A Review of SAIs relating to the 'Misidentification of Patients'

Date Issued: June 2015

Contents

Executive Summary

Introduction

The Health & Social Care Board (HSCB)/ Public Health Agency (PHA) Regional Serious Adverse Incident Review Group (RSAIRG) requested a review of the reported Serious Adverse Incidences (SAIs) directly related to the “Misidentification of Patients/Clients” across Northern Ireland Health and Social Care Services. This report provides an analysis and evaluation of this review. The aim of the review was to identify any recurrent themes found within reported SAIs and to consider any regional actions that could be implemented to reduce the incidence of “Misidentification of Patients and Clients”.

Cases of misidentification of patients can occur across all specialities in health and social care both in the acute, primary setting and integrated care programs. However, The Term “Misidentification of patient” can be misinterpreted by Health and Social Care staff as specifically relating to activities such as medicine rounds or pre-operative checking procedures.

Methodology

A literature review was completed to collate recent international research or learning and to inform the recommendations the review would make.

SAIs categorised under the theme of ‘Misidentification’ that had been reported between 01 May 2010 and 07 July 2013 in the HSCB DATIX system were sought.

This identified Nine SAIs the findings indicate that the majority of these incidents can be attributed to the following:

Key Findings of the Review

Despite the knowledge that reliable patient and procedure identification processes improve patient outcomes the review identified that health

and social care staff do not routinely re-check patient's identity throughout their inpatient experience.

Misidentification of the patient can occur at every stage in health and social care from the checking in at reception to the delivery of care.

A health and social care team's customs and practice can reinforce poor checking and consenting procedure. A suggested reason for this is that some professionals rely on others to follow protocols. Patient Identification checklists such as the WHO Surgical Safety Checklist (2009)[1] promote a multidisciplinary approach to correct patient identification however this review has demonstrated that there is conflict around whose responsibility it is to carry out these checks.
Some patients feel a loss of autonomy when entering hospital and report that they don't always feel able to correct staff if called by the wrong name and do not appreciate the potential repercussions.

When referring to medical and care records, some staff will accept that the information held in the records is correct without substantiating this with the patient/client or carer.

Up loading patient/client information to computer files and collating documentation following case reviews is often the responsibility of clerical staff. Currently there are no checking procedures to ensure this information is correct before sending to a third party.

Conclusion

It can be seen from the cases reviewed that when misidentification of the patient occurs, regardless of what point in their care that may be, the potential could be that it leads to unnecessary harm and patients and decreased public confidence in the healthcare system.

Recommendations

Following the literature search and analysis of the SAI reports, three regional recommendations/actions have been identified.

[1] World Health Organisation, 2009.

1.0 Introduction

The HSCB/PHA Regional Serious Adverse Incident Review Group (RSAIRG) has responsibility for ensuring that trends, best practice and learning from the occurrence of SAIs are identified and disseminated in a timely manner. RSAIRG requested a review of all reported SAIs relating to the "Misidentification of Patients/ Clients" across Northern Ireland Health and Social Care Services following several reported incidents of misidentification.

The misidentification of patients/clients can occur because of human error e.g. staff not completing mandatory checking processes, incorrect labelling of patient/client documentation, or a belief that local systems were failsafe. However this can have significant consequences such as the patient/client receiving the wrong intervention or care which will increase the risk of potential harm, injury or death.

It is important to note that patient identification and the matching of a patient to an intended treatment, be that, diagnostic, therapeutic or supportive is an activity that is performed routinely both in hospital and community settings

The challenges to improving patient safety in health and social care remain significant although nationally there are no accurate figures on the frequency of the misidentification of patient's this issue is increasingly being recognised as a problem within healthcare[2].

The NHS Institute for Innovation and Improvement (previously, NPSA) represents an important resource in ensuring that information about adverse events are both learned from and shared throughout the NHS. Research and anecdotal evidence has shown that a significant number of healthcare errors arise when patients are misidentified[3].

[2] National Patient Safety Association (NPSA) Organisation Patient Safety Data npsa.nhs.uk accessed 28-08-13

[3] Conley D, Singer S, Edmundson L, Berry W, Gawande A (2011) 'Effective Surgical Safety Checklist Implementation'. *American College of Surgeons* 212 pp. 873-879

A literature search was completed to establish recent international research or learning. The evidence clearly showed that implementing checklists can reduce misidentification of patients/clients, which has demonstrated a reduction in risks to patients/clients although compliance with such checklists can be low[4].

The aim of this review was to identify any recurrent themes found within reported SAIs (Appendix 1) and to consider any regional actions that could be implemented to reduce the incidence of "Misidentification of Patients and Clients.

Although this review was initiated through RSAIRG, SAIs are not the only way of establishing that the patient's experience of care is greatly affected when they are incorrectly identified. While compiling this review, the HSCB Complaints Department reported that they also receive reported incidents relating to the misidentification of patients from service users, this would be supported in the stories received through Patient Client Experience (PCE) monitoring.

An analysis of the SAIs reported in the HSCB DATIX system between 01 May 2010 and 07 July 2013 used the following search terms:

- Misidentification
- Wrong Patient
- Patient Identification
- Labelling
- Wrong site surgery
- Drug errors

This identified Nine SAIs in total, which were considered as part of the thematic review.

[4] World Health Organisation, 2009.

2.0 Background

It is acknowledged that although the 'reported' incident of "Misidentification of Patients" is a rare event, when it happens the implications may be devastating to the patient/client and their families and in addition can have profound medical, legal, and emotional implications for patient/clients and healthcare staff[5].

Cases of misidentification of patients can occur across all specialities in healthcare. However, the Term "Misidentification of patient" can be misinterpreted by Health and Social Care staff as specifically relating to activities such as medicine rounds or pre-operative checking procedures. Seiden and Barach[6] analysed several literature databases which demonstrated that the 'misidentification', can occur as early as the initial contact between the patient/client and health care staff. It is this lack of clarity which can lead to increased risks such as incorrect patient care or treatment, e.g. wrong site /wrong side, wrong procedure.

All of the reports analysed for this review, identified 'initial misidentification as the prime cause of the serious adverse incident and a cascade of contributing factors compounded the risks which resulted in patient/clients receiving inappropriate care. The recurrent theme was a failure to complete the checking processes.

Within health and social care there is an increasing use and reliance on technology, increased volumes of patients leading to increased levels of activity in treatment and care areas. This pressure may be the principal cause of the increased risk of human error. Between Jan 2011 and Dec 2011, the National Patient Safety Agency (NPSA) received 79,925 reports of patient safety incidents and near misses relating to the documentation and misidentification of patients[7]. In Northern Ireland, all

[5] Seiden S, Barach P (2006) 'Wrong-side/Wrong-site, Wrong-Procedure, and Wrong-Patient Adverse Events... are they Preventable? *Archive Surgery*, 141(9) pp. 931-939

[6] Seiden S, Barach P (2006) 'Wrong-side/Wrong-site, Wrong-Procedure, and Wrong-Patient Adverse Events... are they Preventable?

[7] http://www.npsa.nhs.uk

SAIs are reported through the HSCB and are managed locally by the HSC Trusts.

Currently adverse incidents are managed internally by the Health & Social Care Trusts (HSCT), therefore did not form part of this review.

There is National and Professional Guidance[8][9][10][11] which sets out pragmatic advice for healthcare professionals to routinely check the patient's name, with the patient/client or their carer and the identification band against the patient records when:

- administering medications
- labelling samples and specimens,
- transfusing blood or blood products
- the patient is undergoing any procedure.

These guidelines also raise the professional awareness of the consequences of not doing so.

3.0 Findings from Analysis of SAI Investigation Review Reports

3.1 Verifying patient identity

This thematic review of SAIs relating to the misidentification of the patient shows that much research is available to support how safety checklists can reduce errors in patient/client care and pre and post-operative complications. This review identified that there are issues relating to the checking procedures, particularly as inpatients.

It is well known that some patients feel a loss of autonomy and anxiety when entering a hospital[12] and this can result in patients becoming

---

[8] SHOT, 2011
[9] BCSH, 2009
[10] RCN, 2008
[11] GMC, 2013
[12] Weingart S, Wilson R, Gibberd R, Harrison B (2000)'Epidmiology of medical error' *British Medical Journal* 320(7237) pp. 774-777

subdued and acquiescent. Significantly in two of the events reviewed, patients reported they had been aware that staff addressed them by an incorrect name, however they didn't feel able to correct this mistake and hadn't considered the subsequent repercussions.

Patients with the same or similar sounding names present challenges to all healthcare systems. Examples of patients coming forward when someone else's name is called at clinics are familiar to healthcare staff.

In one of the cases reviewed:

'An invasive procedure was performed on the wrong patient'

> When the incident was reviewed by the HSC Trust the sequence of events occurred because 'Patient A', who was hard of hearing, came forward when staff called out 'Patient B's' name.
>
> This occurred in a busy day procedure unit with a team of experienced staff. Expecting to see a patient of the same gender and approximately the same age staff ***presumed*** that the patient who had come forward was the correct patient and didn't complete the checking procedure.
> This error wasn't detected until midway through the procedure when the patients arm band was checked against specimen bottles.

In this HSCT investigation report it was identified that the team's custom and practice had reinforced the poor checking and consenting procedure. The investigation team remarked that 'In hindsight, we can clearly see how the particular action of failing to check an armband was the first break on the error chain which resulted in this incident'. The unit had a culture of high expectations, and staff delivered safe and efficient

care but had become complacent in re-checking patient/clients identity. As a result of this incident a learning letter was sent out to each Trust[13].

3.2 #hellomynameis

The NHS England “hello my name is” campaign was started by Dr Kate Granger after she became frustrated with the number of staff who failed to introduce themselves to her when she was an inpatient with post-operative sepsis at the end of August 2013. This campaign has been adopted widely by Trusts across England and has since been endorsed regionally by all HSC trusts in Northern Ireland.

Introducing yourself is the first basic step taught in any clinical interaction for any health and social care professional as getting to know people’s names is known to be fundamental to building good working relationships with patients. Frequently, HSC service users report through Patient Client Experience mechanisms and the 10,000 Voices Initiative that health and social care staff do not always introduce themselves to the person they are delivering care to.

It is widely documented that delivering compassionate care often means getting the simple things right. 'Hello my name is' and 'I am looking after you today' makes patients automatically feel safe, looked after and cared for and affords them the opportunity to respond to the introduction by telling the staff member their preferred name. The #hellomynameis campaign seeks to open up a two way dialogue between the health and social care professional and patient encouraging the staff member to get to know the patient. This simple measure could help to reduce the incidences of misidentification of patients.

Misidentification of the patient can occur at every stage in health and social care from the checking in at reception to the delivery of care.

[13] Learning Letter- LL/SAI/2012/012

One example of this is when:

> The receptionist in the Emergency Department searched on patient A's last name **but did not input** their full double barrelled first name to the Emergency Department Admissions System (Symphony).
>
> By using only the surname and patient's date of birth the system located Patient B who had a similar name.
>
> ***The care for Patient A was planned using Patient B's history resulting in the wrong medication being prescribed and administered***. Patient A's condition deteriorated until the error was identified and corrected. Subsequently patient A made a full recovery.

3.3 Documentation

Unfamiliar documentation can increase the possibility of staff incorrectly or poorly completing sections within patient/client records. This can increase the risk of patient's identity and conditions being misinterpreted. This risk is enhanced with vulnerable patients who may not have an advocate available to them such as the elderly, paediatric or ethnic minority groups as these patients/clients may not be aware of the error. In addition staff may not verify the information contained within the record directly with the patient due to the patient/clients condition[14].

When referring to medical and care records from other departments, Trust areas and care home facilities within and external to the Health and Social Care services, staff often accept that the information is correct without substantiating this with the patient/client or carer. This lack of vigilance can increase the risk of errors.

[14] Weingart S, Wilson R, Gibberd R, Harrison B (2000)'Epidmiology of medical error' *British Medical Journal* 320(7237) pp. 774-777

Evidence of this was seen when:

A patient was admitted to ED by ambulance from a nursing home and '**received the incorrect medication for the duration of their in-patient stay in hospital'**.

The admitting doctor ***had not noticed*** that the documentation received from the care home where the patient resided, contained another person's medication kardex. This kardex clearly detailed another patients name and there were no similarities with the patient's own name, but had been mistakenly inserted into the wrong chart at the nursing home.

There is awareness in HSC that this weakness in the system exists. HSC in Northern Ireland is currently developing a new record system for all of Northern Ireland that will extract key details from existing HSC systems. This will make it easier for staff to get the information that is required to ensure the care and treatment delivered to patients is Safer, Faster and Better.

The Transforming your Care Review [15] recommended the full roll out of the Northern Ireland Electronic Care Record (NIECR).

"The current duplication along with poor patient records slows down the system and causes frustration to the individual when forced to continually relay their particular situation and treatment. A solution to this would be the creation of a single Electronic Care Record (ECR) which follows the individual through different care settings and Trust boundaries"

3.4 Documentation Containing Sensitive Information

The Data Protection Act (1998)[16] allows personal data relating to a person's care and treatment to be shared with the patient, client and or

[15] Transforming Your Care – A Review of Health and Social Care in Northern Ireland (2011)
[16] Data Protection Act (1998) London HMSO

carer, if their permission is obtained. Three out of the nine cases in this review demonstrate the importance of having measures in place to safe guard sensitive data. In these cases,

> **'A breach of client confidentiality'** occurred when Family A's health and social care histories were inadvertently placed among copies of reports and reviews for Family B.
>
> Generally, the preparation of documentation from case reviews is a task which is delegated to unregistered members of staff. ***In these three cases it was highlighted that there was no Quality Assurance processes in place for checking this documentation*** by another person prior to them being mailed out to clients.

Ensuring that correspondence was double checked before being issued would increase the opportunity to identify and correct such errors.

3.5 Use of Technology

Health and social care is growing increasingly complex and the use of Information Technology can be a powerful enabler. It is possible to store vast amounts of patient information on computerised files that are held in an easily readable format; it would be impossible to contemplate the same amount of information being kept in a paper system.

An over reliance on computer systems can lead to the user to become complacent and makes them less likely to check the accompanying information against the computer findings. A review of the 'Symphony User Guide' and training package showed that clear processes exist for patient identification and that these were not followed in the cases identified.

It is widely acknowledged that the HSC workforce lack experience in the use of technology[17] therefore clerical staff are often delegated the task of

[17] Baird G (2008) 'Confidentiality: what everyone should know, or, rather, shouldn't'. British Journal of General practice 58(547) pp.131-133

up loading patient/client information and forwarding it to the relevant care providers.

A widely reported case in the media, involved the medical and social information of eight patients/clients being accidently attached to a report which was sent by email to a patient's relative. When stories like this happen it can damage the reputation of the Trust and decrease public confidence in the health and social care system. This again emphasises that such processes should be subject to a checking procedure before being sent. Other contributory factors included high volumes of case reviews which had led to a back log of minutes for staff to prepare. This highlights the need for Trusts to ensure that safeguards are in place to ensure medical information held electronically are checked before sending to a third party.

When patients/clients receive a blood transfusion there is a complex sequence of activities which occur to check that the right patient/client receives the right blood[18]. Administering the wrong blood type (ABO incompatibility) is the most serious outcome of error during transfusions. Most of these incidents are due to the failure of the final identity checks carried out between the patient (at the patient's side) and the blood to be transfused (SHOT Check List Appendix 2).

Training for staff responsible for ordering or administering blood products has been in place within Health Care Trusts since 2006. Conley et al[19] (2011) believe that if staff can understand why procedures are in place, compliance will be higher.

One of the case reports describes how:

'**The wrong blood was administered to a patient'.**

[18] Gray A, Illingworth J (2008)'*Right blood, right patient, right time: RCN guidance for improving transfusion practice'* Royal College of Nursing, 20 Cavendish Square, London

[19] Conley et al, 2011.

The registered nurses who administered the blood had completed the Trusts competency training 'Right Patient Right Blood'[20]. At each point in the administration of the product ***the essential checking procedure was not carried out in the correct way***. The nurses reported that this event happened at a time when the ward was very busy and they were working under a lot of pressure. The nurses failed to follow the correct checking procedures, checking the bag of blood against the laboratory label rather than the patient's records and arm band and finally omitting the final and most important check made against the patient's armband and with the patient at the bedside. On this occasion, this transfusion error caused no harm to the patient. The event was recorded as a near miss.

3.6 Contributing Factors

- In five of the nine SAI investigation reports it was stated that the wards and departments were exceptionally busy and as a result, the necessary time that it takes to complete mandatory checking procedures was not allowed for.

- In three of the nine cases, there was confusion among the teams around whose role and responsibility it was for undertaking the patient verification procedures.

> **A surgical consultant stated:**
> ***"I rely on my team of competent staff to ensure the correct checking procedures are carried out"***

- In two cases, unregistered staff had been given the responsibility for managing sensitive information and no validation system was in place to ensure all the documents were Quality Assured prior to distribution.

[20] http://www.shotuk.org accessed 05/09/2013

- In one case it was evident that the ‘best practice’ of having regular safety briefings throughout shift did not happen in every ward area or department.

- In another example, armbands were not routinely used to check patient details.

4.0 Gold Standard

Unfortunately, the occurrence of misidentification of patients is not exclusive to Northern Ireland. It is widely reported nationally and internationally as an area of concern which is challenging to overcome. A literature review of misidentification of patients demonstrated various different approaches adopted by health care systems in tackling this issue. The most successful and sustainable model was identified in a strategy implemented in Australia known as ‘responsive regulation’.[21]

In 2004, the Australian Health minister called for all public hospitals to follow a five step checking procedure (Appendix 3). Policy makers expected the checklist to be readily adopted but compliance was low and slow.

A further study on the regulation of patient safety and quality looked at what strategies hospital leaders had employed to promote staff compliance with checking procedures. This study found that a traditional approach -‘soft regulation’- had been adopted. Soft regulation is where the clinician is relied on to change their behaviour voluntarily. Observing that this approach was not getting the desired outcome, the Australian system adopted a graduated and multiplex regulation system to improve staff compliance[22].

[21] Healy J, Braithwaite J(2006) ‘Designing safer healthcare through responsive regulation’. Medical Journal Australia 184(10):56

[22] Healy J (2012) ‘How hospital leaders implemented a safe surgery protocol in Australian hospitals’. *Internal Journal for Quality in Health Care,* 24(1): pp.88-94

The ‘responsive regulation’ framework involves a management approach ranging from persuasion to enforcement. These mechanisms can be mapped on a pyramid of support and sanctions (Appendix 4). Responsive regulators give softer mechanisms of trust and respect a chance to work first, rather than opting immediately for enforcement. This model allows leaders the capacity to escalate upwards to enforcement if necessary. This model is a good fit for health and social care as it still begins with a ‘soft regulation’ approach.

5.0 Conclusion

In summary, it can be seen from the cases reviewed that when misidentification of the patient occurs, regardless of what point in their care that may be - the potential could be that it leads to unnecessary harm to patients and decreased public confidence in the healthcare system.

Despite the knowledge that reliable patient and procedure identification processes improve patient outcomes, there is strong evidence that this is not routinely carried out across all wards, departments or with all staff. A suggested reason for this is that some professionals rely on others to follow protocols. Patient Identification checklists such as the WHO Surgical Safety Checklist (2009)[23] promote a multidisciplinary approach to correct patient identification however this review has demonstrated that there is conflict around whose responsibility it is to carry out these checks.

Patients frequently report that staff introductions do not routinely occur. This omission affects the natural process where the patient will respond by giving their name and could potentially highlight errors in identification to the staff member.

It is recognised that modern health and social care teams are working in challenging environments with many conflicting priorities. These conditions make it even more relevant that staff awareness of the risks associated with omitting checking procedures is raised.

[23] http://www.who.int/patientsafety/safesurgery/ss_checklist/en/

6.0 Recommendations/Actions

All HSC Trusts have in place policies relating to the checking of patient identity. Following the literature search and the analysis of the SAI reports the resulting recommendations and actions have been identified:

1. A poster has been designed* which should be displayed throughout Trust wards and departments to raise awareness across all HSC staff of the importance of patient verification processes at every stage of care (Appendix5).

2. A newsletter article "**Right Patient Right Care**" has been published in the PHA newsletter "Learning Matters" (December 2013).This newsletter is disseminated Trust wide and its purpose is to provide service users and health service staff access to important learning[24].

3. The Patient Safety Forum and the Royal College of Nursing (RCN) are exploring the possibility of including a topic based on **Quality improvement in Leadership for Safety with theatres and procedural areas** within the Leadership programs available to staff.

[24] http://www.publichealth.hscni.net/sites/default/files/LM_issue_1_[web]_0.pdf
*An A5 poster will be distributed to the governance departments in each HSC Trust.

Appendix 1

DEFINITION OF AN ADVERSE INCIDENT AND SAI CRITERIA[25]

'Any event or circumstances that could have or did lead to harm, loss or damage to people, property, environment or reputation'[26] arising during the course of the business of a HSC organisation / Special Agency or commissioned service

The following criteria will determine whether or not an adverse incident constitutes a SAI.

SAI criteria

- serious injury to, or the unexpected/unexplained death of:
  - a service user (including those events which should be reviewed through a significant event audit)
  - a staff member in the course of their work
  - a member of the public whilst visiting a HSC facility;

- any death of a child in receipt of HSC services (up to eighteenth birthday). This includes hospital and community services, a Looked After Child or a child whose name is on the Child Protection Register;

- unexpected serious risk to a service user and/or staff member and/or member of the public;

- unexpected or significant threat to provide service and/or maintain business continuity;

- serious self-harm or serious assault (*including attempted suicide, homicide and sexual assaults*) by a service user, a member of staff or a member of the public within any healthcare facility providing a commissioned service;

- serious self-harm or serious assault *(including homicide and sexual assaults*)
  - on other service users,
  - on staff or
  - on members of the public

  by a service user in the community who has a mental illness or disorder (*as defined within the Mental Health (NI) Order 1986*) and

[25] HSCB "Procedure for the reporting and follow up of Serious Adverse Incidents" Oct 2013

known to/referred to mental health and related services *(including CAMHS, psychiatry of old age or leaving and aftercare services*) and/or learning disability services, in the 12 months prior to the incident;

- suspected suicide of a service user who has a mental illness or disorder (*as defined within the Mental Health (NI) Order 1986*) and known to/referred to mental health and related services *(including CAMHS, psychiatry of old age or leaving and aftercare services*) and/or learning disability services, in the 12 months prior to the incident;

- serious incidents of public interest or concern relating to:
    - any of the criteria above
    - theft, fraud, information breaches or data losses
    - a member of HSC staff or independent practitioner.

ANY ADVERSE INCIDENT WHICH MEETS ONE OR MORE OF THE ABOVE CRITERIA SHOULD BE REPORTED AS A SAI.

Appendix 2

TABLE OF FOUR MAIN ERRORS MADE IN THE BLOOD TRANSFUSION PROCESS 2011.

	SHOT IBCT Errors (SHOT, 2011)
1	The blood sample was drawn from the wrong patient.
2	Patient details were recorded incorrectly on the blood sample label or the blood request form.
3	The incorrect unit was collected from the blood refrigerator.
4	The final formal identity check at the patient's bedside, prior to transfusion, was omitted or performed incorrectly.

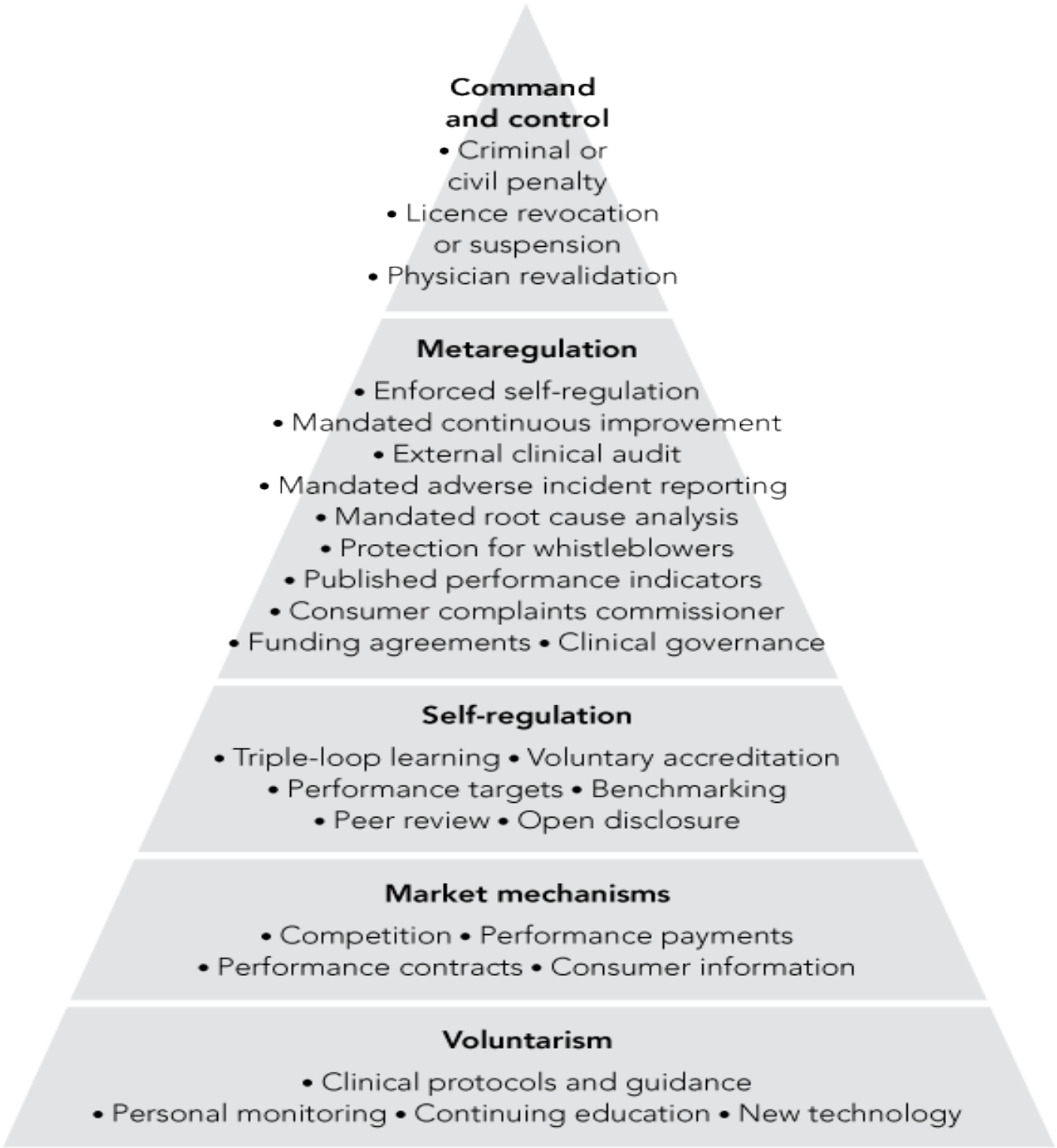
Appendix 3

THE FIVE- STEP 'ENSURING CORRECT PATIENT, CORRECT SITE, CORRECT PROTOCOL'.

1. Check consent form or procedure request
2. Mark the site (usually with a permanent felt-tip marker)
3. Confirm identification with patient
4. Take 'team time out' to verbally confirm all is correct before commencing the procedure
5. Check all diagnostic images

Appendix 4

REGULATORY PYRAMID AND EXAMPLES OF SAFETY AND QUALITY MECHANISMS




HSC Health and Social Care
ASK
Correct Patient
Correct Identity
Every time
ASK the Patient to state their name and date of birth before any intervention, treatment, medication or transfer.
SEE that the answer matches the name band and/or all documentation.
KEEP patient safe from intervention or treatment until you are sure.

Bibliography

Braithwaite et al 2006:http://www.gmc-uk.org/guidance accessed 05/09/2013

http://www.bcshguidelines.com accessed 05/09/2013

Chassin M, Becher E (2002) 'The Wrong Patient' *Annual of Intern Medicine* 136(11) pp.826-833

Coiera E (2007) 'Lessons from the NHS National Programme for IT, a program of this size is bound to experience challenges'. *MJA* 186(10 pp.3-4

Devine J, Chutkan N, Norvell D, Dettori J (2010) 'Avoiding Wrong Site Surgery: a Systematic Review'. *Spine* 35(9s) pp. S28-S36

Lilford R (2010) 'The English Patient Safety Research Programme: a commissioner's tale' *Journal of Health Services Research and Policy* vol. 15 / supplement 1 pp. 1-3

Stahel P, SabelA, Victoroff M, Varnell J, Lembitz A, Boyle D, Clarke T, Smith W, Mehler P(2010) Wrong site and Wrong Patient Procedures in the Universal Protocol Era. Analysis of a Prospective Database of Physician Self-reported Occurances' *Archive Surgery* 145(10) pp.978-984

Taxis K, Barber N (2003) 'Ethnographic study of incidence and severity of intravenous drug errors. *British medical Journal* 326:684 pp. 113-124