IHI Open School (England) Conference
19th March 2011, Birmingham University

Because quality and safety aren’t electives

Conference Proceedings
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Sue Lister, Coventry University and NHS Institute for Innovation and Improvement
Keynote Speakers

Shannon Mills, The IHI Open School? Its development and expansion internationally

Shannon Mills
Shannon Mills, MHS. Ms. Mills is the Community Manager for the Institute for Healthcare Improvement’s student initiative, the IHI Open School for Health Professions; Ms. Mills is also an Improvement Advisor. She joined IHI in 2008 and is responsible for the Chapter Network, a community of health profession students and faculty.

Before joining IHI, she served as a Program Coordinator for the Komansky Center for Children’s Health and Morgan Stanley Children’s Hospital of NewYork-Presbyterian Hospital and a Research Coordinator at the Weill-Cornell Medical College. Ms. Mills received her master’s of health science in Health Policy from the Johns Hopkins University Bloomberg School of Public Health and received a bachelor of science in Public Health at the University of North Carolina – Chapel Hill.
IHI & the IHI Open School

Institute for Healthcare Improvement
IHI Open School

IHI Open School Course Catalog

Quality Improvement:
- QI 101: Fundamentals of Improvement
- QI 102: The Model for Improvement: Your Engine for Change
- QI 103: Measuring for Improvement
- QI 104: Putting It All Together: How Quality Improvement Works in Real Health Care Settings
- QI 105: The Human Side of Quality Improvement
- QI 106: Level 100 Tools

Patient Safety:
- PS 100: Introduction to Patient Safety
- PS 101: Fundamentals of Patient Safety
- PS 102: Human Factors and Safety
- PS 103: Teamwork and Communication
- PS 104: Root Cause Analysis
- PS 105: Communicating with Patients After an Adverse Event
- PS 106: Introduction to the Culture of Safety

Leadership:
- L 101: So You Want to Be a Leader in Health Care

Upcoming Courses:
- Patient and Family-Centered Care: PFCC 101: Dignity and Respect
- Operations Management: MHCO 101: How to Achieve Breakthrough Quality, Access, and Affordability

Our Mission

“Advance health care improvement and patient safety competencies in the next generation of health professionals worldwide.”
IHI Open School Chapters

US Chapters in 45 states
International Chapters in 38 countries

Chapters in the UK

England
- University of Aberdeen
- Aberdeen Royal Infirmary
- University of Leeds
- University of Manchester
- University of Sheffield
- University of Oxford
- University of Southampton
- University of Exeter
- University of Dundee
- University of Glasgow
- University of the West of Scotland

Northern Ireland
- Queen’s University - Belfast

Republic of Ireland
- University College Cork
- Royal College of Surgeons

Scotland
- Stirling Royal Infirmary
- University of Aberdeen’s Aberdeen Royal Infirmary
- University of Stirling
- University of Dundee
- University of Edinburgh
- University of Glasgow
- University of the West of Scotland

Wales (Chapter)
- Bangor University
- Cardiff University
- North East Wales Institute of Higher Education - Wrexham
- Swansea University
- University of Glamorgan - Pontypridd
- University of Newport
- University of Wales Institute, Cardiff

How many people use IHI.org and take IHI Open School courses?

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<tr>
<th>Country</th>
<th>Users</th>
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Building a Global Network

• Regional Chapter Leaders
  - Jo Inge Myhre, University of Oslo
  - Fraser Pryde, Dundee University

• Course Translation
  - Chinese
  - Dutch
  - French
  - Portuguese
  - Spanish

• Student Events
  - International Forum 2011

Progress

• >44,500 students and residents registered on IHI.org
• >8,600 faculty and deans registered on IHI.org
• >14,000 students and residents have completed an online course
• >1,000 students and residents have earned their Certificate of Completion
• >293 Chapters in 45 states and 38 countries

Thank You

Questions? Email openschool@ihi.org
Helen Bevan, Being a Change Agent

Helen Bevan
Helen Bevan is Chief of Service Transformation at the NHS Institute for Innovation and Improvement. She has worked in the field of healthcare improvement at local, national and international level.

Helen has led and supported initiatives that have created improvements for millions of patients. Her specialist interests are in large-scale change approaches to improvement and mobilising and organising for improvement.

In 2008, the 60th anniversary of the NHS, Helen was named as one of the 60 most influential people in the history of the NHS and in 2010 was named as one of the top 10 NHS opinion formers.
Being a change agent
Helen Bevan
19th March 2011

Which tradition of change?

- Organisational behaviour
- Leadership and management studies
- Clinical/medical audit
- Improvement “science”
- Academic tradition(s) – 100 years

Focus: energy for change
- imagination
- engagement
- moving
- mobilising
- calling to action
- creating the future

The ‘clinical system’ mindset for improvement
Focus: effectiveness and efficiency
- metrics and measurement;
- clinical systems improvement;
- reducing variation,
- pathway redesign;
- evidence based practice

Focus: energy for improvement

Management of change
Organising and mobilising

Which tradition of change?

- Community organising, campaigns and social movements
- Learning from popular, civic and faith-based mobilisation efforts.
- Academic tradition – 100 years

Focus: effectiveness
- metrics and measurement;
- clinical systems improvement;
- reducing variation;
- pathway redesign;
- evidence based practice

Focus: energy for improvement

Management of change
Organising and mobilising

How do we create improvement at scale?

The ‘clinical system’ mindset for improvement
Focus: effectiveness and efficiency
- metrics and measurement;
- clinical systems improvement;
- reducing variation;
- pathway redesign;
- evidence based practice

Focus: energy for improvement

What do great change agents do?

Strategy what?

Narrative why?

Shared understanding leads to Action

Source: Marshall Ganz

What is strategy?

Strategy is the process of turning the RESOURCES you have into the POWER you need to win the CHANGE you want

Source: Marshall Ganz

Change agents help to shift power

POWER OVER

POWER WITH

Who do we need to organise?

The “decision makers”

- GPs
- Hospital doctors
- Psychiatrists
- Care homes
- Pharmacists
- Boards of trusts
- Commissioners
- Policy makers
- Regulators
- etc

Locked up and sedated

Dementia patients being denied basic rights, says damning report

Who do we need to organise?
Who do we need to organise?

The “decision makers”
- GPs
- Hospital doctors
- Psychiatrists
- Care homes
- Pharmacists
- Commissioners
- Boards of trusts
- Policy makers
- Regulators
- etc

Others who we can organise to incentivise those with the power to make changes

What will a "call to action" mean?

- Create a sense of “us”
- Define goals that we want people to mobilise around
- Determine our tactics:
  - a story (narrative) that calls people to action
  - a strategy for turning the resources we have into the power we need to get the outcomes we want
  - specific actions that we are calling people to take
  - showing people where the resources and support are

What are we planning across the NHS?

- An England-wide “call to action” to get people with dementia who shouldn’t be getting anti-psychotic drugs off of them and onto a more appropriate therapeutic regime
- An England-wide launch later in the spring
- A set of actions that we want to ask people to commit to
- Improvement guides to back up the call to action
- Local and regional action to deliver the England-wide goal

Back to energy.....

Great change agents manage our own energies and those of the people around them

Four sources of energy

<table>
<thead>
<tr>
<th>Energy</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intellectual</td>
<td>Energy of analysis, logic, thinking, rationality. Drives curiosity, planning and focus</td>
</tr>
<tr>
<td>Emotional</td>
<td>Energy of human connection and relationships. Essential for teamwork, partnership, alignment and collaboration</td>
</tr>
<tr>
<td>Spiritual</td>
<td>Energy of vitality, passion, the future and sense of possibility. Brings hope and optimism and helps people feel more ready and confident to build the future</td>
</tr>
<tr>
<td>Physical</td>
<td>Energy of action, making things happen and getting them done. Key part of vitality, maintaining concentration and commitment</td>
</tr>
</tbody>
</table>

Source: adapted from Steve Radcliffe
Someone who understood the importance of spiritual energy

“Society becomes more wholesome, more serene, and spiritually healthier, if it knows that its citizens have at the back of their consciousness the knowledge that not only themselves, but all their fellows, have access, when ill, to the best that medical skill can provide.”

Aneurin Bevan

Conclusions about energies for quality and cost improvement

- Tendency to focus on intellectual energy
  - connecting intellect to intellect keeps us in our comfort zone
  - it isn’t transformational
- We will achieve greater results (pace and scale) if we link physical energy to spiritual energy
- Emotional energy is critical for new ways of working

What do great change agents do?

Strategy
what?

Narrative
why?

Shared understanding leads to Action

The challenge

“What the leader cares about (and typically bases at least 80% of his or her message to others on) does not tap into roughly 80% of the workforce’s primary motivators for putting extra energy into the change programme”


What happens to heretics and radicals in organisations?

Definition: people who question the direction and challenge the status quo

Valuing radicals

- “and yet corporate heretics may be the closest thing we have to genuine heroes, the unsung conscience of our civilisation” (Kleiner: xi)
- “New truths begin as heresies” (Thomas Huxley, defending Darwin’s theory of natural selection)
- big things only happen in organisations because of heretics and radicals
What are the risks for an organisational radical?

Our experiences of “being different” can be fundamentally disempowering. This can lead us to:
• conform because we see no other choice
  – we surrender a part of ourselves, and silence our commitment, in order to survive
• leave the organisation
  – we cannot find a way to be true to our values and commitments and still survive

“The moment we begin to fear the opinions of others and hesitate to tell the truth that is in us, and from motives of policy are silent when we should speak, the divine floods of light and life no longer flow into our souls.”

(Elizabeth Candy Stanton, 1890)

What do we know about successful organisational radicals?

• they feel somehow “different” from the traditional majority in their organisation
• they know who they are and what is important to their sense of self
  – profound sense of purpose
• they are able to rock the boat, but able to stay in it at the same time
  – they walk the fine line between difference and fit, balancing conformity and rebellion; ‘insider-outsiders’
  – they work within systems not against them
• often not the CEOs, Presidents or senior clinical leaders in organisations
  – yet they frequently have as critical a role in organisational change as that of the people with the formal authority
• “everyday” leaders, are often unrecognised
  – but essential agents of organisational learning and change
• convictions and values - driven
  – strong sense of self-efficacy
    – belief that I am personally able to create change
    – belief in others
• Action orientated
  – ignite collective action
  – mobilising others, inspiring change
  – able to join forces with others
    – work as a collective body for commonly valued changes
  – able to achieve small wins which precipitate a sense of hope, self-efficacy and confidence
• optimistic in the face of challenge
  – see opportunities
  – take account of obstacles
Values into action

Values into action

Emotion and Action

Emotion and Action

Public Narrative

Public Narrative

What is your public narrative?

What is your public narrative?

Outcome

Outcome

Task

Task
Developing my story of self

<table>
<thead>
<tr>
<th>challenge</th>
<th>choice</th>
<th>outcome</th>
</tr>
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We have a choice

- “This is the true joy of life, the being used up for a purpose recognised by yourself as a mighty one, being a force of nature instead of a feverish, selfish little clot of ailments and grievances, complaining that the world will not devote itself to making you happy”

  - George Bernard Shaw
Bernard Crump qualified in medicine from the University of Birmingham in 1980. He practised as a physician and carried out clinical research in the Midlands and the South East before training in Public Health Medicine. He became Director of Public Health in South Birmingham Health Authority in 1990. He subsequently became Director of Public Health and Deputy Chief Executive of Leicestershire Health Authority and Chief Executive of the Shropshire and Staffordshire Strategic Health Authority from 2001 – 2005, prior to joining the NHS Institute as Chief Executive.
Improving Quality and Reducing Cost from Experience to Evidence

Bernard Crump

Context 1
The NHS 2010
Recent unprecedented growth in funding
Approaching EU average share of GDP

Context 2
Productivity not increasing during this period of growth

The Chief Executive of the NHS speaks.....

• Budget 2009: funding squeeze looms in 2011, says David Nicholson
• 22 April, 2009 | By Richard Vize
NHS chief executive David Nicholson has not ruled out a cash cut in NHS funding from 2011.

29 June 2009 ‘But I think we are in for a period of at least three years and probably more of the NHS budget being frozen. If we are going to achieve real-term growth it will be small, and I guess the Government will want more for it when we do it. Therefore, we are going to have to deliver unprecedented levels of productivity in the NHS, there is no doubt in my mind.’

The gap between Wanless and the likely settlement

(Source: The King’s Fund and Institute for Fiscal Studies 2009)

Funding flows

Department of Health
Allocation
Primary Care Trusts
Pay
Prices
Actions taken already nationally may have reduced the additional challenge to £11–14Bn

**WHAT CAN BE DONE LOCALLY?**

- Evidence of quality improvement....
- ....some of it having happened at scale and at pace....
- ....but with much more limited evidence of the delivery of cash releasing savings...
- ...and sometimes with negative unintended consequences

Fig 1 Hospital standardised mortality ratios (HSMRs) 2006-7 and 2007-8, calculated with 2007-8 national baseline; bars indicate 95% confidence intervals

Care bundles implementation

NHS INSTITUTE
Three complementary approaches...

- Increase visibility of Productivity Opportunity through Benchmarking
  
  Better Care Better Value Indicators
  
  - Adopt the practices of the best organisations for the commonest things we do
  
  High Volume Care
  
  - Help frontline staff to see and eradicate waste

The High Volume Care programme aims to help improve the quality and efficiency of the care that consumes the most NHS resources and we looked at what the highest quality and most efficient clinical teams did...

- 58 HRGs account for 50% of all Finished Consultant Episodes and bed days
- We focused on 8 high volume areas....

  - Fractured neck of femur
  - Primary hip and knee replacement
  - Acute stroke
  - Caesarean section
  - Cholecystectomy
  - UTI (tracker for Frail elderly patients)
  - Acute mental health admissions
  - Short stay emergency care

Experience to date

- Strong evidence that organisations can learn to adopt and adapt “ideal” care pathways from high performing organisations

- Have extended the approach to new clinical areas;
  - Inpatient care of people with Diabetes admitted for something else
  - Year of care prior to need for Renal Replacement Therapy
  - Avoidance of emergency admission

- Lends itself to collaborative implementation
  - 12 CEOs working together over 18 months
  - Focused initially on Transformation Plan and Stories
  - Then worked collaboratively on two care pathways
    - Neck of Femur
    - Stroke
  - Dramatic improvements in Length of Stay, Mortality, Use of clinically appropriate interventions

- Now engaged with 90 hospitals using these pathways

- Tariff will change for five pathways this month

The Productives

- Put into the hands of people responsible for key clinical areas tools to help them identify waste and to reorganise their service to reduce waste

- Draws on the principles of approaches such as Lean and Six Sigma

- Co-produced with frontline clinicians

Caesarean section rates

19 Trusts working collaboratively to introduce Focus on Caesarean Section guidance over a nine month period

The Productives
Overall impact

• Typical improvements in time for direct patient care of 20%
• Re-investment of the time leads to safety, quality and productivity impacts
• These in turn have led to patient experience improvements...
• ...and also to benefits in staff morale, reduced sickness absence and a feeling of self efficacy
• ...and more than 60,000 staff have experienced an improvement programme

...and financially

• There are direct benefits in avoidance of waste, handling of stock and supplies
• There are commonly benefits from reduced use of agency staff and from reduced turnover
• But less direct financial benefits have not been tracked and realised in most organisations

In Summary

• Don’t assume that improvements in quality automatically cost more; many save money
• Let’s be professional about how we describe the challenge the NHS is facing; the NHS will have more money each year, and has been “protected”, but it will not be as much as we hoped to have or have been judged to need
• All of us who love the NHS must do all we can to help; to find and eradicate waste and encourage the practices used by the best
• “Gentlemen (sic) we have no money therefore we must think”
  – Rutherford
Exploring patient expectations and satisfaction with gynaecology outpatient services: Patient satisfaction survey

Authors
Simon Deery, University of Nottingham, email: mzybjsd@nottingham.ac.uk
Ceri Murphy, University of Nottingham
Anthony Shanahan, University of Nottingham

Abstract

Background: Clinical governance emphasizes the importance of offering the best standard of healthcare services by creating an atmosphere of continuous dynamic improvement. It is well established that patient satisfaction can be used as a measure of healthcare quality. This study examines the correlation between a patient’s actual clinical experiences with their expectations and how this impacts upon their satisfaction.

Methods: An opportunistic patient survey was performed at four gynaecology outpatient clinics over the course of a month. A two-part questionnaire surveyed pre-clinic patient expectations and post-clinic patient satisfaction. Satisfaction was assessed with questions covering; empathy, interpersonal skills of a healthcare professional, quality of consultation-time and information exchange between clinic staff and the patient.

Results: The collection rate of completed two-part questionnaires was 81%. Overall satisfaction levels with the clinic were high with 86% of patients scoring it ≥4 out of 5. In fact 100% of the patients found the treatment centre staff to be helpful. However, longer waiting times were associated with recorded low patient satisfaction. 42% of patients waited longer than expected, but only 34% of people found their wait unacceptable, many of which were new patients. Other factors that contributed to lower satisfaction levels included patients that felt they were not greeted and patients who felt their queries were not answered adequately. Poor introduction and patient greeting appeared to be associated with shorter consultation time (<15mins) and with patients not knowing who they were seen by (27%).

Conclusion: Disparity between patient’s expectations and actual clinical experience was associated with reduced satisfaction. Long waiting times were causative of most of dissatisfaction observed. However, shortening waiting times by decreasing the length of consultations would be counter-productive. Improved patient greeting and an informative patient referral letter could be used to reduce the degree to which patient’s expectations are not met.

Introduction

Aims
- To collect data representative of the expectations of patients attending a gynaecology outpatients clinic.
- To collect data representative of the same patient’s satisfaction with the current service offered at the clinic.
- To identify any possible improvements that could enhance the patient’s experience of this clinic.
To identify any necessary changes to services that will ensure patient expectations are accurate.

The primary purpose of this study is to explore patient experiences and satisfaction with the services offered by a gynaecology outpatient clinic, in the hope to identify any necessary areas for quality improvement.

Setting
Data will be collected via a questionnaire offered to all of the patients that attend four separate gynaecology outpatient clinics over the course of a month. The current study was conducted at The Treatment Centre, QMC which is a privately run NHS facility that was opened in July 2008, and is operated by Nations Healthcare. It is important to note that the growing number of privately owned NHS facilities may assist in increasing patient satisfaction due to a more aesthetically pleasing environment. Due to an element of consumerism, an increase in the use of business models to improve healthcare is being seen.

Background
The emerging importance of clinical governance in the NHS emphasizes the importance of offering the best possible standard of healthcare services by creating an atmosphere of continuous dynamic improvement.

Engaging with patients in an open dialogue, as this study demonstrates, aims to increase patient involvement at the gynaecology outpatient services. It may also aid the ‘tailoring’ of services offered by the clinic to the most important need of the patient. This complies with the one of the key principles of the NHS constitution (2009), “NHS services must reflect the needs and preferences of patients, their families and their carers.”

It is important to run studies like this so that patients have the opportunity not only to voice their satisfaction with certain services but also to give them a platform to voice any concerns. Patients have the basic right to express any dissatisfaction NHS services, and it is the goal of openness involved in clinical governance that stresses the significance of this.

Following high standards of clinical outcomes, patient satisfaction becomes an important measure of quality of healthcare. Satisfaction surveys can be used to look at several different aspects of care including arbitrary success levels and more importantly to check if services are meeting the needs of the patients (Avis, Bond, Arthur, 1995). This is achieved by taking into account specific patient opinions and feelings that will impact on their outcomes. For example increased empathy in communication skills can increase patient satisfaction and thus compliance (Soo, et al, 2004).

Previous successful patient surveys have identified certain key areas all of which this study aims to target; information exchange, interpersonal skills, empathy and quality of time (Loblaw et al, 1999; Pandit and Mackenzie, 1999; Vashisht et al. 2000).
Waiting room waiting times and consultation times were analyzed with regards to patient satisfaction and expectation. This is under the influence of guidance from the Patients charter (1995), which states that ‘targets should be set and met for the duration of wait in the outpatient clinic.’

**Method**

This is an opportunistic patient satisfaction survey at a NHS outpatient gynaecology clinic.

**Design**

Question content was decided after consultation with the consultant, registrars, nurses and admin staff working at the clinic. The identified target areas were incorporated along with known areas of satisfaction measurement.

In this way the questionnaire used to survey the patients was adapted from a combination of questions used previously by the lead consultant and the “Development and Testing of a Visit-Specific Patient Satisfaction Questionnaire: The Princess Margaret Hospital Satisfaction with Doctor Questionnaire” (appendix1).

**Data collection**

All patients who attend four separate gynaecology outpatient clinics over the course of a month were asked to complete a 2 part questionnaire (appendix 2). Patients were asked to take part in the study as they arrive in the waiting area. They were given a short introductory paragraph explaining the study and that they do not have to take part in the study if they do not wish to (appendix 3). This selection process gave us an opportunistic sample representative of the patients attending the clinic, with 89 patients completed part 1 and 72 completed part 2 of the questionnaire. Part 1 of the questionnaire was completed in the waiting area before their consultation and the questions focused on their beliefs and expectations of the clinics services. Patients were asked to complete Part 2 of the questionnaire as they left the clinic after their consultation. Questions in Part 2 focused on the patient’s experiences at the clinic and their satisfaction with the service they received. When patients had completed each section they posted their responses into a sealed box in the waiting room. This ensured the patients’ responses were anonymous and honest, eliminating any bias.

**Results**

**Sample**

A total of 161 questionnaires were completed in this study. 89 patients completed ‘questionnaire 1’ which preceded their appointment. Of these 89 patients, 72 completed ‘questionnaire 2’ after their appointment. This was a drop out of 17 between part1 and part2. This equates to only 81% of the patients completing both part1 and part2.

![Pie chart showing how important gynecology problems are to patients](image-url)
This was an opportunistic sample of all patients attending a gynaecology outpatient’s clinic on 4 separate occasions over the course of a month. 77% of patients who responded had attended this clinic previously whereas 23% were new patients.

All participants ranked the importance of their gynaecological problems out of 5 (1=Low 5=High). 94% gave a score of 4 or above. Confirming that the majority of patients attending the clinic consider their symptoms to be important to them. All the new patients ranked problems 4-5 out of 5, some of the lowest rankings came from follow-up patients, suggesting that gynaecology problems become less important once they have been resolved.

Despite not every question being answered, all completed questionnaires were submitted for analysis to maximise the data.

![Pie chart showing preferences for female gynaecologist](image]

**Expectations**

Of the 42% of patients who preferred to see a female gynaecologist, 26% of these were new patients.

64% of patients expected to see a consultant, 36% did not. Of these patients, 42% did see a consultant, 31% saw a more junior doctor, and 27% did not know. This suggests that initial introductions in a consultation should be clearer.

![Survey results on expected consultant and seen](image]
25% of patients said that they would not want their partners to present during the consultation. This emphasises the personal nature of gynaecology diseases and that adequate privacy should be given to patients during their consultation. However, 41% said that they would like their partner to be present. This means that to satisfy the majority of patients needs the clinic should provide facilities for the patient to be seen both by themselves and with their partner.

Would you like your partner to be present if possible?

<table>
<thead>
<tr>
<th>Option</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Yes</td>
<td>41%</td>
</tr>
<tr>
<td>No</td>
<td>25%</td>
</tr>
<tr>
<td>Indifferent</td>
<td>34%</td>
</tr>
</tbody>
</table>

The majority of patients were well informed with regards to an internal examination being a possibility.

Meeting patient expectations is an important part of creating a health service that meets the needs of its users.

<table>
<thead>
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<th>Expected waiting times</th>
<th>Frequency</th>
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<td>&lt;50</td>
<td>2</td>
</tr>
<tr>
<td>&gt;60</td>
<td>7</td>
</tr>
</tbody>
</table>

Both the median and modal expected waiting time was 20 minutes. It is important to note that the patients who said that they expected the longest wait (>60 minutes) were all follow-up patients suggesting they have previously waited for a long period of time.

Actual waiting times

The actual waiting time does follow the same trend as the expected however many
patients did experience waiting times longer than they expected. The median and modal time to wait was <30 minutes.

<table>
<thead>
<tr>
<th>&lt;10</th>
<th>&lt;20</th>
<th>&lt;30</th>
<th>&lt;40</th>
<th>&lt;50</th>
<th>&gt;60</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>17</td>
<td>18</td>
<td>10</td>
<td>10</td>
<td>8</td>
</tr>
</tbody>
</table>

Whilst only 15 patients expected to wait any time >40 minutes in real practice 28 patients had to wait >40 minutes. During the clinic it was found that whilst the first patient only had to wait 10 minutes to be seen patient as the clinic went on waiting times would steadily increase. The longest waiting time experienced during the survey (75 minutes) was one of the last patients booked for the day.

As can be seen from the chart below, as waiting times increased above 30 minutes the proportion of dissatisfied patients greatly increased.

Should be worth note that whilst 75 patients responded to this part of the questionnaire only 22 (29%) found their wait unacceptable. Whilst 29% of the patients found their wait unacceptable when we look at all of those that waited >40 minutes this proportion rises to 79%.

![Waiting time experienced by patients and the number who found it unacceptable](image)

<table>
<thead>
<tr>
<th>No. Patients</th>
<th>&lt;10</th>
<th>&lt;20</th>
<th>&lt;30</th>
<th>&lt;40</th>
<th>&lt;50</th>
<th>&gt;60</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Patients found this unacceptable</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>8</td>
<td>8</td>
<td>7</td>
</tr>
</tbody>
</table>

Patient Satisfaction

100% of patients found the staff in the Treatment Centre to be helpful. However, 19% did not find the surroundings in the waiting area to be suitably private. Note that 23% of these were new patients. No correlation between age and satisfaction of privacy was found.

When considering the patient satisfaction with the consultation the questionnaires can split into sections regarding ‘target areas’
Target Areas

Information exchange
‘Did you feel the treatments were properly explained?’ 100%
Only one patient felt that their queries were not answered adequately. This same patient was one of two who waited for greater than an hour for the consultation suggesting a trend between waiting times and satisfaction at the end of a consultation.

Interpersonal skills
‘Did the doctor greet and introduce themselves adequately?’ 8 people said no (11%)
It is important to note that all those that felt they weren’t greeted adequately spent less than 15mins in their consultation. Of this group 6 of the patients did not know who they were seen by. Also worth note that of this group 6 patients were indifferent in who they expected to be seen by.

Who were you seen by?

<table>
<thead>
<tr>
<th>Consultant</th>
<th>Registrar</th>
<th>Don’t know</th>
<th>No response</th>
</tr>
</thead>
<tbody>
<tr>
<td>29</td>
<td>23</td>
<td>18</td>
<td>5</td>
</tr>
</tbody>
</table>

Empathy
‘Did the doctor consider your individual needs?’
Only one patient felt that their individual needs were not met. This patient had to wait greater than 60minutes to be seen and had expected to be seen by Mr. Powell. Unfortunately they felt that there treatment was not even discussed with the lead consultant and worth note that their consultation only lasted less than 10minutes.

Quality of Time
‘Did you find this appointment useful?’
‘Did you feel the appointment was necessary?’
Of all attending the outpatients’ clinics, 1 patient found their appointment to be unnecessary. This same patient did not find the consultation to be useful. The individual needs of another patient were not met. These were the only two patients who had to wait for greater than 60 minutes.
Whilst these 2 patients discussed last are a small number of responses to the survey perhaps improvements could be made so that other patients do not experience this dissatisfaction.

Overall Satisfaction Score
Both the median and modal satisfaction score was the highest possible score 5 out of 5.

Patient satisfaction scores (1=low - 5=high)

<table>
<thead>
<tr>
<th>Satisfaction score</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. patients</td>
<td>0</td>
<td>2</td>
<td>8</td>
<td>25</td>
<td>37</td>
</tr>
</tbody>
</table>
Conclusion

Overall satisfaction levels with the clinic were high with 86% of patients scoring it ≥4 out of 5. In fact 100% of the patients found the treatment centre staff to be helpful.

Satisfaction
We identified 4 areas to investigate: information exchange, interpersonal skills, empathy, and quality of time. Each area scored highly but some results suggested possible areas for improvement.

Information exchange seemed to be performed at an excellent standard, with 100% feeling that treatment was explained properly. Interpersonal skills were not reflected as well from the results. 11% of the patients felt they had not been greeted adequately. This is reflected even more dramatically in that 18% of patients either did not know or didn’t respond to the question “who were you seen by?” This highlights a possible need for doctors at the clinic to concentrate on a full more definite introduction to patients in the future.

To look at empathy we asked the question, “Did the doctor consider your individual needs?” This area performed very well with only one patient felt that their needs weren’t considered. Whilst this is a small proportion of the sample, it is important to identify how this patient was let down. This patient had to wait >60minutes to be seen and felt this wait was unacceptable. They had also expected to see Mr. Powell and felt that their treatment had not even been discussed with him. Also this patients consultation had only lasted for <10minutes.

To improve this patient’s experience of the clinic perhaps patients should be better informed prior to the clinic regarding the likelihood of seeing Mr. Powell and also the problematic nature of long waiting times towards the end of the clinic.

In an attempt to measure the quality of time during the consultation we asked the questions, “Did you find this appointment useful?” and, “Did you feel the appointment was necessary?” 2 patients (3%) did not find the appointment useful. One of these patients was also the only patient who felt that the appointment was unnecessary. Negative aspects of these 2 patients experience include both had a consultation time of >5minutes. Also both these patients had very long times in the waiting room. The patient who found appointment both unnecessary and not useful had to wait 2hours to be seen.

Waiting times
This was the main problematic area for the clinic. An observational report was that waiting times would steadily increase as the clinic went on.

When patient’s arrived at the clinic the majority expected to be seen within ≤20minutes. A small cluster reported that they expected to wait >60minutes, it is worth note that these patients were all follow-up patients and were used to the long waiting times that can be experienced towards the end of the clinic.

When comparing the expected waiting times with the actual waiting times there is a marked shortfall in performance. Whilst 82% expected to be seen within 20mins in reality only 40% were. This meant that at least 42% of patients had to wait longer than expected; this number is significant as it is larger than the 34% who found the wait unacceptable. This meant a small number found the additional wait acceptable.

Actual waiting times showed the median and modal waiting time to <30mins. This is important as only 4% of all patients who had to wait ≤30minutes found it unacceptable, whereas those who fell into the longer wait time categories 83% found them unacceptable.
From this it is reasonable to set the target for time in waiting room to ≤30 minutes, this would greatly increase the number of patients satisfied with their wait times.

From the free response it was noted that wait times to see Mr. Powell specifically can be longer than to see one of the other Doctors, to improve the similarity between expectations of wait times and actual wait times perhaps patients should be better informed in their appointment letter about this problem.

Also the waiting room currently operates a pager system for patients who would prefer to wait in the coffee shop or somewhere else in the building, perhaps if this service was better advertised to the longer waiting patient the number finding the wait unacceptable could be reduced.

**Suggestions:**

This project forms the basis for an improvement cycle i.e. the ‘plan’ part of “plan-do-study-act” (PDSA) cycle (2008). We have identified areas in which we need to improve. We hope to increase employee involvement as improvements will affect all staff involved in supplying the healthcare service. We need to ensure that everyone works to the same consistent and appropriate objectives. We believe that the following adjustments to our service are easy to enforce and are able to be objectively measured in a future cycle to determine if changes have increased patient satisfaction.

- Need for doctors at the clinic to give a full, more definite introduction to patients.
- More detailed appointment letter sent to patients. Therefore better inform patients about possible long waiting times, especially to see Mr. Powell.
- If new patients want to see consultant they must arrange an appointment prior to clinic.
- Ask patients to indicate, prior to clinic, whether they would object to seeing a male gynaecologist.
- 30 minute waiting time target
- Better advertise the pager system to patients with long waits.

**Acknowledgements**

Many thanks to all the staff and patients at the Gynaecology outpatient clinic, Treatment Centre, QMC, without your help this project would not be possible.

Special thanks to Mr. Martin Powell for all your help and inspiration

**References**


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Nottingham Treatment Centre (n.d.) *Nations healthcare*. http://circlepartnership.co.uk/our-hospitals/nottingham [accesses 30/01/2011]
Appendices

Development and Testing of a Visit-Specific Patient Satisfaction Questionnaire: The Princess Margaret Hospital Satisfaction With Doctor Questionnaire

<table>
<thead>
<tr>
<th>Factor</th>
<th>Cronbach's Alpha</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information exchange</td>
<td>0.92</td>
<td>I will follow the doctor's advice because I think he/she is absolutely right.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I really felt understood by my doctor.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>After my last visit with my doctor, I feel much better about my concerns.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I understand my illness much better after seeing this doctor.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This doctor was interested in me as a person and not just my illness.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I feel I understand pretty well the doctor's plan for helping me.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>After talking with the doctor, I have a good idea of what changes to expect in my health over the next few weeks and months.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The doctor told me to call back if I had any questions or problems.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I felt the doctor was being honest with me.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The doctor explained the reason why the treatment was recommended for me.</td>
</tr>
<tr>
<td>Interpersonal skills</td>
<td>0.90</td>
<td>The doctor did not take my problems very seriously.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The doctor did not give me all the information I thought I should have been given.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I didn't have a chance to say everything I wanted or to ask all my questions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The doctor was not friendly to me.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I would not recommend this doctor to a friend.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The doctor seemed to brush off my questions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The doctor should have told me more about how to care for my condition.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>It seemed to me that the doctor wasn't really interested in my physical well-being.</td>
</tr>
<tr>
<td>Empathy</td>
<td>0.88</td>
<td>The doctor considered my individual needs when treating my condition.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>There were some things about my visit with the doctor that could have been better.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>It seemed to me that the doctor wasn't really interested in my emotional well-being.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The doctor seemed rushed today.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The doctor should have shown more interest.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>There were aspects of my visit with the doctor that I was not very satisfied with.</td>
</tr>
<tr>
<td>Quality of time</td>
<td>0.88</td>
<td>The doctor went straight to my medical problem without first greeting me.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The doctor used words I did not understand.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>There wasn't enough time to tell the doctor everything I wanted.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I feel the doctor did not spend enough time with me.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I felt the doctor diagnosed by condition without enough information.</td>
</tr>
</tbody>
</table>
Appendix 2

Clinic Evaluation Study

Please circle your answers – about your appointment today

1. What type of appointment are you here for? First time at this clinic/ follow-up

2. How important are your gynaecology problems to you?
   Not important 1 2 3 4 5 Very important

3. Are the Treatment Centre staff you have met helpful? YES / NO

4. Are your surroundings in the waiting area private enough? YES/ NO

5. Would you have preferred to see a female gynaecologist? YES / NO/ INDIFF
   How long are you expecting to wait to see Mr Powell or one of his team?
   Minutes < 10 < 20 < 30 < 40 < 50 < 60

6. Would you accept the presence of a medical student during your appointment? YES / NO/ INDIFF

7. Do you expect to see Mr Powell himself? YES / NO

8. How long overall do you expect to spend with the doctor?
   Minutes < 5 < 10 <15 <20 20+

9. Would you like your partner to be present at the Consultation, if it were possible? YES/ NO/INDIFF

10. Are you aware an internal examination may be carried out? YES/NO/INDIFF

11. Are you expecting an operation to be planned? YES/NO/INDIFF

FOLLOW UP APPT

12. If after surgery… what procedure did you have done? _____________________

13. How happy were you with the outcome of your procedure?
   ☹ 1 2 3 4 5 ☺

Thank you for completing the first questionnaire.
You will be asked to fill in a second one after your appointment.
Clinic Evaluation Study

Questionnaire 2

Please circle your answers

1. How long did you actually wait before being seen?
   Minutes: < 10, < 20, < 30, < 40, < 50, > 60

2. Was this wait time acceptable? YES / NO

3. How long were you with the doctor?
   Minutes: < 5, < 10, < 15, < 20, < 30, 30+

4. Who did you see? Consultant / Registrar /SHO/ trainee GP/Don't know

5. Was your management discussed with Mr Powell YES/NO

6. Who did you expect to see? Consultant / Registrar /SHO/ trainee GP/ INDIFF

7. Would you have preferred to meet Mr Powell? YES/NO/INDIFF

8. Did the doctor greet & introduce themselves adequately? YES/NO

9. Did the doctor consider your individual needs? YES/NO

10. Did the nurses help you to feel relaxed? YES/NO/INDIFF

11. Did you find this appointment useful? YES/NO

12. Did you feel this appointment was necessary? YES/NO

13. Were your queries during the appointment all answered today? YES/NO

14. Did you feel that treatments offered were properly explained? YES/NO

15. Was this what You were expecting or what Mr Powell or his team suggested?
    Please circle correct response
    You / Mr Powell or his team

16. Were you satisfied with your consultation?
    1 2 3 4 5

Do you have any other comments about the clinic?

Thank you for completing the questionnaire
Appendix 3

INTRODUCTION

Dear Patient,

We are a group of medical students currently on placement at the QMC.

We are working with the staff at this clinic to conduct an audit into ladies perception of this gynaecology clinic.

We would be very grateful if you could fill in two questionnaires one before and one after your appointment.

They will be anonymous and our aim is for the Consultant to improve the quality of care to all women attending the gynaecological clinic.

If you do not wish to take part please feel under no obligation to take part.
Exploring patient expectations and satisfaction with gynaecology outpatient services: Patient satisfaction survey

Simon Deery, Ceri Murphy, Anthony Shanahan

Aims
- Collect data representative of the expectations of patients
- Collect data representative of these patients’ satisfaction with the current service
- Identify possible improvements
- Identify necessary changes to services

Background
- Important to offer the best standard of healthcare services.
- NHS services must reflect the needs and preferences of patients, their families and their carer’s
- Patient satisfaction becomes an important measure of quality of healthcare

Guidance for study:
- Patient Charter: waiting times
- Key areas: information exchange, interpersonal skills, empathy and quality of time

Method
- 4 separate gynaecology clinics over a month

Questionnaire design:
- Multiprofessional input
- Previous studies

Data collection
- Patient consent and introduction to study
- Opportunistic sample representative
- 2 part study
  - Part 1: before consultation
  - Part 2: after
Results

- Opportunistic sample at outpatient clinic
  - 89 patients completed ‘questionnaire 1’
  - 72 patients also completed ‘questionnaire 2’
- 77% of patients had attended this clinic previously,
  - 23% were New Patients

Gynaecologist Gender

- Nearly half of the patients were indifferent to the gender of the gynaecologist that they were seen by

Who patients expected to see...

- Nearly two thirds of patients attending the clinic expected to be seen by the consultant

Waiting times - expected

How long do you expect to wait?

Waiting times - experienced

Would you prefer a female gynaecologist?

Would you like your partner to be present if possible?
Patient Satisfaction

100% of patients found the staff in the Treatment Centre to be helpful.

Information Exchange

‘Did you feel the treatments were properly explained?’

100%

Interpersonal skills

‘Did the doctor greet and introduce themselves adequately?’

8 people said NO (11%)

‘Who were you seen by?’

<table>
<thead>
<tr>
<th>Consultant</th>
<th>Registrar</th>
<th>Don’t know</th>
<th>No response</th>
</tr>
</thead>
<tbody>
<tr>
<td>29</td>
<td>23</td>
<td>18</td>
<td>5</td>
</tr>
</tbody>
</table>

Empathy

‘Did the doctor consider your individual needs?’

99%

Quality of Time

‘Did you find this appointment useful?’

‘Did you feel the appointment was necessary?’

99%
CONCLUSION - Improvements

- Need for doctors at the clinic to give a full, more definite introduction to patients
- Better inform patients about possible long waiting times, especially to see consultant
- Possibility of a 30-minute waiting time target
- Better advertise the pager system to patients with long waits
Improving the efficiency of time spent on ward rounds on the medical assessment unit at Manchester Royal Infirmary

Authors
Jason Jacob, Manchester Medical School
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Stefan Atanasov, Manchester Medical School
Lisa Elliott, Lead for service improvement at Manchester Royal Infirmary

Abstract

Introduction and aim
Manchester Royal Infirmary (MRI) is a University teaching hospital providing specialist care to a large population of patients from Manchester and the North West. Each year the Accident & Emergency department at MRI sees around 145,000 patients, of whom a large proportion are admitted to the Medical Assessment Unit (MAU) for observation and treatment while awaiting referral to a specialist service. Healthcare staff at MAU manage a broad range of acute medical conditions and it was recognised that the time efficiency of the ward rounds in this busy clinical environment could be improved. Consequently, two medical students have volunteered to do an objective assessment of the ward rounds at MAU and thus to help improve this service.

Methods of assessment
Firstly, we conducted a brief stakeholder analysis to identify the key supporters to this service improvement project. We then observed two ward rounds delivered by two healthcare teams on both the male and female ward of MAU. We used “spaghetti diagrams” to map the workflow of each ward round and identify any unnecessary steps in the process where time could be saved. Serial recordings were made for time wasted per patient while the main reasons for delays were also noted.

Results
Inefficient steps in the ward round process, where time was wasted, were primarily caused by the location of available computer stations in relation to patient beds. Furthermore, crowding and use of the limited number of computers by other health professionals on the ward caused delays in accessing patient results by the ward round team. Another unnecessary delay resulted from not being able to use the nearest computer because it wasn’t functioning. These results were discussed with the key stakeholders.

Conclusions
Our observations support the need for the installation of a mobile computer unit (MCU) for exclusive use by the ward round team. We believe this could save considerable time and reduce delays. In the future we are planning to conduct a PDSA cycle with the MCU and also a standardised operating procedure (SOP) in place for all ward rounds to assess for any improvements in efficiency.
**Introduction**

Open School Manchester was set up as part of a national movement – Open School England. The primary aims of the group are to raise awareness of quality improvement and to encourage medical students to liaise with QI teams at teaching hospitals in Greater Manchester to actively participate in Quality Improvement Projects.

Central Manchester Foundation Trust (CMFT) is a university teaching hospital providing specialist care to a large population of patients from Manchester and the North West. Each year the Accident & Emergency department at Manchester Royal Infirmary sees around 145,000 patients, of whom a large proportion are admitted to the medical assessment unit (MAU) for observation and treatment while awaiting referral to a specialist service (Central Manchester Foundation Trust website, n.d.). Through the link our group made with the QI team at CMFT we were made aware of concerns regarding the efficiency of ward rounds on the medical assessment unit. The current study was carried out by two medical students in association with key QI individuals and clinical staff working on MAU. The primary aim of this study was to objectively assess the efficiency of the ward rounds and help the team in designing solutions for the problem.

**Methods**

Our project was based on the SUDA cycle of improvement (short for Sense, Understand, Decide and Act). This cycle was developed by the QI lead at MRI to help assess the need for improvement in a particular healthcare service and identify the type of improvement that would need to be implemented in the future by means of a PDSA cycle.

**Sense**

During the first step of SUDA, we spoke to medical and senior nursing staff on MAU to get an understanding of the nature of the problem. Their response was that the ward rounds were sometimes slow and that in this situation potential delays might have been avoided if the layout of the male and female wards at MAU had been different. With the help of Lisa Elliott, service improvement lead, we conducted a brief stakeholder analysis to identify the key supporters and opponents to this service improvement project. Such analysis is necessary for any QI project in order to identify and involve all groups and parties with an interest or concern so that any proposed changes could be implemented successfully (NHS Institute, 2008a).

**Understand**

As medical students, we volunteered to act as independent observers of two ward rounds on both male and female wards of MAU in order to understand and evaluate the potential problems. In order to minimise bias, ward rounds led by medical staff outwith the key stakeholders were observed. We used the “lean model” of quality improvement for our assessment. “Lean thinking” has been used extensively in healthcare to maximise the efficiency of processes such as ward rounds, “patient journeys” in the hospital and use of medical equipment. (Jones & Mitchell, 2006). The “lean model” divides any healthcare process into steps that add value to patient care, which are therefore essential for optimal patient outcomes, and steps that do not add...
value. Non-value-adding steps can be categorized into: overproduction, waiting, transportation, inventory, motion, over-processing and defective units. Any non-value-adding steps represent waste in the process that should be reduced in order to increase the efficiency and streamline the workflow of the process. However, another way of achieving improvement could involve increasing the efficiency of some or all value-adding steps (Fillingham, 2008).

For every patient seen on the ward rounds we recorded the total time spent by the medical team discussing the patient’s current condition and the total time spent reviewing the patient at the bedside. In this context, discussing a patient included the handover of information about their current problem from night shift resident medical officers (RMOs) to consultant and day shift RMOs. Reviewing a patient encompassed the time spent by the medical team directly at the bedside talking to and examining the patient, reviewing their medication and observation charts, and formulating a management plan. Discussion and review of each patient were regarded as steps essential to patient care and therefore recorded as part of the value-adding time. We also documented the type and duration of any delays or interruptions that occurred during either the discussing or reviewing phase for each patient. These delays and interruptions, along with the time taken for staff movement between patients, were recorded as part of the non-value-adding time of the ward rounds.

Finally, we used Spaghetti diagrams to map the movement of medical professionals on each ward round. Spaghetti diagrams are standard QI tools used to show schematically the movement of a team within a particular work area in order to identify inefficient room layouts that may require re-organisation (NHS Institute, 2008b). Before starting our observations, we produced our own sketch of the layout of each ward on MAU. We mapped on these sketches the path taken by the medical team during each ward round. Thus, we were able to record schematically the extra steps taken by the team during any interruptions that occurred.

Decide and Act
Following our assessment, we organised a multi-disciplinary meeting with members of the medical team and key stakeholders on MAU, where we presented our results and initiated discussion on the changes that need to be implemented to improve the efficiency of ward rounds. This represented the final step in our SUDA cycle.

Results
In total, two ward rounds were observed in order to gain an understanding of the problem. As the second ward round was incomplete and only four patients in total were observed, these results have not been included here.

In total, the ward round lasted 156.25 minutes approximately. Of this, the total non-value-adding time constituted 32.25 minutes (20.64%). Time spent by medical staff on unnecessary movement between patients constituted 10.4% of the total ward round time and was the most significant contributor to the non-value-adding time.

It was important for us to identify all unnecessary delays and interruptions for each patient seen, since this represented the majority of non-value-adding time in the ward
rounds. Spaghetti diagrams (Fig. 1) generated by mapping the movements of the ward round team were used to visually identify any unnecessary movements.

**Figure 1**—Spaghetti diagrams of the early morning ward round - female (above) and male wards (below).

In addition to spaghetti diagrams, time recordings were made to quantify the value-adding and non-value-adding components of the total time spent on each patient. The results are shown in table 1.
Figure 2 Summary of ward round time recordings.

<table>
<thead>
<tr>
<th>Patient number</th>
<th>Value-adding time (mins)</th>
<th>Motion between patients (mins)</th>
<th>Other waste (mins)</th>
<th>Reason for waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>0</td>
<td>5</td>
<td>Waiting - for staff to arrive.</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>1</td>
<td>1</td>
<td>Searching – no drug chart at bedside.</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>0.5</td>
<td>0.5</td>
<td>Searching - no drug chart at bedside.</td>
</tr>
<tr>
<td>4</td>
<td>8.5</td>
<td>0.5</td>
<td>0</td>
<td>Searching – lack of equipment.</td>
</tr>
<tr>
<td>5</td>
<td>13.5</td>
<td>0.75</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>4.5</td>
<td>0.5</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>6.5</td>
<td>1.0</td>
<td>1</td>
<td>Waiting – to check if correct patient on the list.</td>
</tr>
<tr>
<td>8</td>
<td>6.5</td>
<td>0.5</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>5.5</td>
<td>4.5</td>
<td>2.5</td>
<td>Motion to computer station to review missed X-ray report.</td>
</tr>
<tr>
<td>10</td>
<td>15.5</td>
<td>2.5</td>
<td>1</td>
<td>Waiting – for computer station availability to check results.</td>
</tr>
<tr>
<td>11</td>
<td>7.5</td>
<td>1</td>
<td>0.5</td>
<td>Searching – no observation chart at patient bedside.</td>
</tr>
<tr>
<td>12</td>
<td>6.5</td>
<td>0.5</td>
<td>4</td>
<td>Waiting – discussion between consultants.</td>
</tr>
<tr>
<td>13</td>
<td>11.5</td>
<td>0.5</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>11.5</td>
<td>1.5</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>9</td>
<td>1 min</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>124.5</strong></td>
<td><strong>16.25</strong></td>
<td><strong>16</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table 1 – table showing the value-adding and non-value-adding time recorded for each patient seen on the early morning ward round.
Discussion

As evidenced by the time recordings and spaghetti diagrams, the most significant non-value-adding element in the early morning ward round was the unnecessary motion of medical staff between patients, which also included access to the computer workstations. Similarly, our results of the second ward round (data not shown, as we didn’t observe it from the start) also support this trend and the need for reducing the time spent in accessing the computer workstations. Considering this, we feel that introducing a mobile computer unit (MCU) for exclusive use by the ward round team would significantly improve the efficiency of time spent on future ward rounds. Studies have shown that MCUs have the potential to improve the efficiency of care given on the wards by allowing smooth uninterrupted delivery of care. MCUs allow easier access to patient lab results, which could lead to faster decision-making and recording of patient management plan directly at the bedside without wasting time in unnecessary motion (Henrique et al, 2005 and Bardram et al, 2003).

As our observation was only limited to two ward rounds, it is not possible to predict whether these results are representative of all ward rounds on MAU. Despite this limitation, we believe that our preliminary observations have identified correctly the key issues with workflow that require improvement. Prior to our study, plans had already been made by the key stakeholders to pilot the use of a mobile computer unit (MCU) on MAU. Our findings further support their decision and we believe that introducing a MCU would reduce unnecessary staff movement on future ward rounds.

Table 2: Standardised operating procedure (SOP) for use on future ward rounds in MAU. SOP could avoid any other potential wastes within the value-adding process of discussing and reviewing each patient during the ward round.
Another limitation of our study was the assumption that all the steps within the value-adding time we recorded (i.e. the time spent discussing and reviewing each patient) were absolutely necessary to patient care. It was logistically not possible for two student observers to analyse all components of the value-adding process and identify all wastes in addition to the time spent in unnecessary motion.

We discussed this limitation at our meeting with the stakeholders and this led to the medical team developing a standardised operating procedure (SOP) for use at every ward round on MAU (Table 2). We are now going to use SOP to complete further observations of future ward rounds in order to identify any additional non-value-adding steps within the direct patient contact time. This would allow us to test and refine the standardised operating procedure before implementing it as an improvement. In addition, by developing such a tool for the before and after observations of ward rounds, repeatability can be achieved and so observer bias can be reduced.

Conclusions
Our observations support the need for installing a mobile computer unit (MCU) for exclusive use by the ward round team and to develop a standardised operating procedure (SOP) for use during all ward rounds. In the future we are planning to conduct a PDSA cycle with both MCU and SOP in place to assess any improvements in ward round efficiency.

References
Central Manchester Foundation Trust website (n.d.) www.cmft.nhs.uk [accessed on 02/03/2011]
Primary aim to raise awareness and increase student involvement in QI

Links with QI department in CMFT

Context of Problem

A&E sees 145,000 patients of whom a majority are admitted to MAU for further management.

Through our link with the QI lead at CMFT, we were made aware of concerns regarding the efficiency of ward rounds on MAU.

Assessment of problem

Observational study

To objectively assess the efficiency of ward rounds on MAU and help the team in designing solutions for the problem.

SUDA cycle

- developed by QI leads at CMFT
- to assess the need for improvement in a healthcare setting

SUDA – Sense

Talking to medical staff

Conducting Stakeholder Analysis with the QI lead

<table>
<thead>
<tr>
<th>Low impact</th>
<th>High impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ward Staff</td>
<td>Patients</td>
</tr>
<tr>
<td>Secretaries</td>
<td>FY doctors</td>
</tr>
<tr>
<td>Auxiliary Nurses</td>
<td>ward managers</td>
</tr>
</tbody>
</table>

SUDA – Understanding

Directly observing ward rounds:

- As independent observers
- Ward round team not directly involved with the project

Methods:

- Based on “Lean thinking in healthcare”
- Measuring time taken per patient: Value-adding & non-value-adding time
- Mapping out movement of the wardround team to visually identify unnecessary steps
Decide and Act – Discussing results with the MDT team and moving forward with an action plan.

Results

- Value-adding
  - Discussing patient
  - Review of patient

- Non-Value-adding
  - Waiting at computer workstation
  - Searching for results, drug charts, obs charts, equipment
  - Unnecessary motions between patients.

Study limitations:
- Two ward rounds observed – data from larger sample of ward rounds required
- Observations focussed on non-value-adding time only
- Need to assess for any unnecessary steps within the value-adding time

A standardised operating procedure was developed to eliminate potential wastes within the direct patient contact time (discussion and review)

MDT meeting:
- Presentation of results
- Observations support the need for a mobile computer unit

Future PDSA cycles required to refine the SOP and assess its impact on ward round efficiency.

The impact of a mobile computer unit will also need to be assessed using a PDSA cycle.
Lessons Learnt

- Teamwork and collaboration are central to quality improvement work.
- It was challenging to accommodate this project into our busy timetable, but satisfying to make a positive change.
- Time allocated for QI work in undergraduate curriculum?
- Medical students are an untapped resource who bring new and fresh perspectives on QI work.

References


Thank you!
Cardiac surgery, SIRS and post-operative outcomes: an audit of the role of Statins and Cardiopulmonary Bypass

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Kelly Jacobs, University of Nottingham.

Supervisors
Dr Vincent Wilson, Trent Cardiac Centre, Nottingham City Hospital.
Dr Matloob Shajar, Trent Cardiac Centre, Nottingham City Hospital.

Abstract

Background:
Statins used for their cholesterol-lowering properties may possess a range of pleiotropic effects such as anti-inflammatory. Cardiac surgery presents a significant risk of post-operative complication including systemic inflammatory response syndrome (SIRS), sepsis and death. Recent studies suggest that statins may provide protection against inflammation and infection for patients undergoing coronary artery bypass grafting.

Objectives:
To determine if statin therapy prior to surgery is associated with improved patient outcomes in the form of reduced incidence of SIRS, sepsis and reduced thirty day mortality rate.

Method:
261 patient records were retrospectively analysed for those undergoing coronary artery bypass grafting at Trent Cardiac Centre, City Hospital Nottingham between January 2008 and December 2008. Demographics, pre-operative scoring measures, previous drug and medical histories, operation details and ICU admission data were compiled into a database via a proforma.

Primary outcomes analysed were incidence of thirty-day mortality, SIRS and modified SIRS. Secondary outcomes analysed were incidence of infection, inotrope and ventilation support and length of ICU/hospital admission.

Results:
The statin cohort made up 90% (235) of the population. The cohorts were evenly matched with the statin cohort presenting significantly less COPD sufferers (p<0.05) and significantly more patients taking additional cardiovascular drugs (p<0.05). No significant differences in primary outcomes were observed. Incidence of infection and median length of hospitalisation were significantly reduced (p<0.05) in the statin cohort.

Conclusions:
No significant difference between the statin and non-statin cohort for the thirty day mortality or incidence of SIRS/modified SIRS was observed. The statin cohort showed improved post-operative recovery with reduced length of inotrope/ventilation support required. Furthermore results demonstrated a significantly reduced length of hospital stay and incidence of sepsis, which may be attributed to statin therapy. Statin protection against post-operative complications should be explored further before their prophylactic use prior to surgery can be advocated.
Ischaemic heart disease (IHD) is the leading cause of both morbidity and mortality for adults in the western world with an estimated 1.4 million patients in the US admitted to hospital each year (Gerstenblith, 2005) with a standardised mortality rate of around 200 per 100,000 population (Kumar and Clark, 2005).

IHD occurs when the myocardial oxygen demand is not met by supply, this can occur in obstructive coronary artery disease (CAD) due to a mechanical blockage in the coronary artery/arteries providing insufficient blood flow to the myocardium. IHD clinically presents as Angina Pectoris, or acutely and often fatally as a myocardial infarction. CAD in the form of coronary atherosclerosis is responsible for the bulk of IHD.

Coronary artery bypass grafting (CABG) is carried out for two main indications: improved symptom control and improved survival of patients with IHD. Improved symptom control is required when patients remain symptomatic on normal pharmacological treatment regimens and are not suitable for percutaneous transluminal coronary angioplasty (PTCA). The graft can either be of venous or arterial origin and the most commonly grafted are the internal mammary artery or one of the saphenous veins; these vessels are attached proximally to the aorta and then to the affected coronary artery distal to the occlusion (Phillips & Fortunato, 1978). Due to increased patency at 10 years with an arterial graft (90 vs. 60%) the left internal mammary to the left anterior descending artery is the commonest form of CABG performed worldwide, with any additional occluded coronary arteries being bypassed with saphenous or radial grafts (Goodwin and Dunning, 2004).

CABG can be performed either using traditional cardiopulmonary bypass (CPB) or via new innovative ‘off-pump’ surgical techniques (OPCAB). The first cardiopulmonary bypass (CPB) procedure was performed in 1953 in the USA (Gibbon, 1954). CPB can be described as an extracorporeal artificial heart and lung unit, taking over the pumping action of the heart and the gas-exchange function of the lungs (Millner & Treasure, 1995). OPCAB is classed as a ‘beating heart’ procedure – the heart continues to provide the systemic blood flow; only the area required to be operated on is immobilised. The main challenge of operating on a beating heart is the need to stabilise the operating field; initially this was approached pharmacologically using drugs to induce bradycardia, such as beta-blockers (β-blockers), adenosine and calcium antagonists; however this bradycardia lead to increased stroke volume and so possibly even greater movement in the operative field. Later, mechanical apparatus was introduced and now many stabilisers are available; the most widely used being the Medtronic “Octopus” system. It acts using suction force around the desired area to provide stability, allowing the bypass graft to take place (Kappert et al., 1999). The procedure, which initially focused on patients with easily accessible single or two-vessel disease has now expanded to treat elderly patients with less accessible multi-vessel disease and significant comorbidities (NICE, 2004).

The benefits of OPCAB over traditional on-pump CPB procedure is still a source of controversy. The logic behind OPCAB is that as it is less invasive, as well as the blood remaining within the systemic circulation and not into an extracorporeal circuit,
this would lead to less damage being done to the blood and improved post-operative outcomes. This hypothesis has been supported in some studies, suggesting that OPCAB procedures reduce length of hospitalisation, intraoperative and pulmonary complications, and receive fewer blood products (Berson et al., 2004). A study by Brasil et al., in 1998 compared ten CPB against ten OPCAB patients following cardiac surgery and showed the OPCAB cohort to require significantly less inotropic and ventilation support, as well as reduced heart rates and hypertension attributed to the OPCAB cohort having significantly reduced serum TNF-α. An alternative study compared directly the outcomes from both types of surgery and determined that in practice there were no significant differences in post-operative outcomes, cost-effectiveness and length of hospitalisation (Bull et al., 2001). These results were also observed in a study by Groeneveld et al., in 2007, which claimed the differences in post-operative outcomes were independent of the type of surgery performed, and were actually due to atelectasis – alveolar collapse due to fluid consolidation.

A lot of research is currently on-going into statin therapy and the utilisation of their pleiotropic effects. Statins are well known and successful in their lipid-lowering capabilities. Since their introduction, statins have proved themselves as the most widely used class of drugs for treating hypercholesterolaemia. It has been shown that elderly high risk patients, those with coronary artery disease and those undergoing major surgery can all benefit from statin therapy (Kruger et al., 2006). The possible prophylactic use of statins has been the focus of numerous large trials such as the Myocardial Ischemia Reduction with Acute Cholesterol Lowering (MIRACL) trial, which showed a fast reduction in ischaemic events in patients with acute coronary syndrome after statin therapy (Schwartz et al., 2001). The ASTEROID trial in 2006 showed the regression of atherosclerotic plaques in response to administration of high dose rosuvastatin, and the JUPITER trial in 2010 investigated and supported the use of statins in healthy patients with normal cholesterol levels (Ohsfeldt et al., 2010).

Systemic inflammatory response syndrome (SIRS) is the physiological response of the host to the systemic activation of human inflammation, occurring as a result of severe insult such as trauma (surgery). Diagnosis is made if 2 or more of the following criteria are present (Baue et al., 2000):

- **Core body temperature:** > 38°C or < 36°C
- **Heart rate:** Tachycardic – > 90 beats per minute
- **Respiratory rate:** > 20 breaths per minute
- **White blood cell count:** > 12,000 cells/mm³ or < 4,000 cells/mm³

SIRS has been linked to circulatory instability and organ dysfunction following open-heart operations, such as CABG (Cremer, 1996). Sepsis is the systemic inflammatory response to a known, severe infection (Bone et al., 1992). Severe sepsis is sepsis associated with hypoperfusion, hypotension and organ dysfunction, often clinically presenting as lactic acidosis, oliguria and altered mental status (Baue et al., 2000). Almog noticed that 18% patients admitted to his hospital were taking statins yet only 3% of patients in ICU, due to severe sepsis, were also on statin therapy. These findings prompted him to hypothesise that statins are able to affect the diverse process of sepsis due to their widespread anti-inflammatory effects which are independent of their lipid lowering capabilities (Almog, 2003, Almog et al., 2004). A population based cohort analysis on 5353 patients with bacteraemia seconded this
belief as no benefit was seen in patients on non-statin lipid lowering drugs (Hackam et al., 2006). The potential use of statins to reduce incidence of SIRS and sepsis post-operatively therefore requires further investigation to understand the role they can play in improving patient care.

**Objective**

To investigate whether pre-operative statin usage or avoidance of cardiopulmonary bypass (CPB) has protective effects with regards to an inflammatory response and is therefore associated with a reduction in 30 day mortality after a CABG.

**Methodology**

An audit was performed consisting of 261 patient records which were retrospectively analysed for patients undergoing coronary artery bypass grafting at Trent Cardiac Centre, City Hospital Nottingham between January and December 2008. Baseline demographics, pre-operative scoring measures, previous drug and medical histories, operation details and ICU admission data were compiled into a database via a proforma. Primary outcomes analysed were incidence of thirty-day mortality, SIRS and modified SIRS. Secondary outcomes analysed were incidence of infection, inotrope and ventilation support required and length of ICU/hospital admission.

**Results**

The necessary information for analysis was recorded for 261 patients, for the analysis the data was broken into two cohorts:

- i. Comparison of statin and non-statin cohorts.
- ii. Comparison of traditional CPB and OPCAB patients undergoing isolated CABG procedures

**Overall population analysis:**

Of the 261 patients who underwent a CABG procedure 129 (49.4%) were placed on CPB. The average overall age was 70 (SD 10.1) and 77.8% of these patients were male. The most prevalent co-morbidity was predictably ischemic heart disease (98.5% of patients), followed by non-insulin dependent diabetes (15.3% of patients). The most commonly prescribed medication was a statin (90.0% patients) followed by β-blockers (69.7%) and ACE-Inhibitors (53.6%).

**Statin comparison:** Demographic comparison of the statin and non-statin cohorts showed similar age and gender distributions. Those not on statins were more likely to have two or more co-morbidities, especially COPD, than those in the statin cohort (p<0.05). Both cohorts had comparable logistic and additive pre-operative EuroSCOREs however the statin cohort was more likely to be prescribed additional cardiovascular drugs.
Table 1. Primary and secondary outcomes for statin and non-statin cohorts. Significant results are denoted by an (*) within the p-value column. Average length of ventilation, average cumulative inotropic support and median length of ICU/hospital stay are all non-parametric and so calculated as median and interquartile range.

<table>
<thead>
<tr>
<th>Primary outcomes</th>
<th>Statins (n=235)</th>
<th>Non-statin (n=26)</th>
<th>P value</th>
<th>Statistical test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survival to 30 days or until discharge (%)</td>
<td>235 (100)</td>
<td>26 (100)</td>
<td>1.000</td>
<td>Fishers exact</td>
</tr>
<tr>
<td>SIRS (%)</td>
<td>177 (75.3)</td>
<td>21 (80.8)</td>
<td>0.538</td>
<td>Chi-squared test</td>
</tr>
<tr>
<td>Modified SIRS (%)</td>
<td>100 (42.6)</td>
<td>9 (34.6)</td>
<td>0.436</td>
<td>Chi-squared test</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Secondary outcomes</th>
<th>Statins (n=235)</th>
<th>Non-statin (n=26)</th>
<th>P value</th>
<th>Statistical test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient ventilated? (%)</td>
<td>203 (86.4)</td>
<td>20 (76.9)</td>
<td>0.194</td>
<td>Chi-squared test</td>
</tr>
<tr>
<td>Average length of ventilation, hours (IQR)</td>
<td>6 (4.5)</td>
<td>5 (6.5)</td>
<td>0.896</td>
<td>Mann-Whitney U</td>
</tr>
<tr>
<td>Ventilated for 12 hours and over (%)</td>
<td>36 (15.3)</td>
<td>4 (15.4)</td>
<td>0.776</td>
<td>Fishers exact</td>
</tr>
<tr>
<td>Inotropic use? (%)</td>
<td>108 (46.0)</td>
<td>13 (50.0)</td>
<td>0.695</td>
<td>Chi-squared test</td>
</tr>
<tr>
<td>Average cumulative length of inotropic support, hours (IQR)</td>
<td>35 (41.5)</td>
<td>50 (74.25)</td>
<td>0.362</td>
<td>Mann-Whitney U</td>
</tr>
<tr>
<td>Patients with infection (%)</td>
<td>22 (9.4)</td>
<td>6 (23.1)</td>
<td>0.032*</td>
<td>Chi-squared test</td>
</tr>
<tr>
<td>Median length of ICU stay, days (IQR)</td>
<td>4 (2)</td>
<td>4 (2.5)</td>
<td>0.543</td>
<td>Mann-Whitney U</td>
</tr>
<tr>
<td>Median length of hospital stay, days (IQR)</td>
<td>8 (5)</td>
<td>10 (5.25)</td>
<td>0.049*</td>
<td>Mann-Whitney U</td>
</tr>
</tbody>
</table>

The primary outcomes in table 1 do not show any significant results. Survival to 30 days/discharge for the entire cohort was 100%. In terms of incidence of SIRS the non-statin cohort had a higher rate by 5.5% yet this did not produce a significant result. The secondary outcomes in table 1 highlighted some key differences. The statin cohort had approximately half the incidence of infection than the non-statin cohort representing a significantly lower incidence of infection. The length of CICU stay for both cohorts was 4 days however the statin cohort exhibited a significantly lower median length of hospital stay by 2 days. In terms of immediate post-operative support, there was no significant difference between the two cohorts.

Cardiopulmonary bypass comparison: In terms of demographics there was no significant difference between the two cohorts with respect to age, sex, or proportion of emergency procedures. Both cohorts had similar past medical histories but those in the OPCAB cohort had significantly higher additive and logistic EuroSCOREs and greater number of co-morbidities than the CPB cohort.
Table 2. Primary and secondary outcomes for CPB and OPCAB cohorts. Significant results are denoted by an (*) within the p-value column. Average length of ventilation and average cumulative inotropic support are non-parametric and calculated as median and interquartile range.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>CPB (n=105)</th>
<th>OPCAB (n=128)</th>
<th>P value</th>
<th>Statistical test</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary outcomes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Survival to 30 days or until discharge (%)</td>
<td>105 (100)</td>
<td>128 (100)</td>
<td>1.000</td>
<td>Fishers exact</td>
</tr>
<tr>
<td>SIRS (%)</td>
<td>78 (74.3)</td>
<td>97 (75.8)</td>
<td>0.793</td>
<td>Chi-squared test</td>
</tr>
<tr>
<td>Modified SIRS (%)</td>
<td>38 (36.2)</td>
<td>60 (46.9)</td>
<td>0.100</td>
<td>Chi-squared test</td>
</tr>
<tr>
<td><strong>Secondary outcomes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient ventilated? (%)</td>
<td>101 (96.2)</td>
<td>102 (79.7)</td>
<td>&lt;0.001*</td>
<td>Fishers exact</td>
</tr>
<tr>
<td>Average length of ventilation, hours (IQR)</td>
<td>6 (5)</td>
<td>4 (3)</td>
<td>&lt;0.001*</td>
<td>Mann-Whitney U</td>
</tr>
<tr>
<td>Inotropic use? (%)</td>
<td>54 (51.4)</td>
<td>46 (35.9)</td>
<td>0.018*</td>
<td>Chi-squared test</td>
</tr>
<tr>
<td>Average cumulative length of inotropic support, hours (IQR)</td>
<td>47 (67)</td>
<td>19 (40.5)</td>
<td>&lt;0.001*</td>
<td>Mann-Whitney U</td>
</tr>
<tr>
<td>Patients with infection (%)</td>
<td>13 (12.4)</td>
<td>11 (8.60)</td>
<td>0.344</td>
<td>Chi-squared test</td>
</tr>
<tr>
<td>Length of ICU stay; 3 days or more (%)</td>
<td>93 (89)</td>
<td>86 (67.2)</td>
<td>&lt;0.001*</td>
<td>Chi-squared test</td>
</tr>
<tr>
<td>Length of hospital stay; 7 days or more (%)</td>
<td>92 (88)</td>
<td>104 (81.3)</td>
<td>0.186</td>
<td>Chi-squared test</td>
</tr>
</tbody>
</table>

Table 2 highlighted several significant differences between CPB and OPCAB cohorts. There was no significant difference in the 30-day mortality rate or incidence of SIRS between the cohorts. The secondary outcomes presented significantly better post-operative outcomes for the OPCAB cohort. 96.2% of CPB patients were ventilated in CICU compared to 79.7% of OPCAB patients, representing a significant reduction. Of those patients who were ventilated in CICU, the average length of ventilation for OPCAB patients was significantly lower than CPB. Inotropic support showed similar results, in that only 35.9% of OPCAB patients required inotropic support in CICU compared to 51.4% of CPB patients, showing a significant reduction. Of those patients who did receive inotropic support, OPCAB patients required on average 19 hours (cumulative), compared to 47 hours for CPB patients presenting a significant difference. A significantly lower proportion of OPCAB patients were in CICU for 3 days or more as compared with the CPB cohort. No significant incidence was noted for incidence of infection or overall length of hospital admission.

**Discussion**

In summary audit data showed no change in mortality rates between the statin and the non-statin cohort. Patients in the statin cohort had a significantly reduced incidence of infection supporting findings from previous studies showing statins to reduce the incidence of sepsis following cardiac surgery (Almog et al., 2004). Statin
use was also associated with a reduction in hospital stay, suggesting that statins have the ability to promote recovery post-operatively, despite the lack of evidence from this audit to suggest that statins have an effect on SIRS.

There was shown to be no alteration in mortality rates at 30 days for either cohort yet those undergoing CPB were significantly more likely to require ventilation and inotrope support post-operatively, in both cases required for longer periods, replicating the results of a study by Brasil et al., in 1998. Additionally the OPCAB cohort had a significantly shorter ICU stay than the CPB cohort despite the fact that the OPCAB cohorts had significantly greater additive and logistic EuroSCOREs suggestive of worsened post-operative outcomes. Both cohorts were comparable with respect to SIRS and modified SIRS diagnoses. This audit suggests that whilst OPCAB surgery does appear to improve recovery post-operatively it does not appear that it is providing this benefit through modification or attenuation of the inflammatory response and SIRS.

The results from this audit suggest that statins could play a vital role in improving patient outcomes for those undergoing CABG procedures. The reduced incidence of infection and sepsis, coupled with a reduced length of hospital admission, suggests that the pleiotropic effects of statins may be exploited beyond that of their lipid-lowering capabilities in clinical practice. The development of off-pump coronary artery bypass grafting is in-line with the increasing demand for minimally invasive surgical procedures, offering a viable alternative to traditional cardiopulmonary bypass. In doing so, this audit has shown that OPCAB can be associated with greatly improved post-operative recovery, highlighted by the significantly reduced CICU support administered, advocating its increasing use over extracorporeal methods.

References


Phillips N and Fortunato RN (1978) *Berry & Kohn's Introduction to Operating Room Technique*, USA,McGraw-Hill

CARDIAC SURGERY, SIRS AND POST-OPERATIVE OUTCOMES: AN AUDIT OF THE ROLE OF STATINS AND CARDIOPULMONARY BYPASS

Ross Kenny and Kelly Jacobs, University of Nottingham

Objectives
- Investigate the use of statins on post-operative outcomes for CABG patients
- Compare the outcomes after bypass grafting using traditional CPB against off-pump procedures

Ischaemic Heart Disease (IHD)
- IHD occurs when the myocardial oxygen demand is not met by supply
- Commonly caused by atherosclerotic disease
- Clinically presents as angina pectoris, or in more severe and acute cases as myocardial infarction

Ischaemic Heart Disease (IHD)
- One of the leading causes of mortality and morbidity in the western world
- Standardised mortality rate of 200 per 100,000 population

Background

Coronary Artery Bypass Grafting (CABG)
- CABG procedure provides alternative flow of blood to a previously ischaemic portion of myocardium
- Grafted vessels are harvested from alternate sites; commonly left internal mammary artery, radial artery or saphenous veins
Coronary Artery Bypass Grafting (CABG)

Main indications are:
- Improved symptom control (following standard pharmacological treatments)
- Improved survival for patients with IHD

Cardiopulmonary Bypass (CPB)

- First performed in 1953 in the USA
- Systemic blood flow directed into an extracorporeal circuit to allow:
  - adequate oxygenation of the patient
  - adequate systemic blood flow
  - control of body temperature
  - blood to be salvaged and if necessary re-transfused safely
  - the heart field to be stabilised enough to perform surgical grafting

Cardiopulmonary Bypass (CPB)

Off-pump coronary artery bypass (OPCAB)

- Specific area of myocardium stabilised mechanically
- Most commonly used stabiliser is the Medtronic Octopus stabiliser

Medtronic Octopus stabiliser

Off-pump coronary artery bypass (OPCAB)

- Blood remains in the systemic circulation:
  - Heart continues to provide cardiac output
  - Lungs continue to provide adequate oxygenation and removal of carbon dioxide
Off-pump coronary artery bypass (OPCAB)

- Proposed benefits of OPCAB:
  - Less invasive than CPB
  - Less damage occurring to blood as it remains within the systemic circulation
  - Improved post-operative recovery
  - Source of controversy

Statins

- HMG-CoA reductase inhibitors
- First-line treatment for Hypercholesterolaemia
- Well tolerated and proven to be clinically effective
- Main side effects include muscle pain/weakness

Statins

- Research on-going into statins pleiotropic effects
- Specifically for surgery, their possible anti-inflammatory effects could be utilised
- ASTEROID trial (2006) showed atherosclerotic plaque regression
- JUPITER trial (2010) supported prophylactic use of statins in healthy patients with normal cholesterol levels

SIRS and Sepsis

- Systemic inflammatory response syndrome (SIRS) criteria (2 or more of):
  - Core body temperature: > 38°C or < 36°C
  - Heart rate: Tachycardic – > 90 beats per minute
  - Respiratory rate: > 20 breaths per minute
  - White blood cell count: > 12,000 cells/mm³ or < 4,000 cells/mm³

SIRS and Sepsis

- Sepsis is SIRS due a known infective agent
- SIRS and sepsis are common complications following invasive surgery such as CABG
- Pleiotropic effects of statins could reduce the incidence of these complications

Methodology
Methodology

- Audit performed on 261 patients from Trent Cardiac Centre, City Hospital Nottingham admitted between January and December 2008
- Retrospectively analysed for patients undergoing coronary artery bypass grafting

Demographic analysis

- 129 patients underwent CPB CABG, 132 underwent OPCAB procedure
- 235 patients were prescribed statin therapy compared with 26 non-statin patients
- Average age of patient: 70.0 years
- 77.8% patients of male gender
- Ischaemic heart disease and non-insulin dependent diabetes most common co-morbidities
- Statins, ACE-Inhibitors and Beta Blockers most common cardiovascular therapeutics prescribed

<table>
<thead>
<tr>
<th>Primary outcomes</th>
<th>Statins (n=235)</th>
<th>Non-statin (n=26)</th>
<th>P value</th>
<th>Statistical test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survival to 30 days or until discharge (%)</td>
<td>235 (100)</td>
<td>26 (100)</td>
<td>1.000</td>
<td>Fisher’s exact</td>
</tr>
<tr>
<td>SIRS (%)</td>
<td>177 (75.3)</td>
<td>21 (80.8)</td>
<td>0.538</td>
<td>Chi-squared test</td>
</tr>
<tr>
<td>Modified SIRS (%)</td>
<td>120 (42.6)</td>
<td>9 (34.6)</td>
<td>0.436</td>
<td>Chi-squared test</td>
</tr>
<tr>
<td>Secondary outcomes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outcome measured (%)</td>
<td>203 (86.4)</td>
<td>20 (76.9)</td>
<td>0.194</td>
<td>Chi-squared test</td>
</tr>
<tr>
<td>Average length of ventilation, hours (IQR)</td>
<td>6 (4.5)</td>
<td>5 (6.5)</td>
<td>0.896</td>
<td>Mann-Whitney U</td>
</tr>
<tr>
<td>Ventilation for 12 hours or more (%)</td>
<td>36 (15.3)</td>
<td>4 (15.4)</td>
<td>0.776</td>
<td>Fisher’s exact</td>
</tr>
<tr>
<td>Inotropic (%)</td>
<td>108 (46.0)</td>
<td>13 (50.0)</td>
<td>0.695</td>
<td>Chi-squared test</td>
</tr>
<tr>
<td>Average cumulative length of inotropic support, hours (IQR)</td>
<td>35 (41.3)</td>
<td>50 (74.25)</td>
<td>0.362</td>
<td>Mann-Whitney U</td>
</tr>
<tr>
<td>Patients with infection (%)</td>
<td>22 (9.4)</td>
<td>6 (23.1)</td>
<td>0.032*</td>
<td>Chi-squared test</td>
</tr>
<tr>
<td>Median length of ICU stay, days (IQR)</td>
<td>4 (2)</td>
<td>4 (2.5)</td>
<td>0.543</td>
<td>Mann-Whitney U</td>
</tr>
<tr>
<td>Median length of hospital stay, days (IQR)</td>
<td>8 (3)</td>
<td>10 (5.33)</td>
<td>0.049*</td>
<td>Mann-Whitney U</td>
</tr>
</tbody>
</table>

Results

1. Comparison of statin and non-statin cohorts
2. Comparison of traditional CPB and OPCAB patients undergoing isolated CABG procedures

1. Statin versus non-statin comparison
### 2. CPB versus OPCAB comparison

<table>
<thead>
<tr>
<th>Primary outcomes</th>
<th>CPB (n=105)</th>
<th>OPCAB (n=128)</th>
<th>P value</th>
<th>Statistical test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survival to 30 days or until discharge (%)</td>
<td>105 (100)</td>
<td>128 (100)</td>
<td>1.000</td>
<td>Fishers exact test</td>
</tr>
<tr>
<td>SIRS (%)</td>
<td>78 (74.3)</td>
<td>97 (75.8)</td>
<td>0.793</td>
<td>Chi-squared test</td>
</tr>
<tr>
<td>Modified SIRS (%)</td>
<td>38 (36.2)</td>
<td>60 (46.9)</td>
<td>0.100</td>
<td>Chi-squared test</td>
</tr>
<tr>
<td><strong>Secondary outcomes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Had postventilation (%)</td>
<td>101 (96.2)</td>
<td>103 (79.7)</td>
<td>&lt;0.001*</td>
<td>Fishers exact test</td>
</tr>
<tr>
<td>Average length of ventilation, hours (IQR)</td>
<td>6 (3)</td>
<td>4 (3)</td>
<td>&lt;0.001*</td>
<td>Mann-Whitney U</td>
</tr>
<tr>
<td>Inotropic use (%)</td>
<td>54 (51.4)</td>
<td>46 (35.9)</td>
<td>0.018*</td>
<td>Chi-squared test</td>
</tr>
<tr>
<td>Average cumulative length of inotropic support, hours (IQR)</td>
<td>47 (28)</td>
<td>19 (40.5)</td>
<td>&lt;0.001*</td>
<td>Mann-Whitney U</td>
</tr>
<tr>
<td>Patients with infection (%)</td>
<td>13 (12.4)</td>
<td>11 (8.60)</td>
<td>0.344</td>
<td>Chi-squared test</td>
</tr>
<tr>
<td>Length of ICU stay ≥ 3 days or more (%)</td>
<td>93 (89)</td>
<td>86 (67.2)</td>
<td>&lt;0.001*</td>
<td>Chi-squared test</td>
</tr>
<tr>
<td>Length of hospital stay ≥ 7 days or more (%)</td>
<td>92 (86)</td>
<td>104 (81.3)</td>
<td>0.186</td>
<td>Chi-squared test</td>
</tr>
</tbody>
</table>

### Discussion

- **Statin comparison:**
  - No change in mortality rate or incidence of SIRS between the statin and the non-statin cohort
  - Patients in the statin cohort had a significantly reduced incidence of infection supporting findings from previous studies
  - Statin use was also associated with a reduction in hospital stay

### Conclusion

- The results from this audit suggest that statins could play a vital role in improving patient outcomes for those undergoing CABG procedures
- The reduced incidence of infection and sepsis, coupled with a reduced length of hospital admission, suggests that the pleiotropic effects of statins may be exploited beyond that of their lipid-lowering capabilities
Conclusion

- The development of off-pump coronary artery bypass grafting is in-line with the increasing demand for minimally invasive surgical procedures, offering a viable alternative to traditional cardiopulmonary bypass.
- This audit has shown that OPCAB can be associated with greatly improved post-operative recovery, highlighted by the significantly reduced ICU support administered, advocating its increasing use over extracorporeal methods.

Acknowledgements

We would like to thank the staff at Trent Cardiac Centre, Nottingham City Hospital, Consultant Anaesthetist Matloob Shajar, and Dr. Vincent Wilson for their advice and support throughout this audit.

References

- Atkinson & Kohn’s Introduction to Operating Room Technique, USA, McGraw-Hill.
Managing Environmental temperature for patient comfort in the Paediatric Assessment Unit (PAU)

Author
Zara Murtaza, University of Bedfordshire, email; zara.murtaza@study.beds.ac.uk

Abstract
The aim of this service improvement project is to reduce temperature levels in PAU. Room temperatures in (the*) hospital are controlled centrally and in PAU aims to be 19°C. In a normal scenario when temperature levels rise, it results in opening the windows. However as PAU is located on the 4th floor, this is not possible. The current solution is to use table top fans and encourage the children to drink more. I shared the nurses’ concern about the heat levels and the distress caused to children and parents, and their frustration of being unable to change the heating system.

Children admitted in PAU are frequently pyrexial. It seemed strange that they were placed in a temperature environment which affects their physiological wellbeing and could potentially compromise recovery. In addition, high room temperatures with reduced air flow could cause lethargy and reduced concentration for parents and staff.

If the room temperature remained constant at around 19°C it increases comfort, assists cooling and increases a child’s preference to drink more. After process mapping the current situation, I identified an area of improvement and I suggested that adding a portable air conditioning unit. The investment cost would be off-set in comparison to the risks service users and professionals have to face by professionals continuing with the current approach to reduce temperatures.

To ensure the air conditioning unit is only used when necessary, I suggested adding a wall poster with a thermometer to allow nurses, children and parents to notice and prevent room temperature exceeding an agreed temperature by turning on/off accordingly. It will also be efficient as it will enable staff to focus on the treatment of patients’ without any distraction.

I learnt the importance of thinking differently, involving different specialist professionals to help me understand how heating systems work and to take the ideas of many to propose a practical solution. Through listening to what matters to children and parents I have a new perspective on how team working and advocacy supports high quality care.

Overall by adding an air conditioning unit it will enhance temperature comfort for patients, parents and professionals.

(the*) = organisational Confidentiality

The Paediatric assessment Unit (PAU) is an acute assessment unit for children aged up to sixteen years. PAU consists of five beds and is located on the fourth floor of (the*) hospital. In several occasions the unit gets really warm leading to uncomfortable temperature levels which lead to difficult working conditions and also leading to increased lethargy and a delay in reducing body temperatures for those with pyrexia.
Following the Plan, Do, Study, Act (PDSA) cycle it can help assisting in trialling and assessing change. The PDSA cycle enables you to be able to test new service change ideas on a small scale to see if the proposed change will work (NHS, 2008). Focussing on the Planning part of the PDSA, I will be talking about what I would like to accomplish for the service and how the change can be implemented.

The aim of this service improvement project is to reduce temperature levels in PAU. Room temperatures in the hospital are controlled centrally and in PAU aims to be 19°C. In a normal scenario when temperature levels rise, it results in opening the windows. However as PAU is located on the 4th floor, this is not possible. The current solution is to use table top fans and encourage the children to drink more. I shared the nurses’ concern about the heat levels and the distress caused to children and parents, and their frustration of being unable to change the heating system.

The required room temperature for PAU is 19°C. As the unit is well insulated it does not get cool quickly, especially when the unit gets full. The majority of times most of the patients come in the unit with pyrexia and with the environment getting exceedingly warm, it does not help the speed of the patients’ recovery. Alternatives measure such as using a table top fan has to be used to help cool patients.

Children admitted in PAU are frequently pyrexial. It seemed strange that they were placed in a temperature environment which affects their physiological wellbeing and could potentially compromise recovery. In addition, high room temperatures with reduced air flow could cause lethargy and reduced concentration for parents and staff.

After process mapping the current situation, I could clearly see where there were flaws. I could clearly see the risks imposed to patients, parents and staff. The use of a table top fan was a current solution but this had many risks such and health and safety and just circulating hot air and not really helping in cooling the patients. The physiological wellbeing of the patients, parents and professionals were all at risk of lethargy and dehydration. I then thought of possible solutions which could help in reducing temperatures. I came up with two solutions. The first solution was to get a thermostat control for PAU’s radiators. After talking to other members of the hospital, I discovered that there was already a thermostat value already in the unit which is automatically controlled for the whole unit by estates.

The second solution which I had come up with was to add a portable air conditioning unit. This had benefits of leading to better local working conditions as the room is cooler and positive wellbeing for patients as each child’s individual physiological reaction to the cooler temperature will help them recover from pyrexia quicker and their duration of stay in the unit could possibly be reduced.

If the room temperature remained constant at around 19°C it increases comfort, assists cooling and increases a child’s preference to drink more. After process mapping the current situation, I identified an area of improvement and I suggested adding a portable air conditioning unit. The investment cost would be off-set in comparison to the risks service users and professionals have to face by professionals continuing with the current approach to reduce temperatures. To ensure the air conditioning unit is only used when necessary, I suggested adding a wall poster with a thermometer to allow nurses, children and parents to notice and
prevent room temperature exceeding an agreed temperature by turning on/off accordingly. It will also be efficient as it will enable staff to focus on the treatment of patients without any distraction.

It is important at work to ensure that reasonable steps are taken to achieve a reasonably comfortable temperature (Health and Safety Executive, 2011). This is vital as it is important to ensure that staff are in a comfortable environment to promote efficiency in the care delivered.

Heat exhaustion is when the body’s thermoregulatory system eventually fails as it has been overloaded. This usually occurs when an individual performs demanding activities for long periods of times without consuming any water. Some symptoms of this can be thirst, weakness and headache (Rogers et al, 2007). At present drinks are offered to patients and parents by staff and members of staff are encouraged to get themselves a drink whenever the feel the need. However with the environment they are working in, it could get quite difficult to take time out to go to the kitchen to get themselves a drink as at times the patients cannot be left unattended.

Diggins (2008) suggests that oral rehydration therapy would be equally as effective as intravenous therapy. It is also less stressful and could also be carried out at home too. However to ensure that oral rehydration is successful it is vital that children stay well hydrated in hot climates (Kristen et al, 2006). This is an aspect which needs to have attention drawn to it because as health professionals when patients come in to hospital to use the healthcare service we should be doing our upmost to improve their health and get them back to their normal state. However when they come into PAU and the environment temperatures are not at comfortable levels, it doesn’t help instead it possibly delays the time of recovery for the service users.

Following NICE (2009) guidance the primary solution to dehydration is to encourage oral intake. As health professionals in the hospital, every child who has come in with suspected dehydration is given an oral rehydration solution to replace the lost fluids. This consists of water sodium and glucose to replace the fluids lost within the body (Haddad et al, 2000). This is usually given to patients who come in with suspected Gastroenteritis, more commonly known as diarrhoea and vomiting.

Children who come in with pyrexia are also encouraged fluid intake to prevent dehydration. However with the environment being so hot, the drinks offered to the patients get warm quicker which leads to children not wanting to drink them anymore.

Physical cooling is known to be a major intervention in treating fever (Nicholl, 2002). To contribute to physical cooling it is essential to have a cool environment. Warm and stuffy environments do not help contribute to physical cooling so it is important to keep PAU cool for those who come in with fever and dehydration. These conditions are also most common and seen daily. If the environment is cool it will prevent the individuals’ physiological response to heat loss.

Parents have complained regarding the warm temperatures in PAU. As a student nurse it is fundamental to deal with problems by giving an honest and constructive response about the complain (NMC, 2008). Nurses would have to explain to the parents about the situation regarding the temperatures and inform them about what we can offer them in return, for instance drinks and fans.
The National Service Framework for children, young people and maternity services first standard to promote health and wellbeing, identify needs and early intervention (Department of Health, 2004). When a child comes into PAU, a nurse’s role is to take initial observations including heart and respiration rate, temperature and oxygen saturations. While carrying these out you also assess the child’s physical state to see if they are mottled or look physically drained. Once these observations are completed you can judge from your observations if the child needs to be hydrated with fluids or needs to have layers of clothes removed because they are pyrexial. With the suggestion portable air conditioning unit the unit it will also help the goal of Every Child Matters guidance because as a professional working with children we need to ensure that each child gets the support to be healthy, safe, contribute positively, enjoy and achieve and achieve an economic wellbeing (Department of Education, 2010). Adding a water cooler was also another possible service improvement. Nevertheless this will help cool the patients, parents and staff as they are more likely to drink water as it is available in the room but it does not help manage the environmental temperature comfort.

When health professionals deliver a competent and effective service by helping in recovering the patient back to their normal state it helps in building a positive partnership trust. As the service users are children in PAU, the partnership is with parents. If parents have a positive experience in hospital where all their child’s needs are met appropriately, they will come back to use the service again. On the other hand when parents come into PAU with their child who’s pyrexial is placed in a unit which is really warm and not helping in the time of recovery for their child does not compliment good partnership trust. Keeping Ann Casey’s partnership model in mind it is vital to remember that she found parental involvement is fundamental to gain a successful outcome for the care of the sick child (Votroubek & Tabacco, 2010). By adding an education poster it aims to inform and empower all to be aware of the environmental temperature and take steps to reduce the negative effects of feeling too hot.

By implementing this change it will reduce some risks such as table top fans which service users are exposed to and adapt the thermal environment and deliver a service which has benefits like positive physiological wellbeing and positive partnership trust. The implementation hopes it will make thermal environment more supportive and it will increase children’s wellbeing for participation. It is hoped that this will lead to a decreased duration of stay in PAU, however this will be impossible to measure. The empowerment benefit for the parents and professionals is extremely beneficial as it will lead the health professionals feeling that they have succeeded in delivering their best and the parents will feel empowered because they took the right decision to being their child into PAU. There would also be an education benefit of parents and children understanding the importance of thermal temperature and fluid management and might contribute to the prevention of admissions in the future.

I learnt the importance of thinking differently, involving different specialist professionals to help me understand how heating systems work and to take the ideas of many to propose a practical solution. Through listening to what matters to children and parents I have a new perspective on how team working and advocacy supports high quality care. In future if the opportunity of service improvement arises again, I would always process map the problem to highlight the potential benefits and risks as the process mapping in the planning stage made my project much understandable.
Overall by adding an air conditioning unit it will enhance temperature comfort for patients, parents and professionals.

References


Managing Environmental temperature for patient comfort in the Paediatric Assessment Unit (PAU)

Service Improvement Project
Zara Murtaza
19th March 2011

Introduction
- BSc Nursing Child (Hons) at the University of Bedfordshire
- Disseminating Best Practice
- Service Improvement project
- Assessment to focus on an area to apply the Plan, Do, Study, Act cycle for service improvement

Project Assessment Aims
- To be able to identify the area for service improvement which will benefit children and parents, the staff and support effective and efficient working in the practice area
- To explain process of possible solutions
- To look at key research and literature which supports the service improvement
- To conduct investigations and write a report by 5th June 2011

The Problem: Background 1
- Room temperatures in (the*) hospital is controlled centrally and in PAU aims to be 19°C.
- The minimum temperatures in workplace should be 16°C (Health and Safety Executive, 2011) and for sick children
- Heat output from the PAU radiators can not be controlled
- PAU is located on the 4th floor, windows open 10cms only
- PAU frequently becomes uncomfortably hot

The Problem: Background 2
- Room temperature levels above 19°C leads to:
  - A thermal environment not supportive to reducing body temperatures for patients with pyrexia
  - Physical discomfort
  - Increased lethargy
  - Difficult living and working conditions
- I shared the nurses and parents concern on the heat levels, frustration of being unable to change the heating system and the distress caused to children and parents.
- The aim of this service improvement project therefore is to reduce temperatures levels in PAU.

Government Guidance
- The National Service Framework for children, young people and maternity services first standard to promote health and wellbeing, identify needs and early intervention (Department of Health, 2004).
- With the suggestion portable air conditioning unit the unit it will also help the goal of Every Child Matters guidance because as a professional working with children we need to ensure that each child gets the support to be healthy, safe, contribute positively, enjoy and achieve and achieve an economic wellbeing (Department of Education, 2010).
- It is also important at work to ensure that reasonable steps are taken to achieve a reasonably comfortable temperature for individuals (Health and Safety Executive, 2011).
Following the Plan, Do, Study, Act (PDSA) cycle it can help assisting in trialling and assessing change.

The PDSA cycle enables you to be able to test new service change ideas on a small scale to see if the proposed change will work (NHS, 2008).

Focussing on the Planning part of the PDSA, I will be talking about what I would like to accomplish for the service and how change can be implemented.

Process mapping the current situation showed potential risks imposed to patients, parents and staff.

Children had to be encouraged to drink more to replace increased insensible losses due to their pyrexia and hot dry atmosphere (not always appreciated by the children).

Using table top fans only circulated hot dry air, did not seem to help reduce pyrexia and posed health and safety risks.

This is how it is!

Research also highlights that dehydration is more likely to occur especially in temperate or warm environments (Casa et al 2010).

Heat exhaustion is when the body’s thermoregulatory system eventually fails as it has been overloaded. This usually occurs when an individual performs demanding activities for long periods of times without consuming any water. Some symptoms of this can be thirst, weakness and headache (Rogers et al, 2007).

Physical cooling is known to be a major intervention in treating fever (Nicholl, 2002). To contribute to physical cooling it is essential to have a cool environment, so the portable air conditioning unit will contribute towards this.

Temperatures in PAU: February 2011

Any suggestions for a solution?

Dehydration, Heat exhaustion & Physical Cooling

A : Accept

B : Try to make a change?

Show of hands please
Stage 1: Process Map

- Understanding what happens now
- The importance of the process map
- Clarity
- Comparison
- Change

Stage 2: Plan Possible Solutions

Suggested Change

- Portable air conditioning unit
- Monitoring temperature
- Education wall poster

Benefits

- Improved air quality
- Increased comfort
- Enhanced productivity

Stage 3: Do (proposal)
Making the Solution work

- Suggest working with estates to purchase and maintain a portable air conditioning unit for PAU
- Set the air conditioning unit to automatically control temperature at set point of 19°C
- Add a large room thermometer to show the room temperatures and measure on a regular basis
- Create an education wall poster for all – the effects of heat, the need to drink and what to do if the temperature in the room goes above 19°C
Stage 4 : Study

If the proposal was taken up:

- Room temperature records would be created to act as a comparison
- Perceptions of staff, children and parents would aim to show a positive difference

Service Improvement Conclusion

- Actively listening to what matters to children and parents supports advocacy and high quality care.
- Thinking broader than just my role as a nurse involved me working alongside different specialist professionals to help me understand how heating systems work and to take the ideas of many to propose a practical solution.
- Investing in an conditioning unit will create a more comfortable environment and stop the need for table top fan use
- Adding an education poster aims to inform and empower all to be aware of the environmental temperature and take steps to reduce the negative effects of feeling too hot

Overall

- I have been able to identify the area for service improvement in the practice area
- Most importantly I have learnt how:
  - To approach an accepted situation with a different viewpoint
  - Important it is to clearly define a problem
  - Supportive everyone has been in helping me understand the problem
  - That when a problem process is shared in positive terms, people want to become part of the process
  - To present my findings for discussion and
  - To welcome the ideas of others

References


Medication Errors in Medical Practice

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Abstract

According to the National Audit Commission’s report on patient safety, medication errors were found to be the second most common cause of incidents reported in hospitals, despite being the single most preventable cause of patient harm. These can be defined as errors in prescribing, dispensing or administration of a drug. A large amount of these occur as a result of poor prescribing involving relatively inexperienced staff, responsible for majority of the prescriptions. Recent studies report 7% of orders, 2% of bed days and 50% of hospital admissions being affected by such errors, thus signifying an important threat to patient safety. Furthermore, incorrect dosage has been described as the most common type of error with antimicrobials being the class of drug most frequently affected.

Errors in paediatrics are described as particularly important as the incidence of significant harm from smaller errors is higher. Moreover, dose calculations are also more complicated in this area. Therefore, this future improvement project on behalf of the Open School Nottingham, aims to investigate the incidence of such errors at the Paediatric department (ward E37) of the Queens Medical Centre, Nottingham. Furthermore, focus will be placed on the identifying prescribing errors made by junior doctors, as in its report, Tomorrow’s doctors (2009), the General Medical Council makes it clear that junior doctors are expected to calculate appropriate drug doses and ‘prescribe drugs safely and effectively.’

Retrospective health record reviews conducted by pharmacists, staff reporting and ward based drug cards, will be the designated method for data collection. It is appreciated that obtaining statistics on the rates of errors will be problematic due to reluctance to report errors or avoidance of those corrected before significant harm. The errors will be divided into four groups; Type A (Potential harm to patient), type B (Doctor/pharmacist contact required), type C (Professional judgement required) and type D (trivial) for further analysis. Potential causes such as legibility, miscalculations and inadequate knowledge will be explored further with the aim to establish ward based protective interventions which if implemented, would benefit patient safety in the trust.

Introduction

According to the National Audit Office’s report on patient safety (2005), medication errors were found to be the second most common cause of incidents reported in hospitals (after patient falls), despite being the single most preventable cause of patient harm. The Institute of Medicine (IOM) report on medication errors (1999) and the National Patient Safety Agency Report (2004) highlighted the fact that such errors cause a larger number of deaths (44,000-98000) each year. Furthermore, depending on the clinical setting, a third to a half of Adverse Drug Events (ADE) are associated with medication errors (Bates et al, 1995).
So what are these errors? Medication errors are commonly defined as errors occurring during prescribing, dispensing or administration of a drug, regardless of whether they lead to adverse consequences. There are however, a variety of definitions involved in their classification. Presently, they are commonly classified according to where they occur in the medication use cycle. On the other hand, an outcome based approach depending on whether they lead to patient harm or not (or have the potential to do so) has also been implemented, as well as a psychological approach depending on whether they were mistakes or lapses (Ferner and Aronson, 2006). Mistakes in this case are knowledge based (such as prescribing medication that a patient is allergic to) or rule based (such as using excessive doses of drugs). Lapses are errors in performance (such as writing ‘chlorpropramide’ instead of ‘chlorpromazine’). Slips and technical errors are another subset accounted for and are skills based (such as insertion of cannulas). Therefore, this demonstrates the elevated scope for errors in medication cycles. Hence, prevention is essential to reduce patient morbidity and healthcare costs (Williams, 2007).

**Incidence**

Incidence rates vary between studies due to the different definitions and data collection methods used. Furthermore, inconsistency in reporting of errors such as avoidance to report those that have been corrected, pose further affects (Department of health report (DOH), 2004).

However, a systemic review by the General Medical Council (Equip Study) reported a median error rate of 7% in medication orders, affecting 50% of hospital admission (52 errors per 100 admissions) and occurring at a rate of 2% per patient days (24 errors per 1000 patient). These results clearly illustrate the high frequency of effects posed on the healthcare system. However, 84% of this research was conducted in single hospitals hence errors in primary care was not accounted for. Furthermore, there were no comparisons of error severity due to the ‘lack of standardisation of severity scales between studies’. Hence, the need for conventional definitions and data collection methods is evident. On the other hand, this study argued that few errors actually cause harm to patients as they are corrected or identified by senior healthcare professionals and especially pharmacists before reaching patients.

**Types and causes of errors**

The IOM report (1999) suggested that the driving force behind medication errors are the ‘speed and complex natures of medication-use cycles’ as well being a result of poor prescribing involving relatively inexperienced staff, responsible for majority of the prescriptions. However, these vary in nature depending on the type of error made.

Prescribing errors constitute incorrect drug selection for patients including aspects such as doses, quantity, indications and contraindications. In a UK prospective study of 36,200 prescriptions, 1.5% reportedly had a prescribing error, 25% of which were potentially dangerous (Dean et al, 2002). 58% of the dangerous errors originated from prescribing decisions while 42% resulted from the illegible writing. Thus, improving legibility could be beneficial in reducing almost half of the serious errors.
Incorrect use of abbreviations, verbal orders and decimal points further contribute to errors (DOH, 2004). In addition, incorrect dosage has been described as the most common type of error with antimicrobials being the class of drug most frequently affected (Dean et al, 2002). Furthermore, junior doctors were responsible for the majority of errors, with FY2 doctors having the highest rate of occurrence. Interestingly, junior doctors themselves feel least confident regarding their prescribing skills as compared to other skills (Han and Maxwell, 2006), thus emphasising the need for development of prescribing skills in education.

A GMC review (Equip Study) of 1261 papers looking for causes of prescribing errors concluded that such errors are multifactorial depending on the risk. Risk factors include work environment (and load), physical/mental well being and most importantly, lack of knowledge (Fijn et al, 2006). This is supported by Lesar et al (1997) who found that 30% of errors related to the application of knowledge while use of calculation, decimal points or units accounted for 17.5% of errors. Absence of self awareness of errors and prescribing for other’s patients also contribute to their occurrence, in accordance with inadequate training (Vrca et al, 2005). Furthermore, Primary Care has an estimated error rate of 11% (Kuo et al, 2008). This is relevant as communication in primary and secondary care is shown to be substandard, highlighting it as a potent risk factor. (Patterson et al, 2004).

Dispensing errors relate to the pharmacy sector. They include errors occurring from the time a prescription arrives at a pharmacy to the time the medication is supplied to the patient. Occurring at a rate of 1-24% (Williams, 2007), incorrect selection of strength or confusion regarding drugs with similar trade names have been shown to be causative. Computerised labelling and typing errors further increase the risk of errors in accordance with misidentification of patients (Dean et al, 2002).

Administration errors occur where there is a discrepancy between the intended form of drug therapy and that actually received by the patient, commonly affiliated with nursing practice. Classification of these errors include omission of drug administration, use of incorrect or expired preparations and poor administration technique (Ferner and Aronson, 2006). Intravenous drug administration has been reported as particularly troublesome with an error rate of 49% in either preparation or administration (Taxis and Barber, 2004). Furthermore, these have been associated with significant risks as serious as death due to incorrect administration of drugs intrathecally rather than intravenously.

Causes relate to inappropriate risk perception, inadequate technology and poor models to follow (Barber et al, 2003). Complex design of equipments and uncommon procedures contribute further(Williams, 2007). Other factors include storage of similar preparations, failure to confirm patient identity and environmental factors (noise, poor lighting and interruptions during drug rounds), (Flynn et al, 1999). Dose calculations requiring multiple tablets prior to administration further enhance the possibility of administration errors (Ross et al, 2000).
Proposed Improvements

As healthcare professionals, we have a responsibility to prevent such errors from affecting patient safety and quality of care. It is therefore our responsibility to identify factors contributing to medication errors and address them with the aim of reducing their occurrence. However, as the errors are multifactorial, addressing single issues would be of limited benefit. Furthermore, essential improvement is reliant on efficient reporting of errors which isn’t always as effective as required.

With regards to prescribing errors, the issue of illegible handwriting can be addressed using electronic and/or computerised modes of prescribing. Furthermore, computerised entry systems have been shown to significantly reduce medication error rates (up to 40%) by easing interpretation of order for both nurses and pharmacists (Ammenwerth et al, 2008 and Bates et al, 1999), hence are effective. However, these aren’t cost friendly and could predispose to other potential error sources such as typing errors and drug selection.

Educational interventions such as e-learning packages (Maxwell et al, 2006) and web based interactive curriculums (Smith et al, 2006), to aid development of prescribing skills in junior doctors could help reduce knowledge based errors (Scobie et al, 2003). However, evidence for this is limited with a GMC review (Equip study) concluding that education had no impact on prescribing errors but was more effective at changing behaviour that could lead to other errors. The behaviour influenced included improved decision support and advice gaining. Therefore, suggesting an indirect effect of education. However, it is resource and time consuming.

With regards to dispensing errors, separating drugs with similar names or appearances to different locations in the pharmacy is effective (DOH report, 2004). Increasing awareness of high risk medication such as cytotoxic agents through signalling methods could help reduce potentially harmful errors (Audit Comission, 2001). Enhancing the dispensing environment by reducing interruptions during dispensing requires organisation, however, if implemented could reduce errors involving incorrect dosage (Flynn et al, 1999). Simplistic measures such as confirming patient identity before delivery of medication would avoid errors due to misidentification (Barber et al, 2003).

In terms of administration errors, dosage calculations are primary hence ensuring that such calculations are independently checked by another health care professional before administration of the drug could reduce error occurrence (Barber et al, 2003). However, this would require efficient organisation to prevent it from affecting required timings of drug administration. Once again, minimising interruptions during drug rounds for nurses would reduce errors due to distractions (Flynn et al, 1999). Moreover, involving clinical pharmacists to visit wards daily with the aim of addressing any arising concerns would not only be preventative but also allow them to identify training needs to implement (Folli et al, 1987). However, this would be time consuming. Interventions to target high risk medications such as potassium chloride, chemotherapy and heparin by restricting choice and supply have been reportedly effective (Hatcher et al, 2004). Another effective intervention regarding drug selection has been implemented in paediatric wards. This involves the stocking of only one strength of morphine ampoule restricting the error in administration of the incorrect ampoule (Ross et al, 2000). Furthermore, involvement of the pharmaceutical industry
to address design issues when creating products of similar or complex designs (such as insulin pumps) could help to reduce errors relating to them (Williams, 2007).

Therefore, medication errors are multifactorial and need to be addressed as a combination of their possible causes. However, this may not always be achievable as different institutions, departments and professionals may have different causative factors. Hence, research tailored to specific high error departments would be essential in uncovering their causes and reducing their error rates.

**Future Service Improvement Project**

Medication errors are multidisciplinary primarily relating to doctors, nurses and pharmacists. As prescribing errors are mainly associated with doctors, I intend to develop an improvement project, to study the causes of such errors in a high risk department, through which tailored preventative measures can be devised for increased effectivity and patient safety.

Errors in paediatrics are described as particularly important as the incidence of significant harm from smaller errors is higher (Wilson et al, 1998). Error rates are found to be as high as 1 in 6.4 orders (Marino et al, 2000). Moreover, dose calculations are also more complicated in this area (Davis, 2010). Therefore, this future improvement project on behalf of the Open School Nottingham chapter, aims to investigate the incidence and causative factors of such errors at the Paediatric department of the Queens Medical Centre, Nottingham. Furthermore, focus will be placed on the identification of errors made by junior doctors, as in its report, Tomorrow’s doctors (2009), the GMC makes it clear that junior doctors are expected to calculate appropriate drug doses and ‘prescribe drugs safely and effectively.’

Retrospective health record reviews conducted by pharmacists, staff reporting and ward based drug cards, used in the last half year, will be the designated method for data collection. It is appreciated that obtaining statistics on the rates of errors will be problematic due to reluctance in reporting errors or due to the avoidance of reporting those corrected before significant harm occurs. The errors will be then be divided into four groups using an outcome based approach (depending on their potential to harm); Type A (harmful to patient), type B (potentially harmful; doctor/pharmacist contact required), type C (Professional judgement required) and type D (trivial). Potential causes such as legibility, miscalculations and inadequate knowledge will be further analysed with the aim to establish ward based protective interventions which if implemented, would benefit patient safety in the trust.

**References**


Medication Errors in Medical Practice

Roma Patel
Chapter Leader – Open School Nottingham

Plan

• What are medication errors?
• Who makes these errors?
• How do they affect us?
• Why do they occur?
• What can we do about them?
• Future improvement project

What are medication errors?

• ‘Any preventable event that can cause or lead to inappropriate medication use or patient harm while the medication is in the control of the healthcare professional, patient or consumer’ (National Co-ordinating Centre for medication error reporting and prevention)

Classification varies:
- Cycle based: During prescribing, dispensing or administration
- Outcome based: Causing harm or not
- Psychological approach: Mistakes, lapses or slips.

What do you think?

True or False?

• 50% of hospital admissions are affected by medication errors
• Foundation year doctors are responsible for majority of the errors
• Medication errors are the most common cause of incidents reported in hospitals

Types of errors

• Prescribing errors: errors due to incorrect drug selection, doses, quantity, indications and contraindications at time of writing the prescription.
• Dispensing errors: those occurring from the time a prescription arrives at a pharmacy to the time the medication is delivered to the patient.
• Administration errors: occur due to a discrepancy between the intended form of drug therapy and that actually given to the patient.

How do they affect us?

• Mean error rate of 8.9% per 100 medication orders
• Affects 50% of hospital admissions (52 errors per 100 admissions)
• Occur at a rate of 2% per patient days (24 errors per 1000 patients)
• FY1 doctors – error rate of 8.4%
• FY2 doctors – error rate of 10.3%
• Most often at time of patients’ admission to hospital
• Between a third to half of Adverse Drug Events are associated with medication errors.
• Medication errors can unfortunately result in death!
Medication errors can result in death!

Nottingham evening post (3/2/01) Error resulted due to wrong route of administration – IT chemotherapy

Daily Express (16/4/01) Wrong patient was injected with an antiepileptic drug

Why do they occur?

Prescribing errors
- Illegible handwriting
- Use of abbreviations
- Inaccurate history taking – allergies
- Inappropriate use of decimal points
- Use of verbal orders – communication
- Lack of knowledge/inadequate training

Risk factors – work environment, work load, physical/mental well being, prescribing for other’s patients

Dispensing errors
- Confusion of drug names
  Lasix (frusemide) and Losec (omeprazole)
- Misidentification of patient
- Typing errors
- Incorrect selection of drug strength

Why do they occur?

Dispensing errors
- Omission of drug administration
- Use of incorrect preparations/expired medication
- Poor administration technique (IV drug error rate – 49%)

Risk factors – environmental factors (noise, poor lighting, interruptions), dose calculations, complex design of equipment, uncommon procedures.

Administration errors
- Educational interventions for foundation year doctors and current students
- Ensure that calculations are independently checked by another health professional before administration

What can we do about them?

Prescribing errors
- Efficient reporting
- Electronic prescribing/computerised entry systems (shown to reduce errors by 40%)
- Educational interventions for foundation year doctors and current students
- Ensure that calculations are independently checked by another health professional before administration

Dispensing errors
- Confirming patient identity
- Increasing awareness of high risk medication (such as cytotoxic agents)
- Reducing interruptions
- Separating drugs with similar names or appearances to different locations
What can we do about them?

**Administration errors**
- Involving clinical pharmacists to conduct regular checks
- Reducing interruptions during drug rounds
- Interventions to target high risk medication (potassium chloride, heparin, chemotherapy) by restricting choice and supply
- Interventions regarding drug selection (stocking single strength of morphine)

**Future Service Improvement Project**

Aim: To study the causes of prescribing errors in a high risk department (Paediatrics) through which tailored preventative measures can be devised for increased efficiency and patient safety.

Why Paediatrics?
- High error rate (1 in 6.4 orders)
- Dose calculations are more complicated

**Method of data collection**
- Retrospective health record reviews by pharmacists
- Staff reporting
- Ward based drug cards

Errors will be divided in 4 groups (outcome based)
- Type A – harmful to patient
- Type B – Potentially harmful (doctor/pharmacist contact required)
- Type C – professional judgement required
- Type D – Trivial/ no potential of harm

**Take home messages!**
- Medication errors are common with potentially life threatening complications.
- As future healthcare professionals, it is our responsibility to ensure patient safety and quality of care.
- Write clearly!
- Avoid decimal points and abbreviations when prescribing.
- Report errors!

Thank you for your attention! Enjoy the rest of your day!

**REFERENCES**

Audit into the Completion of Pathology Test Request Forms at Addenbrooke’s Hospital, Cambridge

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Abstract

Aims
This patient safety improvement project focused on Haematology and Biochemistry investigation request forms, and how they were completed. Everyday, hundreds of handwritten request forms are sent to the Pathology department, and there may be delays in reporting the results if the details on the form are inadequate. Delays can be dangerous and adversely impact on patient care; for example, if the results of a test show dangerous abnormalities, it is vital that these are reported back to the requesting clinician as soon as possible.

From discussions with the Pathology Department, it became apparent that clinicians requesting the tests were not completing several key fields correctly or that their handwriting was illegible. The two most important sections on the form were the requesting ‘Consultant’ and the ‘Ward/Location’ to which results should be reported, since this ensures prompt reporting of significantly abnormal results.

Method
Over a period of one week, we collected and analysed all handwritten Haematology and Biochemistry request forms sent to the Department of Pathology at Addenbrooke’s Hospital over. A form was deemed satisfactorily completed if: (1) the ‘Consultant’, and (2) ‘Ward/Location’ sections were completed accurately and legibly. Data was recorded and verified by the Quality Manager.

Results
A total of 749 Clinical Biochemistry & Immunology forms were analysed, of which 279 (37.2%) did not meet the required criteria. Of the 428 haematology forms analysed, 199 (46.5%) were completed unsatisfactorily.

Intervention
A poster was designed in order to publicise the importance of completing request forms correctly. It consisted of a scanned version of a sample request form with the ‘Consultant’ and ‘Ward/Location’ sections highlighted to emphasise their importance. These posters were placed in all consulting rooms of the thirteen Outpatient Clinics at Addenbrooke’s Hospital.

Outcome
A second cycle re-audit is due to be completed by the end of February 2011, where it is hoped that this intervention will have brought some improvement in this important aspect of patient safety.

Introduction

In today’s medical practice, the pathology laboratory is of great importance in aiding clinical diagnosis and guiding management, playing a role in 60-70% of decisions relating to hospital admission, prescribed medication and patient discharge (Plebani et al 2006). Despite the move towards electronic test requesting (particularly in the inpatient population), hundreds of handwritten laboratory request forms are submitted
everyday to the Pathology Department at Addenbrooke’s Hospital, Cambridge, the vast majority of which come from outpatient clinics. The main drawback in the use of handwritten forms is that requesting clinicians must complete all the required details on the request form in order to allow prompt reporting of results by the Pathology Department.

From speaking to the Quality Manager of the Pathology Department at Addenbrooke’s Hospital, it became clear that there is a significant problem in the completion of handwritten request forms at this hospital. In some cases, pathologists and clinical scientists are unable to report test results back to the requester owing to the paucity of information available on the request form.

This represents a major patient safety issue on a number of fronts. Firstly and most importantly, if results are unable to be reported back, the patient may come to harm if those results highlight dangerous readings, particularly electrolyte and hormonal abnormalities. The Pathology Department at the hospital does make extra efforts in tracking down the requesting physician if the results show dangerous abnormalities. However, this adds delays to any subsequent management that may be needed, leads to sub-optimal patient care, and is an unnecessary addition to the duties of the pathologist. Moreover, even if results are normal, this cannot be reported back to the clinician if the request form has been unsatisfactorily completed. In such cases, the entire process of drawing blood from the patient as well as the steps involved in collecting and analysing the sample is wasteful, and from a medico-legal viewpoint, represents negligence, or, at the very least, severe incompetence. An un-reportable finding is simply a waste of the patient’s and pathologist’s time.

To investigate this further, we obtained clearance from the Medical Director of the hospital and the Quality Manager of the Pathology Department to conduct an audit into the adequacy of completion of Pathology request forms. Our aims were to discover the true extent of this problem, raise awareness of this issue, and implement solutions that can lessen the impact of this important patient safety matter. A study in the Middle East achieved excellent outcomes after performing an audit into this issue (Kaplan et al 2004), and we hoped to achieve similar results at our hospital.

**Methods**

The audit was carried out at the Department of Pathology, Addenbrooke’s Hospital, Cambridge. There were 3 auditors who went through a sample of Haematology and Clinical Biochemistry and Immunology request forms collected over one week (5 days) from the hospital’s Outpatients Department.

**Selection Criteria**

We considered all Haematology and Clinical Biochemistry/Immunology request forms sent to the Pathology Department at the hospital. Only handwritten forms were included, with all electronic forms being excluded. We also excluded forms that had been received from locations that would not be subject to our planned intervention, such as nearby hospitals (including Papworth, Ipswich and West Suffolk) as well as request forms received from General Practitioners.
Process
All eligible forms were screened to see whether the Location and Consultant fields were completed satisfactorily. The following categories of forms were counted:

“No Location” – no location entered on form.
“Odd Location (OP)” – location entered as ‘OP’ for ‘outpatients’ but considered too vague.
“Odd Location (other)” – any location that was ambiguous, e.g. ‘4’ or ‘12’ to indicate perhaps outpatient clinics 4 or 12.
“No Consultant” – no consultant name or valid initials entered on form.
“Neither Consultant or Location” – neither consultant nor location entered on form.
“Illegible” – contents of form considered illegible by all 3 auditors.

Intervention
There were two interventions in our study. First, we designed a poster that highlighted the importance on completing request forms adequately, in particular the ‘Consultant’ and ‘Location’ sections, which we considered to be the most important fields. Copies of this poster were placed in all clinic rooms in the Outpatient Department at the hospital. Secondly, an online notification about this issue was added to the homepage of the hospital intranet, which can be accessed by all doctors working at the hospital. Both these interventions were performed a week after the first audit cycle, and were available for six weeks before the second audit cycle. [Electronic versions of these interventions are available in the Appendix.]

Reaudit
Four months after the first audit cycle, the second cycle was performed. Unfortunately, it was not possible to collect haematology forms for the second cycle and therefore, only Clinical Biochemistry and Immunology request forms were screened.

Results
In the first audit cycle, we screened 749 Clinical Biochemistry and Immunology forms and 428 Haematology forms. 293 Clinical Biochemistry and Immunology request forms (39.1%) were unsatisfactorily completed, along with 199 Haematology request forms (46.5%) [Table 1].

<table>
<thead>
<tr>
<th></th>
<th>Odd Location (OP)</th>
<th>Odd Location (Other)</th>
<th>Illegible</th>
<th>No Consultant</th>
<th>No Location</th>
<th>Neither Consultant or Location</th>
<th>Total Unsatisfactory</th>
<th>Total Satisfactory</th>
<th>Overall Total</th>
<th>% Unsatisfactory</th>
</tr>
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<tr>
<td>Cycle 1</td>
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<td></td>
</tr>
<tr>
<td>Clinical Biochemistry &amp; Immunology</td>
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<td>23</td>
<td>13</td>
<td>23</td>
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<td>144</td>
<td>293</td>
<td>456</td>
<td>749</td>
<td>39.1</td>
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<tr>
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<td>12</td>
<td>33</td>
<td>22</td>
<td>102</td>
<td>199</td>
<td>229</td>
<td>428</td>
<td>46.5</td>
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<td>Cycle 2</td>
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</tr>
<tr>
<td>Clinical Biochemistry &amp; Immunology</td>
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<td>15</td>
<td>14</td>
<td>43</td>
<td>48</td>
<td>113</td>
<td>255</td>
<td>570</td>
<td>825</td>
<td>30.9</td>
</tr>
</tbody>
</table>

Table 1: Results of audit cycles 1 and 2.
In the second audit cycle, we screened 825 Clinical Biochemistry and Immunology forms. Of these, only 255 (30.9%) were unsatisfactory, showing an improvement of 8.2%. At a 99% confidence level with a two proportion one-tailed Z-test, these results are statistically significant (Z = 3.362). The improvement in the number of forms not having either ‘Consultant’ or ‘Location’ details (which was the primary target of our poster) was also significant at a 99% confidence level (Z = 2.896)

Discussion

Before drawing conclusions, the limitations of the study are briefly considered. First, the assessment of illegibility was a subjective judgement made by the auditors. To minimise bias, the request form in question was shown to the other auditors and a collective judgement was made. Further, to minimise observer bias both cycles of the audit were performed by the same auditors who applied the same criteria when assessing forms. Any borderline entries were discussed with the other two auditors and again, a collective decision was made. Additionally, the Quality Manager of the Pathology Department verified the results reassessing forms that were satisfactory and unsatisfactory. In relation to the intervention, an informal inspection was carried out a few days after the delivery of the posters to check that they had remained in the clinical rooms. However for the ensuing six weeks, we cannot be certain that the posters remained on the walls.

Despite these limitations, we feel confident in making the following conclusions. Our results show that a huge percentage of forms are filled in inadequately. Although our intervention was helpful in reducing this, nearly 1 in every 3 forms was still being completed unsatisfactorily. One can argue that even although forms are not being fully completed, the results of tests are eventually received by the requesting clinicians, due to the extra efforts made by the Pathology Department and through follow-up from the requesting clinician. Although this may be true, there are delays in the reporting of results because of this inadequacy and this is certainly detrimental to patient care.

In terms of the impact of our intervention, our results show a statistically significant improvement. Posters in clinic rooms were strategically placed on the walls facing the doctor’s chair so that clinicians would be reminded to complete laboratory request forms adequately. In addition, the online reminder was accessible to all health care professionals working at the hospital. Although we were unable to verify that the posters remained in the clinic rooms after a week, the online notification is still found on the intranet today.

To further improve the adequacy of request form documentation, there are avenues for further intervention. From our audit, we found that the patient addressograph label obscured the boxes for ‘Consultant’ and ‘Location’ on laboratory request forms. It is therefore partly understandable that clinicians fail to complete these sections. A solution to this in the form of re-designing the layout of the request form would undoubtedly help improve the quality of documentation. We also found that the location entered on several forms was not specific enough to allow results to be returned to the appropriate place. This may represent a lack of knowledge on the part of the test requester, and could be improved by education or guidelines on documentation. For example, this issue could be highlighted at the induction session.
for new doctors and at Departmental meetings throughout the hospital. Further, more posters and reminders to doctors could be implemented to ensure that the message does not fizzle out.

Overall, this student-led patient safety audit has highlighted that the adequacy of documentation on laboratory request is as an important patient safety issue that can adversely impact on patient care. Through simple interventions, we were able to improve outcomes and we shall reassess the effect of our interventions in a third audit cycle in the near future. We hope that this audit is the starting point for other solutions to be implemented in this field to ensure that patient safety and quality of care remain at the forefront of medical practice.

References

Appendix

A1 – Electronic version of the poster used in Outpatient clinic rooms.

A2 – Screenshot of Addenbrooke’s Hospital intranet homepage, with intervention boxed.
Audit into the Completion of Pathology Test Request Forms at Addenbrooke’s Hospital, Cambridge

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Why does this relate to Patient Safety?

• Majority of clinical decisions depend on results of pathologic investigations
• If results are not able to be reported to the right person and place, patients are harmed:
  – Dangerous abnormalities
  – Delays in management
  – Extra work for the pathologist/clinical scientist
  – Medico-legal implications
• Drives at the very heart of patient safety

Introduction
Methods
Results
Conclusions

Role of Pathology in Medicine

• Hundreds of pathology investigative request forms submitted each day
• Mainly electronic, but handwritten forms still in use, particularly from Outpatients
• Accurate completion of forms is a must to enable reporting of results to the correct clinician and location (eg. clinic location, ward)

Introduction
Methods
Results
Conclusions

Our Audit

• Liaised with Quality Manager at the Pathology Department
• Recognition of the problem
• Gained clearance from the Medical Director to set up an audit
• Aims:
  – Quantify the problem
  – Raise awareness
  – Implement solutions
  – See whether they worked

Introduction
Methods
Results
Conclusions

Selection Criteria

• Haematology and Clinical biochemistry & Immunology forms over a week (5 days)
• Only hand written forms
• Only forms from Addenbrooke’s Hospital

Introduction
Methods
Results
Conclusions
Process

- Location and Consultant fields analysed
- Sorted into categories:
  - No Location
  - Odd Location (OP)
  - Odd Location (Other)
  - No Consultant
  - Neither Consultant or Location
  - Illegible

Interventions

Missing information on request forms was identified as a result of feedback from the pathology user survey 2008 and an audit carried out within the Biochemistry Department. Issues including missing information, incorrect patient details, incorrect test codes and missing location information were identified as areas for improvement.

- Location and Consultant fields added to BTR (Blood Test Request) form.
- A copy of the form is provided to the consultant.
- Instructions included on form:
  - Ensure location is filled in.
  - Ensure consultant is filled in.
  - Ensure sample is collected promptly.

Results - Cycle 1

Number of Forms Inadequately Completed

- 293/749 Clinical Biochemistry & Immunology
  - 39.1%
- 199/428 Haematology
  - 46.5%
Examples

Introduction Methods Results Conclusions

Results

Cycle 2

Number of Forms Inadequately Completed
• 255/825 Clinical Biochemistry & Immunology
  • 30.9%

8.2% Improvement

Discussion

• Before making conclusions, the limitations of the study are considered
  – Subjective judgements eg illegibility
  – Objective judgements eg Consultant, Location etc
  – Duration of intervention
    • Posters
    • Intranet Message
• Steps taken to minimise bias
  – 3 auditors discussed borderline cases
  – Data verified by Quality manager
Discussion

• Conclusions
  – An improvement of 8.2% (from 39.1% to 30.9%)
  – 99% confidence level with a two proportion one-tailed Z-test ($Z = 3.362$)
  – However still 1 in 3 forms are not adequately completed!
  – Simple interventions showed an impressive effect

Discussion

• Why?
  – Bad Habits die hard
  – Lack of education/awareness
    • On documentation
    • Seriousness of the consequences
  – Form design not conducive eg Addressograph problem

Further Interventions

• Change Form design
• Educate
  – Location – needs to be specific
  – Complete documentation
  – Serious consequences
• Opportunities
  – Induction sessions
  – Departmental meetings

Summary

• A significant patient safety issue
• Improved by simple interventions
• More scope for improvement and further audits required

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SBAR improves quality of communication in Acute Medicine and the Emergency Department

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Abstract

Background
Rapid turnover of acutely ill patients in Acute Medicine and the Emergency Departments demands effective and efficient communications. Situation, Background, Assessment and Recommendation (SBAR) communication tool has been shown to reduce incidence of harm to patients.

Local Problem
In July 2010, the majority of telephone calls about patients on the Acute Medicine Ward as shown by our survey did not help the doctors receiving the calls to prioritize their tasks. This information facilitated the decision by Addenbrooke’s Hospital to implement SBAR as the gold standard for communication about patients. Doctors and other healthcare professionals of all grades were trained to use SBAR.

Aim
To describe the quality of telephone communications about patients in Acute Medicine and the Emergency Department after implementation of SBAR in Addenbrooke’s Hospital.

Methods
Trained data abstractors observed telephone calls received by doctors and nurses working in the two clinical areas. Prospectively designed data-collection forms were used to record (i) demographics, (ii) uptake of SBAR, and (iii) the quality of communication by subjective evaluation of the usefulness of the calls for prioritization, and the content of the messages.

Results and Discussion
43 phone calls were observed. In 44% (19/43) of the calls, the callers used SBAR. When SBAR was used by the callers, the score given by the persons who received the calls for usefulness in prioritising tasks was higher than when SBAR was not used (Median 8 vs 5.5, p = 0.036). 42% of phone calls made using SBAR are rated as having a ‘Well-conveyed’ message, compared to 8% when SBAR was not used (Odds Ratio 5.1, p<0.0001).

As the callers were not aware of the presence of data abstractors, the observations are unlikely to influence the callers’ actions. Phone calls made using SBAR are perceived as more useful in prioritizing tasks and these messages are 5 times more likely to be rated as ‘Well-conveyed’ compared to when SBAR was not used by the caller.

Conclusion
A large proportion of staff adopted SBAR. This is associated with significant improvement in quality of communication in Acute Medicine and the Emergency Departments of Addenbrooke’s Hospital.
**Introduction**

**Background**
Evidence exists that a breakdown in communication is the leading cause of inadvertent patient harm (Joint Commission on Accreditation of Health Care Organizations 2004; Sutcliffe 2004). Hierarchy and loss of information along the chain of communication have been cited as the principle root causes of communication failure (Joint Commission on Accreditation of Healthcare Organizations 2006). Effective communication between members of the multidisciplinary team is associated with improved quality of care and decreased lengths of hospital stay (Gittell 2000).

The World Health Organisation recommends a simple communication tool to standardize handing over clinical information, called the Situation-Background-Assessment-Recommendation or SBAR model (Institute of Healthcare Improvement 2005). SBAR originated from organisations that demand precise and efficient communications, such as the military or the aviation industry. The usage of this formal communication tool can improve patient safety by providing expectations for what should be communicated (Leonard 2004). Following implementation of the SBAR tool, adverse events have been shown to improve from 29.97 per 1000 patient days to 17.64 per 1000 patient days (Haig 2006). In addition, SBAR has been implemented in several high-risk settings, including perinatal care and operating rooms with improvements seen in staff and patient satisfaction, clinical outcomes and the overall patient safety culture (Leonard 2004; Uhlig 2002).

**Local problem**
Our previous survey in July 2010 showed that the majority of telephone calls about patients on the Acute Medicine Ward did not help the doctors receiving the calls to prioritize their tasks.

This information facilitated the decision by Addenbrooke’s Hospital to implement SBAR as the gold standard for communication about patients. Doctors and other healthcare professionals of all grades were trained to use SBAR on multiple occasions by lectures, ward-based teaching and workshops. Cards with information on the components of SBAR have now been attached to the back of all staff ID cards as reminders.

**Study question**
We aim to describe the quality of telephone communications about patients in Acute Medicine and the Emergency Department after implementation of SBAR in Addenbrooke’s Hospital.

**Methods**
Prior to any interventions, we conducted a baseline study in July 2010 to measure the use of SBAR by current staff members when handing over patient information over the phone. This study identified the lack of any structured communication tool
and poor quality of communication. In order to tackle these problems, the hospital wide educational campaign of SBAR was started using a multi-pronged approach in the forms of (i) presentation by student leaders of quality improvement and patient safety during grand rounds, (ii) ward based teaching, (iii) workshops, (iv) posters next to telephones, (v) SBAR card or sticker attached to identity badges of clinical staff and (vi) introduction of SBAR into the medical school curriculum. These aimed to make SBAR the standard and unified method for patient handover. Participation of students and junior staff was particularly important for an effective bottom-up approach in changing culture to achieve a long lasting impact.

This study focuses on the Emergency Department and the Acute Medicine Ward which have the highest turnover of patients in our hospital. Trained data abstractors observed telephone calls received by doctors and nurses working in the two clinical areas. Prospectively designed data-collection forms were used to record (i) demographics, (ii) uptake of SBAR, and (iii) the quality of communication by subjective evaluation of the usefulness of the calls for prioritization, and the content of the messages. Qualitative comments are also recorded for more accurate description of the opinions of staff. The results pre and post interventions are compared.

Demographics are described by the number of years of post-graduate experience and job title of staff. Uptake of SBAR is measured by the proportion of staff who received SBAR training, the form(s) of training received, the proportion of staff who adopted SBAR after training and the proportion of callers who used SBAR when making the phone calls. The quality of communication is based on subjective evaluation of the usefulness of the call for prioritization of tasks by staff receiving the calls, using a numerical scale of 1-10. The information conveyed by the call is assessed by subjective evaluation of the situation, background, assessment and recommendation by staff receiving the calls, using ‘well conveyed’, ‘partly conveyed’ or ‘not conveyed’. The quality of information when SBAR is used is compared to quality of information when SBAR is not used.

Mann-Witney and Chi-squared tests are used where appropriate and the significance level is p=0.05. Ethical committee permission was not required as this is a clinical audit. For confidentiality, the identities of staff making or receiving the phone calls were not recorded.

**Results**

1. **Demographics**

<table>
<thead>
<tr>
<th>Years of Post-grad Experience</th>
<th>Pre-intervention (n=21)</th>
<th>Post-intervention (n=43)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 3</td>
<td>16</td>
<td>30</td>
</tr>
<tr>
<td>4 to 6</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>7 to 9</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>10+</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Unknown</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

**Table1.** Years of experience of staff who received phone calls observed by the data abstractors.
We observed 21 and 43 phone calls before and after the implementation of the SBAR educational campaign, respectively. 46 of 64 observed phone calls were received by staff with less than 3 years of post-graduate experience. They all worked in the Emergency Department or the Acute Medicine Ward. Of the 43 phone calls post intervention, 22 phone calls were received by staff who were not trained to use SBAR. The rest of the phone calls were received by staff who received training in the forms of lecture (n=13), workshop (n=6) and ward teaching (n=2). Of the 21 phone calls received by staff who have received training, 18 considered SBAR to be useful while 3 considered SBAR to be not useful, the reason given for considering SBAR to be not useful was that the caller was ‘able to convey information consciously without the need of SBAR’.

2. Use of SBAR by the Caller

<table>
<thead>
<tr>
<th>Use of SBAR</th>
<th>Pre-intervention (n=21)</th>
<th>Post-intervention (n=43)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>0</td>
<td>19*</td>
</tr>
<tr>
<td>No</td>
<td>21</td>
<td>24</td>
</tr>
</tbody>
</table>

Table 2. Number of phone calls made using SBAR by the callers.

Prior to the educational campaign, none (0/21, 0%) of the observed phone calls used SBAR to handover patient information over the phone. After the educational campaign, 19/43 (44%) of calls were made using SBAR to handover patient information (*Chi Squared test, X² = 78.6, p<0.0001).

3. Usefulness for Prioritization of Tasks

<table>
<thead>
<tr>
<th>Score</th>
<th>Pre-intervention (n=21)</th>
<th>Post-intervention (n=43)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median</td>
<td>7</td>
<td>7*</td>
</tr>
<tr>
<td>IQR</td>
<td>4-8</td>
<td>5-8</td>
</tr>
<tr>
<td>Mean</td>
<td>6.3</td>
<td>6.7</td>
</tr>
</tbody>
</table>

Table 3. Subjective assessment of usefulness of the calls for prioritization of tasks by the staffs receiving the calls before and after educational campaign

<table>
<thead>
<tr>
<th>Score</th>
<th>SBAR Not Used (n=24)</th>
<th>SBAR Used (n=-19)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median</td>
<td>5.5</td>
<td>8**</td>
</tr>
<tr>
<td>IQR</td>
<td>5-8</td>
<td>6-9</td>
</tr>
<tr>
<td>Mean</td>
<td>6.0</td>
<td>7.5</td>
</tr>
</tbody>
</table>

Table 4. Subjective assessment of usefulness of the calls for prioritization of tasks by the staffs receiving the calls after educational campaign.

The subjective assessment of usefulness for prioritization of tasks did not differ before and after the educational campaign overall (*Mann-Whitney Test, Z = -0.461, p = 0.64). A more detailed analysis of the post-educational campaign scores indicate that the staff’s subjective assessment of the usefulness of the calls for prioritization of tasks was higher when SBAR was used compared to the calls when SBAR was not used (**Mann-Whitney Test, Z = -1.981, p = 0.048).

4. Information conveyed by the phone calls after implementation of SBAR

After the educational campaign, we were able to ask the staff who received the calls to subjectively assess how well the four components of SBAR were conveyed by the caller. Compare the calls made using SBAR (n=19) with the calls not using SBAR (n=24), 8/19 (42%) of the calls made using SBAR were subjectively rated as ‘well-
conveyed’ by staff receiving the calls, while 2/24 (8%) of the calls made without SBAR were rated as ‘well-conveyed’, this was significantly lower (Chi squared test, \( X^2 = 161, p < 0.0001 \)).

**Discussion**

Prior to implementation of SBAR, use of this communication tool to handover patient information over the phone was poor, with none of the observed phone calls using SBAR (0/21, 0%) (Table 1). The majority of telephone communications at this time in Acute Medicine and the Emergency Department showed an overall lack of any structured communication tool, often resulting in poor quality of communication, and difficulty for doctors receiving calls to prioritize their tasks. As the callers in our study were not aware of the presence of data abstractors, the observations were unlikely to influence the callers’ actions.

Following our hospital wide SBAR educational campaign, we saw a large increase in the use of SBAR as a structured communication tool, with 19/43 (44%) of the calls recorded using SBAR to handover patient information over the phone (Table 1). This demonstrates the effectiveness of our multi-pronged educational approach of introducing SBAR as a communication tool in the hospital setting, and represents a large uptake in the use of SBAR amongst healthcare professionals.

In terms of overall usefulness of calls in helping to prioritize tasks, staff subjective assessments showed that phone calls made using SBAR were perceived as more useful in prioritizing tasks (Table 2). Furthermore of these phone calls where SBAR was used, messages were 5 times more likely to be rated as ‘Well-conveyed’ compared to when SBAR was not used by the caller (Table 3). This shows use of SBAR significantly improves the quality of telephone communication.

Subjective comparison of how well the four individual components of SBAR were conveyed by the caller was carried out for all calls, including those where SBAR was
not used (Table 4). For all four components (Situation, Background, Assessment, Recommendation), use of SBAR led to much greater efficacy in conveying the relevant information for each component. This is most likely a result of the structured framework of calls where SBAR is used, which means each component is dealt with in turn.

**Future Studies**

To reinforce the conclusions of our study it may be interesting to look at each of the components of SBAR (Situation, Background, Assessment, Recommendation) in more detail to ascertain where further targeted improvements can be made. For instance, further and more focussed training may be required in order to improve the efficacy with which information is conveyed for particular SBAR components. Any further implemented changes should then be followed up with re-auditing.

**Clinical Implications**

The importance of communication cannot be underestimated, with effective communication leading to greater efficiency, improved clinical outcomes, reduced patient morbidity and improved patient satisfaction in the hospital environment. In light of this we hope the positive results of our study will pave the way for furthering the SBAR protocol amongst other Hospitals in order to make SBAR the standard and unified method for patient handover. Ideally this should be targeted to healthcare professionals at all levels in order to achieve a long lasting impact.

**Conclusion**

In conclusion, we have found that following our educational campaign a large proportion of staff have adopted SBAR in the Acute Medicine and the Emergency Departments of Addenbrooke’s Hospital and this is associated with a significant improvement in the quality of communication. This information has facilitated the decision by Addenbrooke’s Hospital to implement SBAR as the gold standard for communicating patient information.

**References**


Situation-Background-Assessment-Recommendation (SBAR) improves quality of communication in the Emergency Assessment Unit and the Emergency Department

Ivan Wong
On behalf of the IHI Open School University of Cambridge Chapter

What is SBAR?

- Structured method of communication between health professionals
- Simple and effective; well-established in military, aviation and acute medical settings
- Ensures critical information that requires urgent attention and action is communicated
- Effective escalation and improved safety
- 4 Steps: Situation, Background, Assessment, Recommendation

Why use SBAR?

- Poor verbal/written communication identified as one of the most common sources of serious error
- SBAR helps to reduce the barriers to communication between different health care professionals and levels of staff
- Takes the uncertainty out of communication through a ‘shared mental model’

Background

- In July 2010, there was no formal training in patient handover communication skills over the telephone in Addenbrooke’s Hospital
- Audit in July 2010 showed:
  - Majority of telephone calls were not helpful for the healthcare professional receiving the call to prioritize tasks
  - No structured communication tool was used in a sample of calls in the Emergency Assessment Unit (EAU) 5

SBAR Awareness Initiative

SBAR Pocket-Sized Reminder Card
**Methods**

- Using a prospectively designed data collection sheet, trained data abstractors observed calls received by healthcare professionals.
- Clinical Areas: Emergency Department and EAU 5.
- The healthcare professionals were asked to rate the quality of calls:
  - On a scale of 1-10, how useful were the calls in helping them prioritize tasks?
  - Following SBAR training, whether the SBAR components were 'well conveyed', 'partly conveyed' or 'not conveyed'.
- Outcomes:
  - Prevalence of SBAR training and its effects.
  - Quality of patient handover.

**Demographics**

- This audit reflects the opinion of junior medical and nursing staff.

**SBAR Training**

- **Forms of SBAR Teaching Received**

**Use of SBAR by the callers**

- **Comparing all phone calls made in January 2011 versus in July 2010**

- **No difference overall for usefulness in prioritizing tasks (Z = -0.461, p = 0.64)**

**Use of SBAR by the callers**

- **X² = 78.6, p<0.0001**
Comparing phone calls made with or without SBAR

- A comparison post-SBAR training showed that phone calls using SBAR were significantly more helpful in prioritizing tasks ($Z = -1.981$, $p = 0.048$)

![Proportion of calls with 'well conveyed' information, comparing calls with or without SBAR](image)

<table>
<thead>
<tr>
<th>SBAR Used</th>
<th>SBAR not used</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Situation</td>
<td>Background</td>
<td>Assessment</td>
</tr>
<tr>
<td>SBAR Used</td>
<td>70</td>
<td>60</td>
</tr>
<tr>
<td>SBAR not used</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>All</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Proportion of calls with ‘well conveyed’ information, comparing calls with or without SBAR

$X^2 = 161$, $p < 0.0001$

Summary of Main Findings

- SBAR currently used for nearly 50% phone calls made in the Emergency Department and EAU 5
- Calls made using SBAR were rated as significantly more useful by person receiving the calls
- Content of information conveyed by calls made using SBAR more likely to be rated as ‘well-conveyed’

Key Conclusions

- SBAR training in Addenbrooke’s has been successful
- The use of SBAR is common in the ED and EAU 5, however, the use of SBAR can be improved through further education
- Junior medical and nursing staff find SBAR useful to help them to prioritize tasks and convey information

Acknowledgements

- Dr Sue Broster, Consultant in Patient Safety and Neonatology, Addenbrooke’s Hospital
- Emergency Department, Addenbrooke’s Hospital
- Emergency Assessment Unit 5, Addenbrooke’s Hospital
Genetic Polymorphisms associated with side effects of antibiotics in children

Author
Siew Chee Wong, University of Nottingham
email: mzysw@nottingham.ac.uk

Abstract

Background
Aminoglycoside (AG) antibiotics are widely used in cystic fibrosis (CF) patients to combat Pseudomonas aeruginosa infections. However, they can result in significant nephrotoxic and ototoxic effects that can reduce the quality of life of patients. Approximately 17% of CF patients suffer from hearing impairment. Several maternally inherited mitochondrial mutations may predispose patients to AG-induced hearing loss. The 1555A>G mutation (in the MT-RNR1 gene) is the most well-known mutation, with a prevalence of approximately 0.2% in the European population. Previous studies have not sequenced the entire MT-RNR1 gene in CF patients.

Objective
This study optimised the methods involved in the mutational screening of the mitochondrial MTRNR-1 gene associated with AG-induced hearing impairment. We hypothesised that mutations associated with hearing impairment can be found in the CF population as they are more often exposed to AG treatment compared to the general population.

Methods
Sequencing of saliva samples in a cohort of 15 CF patients with the MT-RNR1 gene was done. The resultant sequence data were compared against the revised Cambridge Reference Sequence (rCRS) to check for mutations. Results were correlated with AG exposure and hearing impairment.

Results
Two polymorphisms in three patients were found in this study. 709G>A, with a prevalence of 7.14% (0.18, 33.9) was found in one patient with normal hearing. 1189T>C, with a prevalence of 14.3% (1.78, 42.8) was found in two patients with mild to moderate hearing impairment. These three patients were all previously exposed to AGs treatment. The literatures suggested that these were not significantly associated with hearing impairment. However, in the present study, 1189T>C was found in two hearing impaired patients.

Conclusions
This study suggests that the methods used here to screen for mutations are feasible and can be used for a large scale research in the future. Further studies are needed to clarify the role of 1189T>C given that both the patients in this study have hearing impairment.

Aminoglycoside (AG) antibiotics are one of the mainstay treatments of Cystic Fibrosis (CF) particularly against Pseudomonas aeruginosa infections. Many studies undertaken in the last few decades have linked AG induced deafness to mutations in genetically susceptible individuals (Prezant et al, 1993, Fischel-Ghodsian et al, 1997). Hence, CF patients who are genetically susceptible are at a higher risk of
hearing impairment. The UK Cystic Fibrosis Trust Antibiotic Working Group reported that approximately 17% of CF patients suffer from hearing impairment (Cystic Fibrosis Trust, 2009).

Hearing impairment is a common congenital defect, affecting approximately 1 in 1000 newborns (Morton, 1991). More than 50% of these cases are of genetic causes with either Mendelian inheritance or mitochondrial mode of inheritance (Petit et al., 2001). Although nuclear gene defect is responsible for most of the heritable cause of hearing impairment, it has become obvious in the recent years that mitochondrial genes are also pertinent to hearing loss. The first mitochondrial point mutation associated with hearing loss was identified in 1993 and ever since then, several other mitochondrial mutations have been implicated (Prezant et al, 1993).

It was discovered that AG hypersensitivity was often maternally transmitted in familial cases of ototoxicity. A cross sectional study carried out in Shanghai revealed 36 pedigrees with maternally inherited predisposition to AG- induced deafness (Hu et al, 1991). This suggests that the molecular basis for this susceptibility lies in the mitochondrial DNA.

Prezant and colleagues discovered the first homoplasmic mutation, 1555A>G in 12S rRNA in an Arab-Israeli family (Prezant et al, 1993). This mutation has been associated with both non syndromic and AG- induced ototoxicity in different ethnicities worldwide (Casano et al., 1998 and Li et al, 2005). The prevalence of this homoplasmic mutation was found to vary among the different ethnicities. Usami et al (1997) established that 28 out of 32 Japanese subjects were found to have this mutation compared to none in 100 American control subjects. In a European survey on the general population, 0.19% of the paediatric population was found to have this mutation compared to 0.21% of the adult population (Bitner-Glindzicz et al and Vandebona et al, 2009).

It was discovered that the eukaryotic and prokaryotic ribosomes share more similarities to each other than do cytosolic counterparts (Hutchin et al, 1993 and Lu et al, 2010). Thus, it is of no surprise that the ototoxic site of action of AG is proposed to be in the eukaryotic mitochondrial ribosomes. It is proposed that the 1555A>G mutation changes the secondary structure of the 12S rRNA of the mitochondria, leading to increased susceptibility to AG- induced hearing impairment.

The position 1555 in eukaryotic ribosomes is equivalent to position 1491 in the decoding region of bacterial ribosomes (Hermann, 2007). The resulting 1555A>G mutation forms a new G-C base pair (pair with nucleotide C at position 1494), hence extending the neighbouring stem by one nucleotide. The resulting secondary structure of the 12S rRNA will hence, resemble the bacterial 16S rRNA more closely. Since this mutation introduces a new base that is needed for AG attachment to the decoding region, the resulting mutated 12S rRNA will hence have greater affinity for AG. This results in increased susceptibility to the ototoxic effects of AG. This theory has been postulated by several authors (Prezant et al, 1993 and Guan et al, 2000).

In the absence of AG exposure, the clinical phenotype of the mutation 1555A>G varies among the affected population, exhibiting a variety of clinical phenotypes with respect to the penetrance and expressivity of the mutation, age of onset and the
degree of hearing impairment (Estivill et al., 1998 and Tang et al., 2007). Analysis of the lymphoblastoid cell lines derived from an extended Arab Israeli family with the 1555A>G mutation revealed that the existence of the clinical phenotype depends on the degree of biochemical defect (Guan et al., 1996 and Guan et al., 2000). This implies that other factors like nuclear modifier genes, environmental factors such as AG exposure and the presence of mitochondrial haplotypes might play a role in modulating the phenotypic expression of the primary mutation.

Though multiple studies have shown the association between mutations and AG-induced hearing impairment, these results may not be applicable to this CF population. A recent study on 153 adults with CF revealed that 42.2% and 8.6% suffered from “mild” and “moderate to severe” ototoxicity respectively (Conrad et al., 2008). The investigators in this study sequenced part of the MT-RNR1 gene and discovered five mutations previously linked to hearing impairment. Of these five, three of the patients had hearing impairment.

Since CF patients represent one of the biggest populations on AG treatment, it is thus important to determine the prevalence and impact of such mutations in this population. A cross sectional of 120 CF patients revealed that 4-11% of them had hearing impairment (Martins et al., 2010). However, there were no significant association between AG usage and hearing impairment. Additionally, it has been demonstrated in previous studies that CF may have a protective effect against the toxic effects of AGs (Woodland et al., 1998). However, this particular population is exposed to a higher dose of AGs more often than the general population. Due to this, researchers are uncertain whether this protective effect have resulted in equivalent chance of risk to ototoxicity as compared to other populations who are on a shorter dose of AGs for a shorter period.

Additionally, the presence of mitochondrial mutations may increase their susceptibility to AG-induced deafness. Knowledge about the prevalence of such mutations and associated hearing impairment in CF patients has yet to be determined. To date, CF patients represent one of the biggest populations on AGs treatment and are hence, at a significantly greater risk to the development of ototoxicity compared to the general population. Further studies are needed to clarify these issues in this particular population so that precautionary steps can be taken in advance.

A model analysing the cost effectiveness of the 1555A>G mutation in CF patients was carried out previously (Veenstra et al., 2007). This model concluded that screening was not a cost-effective decision based on the assumptions made in this study; low prevalence of 1555A>G (0.086%) in the population, high false positive rate and the chance of a less effective treatment regimen in response to a positive test. However, this study may have underestimated the prevalence of this mutation in the population as a recent study by Vandebona et al. (2009) showed that the prevalence of 1555A>G among the Caucasian population was approximately 0.21%.

Measures to decrease the incidence of AG-induced hearing impairment have been investigated and seem promising. Some have suggested the use of anti-oxidant to decrease the formation of reactive oxygen species (Rybak and Whitworth, 2005). Another study reported on the use of aspirin together with gentamicin to decrease
the incidence of hearing loss (Sha et al., 2006). In addition, a further randomised controlled trial compared the use of N-acetylcysteine (NAC) versus no NAC in a group of dialysis patients taking gentamicin reported reduced incidence of hearing loss in the NAC-treated group of patients (Feldman et al., 2007). Though these are just preliminary reports that require further research, they are nevertheless encouraging.

Hence, this study serves as a pilot study that aims to optimise the methods involved in the process of testing for mutations in CF patients. Our central hypothesis is that CF patients with maternally inherited mitochondrial mutations are at increased risk of hearing impairment on exposure to AG. Currently, this study is in the “planning” stage of the PDSA (Plan-Do-Study-Act) cycle, with the aim of doing a larger study on the whole CF population in the UK in the future.

In this study, 15 saliva samples were collected from the CF clinic. Sequencing of the whole MT-RNR1 gene was carried out. The resultant sequence data were compared against the revised Cambridge Reference Sequence (rCRS) to check for mutations. Results were correlated with AG exposure and hearing impairment.

Two variants, 709G>A and 1189C>T were identified in 3 patients. 709G>A, with a prevalence of 7.14% was found in one patient with normal hearing. 1189T>C, with a prevalence of 14.3% was found in two patients with mild to moderate hearing impairment. These three patients were all previously exposed to AGs treatment. The literatures suggested that these were not significantly associated with hearing impairment (Lu et al., 2010). However, in the present study, 1189T>C was found in two hearing impaired patients. Hence, the pathogenicity of this variant remains unclear.

This study represents a pilot study for the future work. Based on this pilot study, a large scale study that involves all the CF patients in the UK will be feasible in the future. Identification of mutations associated with hearing impairment in this group of population is important as they represent one of the largest populations on AG treatment. Knowledge of the genetic background will allow clinicians to prescribe with care and the dosage of AG can be tailored to suit the patient, thus decreasing the risk of ototoxicity.

**References:**


GENETIC POLYMORPHISMS ASSOCIATED WITH SIDE EFFECTS OF ANTIBIOTICS IN CHILDREN

Siew Chee Wong

INTRODUCTION

- AGs are commonly used in a wide range of conditions including CF
- SE: nephrotoxicity and ototoxicity
- Previous literature - mtDNA mutations predispose to AG induced hearing loss
- A1555G - common mtDNA mutation, prevalence of approx. 0.2% in the European population
- 17% of CF patients suffer from hearing impairment

INTRODUCTION

- Most common mtDNA mutation - 1555A>G
- mtDNA mutation changes the secondary structure of the ribosomes \( \rightarrow \) increased susceptibility to AG-induced hearing impairment
- In the diagram, \( A \rightarrow G \), extending the adjacent stem

CURRENT SITUATION

- CF - 1 in 2500 newborns
- UK - >7000 people with CF, 17% with hearing impairment
- Better treatment \( \rightarrow \) prolonged life expectancy \( \rightarrow \) more complications from AG usage (ototoxicity and nephrotoxicity)
- 0.20% have the most common mtDNA mutation, 1555A>G

CURRENT SITUATION

- Veenstra et al - developed a decision analytical model to evaluate the cost effectiveness of mutational screening among CF patients
- Concluded that this was not a cost effective decision based on low prevalence of the 1555A>G mutation, high rate of false positive cases and less effective treatment with alternative drug

COST-EFFECTIVENESS

- Vandeboma et al - estimated that the prevalence of 1555A>G was 0.21%
- Overall - There may have been an underestimation of the prevalence in the study by Veenstra et al, hence leading to inconclusive results.
• CF - prevalence of mtDNA mutations and their impact on CF patients are still unclear
  - represents one of the biggest populations on AG

• Pilot study – aims to optimise the methods involved in the mutational screening of the MT-RNR1 gene.

• Hypothesis: Mutations can be identified on sequencing the whole MT-RNR1 gene.

THIS PROJECT

• Methods: Saliva samples were collected, sequenced, and analyzed.

• Results: 2 variants in 3 were found, 709G>A and 1189T>C.
  - From previous literatures, these were not significantly associated with hearing impairment.
  - However, in this study, 1189T>C was found in two hearing impaired patients.

• Hence, the pathogenicity of these variants remain undetermined.

THIS PROJECT

• Strength: whole MT-RNR1 gene was sequenced.

• Weakness: limited sample size (only 15 samples in this study)

• Long-term goal: plan for a larger population based in the future that can reliably test the whole CF population in the UK.

• This can help to prevent ototoxicity among the patients.

FUTURE WORK

PDSA CYCLE

This project is in phase “P” of the PDSA cycle.
My experience of being in an IHI Open School Chapter

Author
Kate Moores, Cardiff University, email: kate_moores3@hotmail.com

Abstract
Change has made an improvement for the Wales Student Chapter.
My introduction to Quality Improvement began in April 2009 as a first year physiotherapy student. I always wanted to work in a health profession to help others. However, I was alarmed to learn that healthcare can be harmful. This was my call to action. Whilst the Chapter achieved many successes, we recognised that whilst we were engaging students studying locally, we were struggling to engage students nationwide. In September 2010, we re-launched as an online inter-professional community connecting healthcare students in Universities across Wales; as a result, membership increased from 86 to 600 members (20% of which are Physiotherapy students!). This journey has been challenging!

When introducing the work of the Chapter to fellow students, some were sceptical. However through raising publicity for the Chapter at fresher’s fairs, and 10 awareness-raising sessions within the academic timetable, students are becoming increasingly interested. As Chapter Advisor, I advocate quality improvement and patient safety learning to my contemporaries through demonstrating the benefits to them as the future healthcare workforce. To communicate to my student body, I wrote an article for student healthcare magazine ‘ParkLife’ which saw an increase in our membership. In November 2010, my quality improvement knowledge was tested as I sat on the judging panel alongside 1000 Lives Plus representatives, for the first Wales Student Chapter essay competition on the topic “As a student have you made a small change that made a big difference in healthcare?”

My role enabled me to engage Academic Faculty and Clinical Staff, gaining their support for quality improvement and patient safety to be incorporated within the curriculum. We have been able to raise the profile of the Chapter by delivering sessions in Universities; for example, a presentation on an inter-professional learning day within the School of Healthcare studies at Cardiff University. I have delivered presentations to a diverse group of health professions students by emphasising the importance of patient safety through context-rich examples. The work of the Chapter has been exciting, which I’m keen to share with other Chapters.

Is change always an improvement? In this case, change has made an improvement for the Wales Student Chapter.

My introduction to Quality Improvement began in April 2009 as a first year physiotherapy student. I always wanted to work in a health profession to help others. However, I was alarmed to learn that healthcare can be harmful with 1 in 10 patients...
being harmed and 1 in 300 patients being killed by the care they receive (WHO, 2009), and yet this hadn’t been mentioned in any of my lectures. This was my call to action, which is why I got involved with the Wales Student Chapter.

The Wales Student Chapter achieved many successes in its first year, such as the co-organisation of the first Quality Improvement Academy for Health, Social Care and Public Health in Wales. The Academy gave 60 healthcare students the opportunity to be introduced to the methodology of improvement and understand errors in healthcare; a particular feature included a root cause analysis competition run by Dr Greg Ogrinc from Dartmouth University. Several of our membership completing the IHI Open School online courses in Quality improvement, Patient Safety and Leadership. In addition, members of the Wales Student Chapter were involved in “Check a Box, Save a Life” the first global student sprint for healthcare improvement. Despite these successes, we recognised that whilst we were engaging students studying locally, we were struggling to engage students nationwide as a multi professional steering group.

In September 2010, we re-launched as an online inter professional community connecting healthcare students in Universities across Wales and providing a hub for relevant up-to-date articles and information on Patient safety and Quality Improvement. As a result, membership increased from 86 to 600 members (20% of whom are Physiotherapy students!). This journey has been challenging, with lots of learning, which I aim to capture in this paper.

Engaging students in Healthcare Improvement

Introducing healthcare improvement and the work of the Chapter to fellow students can be a very daunting task; particularly since so many of my colleagues have been sceptical. However, through raising publicity for the Chapter at fresher’s fairs, and over 10 awareness-raising sessions within the academic timetable, students are becoming increasingly interested. We have achieved this through helping students to realise the potential value of learning about quality improvement and patient safety to their training, course assignment, and future practice as a healthcare professional. As Chapter Advisor, I advocate quality improvement and patient safety learning to my contemporaries through demonstrating the benefits to them as the future healthcare workforce.

I also illustrate the benefits to them as student members to aid their professional development, such as being able to attend 1000 Lives Plus learning events; take online courses with the IHI Open School; and have free access to up-to-date resources on quality improvement and patient safety, along with opportunities to enter essay competitions with exciting prizes. Further, the added value from knowledge and understanding of quality improvement in healthcare and patient safety develops skills such as leadership and improved communication ability - both of which are attractive to employers! To communicate these benefits to a large student body of several thousand students at my University, I wrote an article for the student healthcare magazine called ‘ParkLife’. We use the ‘number of members’ as an outcome measure for our raise awareness events and activities and we saw a 20% increase in our membership. The article detailed my involvement with the Wales
Student Chapter, including how I feel I have been able to improve the quality of care that I provide to my patients.

In November 2010, my quality improvement in healthcare knowledge and understanding was tested when I was invited to be a judge alongside 1000 Lives Plus representatives, for the first Wales Student Chapter essay competition on the topic “As a student have you made a small change that made a big difference in healthcare?”. The essay competition enabled us to reach out to students and capture some of their experiences of healthcare and ideas for improving its quality. Our most recent essay competition challenges students to write a short essay using a structured communication method called SBAR. We have asked them to consider how this can be used to improve communication during a patient safety incident that they may or may not have witnessed on placement. The essay competitions are a great tool to engage with students by introducing improvement tools; particularly to encourage them to think more about safety and quality issues in relation to their own practice and what they have seen while on placement. As a student with a knowledge and understanding of SBAR, I was able to create the learning material for students about SBAR, and as a reflection of my developing expertise I will sit on the judging panel for subsequent essay competitions.

Engaging others in Healthcare Improvement

The Wales Student Chapter recognised early that it would be critical to invite Academic Faculty and Clinical Staff into discussions regarding our intentions with students. Over the past two years we have worked to gain their support for quality improvement and patient safety to be incorporated within the curriculum. In physiotherapy, I have met with the appropriate educational leads at my healthcare school to endorse and encourage the uptake of various QI and Safety competencies into areas of the physiotherapy curricula. In addition, we have been able to sensitise staff to the importance of these issues through profile-raising events that the Chapter has been invited to deliver at Universities; for example, a presentation at an interprofessional learning day within the School of Healthcare studies at Cardiff University.

There are challenges to delivering presentations to diverse group of health professions students! I found giving a presentation on the WHO Safer Surgery Checklist and the “Check a Box, Save a Life” campaign (Henderson and Carson-Stevens 2010) to first year operating department practitioners an insightful experience. We have learned the value of providing students with examples they can understand and connect with the content and its relevance to their student and future professional roles. Whilst the Wales Chapter serves as an online community, we have scheduled outreach events at Universities across Wales engage more personally with the students. These enable me to develop my confidence in presenting to audiences from multiple healthcare professions and variable understanding of healthcare improvement.

Raising awareness about QI and Safety at other forums is important too! Through positions of responsibility that I hold at my professional body and University, I have taken every opportunity to promote the Wales Student Chapter, the 1000 Lives Plus programme and the relevance of students connecting with these initiatives. As a
school representative at the Chartered Society of Physiotherapy, I sit on Welsh Board with clinical managers and other representatives of the profession from throughout Wales. The Board are currently looking at the use of patient stories, a quality improvement tool, within the profession. I have liaised with key members of both the Welsh Board executive and connected them with members of the 1000 Lives Plus programme team to join up the work both parties are doing around the use of patient stories, and the training of healthcare professionals to capture them. The 1000 Lives Plus team were able to demonstrate the role and value of stories for sensitising frontline staff to issues that need improving in healthcare. Collectively, they are now looking to start every Welsh Board meeting with an example of a patient story, and then work together as a team to come up with improvement ideas based upon the story.

My involvement with this project enabled me to appreciate real links between the roles that I have taken on, as well as helping me to develop my communication, leadership and organisational skills, which will help me when I start my professional career. It has also been extremely rewarding to think I have had a role to play in influencing the development of quality improvement within physiotherapy in Wales.

**From Cardiff to the whole of Wales**

While the successes we have had within the Chapter have been great, they have not been without their challenges. We have to be extremely mindful that being the Wales Student Chapter means we must be inclusive to University students across Wales, regardless of where they maybe studying. Due to the wide geographical spread of members of the Wales Student Chapter, we tend to spend time travelling the country establishing links with members of faculty at different Higher Education Institutions. Our website and e-newsletter supports our work as a resource for promoting and engaging students as an online community. Our website links to the IHI Open School website, which is a valuable tool when trying to engage with students. As well as links to other websites, we direct students to both the 1000 Lives Plus and IHI twitter accounts so they can receive real time updates of what the programmes are working on.

A student version of the 1000 Lives Plus quality improvement e-Newsletter was launched in October 2010. The first issue was read by over 300 students across Wales! The e-Newsletter combines articles from 1000 Lives Plus, with articles and events that are relevant to the student body. These have included video interviews with Chapter members about their experience of being involved with the Wales Student Chapter, and resources to support essay competitions. The website also contains a copy of the e-newsletter as a resource for everyone to access, along with other articles, reports or upcoming events.

The Wales Student Chapter website is regularly accessed by students, and in December 2010 received over 2000 'hits'. I have helped the Wales Student Chapter Co-ordinator source articles and resources to upload onto the website to share with other students. While looking for articles it is important to be mindful that our membership covers a wide range of healthcare students.
Medical students and nursing students make up a large amount of our membership with 146 medical students and 106 nursing students currently comprise a large share of our membership. However, when sourcing resources we seek to provide for the entire membership, which includes midwifery, occupational therapy, pharmacy, clinical psychology and operating department practitioner students. With our total membership at over 500 students and faculty staff, our e-Newsletter and website content must be relevant to all, in order to engage as many as possible.

Along with the geographical challenges, we have worked hard to ensure that the presentations we give are relevant to the audiences that we are presenting to, and to make sure that our promotional material is not too specific to one healthcare group. We have done this by making sure that the focus of the material is patient-centred. This is because we believe that every health professional should have patients at the centre of everything that they do.

In conclusion, my time spent developing and aiding the success of the Wales Chapter has been an rewarding experience (professionally and socially). I am able to combine my enthusiasm to deliver high quality care for patients with my love of teaching others. Working with students from other healthcare professions has been a fun and insightful experience; having opportunity to learn about the different ways other students learn in hospitals has helped me appreciate the value we can collectively bring as a team through our ‘fresh eyes’ to the workplace. I am excited about linking with members of other IHI Open School chapters across the UK, and internationally, to share learning and improve the quality of care for the future of the NHS. I hope that we can learn from each other’s triumphs and mistakes to help prevent harm to our patients, and improve the quality of all aspects of healthcare, in every healthcare profession.

References

Wales Student Chapter (n.d.) Wales Student Chapter Website. www.walesstudentchapter.wales.nhs.uk [accessed 08.03.2011]
IHI (n.d.) IHI twitter account. http://twitter.com/#!/TheIHI [accessed 08.03.2011]
A little bit about me ..

- Kate Moores
- 3rd year Physiotherapy student at Cardiff University
- Involved with the Chapter since 1st year
- 3rd year research project on quality improvement

Future of NHS Wales

"NHS Wales has an extraordinary opportunity to deliver its ambition and become one of the world’s high performing integrated healthcare systems. The challenge now is to seize that opportunity and develop a world-class health system for the citizens of Wales."

Aim

- Policy - 5 year Strategic Framework
- Improve health
- Transform system & service performance & quality
- Transform health services
- Transform people’s lives

The Wales Student Chapter is fundamental to the NHS Wales of the future!

Create resources

- New Wales Student Chapter brochure
- Articles & information on patient safety & quality improvement on website:
  www.walesstudentchapter.wales.nhs.uk
### Create visibility

- E-newsletter launched on 14th October and is read by over 300 students across Wales.
- My contribution = articles, interviews and even lent my face to the 1000 Lives Plus programme

<table>
<thead>
<tr>
<th>Article for healthcare student magazine “ParkLife” that is published by Cardiff University.</th>
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<tr>
<td>Attended freshers fairs to raise publicity for the Chapter and encourage students to join!</td>
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### Create benefit

- Essay competitions for healthcare students across Wales
- Judging panel

<table>
<thead>
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<th>10 x presentations given to students</th>
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<tr>
<td>Delivered to students studying:</td>
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<td>Nursing</td>
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<td>Medicine</td>
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<td>Midwifery</td>
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<td>Other allied health professions</td>
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<td>Membership now 557 students</td>
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### Key message: why should students join?

- Your specialist training + quality improvement = better patient care

### Conclusions

- Rewarding experience (professionally & socially)
- Enthusiasm to deliver high quality care
- Opportunities to work with students from other healthcare professions
- Importance of interprofessional teams
- Improve quality of care for future NHS

Membership now 557 students
Please visit our websites:

www.walesstudentchapter.wales.nhs.uk

www.1000livesplus.wales.nhs.uk

Any Questions?

Thank you to:
Victoria Evans, Wales Student Chapter Coordinator, 1000 Lives Plus
Dr Andrew Carson-Stevens, Clinical Academic Advisor to the Wales Student Chapter
Abstract

Since one person had the idea to improve patient safety and the quality of care within the medical school at the University of Nottingham, Open School Nottingham has now recruited over 100 members in the past 10 months. This chapter has received excellent feedback from the events and skills sessions organised so far also.

Initially, members were recruited through advertisement and from this a committee was chosen using a written application process, in which members were requested to identify relevant skills and ideas for improvement projects in the future. By looking for vital character traits such as determination and originality as well as time management and organizational skills, it was possible to identify a team in which effort would prevail.

The committee was divided into chapter leaders to deal with general enquiries, source conferences to attend and opportunities for recognition through conferences, posters and publications and to oversee the other committee members. Project leaders were set with the on going task of introducing new improvement projects, a main stay of which has been auditing within the departments of the local hospitals. Through liaising with health care professionals, project leaders were able to allocate OSN members and keep regular progress updates within neurology as well as A&E. In continuity with this, events leaders were appointed to arrange conferences at the University of Nottingham as well as meetings and skills sessions such as the highly rated ‘Audit skills Training’ session. But none of this would have been possible without the continued enthusiasm of the recruitment leaders. Through constant emails, fresher’s fayre, university intranet, posters and lecture shout out advertisements, not to mention the recent launch of the OSN website and newsletter by the communication leaders, the number of members in OSN has grown substantially to surpass the predefined targets.

The creation of a successful chapter can be compared to starting and maintaining a business. In the future, OSN plans to use such established methods defined by the business industry to further set goals, such as recruiting over 200 members within a set timeframe. With the right motivation and support, it has been possible to give the members what they want, as well as contribute to their CV’s. With continual efforts of the OSN committee in their roles, this Chapters’ progress has shown to be increasingly rewarding to the individuals involved.

Introduction

The word “success” originates from the 16th century, from the Latin “successus” (Oxford Dictionaries, n.d.). Historically, success was a belief that was mainly standardised by religion, literature and social features. But now, in the 21st century, society deems success as a reward achieved by those who work hard, helps others and has a strong will. In the last twelve months, the Open School Nottingham (OSN) Chapter, budded from the IHI Open School initiative, has demonstrated huge success in establishing and maintaining our
Chapter as a new and positive way forward, in making a stand for patient safety and quality improvement at the University of Nottingham, UK.

The main critical issue, which we felt required immediate transformation, was the lack of knowledge of medical students and junior doctors, in the importance of patient safety and quality improvement. A recent paper (Berwick & Finkelstein, 2010) established that this must be an integral part of the medical curriculum - not only must students be able to negotiate the complexities of everyday diagnoses and treatment, but they must be able to encompass improvement projects centred around real life situations as part of their professional progression. The Open School Nottingham Chapter believes that by providing the correct information and teaching, the younger health professionals can successfully shape the way in improving our healthcare system for the better.

Organising and leadership

Cohen et al., 2003, proposed that in order for a leadership organisation in quality improvement to succeed, five realities must be addressed in line with predefined objectives - purpose, structure, relationships, leadership and helpful mechanisms (Cohen, Eustis & Gribbins, 2003). Further to this, the paper also highlighted the importance of rapport, rewards and team building skills. We have based our starting principles on these core realities.

The purpose of our Chapter has been to educate students and raise awareness regarding the need for continuous patient safety projects and quality improvement, support them in leading and carrying out initiatives and find formal recognition for their efforts.

In terms of structure, after determining the urgent challenges and gaps in our modern healthcare systems, we publicised and called for applications for positions on our core committee to begin an organisational leadership structure in our Chapter. The committee was given designated roles according to the needs of the chapter with specific criterions to recognise dedicated students and reward their efforts. This consisted of three Chapter Leaders, three Recruitment Leaders, three Events Leaders, four Projects Leaders, two Communications Leaders and one Treasurer.

By creating a hierarchy of leadership, where the Chapter Leaders were able to provide a key role in helping and facilitating projects, recruitment and events, we were able to develop a relationship – not only between leaders in the same role, but between roles also. In the case of the Chapter Leaders, this was to delegate tasks and research sources of recognition, such as the opportunity to present at conferences and publicise the efforts of the OSN members. These efforts were overseen by Project Leaders, who have been able to exude confidence and reliability in their abilities to create, manage and progress improvement projects and take the best ideas to the next level within a group setting. Aside from improvement projects, OSN also endeavoured to introduce regular events to improve teaching on the so-called ‘soft skills’ of medicine; events which were publicised and for by Recruitment Leaders, who have also focused on general aspects of raising awareness of the role of OSN within the medical school and increasing the number of members within OSN as an on going improvement project.

Helpful mechanisms involved accessing and making available as much support as possible. We also made all committee members aware of the huge wealth of guidance and information on different subjects on the international IHI website. In addition, we have successfully been maintaining contact and rapport with several different supervisors and local champions at the University of Nottingham, who are interested in developing our Chapter and further fulfilling our long-term goals.
Improvement Projects and audits

Developing and leading improvement initiatives have played, and will continue to play a vital role in our Chapters' aims and objectives. A recent study (Hall et al, 2010) established that the resource of medical students can be better utilised in quality improvement projects by recognising and suggesting ideas, action plans and solutions to prevent patient safety errors. Thus, our Chapter have placed a huge emphasis on arranging students to lead projects from organising events and committee meetings to leading large-scale patient safety initiatives and projects involving raising awareness.

Open School Nottingham has heavily been involved in clinical audit. The Healthcare Quality Improvement Partnership (HQIP) is a national organisation, which aims to increase the awareness and impact that clinical audit and governance have on patient safety and healthcare improvement in England and Wales, and they recognise clinical audit as a powerful tool in this process (Healthcare Improvement Partnership, n.d.).

Through subjective feedback, we identified that the majority of medical students at the University of Nottingham did actually want to be involved in audit and clinical governance, but did not know who to contact or how to get involved. In addition, the IHI Student Survey (IHI, 2010) showed that only 33% of students received information regarding quality improvement in their medical school curriculum, 78% showed interest in gaining further skills, 85% believed these skills would be important to future employers and 91% viewed quality improvement skills as important to their personal effectiveness. Thus, the evidence already shows a clear gap in quality improvement education.

To fill this gap, we have established contacts for clinical leads in a vast array of specialties that would like help from medical students to carry out and gather data for their audits. We group students in pairs for one audit in order to establish relationships and leadership profiles. Not only does this benefit the patients in that an increasing number of audits will be completed with regards to their care, but students will ascertain an earlier experience of auditing which will promote future influences on healthcare within the trust and provide them with sought after skills. We have yet to develop a structured model to implement medical students into clinical audit at a mass level.

Skills sessions and other events

Through this aspect of our chapter, we have had ample opportunity to develop our skills in working as part of a team in an effort to achieve progression in health care improvement and enhance medical student competencies. One method of such activity has been the combined effort required to host skills sessions. Not only does this require the creativity of an enthusiastic Chapter Leader, but also the Events Leaders to establish a speaker and venue and Recruitment Leaders to raise awareness of the event.

Our first such session was entitled the ‘Audit Training Session’, for which we recruited a guest speaker – the Quality, Risk and Safety Manager from the Trust auditing office. The session was aimed at all year groups within the medical school and primarily aimed to give students a brief overview of what an audit is, how to collect and analyse data and how to present findings. This session also gave students the opportunity to explore reasons for the lack of completion of audits and how to overcome such barriers as inadequate guidance and support (Crombie et al, 2000). Communication Leaders played a central role in following up this event by means of assessing feedback from students, the positivity and success of which has inspired is to make this an annual event.
Following on from this, a leadership session was arranged in an interactive session, where students were able to discuss ideas regarding each person’s views and opinions regarding good leadership skills as well as provide our members with some insight into the reasons for and the means to acquiring these skills. OSN felt this session was of particular importance in defining a profile of leadership qualities, not only within medical students, but which could be incorporated into the medical school curriculum (Bicket et al, 2010). Given evidence from previous research on the effectiveness of one off sessions, it was clear that this session could prove useful as the student progresses (Ten Eyck et al, 2010). Role-plays were used to depict different aspects of leadership and our members had an opportunity to explore how they could effectively deal with negative attitudes by developing strategic approaches as future leaders of the healthcare system.

Motivation and recognition

Our Chapter believes that recognising one’s strengths and weaknesses and using that to find formal recognition for an individual’s and the team’s contributions are a central part in maintaining the Chapter.

Maslow’s theory of motivation suggests that individual’s motivational levels are based on a hierarchical system consisting of different stages of personal needs (Maslow, 1970). The needs of the Chapter Leaders are based on self-actualisation, as they continuously try to fulfil not only their own full potential, but also of the other core committee Leaders. Chapter Leaders drive the other Leaders up through the hierarchical stages so that they can then fulfil other students’ potentials, thus raising awareness and energising inspiration at the same time to create movement. To establish this movement, Chapter Leaders have extensively been finding opportunities of recognition.

Firstly, we have encouraged the Chapter members to present their work in the format of oral and poster presentations at national and international conferences and at audit meetings. In 2010, we submitted posters titled “The multi-skilled doctor, and how to get there” and “Open School Nottingham: past, present and future” at the IHI Open School England Exchange and the IHI International Forum in Orlando, respectively. As a Chapter, eleven of our abstracts were accepted for presentation at the upcoming IHI Open School England National Conference in March. It has been established that not only does the completion of an improvement project benefit patient safety and provide opportunities for students to be recognised for their efforts, but in actuality, it is this recognition that actually drives the potential of the improvement projects in the first place (Davidoff & Baltalden, 2005). In addition, the Chapter Leaders have thoroughly encouraged members to present their work at audit meetings, write papers and publications and further their knowledge by taking the IHI online module courses. In addition, we have encouraged project supervisors, senior healthcare professionals and members to personally reward each other through positive reinforcement.

Future thoughts

Although the chapter is still very much within its infancy, we have great plans for the future of the society and how we can influence patient safety and improve healthcare quality across the trust and perhaps nationally.

One of our main goals in the coming months is to focus on the integration of other professions within the realms of medicine in general. By piloting an inter-professional learning scheme within the chapter we aim to incorporate a variety of health related disciplines to extend the abilities of OSN by gaining knowledge and support from a greater
range of perspectives and opinions. In doing so, we plan to reflect on previous reviews of such schemes in an effort to avoid the pitfalls of previous research by crafting continuous support mechanisms with flexible leadership programmes suited to each course so that we can develop an environment in which progression is maintained amicably (Greenfield et al, 2011).

Despite initially having focused on auditing as an influential method of recognition both within the trust and the medical school, there is now greater scope for the development of improvement projects having already established direction within the chapter. Of particular interest has been the inclusion of OSN within the medical school curriculum. Not only to increase awareness of OSN and promote our activities within the medical school, but to influence the curriculum and introduce changes in the training and development of the doctors of tomorrow (Walton et al, 2010). One example of this is the improvement of communication skills both in a doctor patient and interdisciplinary setting. By incorporating human factors and real life situations into training, as opposed to generic skills, it may be possible to enhance these skills, which could influence patient satisfaction and adherence, for example (Cahan et al, 2010).

Conclusions

In an effort to focus on quality improvement with in the medical school, OSN has developed a successful team by the creation and completion of reasonable aims and objectives using a strong framework of support, leadership and organisation, a method already proven by Mills and Weeks (2004).

Despite having defined the progression of the Nottingham Chapter as successful, it is important to remember the definition of success as being subjective. As in ones career, to be successful is to psychologically fulfil ones own self-directed goals. The past, present and future aspirations of OSN will only be completed should this stance be applied in a similar fashion, in that the members are committed to work towards improving OSN for their personal benefit, as well as that of colleagues, patients and the wider community (Dobrow , n.d.).

References


**Agenda**

- An introduction to OSN
- Organising and leadership
- Improvement Projects & Audits
- Skills sessions and other events
- Motivation and recognition
- Future Thoughts
- Conclusions

**An introduction to OSN**

- **Success**
  - Curricular Knowledge
  - Patient Safety & Quality Improvement

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**Organising and leadership**

- A structured leadership organisation
- The five realities:
  - Purpose – goals
  - Structure – applications
  - Relationships – support
  - Leadership – hierarchy
  - Rapport
- Rewards
- Team Building

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**Our Committee**

- Chapter Leader
- Chapter Leader, Founder & President
- Chapter Leader
- 3 Project Leaders
- 3 Events Leaders
- 2 Communications Leaders
- Treasurer
- 3 Recruitment Leaders
1. Incorrectly filled out DNAR orders and implications
2. The Use of Clinical Audit in IHI Open School
3. Implementation of a patient safety leaflet: benefits and problems
4. Integration of IHI Open School into the medical school curriculum
5. The Importance of Interpersonal Skills: shaping how 21st century medicine is taught
   - Clinical Audits:
     - Neurology
     - Anaesthetics
     - Colorectal Surgery
     - Gastroenterology
     - Thoracics
     - Radiology
     - Paediatrics
     - Thoracics
     - Radiology
     - Paediatrics
     - Thoracics
     - Radiology
     - Paediatrics
8. Integration of IHI Open School into the medical school curriculum
9. The Importance of Interpersonal Skills: shaping how 21st century medicine is taught
10. Clinical Audits:
    - Neurology
    - Anaesthetics
    - Colorectal Surgery
    - Gastroenterology
    - Thoracics
    - Radiology
    - Paediatrics
    - Thoracics
    - Radiology
    - Paediatrics
11. Skills sessions and other events
12. Audit training session
13. Leadership training session
14. Fresher's Fayre
15. Regular committee meetings
17. Future thoughts
   - WHO Surgical Checklist Improvement Project and events evening
   - Integration into medical school curriculum
   - SBAR Improvement Project
   - IPI Integration
   - Skills sessions – NICE guidelines
   - Further recruitment and awareness
   - WHO Patient Safety Curriculum
18. Conclusions
19. Success is SUBJECTIVE!
THANKS FOR LISTENING!

Sarah Louise Nutt
Experiences from the IHI Open School University of Cambridge Chapter

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Abstract
The Open School Cambridge Chapter has progressed greatly since its inception in April 2010. Chapter membership was founded by only 8 medical students and has since grown to over 60 members. We have established an extensive support network; including senior clinicians, the hospital patient safety department and medical school dean, who have helped us in the implementation of our improvement projects. For example, in conjunction with the hospital patient safety department, we introduced the structured communication tool, ‘Situation Background Assessment Recommendation (SBAR),’ into patient handovers and phone calls in Addenbrooke’s Hospital. The effectiveness of SBAR has since reassessed, with significant improvements in the effectiveness observed. A large group of doctors and nurses have received training and have subsequently adopted SBAR into their clinical practice. The usefulness of the telephone calls for prioritizing tasks had improved since our previous Plan Do Study Act (PDSA) cycle. Moreover, we showed that communications using SBAR were of higher quality than when SBAR were not used.

Our second quality improvement project has been assessing the completeness and accuracy of haematology and biochemistry blood test forms in the outpatient department setting. Our results indicate that over 41% forms (n=1177) are filled in inadequately. Posters to educate doctors of this problem have been designed and circulated. Our other projects include the improvement of infection control, and communication between GPs and hospital out-patient departments.

Aside from our specific quality improvement projects, we have run a number of local workshops, focusing on stimulating interest in patient safety initiatives, teaching the core principles of quality improvement and offering practical advice on project implementation. Furthermore, our chapter leaders and extensive support network offer continued support to interested students. The feedback we have received from workshop attendees has been overwhelmingly positive (87% rated good or above). We are currently looking forward to our first multi-professional workshop including medical, nursing and allied health professional students. This workshop will serve as an excellent platform for the exchange of ideas on quality improvement and form the basis of an even wider student network.

Finally, the Chapter is working to enhance the current medical school curriculum by improving the quality of teaching on SBAR within the communication skills aspect of the course. We hope eventually to incorporate further aspects of quality improvement into the medical course.
Introduction

The Institute of Healthcare Improvement (IHI) Open School (IHI Open School for health professions, nd) initiative is an international network of student-led chapters, concerned with equipping health profession students with the knowledge and skills to drive improvements in the quality of patient care and safety. Since its inception in April 2010, the IHI Open School University of Cambridge Chapter has made significant progress in initiating change through establishing a strong chapter infrastructure, designing and running quality improvement projects and teaching the principles of quality improvement and patient safety (QIPS) through student-led multiprofessional workshops.

Chapter Structure

The Chapter has greatly benefited from its structural framework. Rather than operating via a traditional structure in which committee members are formally assigned the positions of president, vice-president, secretary etc., the Chapter has a system of rotating leadership. Here, a chair and secretary are nominated for each Chapter meeting, who discuss the agenda and record the minutes of the meeting respectively. The roles of chair and secretary are subsequently rotated for each meeting, allowing each committee member to gain leadership experience, ensuring all committee members are treated as full team members, while also equally distributing the workload across the committee. We have found this structure has contributed to the success of the Chapter by ensuring that all committee members are able to assume a leadership role and are thus encouraged to hold a holistic perspective to the Chapter’s progress and activities as well as running their individual improvement projects. We feel this ensures that all committee members are able to contribute to the overall development of the Chapter.

Second, the Chapter has established an extensive support network including senior clinicians, the hospital patient safety department, university academics and the medical school dean. With their support and expertise, we have been able to successfully negotiate the initial challenges of establishing the Chapter as well as run effective quality improvement projects and multiprofessional workshops.

Quality Improvement Projects

Our first improvement project was designed and then run in conjunction with the hospital patient safety department. Here, we ran a Plan, Do, Study, Act (PDSA) cycle to assess the effectiveness of communication on the Emergency Assessment Unit (EAU) and Emergency Department (ED) of Addenbrooke’s Hospital, Cambridge University Hospitals NHS Foundation Trust. The results of our baseline assessment of communication demonstrated that 6/21 (30%) phone calls to junior doctors on the EAU were deemed as below average in terms of the effectiveness of the call in helping them to prioritize patients. None of the calls used the structured communication tool Situation-Background-Assessment-Recommendation (SBAR) (SBAR Technique for Communication: A Situational Briefing Model, 2005) and we found that only 2/21 (10%) phone calls utilized a logical structure. These phone calls
were rated as 8/10 and 10/10 in terms of effectiveness of communication. Based on our findings, we concluded that currently communication via phone calls is below average in a significant proportion of calls and it is likely that a structured communication tool such as SBAR would help to improve the quality of communication in the EAU.

In order to address these problems, an 8-week hospital-wide awareness initiative was run to educate health professionals about SBAR. The educational campaign used presentations, ward-based workshops, posters and pocket-sized SBAR reminder cards to raise awareness. Following this initiative, the effectiveness of communication was re-evaluated to determine whether any improvements were made. We found that phone calls using SBAR \( (n=19) \) were seen as subjectively more useful for the prioritization of tasks compared to those that did not use SBAR \( (n=24, \ p=0.048) \). Moreover significantly more calls were seen as well-conveyed when SBAR was used \( (8/19) \) compared to when it was not \( (2/24, \ p<0.0001) \). These results demonstrated the effectiveness of the awareness campaign in raising awareness about SBAR and that communication is significantly better when SBAR is used compared to when it is not in the EAU and ED. We hope to run a second PDSA cycle to re-evaluate communication once the awareness campaign has run for 6 months.

Our second quality improvement project assessed the accuracy and completeness of documentation of Haematology and Clinical Biochemistry & Immunology blood test request forms in the outpatients department of Addenbrooke’s Hospital, Cambridge University Hospitals NHS Foundation Trust. Here, paper request forms are still used rather than the hospital’s internal electronic accessing system. From observation in outpatient clinics, it was felt that there was a high percentage of forms that were inaccurately and incompletely filled out and on further discussions with the hospital’s pathology department this was confirmed. Resultantly, delays were experienced by the requesting clinicians in receiving the results with an added potential for error in identifying patients. Our baseline evaluation found that overall 41% blood test request forms \( (n=1177) \) were filled in inadequately; 39.1% \( (n=749) \) Clinical Biochemistry & Immunology forms and 46.5% \( (n=428) \) Haematology forms. Thus, two interventions were instituted to raise awareness of this issue: first, posters were placed in all clinic rooms in the outpatients department aimed at educating clinicians of the problem and how to fill in the forms accurately and completely. Second, an online notification was added to the Cambridge University Hospitals NHS Foundation Trust intranet homepage. 6-weeks after introducing these interventions, the accuracy and completeness of documentation was re-evaluated. Only Clinical Biochemistry & Immunology forms were assessed and it was found that 30.9% \( (n=825) \) were inadequately filled out. This was statistically significant \( (Z=3.362 \text{ at } 99\% \text{ confidence level with a two proportion one-tailed Z-test}) \). Thus, our PDSA cycle has first highlighted that the documentation of blood test request forms is unsatisfactory with nearly one-third of Clinical Biochemistry & Immunology forms still inadequately filled out. However, we found that the interventions have served to significantly improve the accuracy and completeness of information. We hope to run our second PDSA cycle in order to assess the adequacy of filling out blood test request forms 6 months after the interventions to gauge its longer-term effectiveness.
Presentations
We have presented our work at two major prestigious meetings, which has provided us with a further impetus to expand and diversify the chapter’s activities. Firstly, 2 of our Chapter leaders presented our work at the IHI’s 22nd Annual National Forum on Quality Improvement in Health Care, Orlando, FL. This was a unique opportunity to interact with leaders in field of QIPS and encouraged us to expand the Chapter’s educational and recruitment activities beyond the domain of our medical school. Secondly, our work was selected for presentation at the Network for No Name’s Launch Meeting: An Evening with the Rt Hon. Andrew Lansley, Secretary of State for Health. This meeting was an excellent opportunity to present and discuss our Chapter’s work to an audience primarily concerned with how QIPS will fit into the soon-to-be reformed NHS. Here, the focus was on the importance of being able to foresee and tackle potential challenges in our recruitment, educational and quality improvement initiatives. Taken together, we feel that these meetings have not only been opportunities to showcase our work but also a timely prompt to continuously re-evaluate the Chapter’s direction and future progress.

Workshops
Workshops have been a central feature of the Chapter’s recruitment and awareness drive. Through structured workshop programmes involving multimedia, interactive presentations and small group sessions we have aimed to highlight the importance of QIPS, teach the core principles of QIPS and offer practical advice on running improvement projects. The chapter leaders and our extensive support network offer continued support to interested students, for instance in the form of troubleshooting advice, while at the same time encouraging the students to shape and develop their own ideas and learn from experience. Our feedback from the first workshop (medical student attendees only) demonstrated an 18% improvement of QIPS and 32% improvement in confidence with regard to approaching improvement projects. The second workshop was multiprofessional with attendees coming from both the University of Cambridge (medical students) and Anglia Ruskin University (operating department practitioner students). We conducted a prospective and retrospective questionnaire of the students’ confidence in their own knowledge and skills with regards to approaching QIPS. We demonstrated that confidence in possessing QIPS knowledge significantly improved after the workshop ($p<0.001$), while there was a trend towards improvement in feeling confident in possessing QIPS skills ($p=0.06$). Overall, we conclude that short (2 hours) multiprofessional student-led workshops are able to improve the confidence and knowledge of students regarding QIPS and that such a model could be used as a platform to train health profession students in QIPS.

Summary
The Cambridge Chapter has made significant progress in the 11 months since its conception. Establishing a strong Chapter support network, recruitment drives and a multiprofessional workshop have served to give the Chapter an excellent platform to promote QIPS. With two quality improvement projects completing a full PDSA cycle
and demonstrating statistically significant improvement in outcomes, we have illustrated the effectiveness of QIPS interventions in achieving higher standards of patient safety. Looking to the future, we hope to engage more students from a wider range of educational backgrounds to lead their own improvement projects. Furthermore, we aim to introduce QIPS training in the curriculum to maximise awareness of its importance and equip students with the knowledge and skills to become leaders in QIPS.

References

IHI Open School for Health Professions (nd)  
http://www.ihi.org/IHI/Programs/IHIOpenSchool/IHIOpenSchoolforHealthProfessions.htm?TabId=0 [accessed 09/03/2011]

Experiences of the University of Cambridge Chapter

Vishal Vyas
Chapter Leader

Introduction

- Chapter
- Quality Improvement Projects
- Presentations
- Workshops

The Chapter

- 8 medical students to membership of >60 health profession students
- Rotating leadership
  - Leadership experience
  - Holistic perspective
- Extensive support network
  - Senior clinicians and academics
  - Patient safety department
  - Medical School Dean

Quality Improvement Projects: Situation-Background-Awareness-Recommendation (SBAR)

- Baseline assessment of communication: 6/21 (30%) phone calls rated below average in helping doctors to prioritize patients
- Conclusion: unstructured, poor quality phone calls increases inefficiency and risk of error
- Intervention: 8 week hospital-wide awareness initiative (ward presentations, workshops, posters, pocket-sized cards)

SBAR: Completing the PDSA cycle

- Re-evaluation of communication: phone calls using SBAR more useful for prioritizing tasks ($p=0.048$)
- More phone calls seen as well-conveyed with SBAR ($p<0.0001$)
- Conclusion: SBAR more effective method of communication

Quality Improvement Projects: Blood request forms

- Problem: 41% blood test request forms ($n=1177$ forms) incompletely and inaccurately documented
- Intervention: posters in clinic rooms and online notification on hospital intranet
- Outcome: re-assessment of form documentation showed 30.9% blood test request forms ($n=825$)
- Conclusion: highlighted problem and improved form documentation needed for further improvement
Presentations & New Insights

- 22nd IHI Annual National Forum on Quality Improvement in Health Care, Orlando, Florida
  - Importance of multiprofessional learning
  - Assessing effectiveness: prospective and retrospective data collection.
- Network With No Name Launch Event: An evening with the Rt Hon. Andrew Lansley, Royal Society of Medicine, London
  - Need for quality improvement in the soon-to-be reformed NHS

Workshops

- Aim: educate and inspire!
- Methods: Multimedia, interactive presentations, small group break-out sessions
- Ongoing support

Workshops: benefits

- Assessing effectiveness: significantly improved confidence in knowledge of quality improvement and patient safety (QIPS) ($p<0.001$)
- Improved skills in QIPS
- Model to train health profession students

Key Conclusions

- Rapid progress in 11 months since inception
- Importance of chapter structure and support network
- Completing two full PDSA cycles for improvement projects
- Workshops and Recruitment

Acknowledgements

- All members of the University of Cambridge Chapter
- Addenbrooke’s Hospital Patient Safety Unit (Dr Sue Broster) and Pathology Department (Angus Gidman)
- Ward staff on the Emergency Assessment Unit and Emergency Department
- IHI, Open School England and the NHS Institute for Innovation and Improvement
Workshops

The Cambridge Chapter,
Developing improvement projects
Measuring Outcomes

- Plan
  - Variables
  - Quantifying data
  - Controls
  - Analysis
  - Sample size

Networks of Support

- Medical School
  - Dean, Academics and Support staff
- Hospital
  - Senior clinicians, Medical Director, Patient Safety Department, Research & Audit Department
- Open School England –
  - Leads, Chapters
- IHI
  - Website support
- Networking

Questions?
Rosalind Gould, The Warwick Chapter,

**Patient handover – An ignored clinical skill?**

Recent changes in working patterns have resulted in more frequent staff changes, and thus more frequent handovers between doctors. These are times where error is common and patient care can be compromised.

There is wide variability between hospitals and departments as to how handovers take place, with no agreed structure. In 2010 RISC, the patient safety society at Warwick University, explored handovers in a qualitative study through interviews with junior doctors. The results and recommendations have since been incorporated by senior staff into a pilot initiative aimed at improving handover at one of the participating hospitals, and we have been asked to evaluate these changes.

This workshop will discuss the process of handover, as well as tips for getting a quality improvement project off the ground and into clinical practice.
Patient handover – An ignored clinical skill?
Rosalind Gould, The Warwick Chapter

Handovers
- What is a handover?
- When should they occur?
- What information should be given?
- What do you think happens in reality?

Our project:
- Conducted by The Warwick Patient Safety Group
  > Medical students
- Seen handovers in action … unimpressed!
- Pilot SBAR audit:
  > Enlightening!
  > Some Drs thought they had perfect communication!
  > We decided to go back to basics

Method
- Semi-structure qualitative interviews
- 19 doctors from F1 to consultant
- 28 specialties
- 3 different hospitals
- Interview schedule
- Thematic analysis
- Representative quotes

Interviews
- Tell me about your experience of handovers
- How could handovers be improved?
- What are the consequences of bad handovers?
- Tell me about a time when a problem has occurred because of poor handover
Main Topics

Content
Format
Impact

Patient Identification

“Go through the patients who have had problems overnight who have been sick, patients who you need to be aware of” [Jenny]

Level of Detail

“The thing about a bad handover is it’s very vague...It’s up to you to put in order of priority what the patients need” [Mary]

Assessment of Urgency

“When you’re...called to a ward...you already know a little bit about them before you get there. Which can be really helpful in terms of knowing how fast to run. Haha. Or not” [Richard]
Discipline

- “It makes a difference if you’ve got somebody... to lead the events, so they kind of stop other people overtalking, who everybody kind of listens to” [Rory]
- “I worked somewhere where you get like an A4 page...split sections forwards that you can write who’s a problem so that you’ve got, you know, everything in front of you...it’s not on one scabby bit of paper that’s covered in scribbles that you at 3 in the morning can’t understand” [Gail]

Attendance

- “It’s really frustrating when if you’re trying to handover events of the night and you’re tired from a night shift and, um, the people you need to handover just haven’t turned up” [Richard]
- “I think there should be nursing staff input...that would be a better idea...[but] they never have time” [Toby]

Regularity

- “The worst handover is no handover at all” [Sarah]
- “You need to know exactly where it’s gonna be and what time... then everyone kind of knows what to expect, and what’s expected of them...and I think people kind of gain in confidence with the system” [Rory]

Quality of Care

- “It’s just inefficient and unsafe, more work for the doctor, but definitely unsafe for the patient as well” [Mary]
- “9 times out of 10 probably wouldn’t have serious consequences but then when it does, it can be serious” [Sarah]

Effect on Staff

- “If you don’t have enough information...you have to go find the notes, sit read through things, what it is that you’re actually meant to be doing...you’re kind of taking away resources from one to another which is less beneficial so a quick handover can alleviate a lot of that” [Rory]
- “It’s really good for building a sense of team...a sense of belonging and sense of team work between the different teams because otherwise you wouldn’t have any contact” [Richard]
Incidents

“A patient that the team thought had been discharged had actually been moved to another ward...I had to deal with the relatives in the middle of the night, who were taking their relative home, in high dudgeon that they hadn’t been seen for 10 days... It could have been stopped at 100 different points in between, but it wasn’t” [Richard]

Incidents

“being called to an arrest...when you look through the notes and you see that somebody has been reviewed on several occasions...and there hasn’t been a plan made...it’s not been handed over to the night shift so they’ve not known anything about it...[the patient’s death] might have been preventable, but it wasn’t preventable might have had a nicer death than the death that they had, and also probably also would have been a much more pleasant experience for the staff around them” [Gail]

Recommendations

- Induction for F1 doctors
- Training for medical students
- Dedicated room at regular times each day
- Nominated lead, nursing representation and register of attendance.
- Use of handover sheets

Audit cycle

- Re-auditing
- Post-implementation analysis of handovers.

Training for medical students

How to prepare for handovers...

- How and Where?
  - Discuss
  - In undergraduate curriculum?
  - Observing handovers?
  - Examinations / OSCEs?

Healthcare students

- Usually not ‘stuck in a rut’
- Don’t have the attitude “this is how it has always been done”
- Students get everywhere!
- Good position to notice what goes on.
Potential projects

- If you see something you think could be improved, even if you don’t know how...
- If you hear different people always complaining about the same thing...

Dissemination of information

- Keep to a simple list of recommendations
- Minimize jargon
- Very clear summary / poster

We didn’t need to drive our recommendations forward, they were happily taken on board.

Why we should undertake patient safety projects...

- We are all responsible for patient safety
- Not rocket science
- Just complaining won’t change anything
- A well structured approach can.

Thank you
Any questions?
Sue Lister, Coventry University,
The foundations of improvement

Many students and healthcare professionals know they want to do something about the quality of care provided but feel it is too complicated. They also often feel they do not have the authority to do anything.

This session is designed to demystify the processes of improvement by showing how to use some basic tools. The aim is to show that small changes can improve the quality of the care that we provide and it is something everybody can (and should) do.

Learning Objectives
1- Improving care from the patients perspective
2- Focusing on the system (not blaming others)
3- Using a model for improvement
Most people would like to ‘do something about quality’ but don’t have the time.

They are too busy dealing with complaints, making good (correcting) mistakes, doing the wrong things right and doing what they do twice.

paraphrased from Øvretveit 1992

It is the system ...

Every system is perfectly designed to produce the outcome it achieves!

paraphrased from Berwick (1996)
The health service has many heroes. The staff who work harder, predict problems and compensate for short comings.

Heroic thoroughness may make patients lives a little safer but a real improvement in the quality of care provided to patients is not created by heroes who compensate for the flawed processes.

The real heroes are those who change the system to remove the flaws!

The PDSA Cycle

- **Act**
  - Objective
  - What do we want to do?
  - Plan to carry out the cycle
  - (who, what, where, when)
  - Plan for data collection
- **Study**
  - Analyse the data
  - What did or didn’t work?
  - Summarise what was learnt
- **Plan**
  - Just do it
  - Carry out the plan
  - Document problems and unexpected observations
- **Do**
  - What changes are to be made?
  - Next cycle?


Student Improvement Projects

1. Patient Dignity in A&E
2. Infection control ...
   a) Hand washing in Theatre
   b) Stethoscopes
3. Dehydration post stroke
4. Communication post stroke
5. Equipment not arriving for Community Occupational Therapists
6. Apparent neglect in a Care Home
Bibliography


Berwick DM (1996) A primer on leading the improvement of systems. BMJ 312  619-622


Useful Links

www.institute.nhs.uk  NHS Institute for Innovation and Improvement

www.tin.nhs.uk  NHS Trent Improvement Network

www.ihi.org  Institute for Health Care Improvement (USA)

www.improvementskills.org  The Healthcare Improvement Skills Center


Improvement Leaders’ Guides

General Improvement Skills

- Improvement knowledge & skills
- Process mapping, analysis and redesign
- Working with groups
- Involving patients and carers
- Evaluating improvement
- Sustainability
- Technology in improvement
- Delivering improvement
- Measurement for improvement
- Matching capacity and demand
- Improving flow
- Working in systems

Process and systems thinking

- Managing the human dimensions of change
- Redesigning roles
- Building and nurturing an improvement culture
- Leading improvement
Shannon Mills, Institute for Healthcare Improvement & Fraser Pryde University of Dundee,

IHI Open School: Developing a truly global network

This session will demonstrate how students and faculty can engage others on their campus through the IHI Open School and will highlight the new efforts to develop a global network.
Sue Mortlock and Bernard Crump, NHS Institute for Innovation and Improvement,
National leadership competency framework in the curriculum of healthcare professionals
This session will aim to offer an overview of the new NHS Leadership Framework and how this will be embedded in medical and clinical career training.
The NHS Leadership Framework

Describing the leadership behaviours for all NHS staff

Sue Mortlock
Head of Board Development

Agenda

• Introduction and background to existing NHS leadership frameworks
  – LQF
  – MLCF
  – CLCF
• New NHS Leadership Framework
• Questions and discussion

Background

• The Health and Social Care Bill published in Jan 2011 will mean radical change for the NHS England
• Frontline clinicians will be at the heart of driving this change forward.
• To enable this to happen and support clinicians and other leaders, managers and executives, in this very important role we will need to further develop the leadership capacity within the system.
• Liberating the NHS Workforce, Health Education England
• This means ensuring the appropriate infrastructure is in place, that it aligns with the new NHS structure, and that it supports the new leadership requirements that will emerge such as fostering leadership talent and overcoming barriers to realising individual leadership potential.

Vision for the NHS Leadership Framework

• A single over-arching framework for all staff in the NHS irrespective of discipline, role or function
• Is underpinned by a consistent set of guiding principles which reflect the values of NHS staff and embodies the NHS constitution and represents the foundation of leadership behaviour for staff throughout the NHS
• Combines and builds on the Leadership Qualities Framework and the Medical and Clinical Leadership Frameworks
• Staff are able to understand their progression and development as a leader
Evolution of Leadership Qualities Framework

- Fifteen qualities, arranged in three clusters
- Each quality defined at levels that identify both effective and outstanding leaders
- The highest levels relate to the expected behaviours demonstrated by outstanding chief executives within the NHS
- Launched in 2002

Evolution of Medical Leadership Competency Framework

- Jointly developed by Academy of Medical Royal Colleges and NHS Institute
- First in use in 2008 now with 2 further ed.
- Describes leadership competences for doctors
- Applies to all medical students and doctors
- Being used to inform formal education and training curricula
- Being progressively embedded into regulation

Evolution of Clinical Leadership Competency Framework

- NLC commissioned the NHS Institute in 2010
- Tests applicability of the MLCF to all clinical professions
- Is multidisciplinary
- Relates to clinician’s practitioners roles and applies to every clinician at all stages of their professional journey
- Being used in formal E & T curricula
- Being progressively embedded into professional, education and regulatory standards

The NHS Leadership Framework - genesis

- Commissioned by the NLC in May 2010 - over the past months we have been developing with the input of a wide range of players
- National Leadership Council programmes eg CL, TL and Inclusion w/s, SHA leadership alliance
- Build on strengths of the LQF and the MLCF/CLCF to reflect change in the NHS landscape and contemporary theories
- The qualities and behaviours described are generic and transcend specific roles
- Designed to be applicable to all staff groups including clinical and medical roles
- The MLCF and CLCF are being embedded in education curriculum and regulation
- Contemporary leadership literature review
- LQF factor analysis-meta qualities

The NHS Leadership Framework

- And links to the Leadership Qualities Framework (LQF) which is currently used throughout the NHS
- Has been in use since 2002
- Developed for senior managers
- Now being adapted for use to all NHS staff, clinical and non-clinical

Current environment

- Workplace
- Vocational and workplace training
- Organisational development
- Inclusion, Emerging leaders, Board development
- Specialist frameworks eg CCF

- Education sector
- Undergraduate, postgraduate, Curricula, and continuing professional development e-learning
- CLCF, MLCF

- Regulation
- Standards of practice & for education and training
- LQF, KSF, HR National Framework
The NHS Leadership Framework – cont’d

• Combines the MLCF (Medical Leadership Competency Framework) and the CLCF (Clinical Leadership Competency Framework) developed for the regulated clinical professions.

• These are now being progressively embedded into professional, education and regulatory standards and will apply across the United Kingdom in the public and private sector.

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The NHS Leadership Framework

• The NHS LF combines the Leadership Qualities Framework (LQF) (developed in 2002, specifically for senior leaders within the NHS), the Medical Leadership Competency Framework (MLCF)/Clinical Leadership Competency Framework (CLCF), and the 4 stages of leadership to form one leadership framework.

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¹Adapted from The Leadership Pipeline model (Charan, R, Drotter, S & Noel, J, 2001)

The NHS Leadership Framework

• It includes 5 core domains, drawn from the MLCF/CLCF:
  – Demonstrating Personal Qualities
  – Working with Others
  – Managing Services
  – Improving Services
  – Setting Direction

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Structure:

• Domains
  T categories describing the scope of leadership behaviours
• Elements
  Divide each domain into 4 manageable components
• Descriptors
  Statements that underpin the Leadership Framework and describe leadership behaviours which are underpinned by relevant knowledge, skills and attributes.
• Context
  The context in which staff operate is defined by their sphere of influence, levels of accountability and risk in terms of impact
• Stages
  Designed to be broadly progressive and illustrate the stage of development of staff as their context changes and responsibilities increase
• Indicators
  Statements which point staff to the type of activity they should be demonstrating to fully or partially meet the relevant element of the NHS Leadership Framework
• Contra indicators
  Generic behaviours expected if individual is not yet demonstrating this domain

© NHS Institute for Innovation and Improvement, 2010
The NHS Leadership Framework

- It is comprised of 7 domains:
  - Demonstrating Personal Qualities
  - Working with Others
  - Managing Services
  - Improving Services
  - Setting Direction
  - Creating the vision
  - Delivering the strategy

- And 4 stages that enable staff to understand their progression as a leader

Domain 1

1. Demonstrating Personal Qualities
   1.1 Developing self awareness
   1.2 Managing yourself
   1.3 Continuing personal development
   1.4 Acting with integrity

Elements x 4

For example

Effective leaders need to draw upon their values, strengths and abilities to deliver high standards of care.

This requires leaders to demonstrate competence in the areas of:

Element 1.1 Developing self awareness

Contextual descriptors

1. Demonstrating Personal Qualities
   1.1 Developing self awareness

And the context is staff...

- Recognise and articulate their own values and principles, understanding how these may differ from those of other individuals and groups
- Identify their own strengths and limitations, the impact of their behaviour on others, and the effect of stress on their own behaviour
- Identify their own emotions and prejudices and understand how these can affect their judgment and behaviour
- Obtain, analyse and act on feedback from a variety of sources.

A clinician’s leadership journey

- very experienced clinician – 13 years in practice
- Questioning what’s next???? Fell something is missing, feeling a bit stale and looking for new challenges
- Drifting from one project to another
- Working on a project and could see the need to involve others but frustrated by her managers
- Steered by mentor into SHA project role parallel by ‘leadership development activity’
- Week 1 terrified
- Week 28 asked to make presentation to Andrew Lansley rehearsed with Ruth Carnell
- Still a practitioner but has developed as a ‘leader’
Stages of leadership

Within the 5 core leadership domains there are 4 stages:
- Stage 1: Own practice/Immediate team
- Stage 2: Whole service/Across teams
- Stage 3: Across services/Wider organisation
- Stage 4: Whole organisation/Wider healthcare system

Adapted from The Leadership Pipeline model (Charan, R., Drotter, S. & Noel, J., 2001)

Context is key

Reflects on how factors such as own values, prejudices and emotions influence their judgement, behaviour and self-belief. Uses feedback from appraisals and other sources to consider personal impact and change behaviour. Understands personal sources of stress.

Stage 1:
- Reflects on how factors such as own values, prejudices and emotions influence their judgement, behaviour and self-belief.
- Uses feedback from appraisals and other sources to consider personal impact and change behaviour.
- Understands personal sources of stress.

Stage 2:
- Reflects on their interactions with a wide and diverse range of individuals and groups from within and beyond their immediate service/organisation.
- Challenges and refreshes own values, beliefs, leadership styles and approaches.
- Overtly role models the giving and receiving of feedback.

Uses sophisticated tools and sources to continuously learn about their leadership impact in the wider healthcare community and improve their effectiveness as a senior leader. Understands how pressures associated with carrying out a high profile role impact on them and their performance.

Shared leadership

The 5 core domains are based on the concept of shared leadership:

- All staff will demonstrate a range of leadership behaviours across these 5 domains dependent on their context.
- For example:
  - Staff at Stage 1 – (own practice/immediate team) will demonstrate a range of behaviours across all 5 domains.
  - Staff at Stage 2 - (whole service/across teams) will also demonstrate a range of behaviours across all 5 domains.
  - Staff at Stage 3 (across services/wider organisation) - will demonstrate a range of behaviours across all 5 domains.

For clinicians, stages 1 – 3 directly link to their MLCF and CLCF. E.g. a newly registered radiographer will demonstrate stage 1 & 2 leadership.

Summary:

- The NHS LF is comprised of 5 core domains that apply to all staff.
- There are two additional stretching domains which apply to positional leaders.
- Each is divided into 4 manageable components by categorising the statements which provide context and help staff understand where they relate to the framework.
- The 4 stages enable staff to understand their progression and development as a leader(4,8),(995,979)
Questions

- What is your view on the new framework?
- How do you see the framework supporting you in your career?
- How do you see the framework see this supporting clinical leadership across the service?
- Comments/observations?

Infrastructure and resources

What’s planned:

For Individuals
- Online 360 diagnostic
- Self assessment diagnostic
- Development Toolkit
- LeAD (e-learning modules)
- Case studies

For Facilitators
- Face to face and e-learning training materials

Timeframes and Outputs

Stage 1: end of Feb
Generic Framework document
Consultation
Focus Groups

Stage 2: Apr - Jul
Create a bespoke 360 Feedback Tool, suitable for the different levels within the revised framework

Stage 3: Apr - Jul
Development of resources e.g. website and training materials for NHS LF facilitators

Stage 4: Jul
Launch tool and engagement activity
LF 360 tool goes live: Sept

Contacts

For further information please contact: leadership@institute.nhs.uk
The Advanced Case Study - Performing Route Cause Analysis of an Adverse Event

The Advanced Case Study is an incident review that aims to improve your ability to perform Route Cause Analysis (RCA) of an adverse event. RCA seeks to answer four questions regarding an adverse event:

1. What happened?
2. Why did it happen?
3. What are we going to do to prevent it from happening again?
4. How will we know that the changes we make actually improve the safety of the system?

RCA enables us to:

1. Understand the system failures that led to a specific adverse event.
2. Prevent a similar adverse event in the future.
Duncan Shrewsbury, The Birmingham Chapter,
**Empowerment through Engagement and Communication**
This highly interactive workshop will build on your communication and negotiation skills to hone your abilities to successfully lead and manage teams. By the end of the workshop, participants should feel empowered to initiate and lead change within the healthcare setting, have an awareness of how to engage key players and understand the importance of good communication in achieving goals. The workshop will cover topics such as negotiating with senior (and potentially intimidating) colleagues, making a 'winning bid', motivating your team and performance management.

The session will contain an introduction to specific theoretical frameworks, practical coaching and will involve some role play to practice the skills explored.
Aims of Workshop

Understand:
- impact of communication on team efficacy
- basic concepts of communication models (and the benefit of using models)

Be able to:
- Use advanced skills to consult and engage
- Assess who will benefit your team

Covering

- Non technical skills
- Communication Models
  - Theory
  - Practice
- Setting the Rules
- Pitching the Sale
- Engaging the Team and beyond
  - Who to choose
  - How to decide

Skills for Change

Communication

- 2-way process
  - Involves LISTENING

- Comprises of
  - Words
  - Tone, speed, stress
  - Actions
Models of Communication

...the result of communication is the response you get.


Nonviolent Communication

...So What?!?

...making common-sense stuff complicated?

• May be obvious
• Can be used to help consciously change
  • Our habits / patterns
  • Specific communication for task
  • How we build rapport with others
  • How successful our communication is

Ground Rules

Break into groups to discuss and explore the "ground Rules" of communication, jot them down on the paper provided.

Think of:

• Who, what where when...
• Common sense as well as the abstract
• Bringing it all in together
Communicating for Success

• Who are you communicating with
  • Overt aims
  • Covert objectives

• What do you want
  • Overt aims
  • Covert objectives

• What you know about your audience
  • Receptivity
  • Attitude and approach

• Be dynamic

The part (or system) with the most behavioral flexibility will control the system (or other systems)

Cybernetics: the Law of Requisite Variety

Engaging the Team

• Identifying who you have and who you need:
  • Who is in your team?
  • Who is your team dependant on?
  • What does your team need to progress?
  • Who can bring these resources?

...SWOT analysis

In groups, conduct a SWOT analysis specifically relating to the engagement of a senior Clinician or member of Faculty

Pitching it Right

• Clear objectives
  • Tanzania SMART goals

• Win-Win situation
  • Making action mutually beneficial
  • Positively Stated
  • Positively framed
  • Like it’s their own idea

Thanks

Any Questions?
Kate Sylvester, South Warwickshire NHS FT,

From Audit to Improvement

Medical students are often asked to do ‘clinical audits’ as part of their training. Their frustration is that these audits often ‘go nowhere’. Objectives:

1) 1. Lean how to turn clinical audits into opportunities for improvement.
   a) Helping unlock the opportunities. (Pareto Analysis)
   b) Creating problem solving plan (A3 Process for problem solving)
Issue and Background

• Time 45 minutes:

• Issue:
  – How do we take the findings from a clinical audit to start an improvement project?

• Background.
  – Medical students are often asked to do ‘clinical audits’ as part of their training.
  – Their frustration is that these audits often ‘go nowhere’.

Objectives:

• Lean how to turn clinical audits into opportunities for improvement.

• Helping unlock the opportunities.
  – Analysis of the Means
  – Pareto Analysis

• Creating problem solving plan
  – A3 Process for problem solving

Examples of Audits

• What have you been asked to do?

Venous thromboembolism
VTE
Prevention Audit
Is the difference statistically significant?

- Who is the better surgeon?
  - The surgeon who does 2 operations and has one death (50% death rate)
  - The surgeon who does 100 operations and has 40 deaths (40% death rate)
- Is this a problem with the
  - surgeons?
  - or is it a problem operation (process)?
- We have to take into account the ‘opportunity’ for error as well as the error rate

Analysis of means

Analysis of Means

ANOM

See spreadsheet

Example data

Analysis of means VTE (Sep 10)

What do these guys do?

It isn’t perfect but they perform far better than the process as a whole: GED. They are working a different, more effective process

Real data

Who are they?

1. ACCIDENT AND EMERGENCY
2. BURNS
3. CARDIOLOGY
4. CARDIOVASCULAR SURGERY
5. CARE OF THE ELDERLY
6. CHEST MEDICINE
7. CLEFT APHQUICKSOMA
8. CLINICAL IMMUNOLOGY
9. CLINICAL ONCOLOGY
10. COLORECTAL SURGERY
11. DERMATOLOGY
12. DIABETES
13. EAR NOSE AND THROAT
14. ENDOCRINOLOGY
15. ENTROLOGY
16. GENERAL MEDICINE
17. GENERAL SURGERY
18. GYNECOLOGICAL ONCOLOGY
19. GYNECOLOGY
20. HEMATOLOGY
21. INFECTIOUS DISEASES
22. NEUROLOGY
23. NEUROSURGERY
24. NEUROMEDICINE
25. NEPHROLOGY
26. NEUROSURGERY
27. NEUROLOGY
28. DENTISTRY
29. GERIATRICS
30. GERIATRICS
31. ORAL SURGERY
32. ORTHOPAEDIC SURGERY
33. PALLIATIVE MEDICINE
34. PLASTIC SURGERY
35. PRIMARY PULMONARY HYPERTENSION
36. RADIOLOGY
37. RADIATION THERAPY
38. SPINAL DISORDERS
39. SPINAL DISORDERS
40. STRATEGIC RADIOTHERAPY
41. STRATEGIC SURGERY
42. TUMOR BIOLOGY
43. UROLOGY
44. VASCULAR ONCOLOGY
45. VASCULAR SURGERY
46. VITREORETINAL
**2 Issues**

1. Improving the best process:
   - Achieving 100% reliably
   - One specialty

2. Spreading best process
   - Every patient
   - All specialties

**A3 Problem Solving**

- A way of tracking a problem and developing solutions
  - Originally A3 paper, pencil and rubber
  - Iterative
    - PD5A cycles to learn about the problem.
  - Once solved:
    - Signed off
    - Fax to other factories so they can solve the same problem
  - A3 paper was the biggest bit of paper that would go through a fax machine.

**Title of Problem: Owner and date**

**Box 3 Issue or Problem:**

**Box 4 Current State Map**

- Current condition
- What is happening currently?

**Box 3 Improvements required**

Concentrate on reaching the future state
What changes are required?

**Box 5 Analysis: DATA**

- Why are these problems happening?
  - Problems, types of waste, how about "A3?"

**Box 6 Future State Map**

- Target condition
- What would the process look like if the waste was eliminated?

**Box 4 Weekly Review Meetings**

- Map here
- Are improvements to the process on time?
- Are improvements successful?

**Box 9 Measures for Improvement**

- Cost
- Time

**Box 5: Analysis**

- The Waste:
  - Transport (moving patients, info and stuff about)
  - Inventory (queues of patients, info and stuff waiting)
  - Motion (staff moving about)
  - Waiting (staff, patients and kit waiting)
  - Over-processing (doing stuff that isn’t needed)
  - Over production (making too much)
- DEFECTS: errors that occur
  - Not the Right thing, not done on time, not done every time

**Examples of process maps:**

- Blood sample from request by doctor to result on ward
Box 6: Future State

- What would the process look like with all the waste removed?

2. Spreading best process:

- Eating the elephant
  - Where do we start?
  - How can we have the biggest impact?
- Pareto analysis

---

Pareto Analysis  

Example data

Pareto Curve  

Example data

Classic Pareto 20% of specialties account for 80% of patients
Concentrate on these 4 specialties

---

Reading:

- Data Sanity
  - A quantum Leap to unprecedented Results
    - Davis Balestracci
    - MGMA press
    - ISBN 978 156829 2953
- A3 Problem Solving for Healthcare
  - by Cindy Jimmerson:
    - Healthcare Performance Press (productivity press)
- £40 so get a copy from the library!

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Feedback

<table>
<thead>
<tr>
<th>Nuggets</th>
<th>Nice - ifs</th>
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<td>Niggles</td>
<td>No-Nos</td>
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</table>
Antral Follicle as a Significant Predictor among the Conventional Ovarian Reserve Markers in Predicting IVF Outcomes, using Previously Defined Cut-off Values

Choo S.J.F.¹, Sritaran N. ¹
University of Nottingham

Introduction
Fertility is hugely dependent on the quantity and quality of ovarian reserve. These two factors also influence the success rate of IVF treatment. Given the strong association between follicular reserve in the ovaries and success rate of IVF, ovarian reserve is seen as the primary determinant for patients who want to conceive, either spontaneously or through IVF. Apart from AFC, other tests such as the dynamic tests and endocrine markers have also been reported in predicting the IVF outcomes.

However, the success rate of IVF is not only depend on the ovarian reserve but also involving other factors such as the techniques used in embryo transfer and sperm quality (Tomsu et al., 2002).

Methods:

407 patients are included

Data collected from patient's notes

Statistical analysis:
- Linear regression
- Multivariate logistic regression
- Sensitivity, specificity and AUC

Results

Table 1: Predictive value of AFC for ovarian response.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Regression coefficient (mean &amp; 95% CI)</th>
<th>P value</th>
<th>R²</th>
</tr>
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<tr>
<td>Age</td>
<td>&lt;1.16 (0.39, 0.12)</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Basal FSH</td>
<td>-0.12 (0.08, 0.10)</td>
<td>0.004</td>
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</tr>
<tr>
<td>Ovarian Volume</td>
<td>0.26 (0.36, 0.07)</td>
<td>0.59</td>
<td></td>
</tr>
<tr>
<td>AFC</td>
<td>0.37 (0.14, 0.22)</td>
<td>&lt;0.001</td>
<td></td>
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</tbody>
</table>

Table 2: Predictive value of AFC for treatment outcomes (i.e. non-pregnancy).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Odd ratio (95% CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.95 (0.914, 0.99)</td>
<td>0.02</td>
</tr>
<tr>
<td>Basal FSH</td>
<td>0.57 (0.38, 0.95)</td>
<td>0.005</td>
</tr>
<tr>
<td>Ovarian Volume</td>
<td>0.93 (0.90, 0.96)</td>
<td>0.41</td>
</tr>
<tr>
<td>AFC</td>
<td>1.02 (1.00, 1.03)</td>
<td>0.002</td>
</tr>
</tbody>
</table>

Table 3: Performance of age and AFC in predicting poor ovarian response.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Optimum value</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>AUC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>237</td>
<td>0.66</td>
<td>0.71</td>
<td>0.601</td>
</tr>
<tr>
<td>AFC</td>
<td>511</td>
<td>1.00</td>
<td>0.62</td>
<td>0.67</td>
</tr>
</tbody>
</table>

Discussion

AFC offers the best predictive ability for determining poor ovarian response among all the conventional ovarian reserve markers. (Table 1) On the other hand, both AFC and age have equal predictive of live birth on ROC curve analysis. However, the linear ship of AFC thresholds was significantly better than that of age in predictive of live birth. (Table 2) Using the previous defined cut off value of AFC s11 in predicting poor ovarian response after an IVF procedure, it was calculated that this cut off value having prefect sensitivity and a specificity of 0.62, with the AUC of 0.67. (Table 3) Other than the findings as stated above, we also found that AFC and age are significantly associated with the number of oocytes being retrieved, which in turn reflect the ovarian response during an ART treatment. (Table 1) This results is in agreement with the study done by K.Jayaprakassan et al.

References:


S Choo,  AFC as a significant predictor among other conventional markers in predicting IVF outcomes, using previously defined cut off values
What is Clinical Audit?
Clinical audit is a quality improvement process that seeks to improve patient care and outcomes through systematic review of care against explicit criteria and the implementation of change.

Barriers to successful clinical audit
Many perceived barriers exist in achieving successful and effective clinical audit. Much research has been undertaken to evaluate the use of clinical audit and identify these barriers.

- One study identified factors that impacted on the process of clinical audit. These factors included lack of resources, lack of expertise, lack of support and motivation, poor study design, poor relationships between groups, and poor participation.

- A study by Davies et al. (2009) identified that only 30% of audits undertaken by F2s were completed and 56% by F1s. Reasons for non-completion included confusion of objectives and outcomes, and lack of resources.

- Consultants have identified a lack of motivation among junior colleagues and lack of support due to the poor success rate.

- Healthcare professionals’ attitudes. Support for audit amongst junior doctors is not universal. It is considered to be an unimportant and unnecessary exercise with no added professional rewards.

- Junior doctors have also reported feeling concerned when suggesting consultants were not audited rigorously enough and saw audit as threatening and bogging them down.

It is clear that clinical audit faces many obstacles. Most importantly, it is lacking in the lack of advice, which leads to poor planning, design and organisation resulting in a failed or low quality audit.

What Open School Nottingham Proposes:
Having identified the barriers to effective clinical audit, it is important to overcome these to ensure that they are not repeated.

- Not all medical students need to further develop their understanding of clinical audit. Ultimately, increasing the number of clinical audits undertaken by students, while decreasing the rate of incomplete audits, helps to address the problem of low audit consciousness and understanding by junior doctors.

- This should be achieved by teaching students the importance of audits early in their medical school career and by giving them the opportunity to become involved in audits in areas of particular interest.

- Emphasising the importance of organisation and planning, together with giving students a checklist to complete before starting an audit, would ensure they have met the needs necessary to complete a successful clinical audit. Part of the audit training should also include guidance on the IT skills necessary to access patient information and to manipulate this data.

- Auditors should arrange regular meetings with supervisors to promptly address any new conflicts of interest, ensuring that the audit progresses at an appropriate pace and appropriate actions are taken.

- Auditors should be given protected time during the curriculum to complete audits. The school can also include the topic of clinical audits as an area for discussion in junior meetings.

Together, these actions should improve the success rate of completing audits and overcoming the barriers, whilst raising awareness of patient safety.
Administration of antibiotics in sepsis: a delay not worth waiting for

Gradi D.1, Lonnugen C.1, Beresford J., Foreman D., Lund J.1
1 Medical Student, University of Nottingham 2 Consultant Surgeon, Royal Derby Hospital

Background: Prompt administration of antibiotics in the treatment of sepsis has been shown to be a critical determinant of survival in septic shock. The Surviving Sepsis Campaign (SSC) recommends administration of antibiotics within 1h from recognition of sepsis.

Aims and Objectives: This audit aimed to assess awareness of the SSC recommendations for administration of antibiotics among doctors and how effectively these have been implemented in practice.

Methods: 51 in-patients, clinically septic on admission as defined by the SIRS (Systemic Inflammatory Response Syndrome) criteria, were retrospectively identified from positive blood cultures taken on emergency admission. Demographic data, observations on admission, clerking and administration of antibiotics were obtained from patient records. The mean time from clerking to administration of antibiotics was calculated. Awareness of the SSC among 46 doctors (6 SPR/Consultant; 15 CT/ST; 25 F1/F2) was assessed by questionnaires. Awareness defined by both questions (What is the SSC? recommended time limit of antibiotics administration?) answered correctly.

Study Limitations: The generalisability of the results are limited by the retrospective study design and small sample size.

Results: Mean time from clerking to administration of antibiotics was 157 min (10-720 min). See table. 22/46 doctors correctly guessed the time limit for administration of antibiotics in sepsis, however only 16/46 doctors were aware of the SSC as demonstrated by both questions answered correctly. 2/46 doctors thought the time limit was more than 1 hour. 10/46 doctors had never heard of the SSC.

Conclusion: This audit found that the majority of septic patients in this teaching hospital do not receive antibiotics within the one-hour time limit as recommended by the SCC. This could be explained by the potential lack of awareness among its doctors as demonstrated by the questionnaires.

Taking pride in caring

D Gradil,  When does the clock start ticking? Administration of antibiotics in sepsis: a delay not worth waiting for
The Open School Manchester:
A Summary of Chapter Progress and Service Improvement Projects

INTRODUCTION

The “Open School” is an “Institute for Healthcare Improvement” initiative, which provides skills to implement changes in healthcare.

The Manchester Open School was started by 4 medical students attending a Patient Safety conference in April 2010. These students decided to bring these values back to Manchester Medical School and its associated University Teaching Hospitals. Feedback from local Quality Improvement (QI) departments suggested that there was a lack of awareness of QI amongst students. No students were involved in projects carried out by the various QI departments.

Aim: To increase awareness of the Manchester Open School and raise student involvement in healthcare decisions to benefit patient welfare.

INCREASING STUDENT INVOLVEMENT

- We aimed to create opportunities for members to make changes in the clinical settings by:
  - Identifying and liaising with QI workers in the North West.
  - Collaborating with the Emerging Clinical Leaders Network (eCLN) to find potential figures to lead QI projects.

PROGRESS IN RAISING STUDENT AWARENESS

- Expansion of the School:
  - 4 members in April 2010
  - 16 members in July 2010
  - 40 members in Jan 2011
  - 87.5% attendance by members at a recent workshop

PROGRESS IN STUDENT INVOLVEMENT

Links have been established with QI teams in Salford Royal Foundation Trust, Central Manchester Foundation Trust (CMFT), and Royal Bolton Hospital. The Open School Manchester has gained support from the eCLN and the postgraduate dean of medicine for the North West.

Students have been able to pilot their own QI projects, with 3 projects currently being undertaken:

- **Pilot Project**
  - **Aim:** To improve time efficiency of ward rounds in the medical admissions unit
  - **Methods:**
    - Monitor ward rounds, and construct “spaghetti maps” of workflow during ward round.
    - Identify unnecessary steps taken.
  - **Results:**
    - Delays in ward rounds were caused by:
      - Location of PC stations in relation to beds
      - Limited access to PCs due to overcrowding at the PC stations
  - **Recommendations:**
    - The use of a mobile PC unit and implementation of a Standardised Operating Protocol would significantly improve the efficiency of ward rounds.
    - The new system implemented will be evaluated in a future PDSA (Plan, Do, Study, Act) cycle.

Jason Jacob, Alex Gawthrope (2011). Manchester Medical School
INTRODUCTION
- We tend to focus on seeing any improvements in healthcare from a professional standpoint.
- To enhance customer experience, we have to understand patients’ feelings, apprehensions and communication barriers. Blatt et al. (2010) argue that by understanding the patient’s perspective, we can increase patient satisfaction.
- “When I go to a doctor, I should have somebody who I know is competent, who I know I can trust and who will put my interests first. Two of those three have nothing to do with science.” Dr. Lucian Leape (Blumenthal and Ganguli, 2010).

OBJECTIVES
- To expose medical students to the many hurdles and difficulties faced by patients
- To inculcate “Patient Perspective Culture” in the healthcare system

PAST EFFORTS
- Community Follow up Projects
- Students “feel” stories of patients through Narrative Medicine
- Students are exposed to the difficulties of the elderly by tying their legs and wearing brasses.

FUTURE PLANS
- Workshops can be arranged for patients to relate their experiences. Patients can share their thoughts, feelings and level of satisfaction with care providers. This may yield a major benefit to patients at a marginal cost.
- There are some patients, with specific needs, who require greater understanding. Lane and Rolfnick (2007) and Saisson et al. (1999) suggest role play to nurture empathy. Thus, students can learn about specific difficulties by experience - blindfolding themselves (blind), using ear plugs (hearing impaired), etc. We can build event days using these themes.

CONCLUSION
Just like a “Safety Culture” led to the development of the “collective mindfulness” of Carl Weick (Hopkins, 2003), “Patient Perspective Culture” needs to be inculcated in the healthcare system. Using patient feedback and role playing, medical professionals ingrained with “Patient Perspective Culture” will enhance the patient experience of healthcare.

REFERENCES
4. Saisson, V.A. et al. (2005). “Teach 1, do 1, believe.” Surgical communication skills to better medical students serving as communication assistants. Communication in Medicine, 71 (9) p. 93-97
Integrating the Works of Open School Nottingham into the Medical School Curriculum

Sarah Louise Nutt, Anuradha Arumugam, Katherine Rancier, Matthew Anthopoulos

Introduction

Skills communication is integral to patient care and is fundamental for health and encompasses a variety of aspects including verbal and non-verbal skills, each with its own essence, meaning and interpretation – all of which are critical for the acquisition of knowledge, diagnosis, treatment and patient education. (Bay et al., 2004; Chalmers, 2000)

Training regimens can be complicated and often fall short, particularly in the medical field. It is argued that, if truly trained in the treatment, they themselves will be more inclined to adhere to it and therefore ultimately provide drug use and treatment (Gutterman et al., 1987; Chalmers and Lauverman, 1988).

Announcement guidelines state that communication skills are often taught at medical schools, programmes emphasize psychological status, character and psychological qualities, and the frequency of implementing classes (Gollub et al., 1986; Bay et al., 2004). This evidence tends to be supported by effective teaching methods demonstrated at medical schools that integrate patient training and the evaluation of the patient's responses. (Bay et al., 2004; Chalmers, 2000)

When students see that they are practicing, students are motivated to practice. (Gollub et al., 1986; Bay et al., 2004)

The Present Curriculum and main issues

As a result, the medical schools solely utilized the skills of the medical curriculum to the teaching of CS (Gollub et al., 1986). This is because it is one of the most important forms of communication for proper medical interaction and setting (Bay et al., 2004).

The main issue is that communication skills are often left behind at the medical school level and are only taught in the medical field itself. (Gollub et al., 1986; Bay et al., 2004)

When students are motivated to practice, they will be more inclined to practice. (Gollub et al., 1986; Bay et al., 2004)

Improvement Projects

On account of the above shortcomings represented by the next of kin assessment, it is acceptable that any improvement would be welcomed. Open School Nottingham (OSN) has recently demonstrated itself as one of the medical schools where other scrivener are lacking and yet again, there is a perfect example. By creating an improvement project based on the issue of CS within the curriculum itself, it may be possible to supplement current courses for a wide range of skills using educational methods, which could prove to be a valuable resource.

CS plan to approach compassionate offer pilot scheme in a total base over a short time span, where a select group is given credit, where CS assessed before and after for current methods and improvements suggested in their tasks. Pilot scheme may include:

• Observation workshops based on recognition of a variety of CS from medical doctors combined with a presentation in doctor patient communication, preceptor and interview (Gollub et al., 2004), to increase understanding of specific component and combat levels in challenging clinical resources.

• Emphasis on self-assessment and reflection to integrate Observation through means of interview analysis of interview, role play based on real life on the ward situation and other such hands on observational exercise, and more frequent: a lecture style learning aims to have been identified or insufficient (Gollub et al., 2004).

• Research in specific communication challenges in practice, as opposed to patient's CS in improving and understanding medical doctors with outcomes on patient's consultation experience and confidence in the future, investigated by Davoren et al., 2000.

• Identifying findings and improving communication based on patient's and doctor experiences and reflections of OSN medical doctors in their respective case and how to address that. (Davoren et al., 2000)

• Faculty development is suggested by Bay et al., 2004, to improve knowledge of course teaching frameworks, enabling classroom teaching consultation with what is now in practice and knowledge of the consequences of adequate CS.

Conclusion:

CS play a vital role in patient care and teaching. From diagnosis to follow-up, communication between patient and professionals is an essential component of patient information. This short communication helps the patient in his/her treatment. In addition, patients often have preconceived ideas about their medical condition, which can influence the patient's overall treatment. The University of Nottingham recently merged CS as part of the curriculum, however, there are still shortcomings. OSN plans to address this by training to students and providing additional opportunity to practice the skills and to learn new skills. With these ideas in mind, OSN proposes to gain opportunities for auditing and future venues, with additional ideas and openness and aims to improve the CS of future doctors.
Clinical Assessment of Blood Pressure in the ITU

M. Oyeleye, Clinical Assessment of Blood Pressure in the ITU. Reducing the risk of reliance on electronic measurement devices.
Incorrectly filled out DNAR orders: implications

In 2010, a patient in a NHS hospital was not resuscitated by his doctors despite having a cardiac arrest, because they had mistakenly inverted a blank 'Do Not Attempt Resuscitation' (DNAR) form into his medical notes. Some patients did not benefit from cardiopulmonary resuscitation (CPR), so procedures were developed to withhold resuscitation which became known as DNAR orders.

These indicate that no resuscitative measures are to be attempted if a patient has a cardiopulmonary arrest. DNAR is considered in presence of factors such as low likelihood of successful CPR, patients’ views, and potential pain and complications to the patient due to CPR.

What Open School Nottingham proposes

1. Sufficient Training
   - Misunderstandings and a lack of training have been seen to be responsible for improper documentation. We suggest that structured teaching on how to fill in DNAR forms becomes a mandatory part of training for doctors, in medical school and continuing as part of postgraduate training.
   - This teaching should take the form of training days and e-learning packages, both incorporating some situation-specific scenarios to give them a chance to practice discussing the DNAR form, thus providing confidence to these doctors when they come to be responsible for completing these forms.

2. Standardised DNAR forms
   - The use of a form that is pre-printed and signed after may have significant use in reducing error rates. Evidence suggests that the use of a standardised form improves documentation and clarity.
   - Bringing up the topic early with the patient.
   - Studies show that patients want to be given the information earlier and not when they become ill.
   - We propose this is implemented into standard protocol.

Reasons for Improper Documentation

- This stems from a few key problems:
- Doctors seem to lack adequate communication skills to discuss this topic with patients.
- A general lack of clarity regarding guidelines to assist end of life decision making.
- Inadequate information may be conveyed to patients and relatives, giving the options they have for their resuscitation in critical medical situations.

Hesitation amongst medical practitioners may compel doctors to convey this information only when patients are extremely ill. At times, the critical nature of their illness may lead to doctors making DNAR decisions on behalf of the patients, without the relevant information being conveyed to patients and for their relatives and carers.

Together, these factors may lead to doctors making inappropriate filling out DNAR forms for patients without having conveyed sufficient information for informed decision making by patients.
A story of self-purposes
- Dissatisfaction with current medical school curriculum and requirements.
- Patient safety and quality improvement as a vital part of practicing better medicine.
- Desire for newly found talents, self-taught and fresh challenges.

A story of us — values and aspirations
- An underlying reason for wanting to become a doctor was to “help people.”
- An example of something medical students need to change — standing up for patient safety, justice, and opportunities to practice better medicine.

A story of now — a vision of success
- Medical students lead the way in quality improvement and set an example to other health professionals.
- To engage every single medical student at the University of Nottingham in patient safety events, improvement projects, IHI online modules, and curriculum development.

E Patel, IHI Open School Chapters: starting from scratch
My Experience of being involved in an IHI Open School Chapter

R Patel, My experience of being involved in an IHI Open School Chapter

Why did I choose IHI Open School?

The beginning of a journey...

My association with IHI Open School began a year ago when I attended their conference in London. I was greatly inspired by the enthusiasm shown by members, and was also made to realise my presence as a medical student. It fell as though I found a new road through which I could pursue my full potential as a student. By making a small step, I realised that a desired change in patient safety and quality of care could be accomplished. Moreover, it stood out as being realistic and achievable with opportunities for projects and presentations. Thus, I decided to embark upon this journey.

As part of the Nottingham chapter, we have:

- Set up a committee to reinforce team work and support the expansion of our chapter.
- Recruited over 100 members with growing interest by the day.
- Organised event activities such as an Audit training and leadership skills sessions to help us ascertain important skills for the future.
- Managed audit projects for members in most departments of the hospital. Currently working on a Neurology audit as an Open School representative.
- Progressed on the IHI online courses.

How did I get involved?

Taking the first steps...

- Consulted the official IHI website, to learn more about Open School Chapters in my institution. Affiliated myself with members of the chapters.
- Successfully applied for the position of chapter leader for Open School Nottingham, currently serving in this position.

How has it helped me?

What have I learnt from this journey...

- It has accelerated my development and a future health care professional by reinforcing vital skills such as leadership and team work, highlighting the importance of interpersonal, organisational and supervisory skills.
- It has taught me to be proactive in making decisions. To be more observant and explore healthcare aspects that need improvement.
- Provided me with a vision where medical students take initiatives and are innovative, regarding future healthcare.

Future plans? The journey continues...

My involvement with IHI Open School has been an extremely rewarding and beneficial experience so far that I aim to continue through developing projects such as investigating the occurrence of preventable errors in pediatrics with the aim of delivering innovative and dedicated them. I would sincerely recommend involvement with Open School to all others.
Aprepitant: A Clinical Audit on its Use and Effectiveness in Patients Undergoing High Dose Chemotherapy

H Treacy, Aprepitant: A Clinical Audit on its Use and Effectiveness in Patients Undergoing High-Dose Chemotherapy
E Usoro,  My experience of being involved in an IHI Open School Chapter
Conference Facilitator

Sue Lister, Coventry University and NHS Institute for Innovation and Improvement

Sue is a Senior Lecturer in Quality and Service Improvement in Healthcare at Coventry University where she teaches leadership, management, change, service improvement, etc to undergraduate and postgraduate students from all healthcare profession across the Faculty of Health and Life Sciences. In addition Sue is a Teaching Faculty member of the NHS Institute for Innovation and Improvement. She recently completed a 2 year full-time secondment at the NHS Institute where she lead the introduction of service improvement into the pre-registration education programmes of health and social care professionals in universities throughout England, working with 50 Higher Education Institutions who embedded the theories of systems management into their education programmes and facilitating more than 10,000 students undertaking improvement projects per year. Sue is currently working with the NHS Institute to support the development of the IHI Open School (England).

Prior to becoming a university lecturer specialising in quality in healthcare, Sue worked in the NHS, originally as a radiographer in an acute Trust, then in management, predominately quality and systems management within primary and community care.

Sue’s expertise is in turning apparently complex problems into small practical initiatives to improve the patients’ experience of healthcare.