture can provide the framework upon which a patient-centric view of information can be developed to provide all information appropriate to an individual patient.

**Measures**

For this intervention, use the following process measure:

Proportion of requests for tests and other services with NHS Number identified

### 2.2 Identify and resolve potential duplicate and duplicate patient records

As illustrated in Figure 1, an organisation can hold information on an individual patient in several separate clinical systems. There may be several instances of the same patient in a single clinical system. To minimise/eliminate errors in treatment caused by lack of information due to duplicate records, all duplicates need to be identified and linked to create a single record for each patient.

Matching rules/algorithms within the EMPI identify duplicate records and potential duplicate records. The EMPI automatically links all duplicate records by appending their system identifiers to the Gold Standard record. A list of potential duplicate records is produced for staff to manually review and determine whether or not they are duplicate records.

Guidelines should be developed as part of the EMPI Project detailing the process that staff should follow to resolve the duplicate records.

**Measures**

For this intervention, use the following process measure:

Number of duplicate records in clinical systems

### 2.3 Amalgamate duplicate records

Whilst the EMPI links duplicate records together, multiple paper case notes will remain for a patient. A decision will need to be made by organisations about what to do with the multiple non-electronic records.

The most advantageous option is to have one patient record and one set of case notes for each patient. This ensures minimal errors in retrieving patient information and reviewing treatment history.
However, the physical merging of records requires significantly more resource than the electronic merging of patient records. An organisation may decide to employ enough staff to merge the physical case notes for every duplicate record or only merge case notes for patients attending for treatment.

### Measures
For this intervention, use the following process measure:
Proportion of duplicate records with amalgamated case notes

### 2.4 Link disparate systems
The most logical method to reduce/remove the duplicate records within an organisation’s clinical systems would be to address each system in isolation. Once the duplicates within each system have been removed, links can be made across to other systems to provide comprehensive information on each individual patient across all systems. The EMPI’s matching process will identify any duplicates or potential duplicates across systems.

### Measures
For this intervention, use the following process measure:
Number of clinical systems not linked together

### 2.5 Batch trace NHS Number for existing records
It is of utmost importance that patients are identified by the correct, verified NHS Number. The organisation may have existing patient records with temporary, old format or unverified NHS numbers. Organisations can send a large number of records to the Welsh Demographic Service in order to verify or obtain NHS numbers. Once the NHS Number has been verified the NHS Number Status within the Gold Standard patient record must be updated to reflect this.

Where the NHS Number cannot be verified an organisation might decide to remove it until a time when enough additional information is available to verify it. This might hinder certain aspects of patient administration but it will provide confidence in the system that only verified NHS Numbers are present and searchable.

### Measures
For this intervention, use the following process measure:
Proportion of patient records with verified NHS Number

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9 As part of the Duplicate Records project, the former Bro Morgannwg NHS Trust employed clerks to resolve duplicate records and amalgamate case notes. One Health Records Clerk was able to link 100 electronic records or amalgamate 20 case notes per day.
2.6 Provide a patient-centric view of information

A patient-centric view of an organisation’s information can be achieved through the development of a Clinical Portal. A Clinical Portal is an ‘electronic window’ that displays a range of information, even if the information is actually held in a number of different places.\(^\text{10}\)

The Portal will provide clinicians with all the relevant information to influence patient care. Once the EMPI has been implemented successfully and all clinical systems are linked then the development of the Clinical Portal is possible and a Virtual Electronic Patient record can be made available to clinicians within the organisation.

2.7 Maintain ‘Gold Standard’ in patient identification

No matter how much resource and effort is invested in robust patient administration processes, duplicate patient records will always be generated. Therefore, processes need to be developed to capture these duplicates and deal with them accordingly. A report must be produced to catalogue these duplicates each day and a team must be available to resolve them in a timely manner (ideally as soon as they occur).

Most patients are the best source for their own most up-to-date demographic information. If they attend hospital and provide new details, their record should be updated in order to maintain the Gold Standard. Procedures should also be put in place so that the Welsh Demographic Service can be notified of any changes to keep their database as current as possible.

\begin{tabular}{|l|}
\hline
\textbf{Measures} \\
\hline
For this intervention, use the following process measure: \\
Number of new duplicates created per day \\
\hline
\end{tabular}

\(^\text{10}\) NHS Scotland eHealth Programme, Clinical Portal: Frequently Asked Questions for the eHealth Community
Appendix A - Measures and Definitions

Measurement is the only way to know whether a change represents an improvement. Improvement takes place over time. Determining if improvement has really occurred and if it is a lasting effect requires observing patterns over time. Run charts are graphs of data over time and are one of the single most important tools in performance improvement. Using run charts has a variety of benefits:

- They help improvement teams formulate aims by depicting how well (or poorly) a process is performing.
- They help in determining when changes are truly improvements by displaying a pattern of data that you can observe as you make changes.
- They give direction as you work on improvement and information about the value of particular changes.

**Definition of Measures**

For those measures that involve compliance or proportions the definitions are as follows:

<table>
<thead>
<tr>
<th>Measure</th>
<th>Numerator</th>
<th>Denominator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliance to searching process</td>
<td>Number of patient searches that followed the agreed searching process</td>
<td>All patient searches</td>
</tr>
<tr>
<td>Compliance to registration process</td>
<td>Number of patient registrations that followed the agreed registration process</td>
<td>All patient registrations</td>
</tr>
<tr>
<td>Compliance to Birth Registration Process</td>
<td>Number of birth registrations that followed the agreed birth registration process</td>
<td>All birth registrations</td>
</tr>
<tr>
<td>Compliance to Death Notification Process</td>
<td>Number of death notifications that followed the agreed death notification process</td>
<td>All death notifications</td>
</tr>
</tbody>
</table>
Reducing Patient Identification Errors

<table>
<thead>
<tr>
<th>Measure</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of patient records with verified NHS Number</td>
<td>Number of patient records with verified NHS Number</td>
</tr>
<tr>
<td>Proportion of patients with standardised bar-coded wristbands</td>
<td>Number of attending patients with standardised bar-coded wristbands</td>
</tr>
<tr>
<td>Proportion of requests for tests and other services with NHS Number</td>
<td>Number of requests for tests and services with NHS Number identified</td>
</tr>
<tr>
<td>Proportion of duplicate records with amalgamated case notes</td>
<td>Number of duplicate records with amalgamated case notes</td>
</tr>
</tbody>
</table>

The remaining measures are defined as thus:

<table>
<thead>
<tr>
<th>Measure</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of clinical systems not linked together</td>
<td>How many clinical systems are not linked via the Enterprise Master Patient Index</td>
</tr>
<tr>
<td>Number of new duplicates created per day</td>
<td>How many new patient registrations create duplicates with existing patient records each day</td>
</tr>
<tr>
<td>Number of cases of harm due to patient misidentification errors</td>
<td>How many patients are harmed due to misidentification errors</td>
</tr>
<tr>
<td>Number of cases of harm where critical information is missed as patient information is unlinked across systems</td>
<td>How many patients are harmed due to the fact that crucial information was not available as records were not linked across clinical systems</td>
</tr>
</tbody>
</table>
**Tips for Gathering Data**

As data collection can be difficult and time-consuming, try to utilise as much data already available, particularly if it can be captured from electronic systems. However, if data is not easily accessible then additional data collection will be necessary.

To assist data collection, attempt to capture the information alongside regular clinical information and incorporate in clinical or administrative practice. To ensure accurate information it is imperative that staff members tasked to input and collect the data are made aware of its importance and are appropriately trained to do so.

As mentioned previously, improvement is made over time, so continuous data collection will be required over a sufficient period to evaluate the effect of an intervention. To enable timely identification of change it is helpful to analyse the data at adequately regular intervals. In other words, if the analysis is completed weekly a change in the performance of a process will be identified quickly, four times quicker than if the data was analysed on a monthly basis.

However, as the collection and analysis processes can be burdensome, local organisations need to find the right balance between collecting sufficient data to identify improvements in a timely manner and the resource required to collect the information.
Appendix B - Setting up your team

Achieving improvements that reduce harm, waste and variation at a whole-organisation level needs a team approach: one person working alone, or groups of individuals working in an unco-ordinated way will not achieve it and this applies equally at all organisational levels.

Whether your improvement priorities relate to 1000 Lives Plus content areas, national intelligent targets or other local priorities, you need to consider three different dimensions in putting your team together:

- Organisation level leadership.
- Clinical or technical expertise.
- Frontline leadership.

There may be one or more individuals on the team working in each dimension, and one individual may fill more than one role, but each component should be represented in order to achieve sustainable improvement.

Organisation level leadership

An Executive, or equivalent level Director, should always be given delegated accountability from the Chief Executive for a specific content area; and all staff working on the changes should know who this is. This individual needs sufficient influence and authority to allocate the time and resources necessary for the work to be undertaken.

It is likely that accountability will be further delegated to Divisions, Clinical Programme Groups or Directorates and this can help to build ownership and engagement at a more local level. However, it is essential that the leader has full authority over the areas involved in achieving the improvement aim. As changes spread more widely, crossing organisational boundaries, appropriate levels of delegation will need to be reviewed.

When working with frontline teams, it is essential for organisational level leaders to have an understanding of the improvement methodology and to base conversations around the interpretation of improvement data. Reporting of progress to higher organisational levels should also use a consistent data format so that the Executive level leader can report to the Board on progress.

Clinical/Technical Expertise

A clinical or technical expert is someone who has a full professional understanding of the processes in the content area. It is critical to have at least one such champion on the team who is intimately familiar with the roles, functions, and operations of the content area. This person should have a good working relationship with colleagues and with the frontline leaders, and be interested in driving change in the system. It is important to look for clinicians or technical professionals who are opinion leaders in the organisation (individuals sought out for advice who are not afraid to try changes).
Patients can provide expert advice to the improvement team, based on their experience of the system and the needs and wishes of patients. A patient with an interest in the improvement of the system can be a useful member of the team.

Additional technical expertise may be provided by an expert on improvement methodology, who can help the team to determine what to measure, assist in the design of simple, effective measurement tools, and provide guidance on the design of tests.

**Frontline leadership**

Frontline leaders will be the critical driving component of the team, assuring that changes are tested and overseeing data collection. It is important that this person understands not only the details of the system, but also the various effects of making changes in the system. They should have skills in improvement methods. This individual must also work effectively with the technical experts and system leader. They will be seen as a bridge between the organisation leadership and the day to day work.

Frontline leaders are likely to devote a significant amount of their time to the improvement work, ensuring accurate and timely data collection for process and outcome measures related to the frontline team.

**Characteristics of a good team member**

In selecting team members, you should always consider those who want to work on the project rather than trying to convince those that do not. Some useful questions to consider are the following:

- Is the person respected for their judgment by a range of staff?
- Do they enjoy a reputation as a team player?
- What is the person’s area of skill or technical proficiency?
- Are they an excellent listener?
- Is this person a good verbal communicator in, and in front of, groups?
- Is this person a problem-solver?
- Is this person disappointed with the current system and processes and do they passionately want to improve things?
- Is this person creative, innovative, and enthusiastic?
- Are they excited about change and new technology?
Appendix C - The Model for Improvement

Successful improvement initiatives don’t just happen - they need careful planning and execution. There are many things to consider and techniques to employ, which are captured in the driver diagram on page 29. The rest of this section explains the primary drivers and where to get more help in using them.

In any improvement initiative you need to succeed in three areas. You need to generate the Will to pursue the changes, despite difficulties and competing demands on time and resources. You need the good Ideas that will transform your service. Finally you need to Execute those ideas effectively to get the change required.

Will

The interventions you need to build Will are explained in the ‘Leading the Way to Safety and Quality improvement’ and ‘How to Improve’ guides. They concentrate on raising the commitment levels for change and then providing the project structure to underpin improvement approaches. Spreading changes to achieve transformative change across the whole health system requires strong leadership. We need to create an environment where there is an unstoppable will for improvement and a commitment to challenge and support teams to remove any obstacles to progress.

Ideas

The interventions in this guide describe ideas which evidence shows to be effective for achieving changes that result in improvements. It gives examples from organisations that have achieved them and also advice based on their experience. Methods and techniques for generating new ideas or innovative ways to implement the evidence can be found in the ‘How to Improve’ guide and other improvement literature.

Execution

However, to bring these ideas into routine practice in your organisation, it is essential that you test the interventions and ensure that you have achieved a reliable change in your processes before attempting to spread the change more widely.

1000 Lives Plus uses the Model for Improvement (MFI) which is a proven methodology as the basis for all its improvement programmes. It requires you to address three key questions and then use Plan-Do-Study-Act (PDSA) cycles to test a change idea. By doing repeated small-scale tests, you will be able to adapt change ideas until they result in the reliable process improvement you require. Only then are you ready to implement and spread the change more widely.
Model for Improvement - PDSA Cycle

For more guidance on using the Model for Improvement, see the ‘How to Improve’ guide.

Seven Steps to Measurement

1. Decide aim
2. Choose measures
3. Define measures
4. Collect data
5. Analyse & present
6. Review measures
7. Repeat steps 4-6
One area that bears extra attention is measurement because we have found that this is often the Achilles heel of improvement projects. When measuring your progress, follow the Seven Steps to measurement shown on page 30 and covered in more detail in the ‘How to Improve’ Guide.

The key is to go round the Collect-Analyse-Review cycle frequently:

- **Collect** your data
- **Analyse** - turn it into something useful like a run chart
- **Review** - meet to decide what your data is telling you and then take action

Successful improvement projects all have clear aims, robust measurement and well tested ideas. Use the ‘How to Improve’ guide to ensure your projects have all three.

**What are we trying to accomplish?**

You will need to set an aim that is Specific, Measurable, Achievable, Realistic and Time-bound (SMART). Everyone involved in the change needs to understand what this is and able to communicate it to others.

**How will we know that change is an improvement?**

It is essential to identify what data you need to answer this question and how to interpret what the data is telling you. The improvement methodology ‘How to Guide’ provides detailed information on the tools, tips and information you need to achieve this, and includes the following advice:

- **Plot data over time** - Tracking a few key measures over time is the single most powerful tool a team can use.
- **Seek usefulness, not perfection.** Remember, measurement is not the goal; improvement is the goal. In order to move forward to the next step, a team needs just enough data to know whether changes are leading to improvement.
- **Use sampling.** Sampling is a simple, efficient way to help a team understand how a system is performing.
- **Integrate measurement into the daily routine.** Useful data are often easy to obtain without relying on information systems.
- **Use qualitative and quantitative data.** In addition to collecting quantitative data, be sure to collect qualitative data, which often are easier to access and highly informative.
- **Understand the variation that lives within your data.** Don’t overreact to a special cause and don’t think that random movement of your data up and down is a signal of improvement.
What change can we make that will result in improvement?

The interventions in this guide describe a range of change ideas that are known to be effective. However, you need to think about your current local systems and processes and use the guide as a starting point to think creatively about ideas to test. The improvement methodology guide gives more advice to support you in generating ideas.

Spreading changes to achieve transformative change across the whole health system requires strong leadership. We need to create an environment where there is an unstoppable will for improvement and a commitment to challenge and support teams to remove any obstacles to progress. The guide on ‘Leading the Way to Safety and Quality Improvement’ gives detailed information on interventions that will support this. However, the Model for Improvement, PDSA cycles and process measurement lie at the heart of the transformative change we seek.
Improving care, delivering quality

If we can improve care for one person, then we can do it for ten.

If we can do it for ten, then we can do it for a 100.

If we can do it for a 100, we can do it for a 1000.

And if we can do it for a 1000, we can do it for everyone in Wales.

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