The importance of training and education in infection control

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Education and training

• Why is it important?
• Who are we trying to educate/train?
• How do we do this?
• How do we assess them?
• How do we measure the effect?
• Who else should we educate?
Educating the infection control team – past, present and future. A British perspective

E.A. Jenner* and J.A. Wilson†

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†Nosocomial Infection Surveillance Unit, Public Health Laboratory Service, Colindale, London NW9 5HT, UK

Summary: This review sets out to explore how education and training provisions for members of the Infection Control Team (ICT) have developed alongside their roles and in response to changes in the British National Health Service. It focuses on the Consultant in Communicable Disease Control, the Infection Control Doctor and the Infection Control Nurse in the United Kingdom, but also briefly considers approaches adopted by other countries. Future developments should include maximizing information technology for delivering teaching materials, shared learning and improvements to pre-registration curricula for both doctors and nurses.
Why is it important?

• Difficult to effect change
  – Semmelweiss (puerperal fever)

• Poor knowledge of health care workers
  – Florence Nightingale
  – ‘the best women who are woefully deficient in sanitary knowledge’

• Problems in fever hospitals eg
  – Peters BA. The elimination of cross-infection in
    fever hospitals. *Publ Hlth* 1913–14; **27**: 296.
Why is it important?

• MRC Memorandum 11 (1944) recommended that every hospital should establish a Control of Cross-Infection Committee which:

‘should be the basis for standing orders which all hospital personnel would be required to know and obey’.
Hospital Acquired Infections 2000

• 10% of patients get a HAI
• 5000 patients every year die of HAI
• Deaths due to MRSA are increasing
• Costs £1 billion per year
• 15% of HAI are preventable
• A hospital with a lower rate of MRSA bacteraemia is a better hospital
• HAI had a low profile in many Trusts
• HAI costly and some preventable
• Dissemination of good practice needs to be improved
• Growing mismatch between what is expected of ICT and resource
Patients enter superbug lottery

MRSA risk to patients depends on where they are treated. 

500,000 DAYS LOST TO SUPERBUGS

To have it would clear waiting lists: study

The number of patients struck down by MRSA—a particularly virulent antibiotic-resistant bacterium—soared in the last year to almost 16,000 a year are killed by hospital acquired MRSA. 

But the same Scottish study also shows a marked variation between NHS trusts in the risks of MRSA. 

NEW KILLER SUPERBUG INFECTS 41 PATIENTS

Hospitals on alert as victim dies

"400 people a year are killed by some form of hospital acquired infection" 

Yorkhill trust and We Health Board had patient infection. Both洛斯太阳 had MRSA related "definite death" Scotland and the message is clear: control MRSA. 

Last ni Professor Aberdeen: "These are the serious infection go on. The cost of treating MRSA is £1.3m just in Scotland's hospitals."

BY JUDITH DUFFY
Winning Ways

• 7 action areas
  – Active surveillance
  – Reducing infection risk from devices
  – Reducing reservoirs of infection
  – High standards of hygiene in clinical practice
  – Prudent use of antibiotics (Stewardship)
  – Management and organisation
  – Research and development
Fighting Infection
UK Five Year Antimicrobial Resistance Strategy
2013 to 2018
Antibiotic resistance: indirect consequences

Disease and infections that, previously easy to control, will become much more significant threats to health. Standard surgical procedures, such as hip replacements, could become riskier with widespread antimicrobial resistance, as would treatments that result in immunosuppression, such as chemotherapy or organ transplant, which rely on the ability...

UK Chief Medical Officer’s report, 2013

Indirect consequences for medical care
- cancer chemotherapy
- complex surgery, implant surgery
- haemodialysis
- Rheumatoid arthritis
- organ transplantation

Consequences beyond human health
- financial cost up to $36bn p.a. in US
  ($70bn including “societal costs”)
Transatlantic Taskforce on Antimicrobial Resistance

Recommendations for future collaboration between the U.S. and EU

2011

- WHO (2009) and G8 (2013) Statements
  - Antibiotic resistance one of the 3 greatest threats to health
- IDSA 10x20 initiative 2009
- BSAC “Antibiotic Action” 2009
- ReAct 2010 (Action on Antibiotic Resistance)
- Transatlantic Task Force on Antimicrobial Resistance (TATFAR)
- European Commission Action Plan 2011
- UK 5 year Antimicrobial Resistance Strategy 2013-18
- Innovative Medicines Initiative (IMI)
Integration of AS and IPC
The new UK antimicrobial resistance strategy and action plan
A major societal, political, clinical, and research challenge

<table>
<thead>
<tr>
<th>Seven key areas of focus</th>
<th>Stakeholders</th>
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<tbody>
<tr>
<td>Promote responsible evidence based prescribing</td>
<td>Individual prescribers, NHS providers, national and local commissioning boards, ARHAI, PHE, Department of Health, professional bodies</td>
</tr>
<tr>
<td>Improve infection prevention and control</td>
<td>Individual clinical staff, NHS providers, national and local commissioning boards, ARHAI, Department of Health, PHE, professional bodies</td>
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<tr>
<td>Raise public and professional awareness of antimicrobial resistance threat and promote behaviour change</td>
<td>Professional bodies, Department of Health, ARHAI, patient groups</td>
</tr>
<tr>
<td>Research programme into new diagnostics, alternatives to antibiotics (such as antiseptics), pathogenesis, effective behavioural change to improve infection prevention and control and prescribing practice</td>
<td>NIHR, universities, Department of Health, ARHAI</td>
</tr>
<tr>
<td>Facilitate development of new antimicrobials, vaccines, and immunomodulators</td>
<td>Department of Health, drug industry, European Union</td>
</tr>
<tr>
<td>Improve surveillance and data linkage</td>
<td>PHE, ARHAI, Department of Health</td>
</tr>
<tr>
<td>Encourage international collaboration and data sharing and learning from best practice</td>
<td>Department of Health, PHE internationally</td>
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**ARHAI** = Department of Health Expert Advisory Committee on Antimicrobial Resistance
### Seven key areas of focus

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Research programme into new diagnostics, alternatives to antibiotics (such as antiseptics), pathogenesis, effective behavioural change to improve infection prevention and control and prescribing practice.

Facilitate development of new antimicrobials, vaccines, and immunomodulators.

Improve surveillance and data linkage.

Encourage international collaboration and data sharing and learning from best practice internationally.

---

ARHAI = Department of Health Expert Advisory Committee on Antimicrobial Resistance.
Who are we trying to educate and/or train?

Early infection control committees

1929  Medical Officer of Health
1944  Control of Infection Officer
1950s Infection Control Nurse

Hospital superintendent
Modern committee

• Director of Infection Prevention and Control (Executive board member)
• Infection Control doctor
• Infection Control team
  – IC Nurses and other practitioners (podiatry, dentistry etc)
  – Admin/analysis support
• Antibiotic pharmacists
• Consultant in Communicable Disease Control
Modern Committee

- Estates Management
- Hospital Hygiene
- Divisional Representatives
  - Doctors
  - Nurses
- Hospital governance/audit
- Etc, etc
- (General public)
The role of the infection control link nurse

S.J. Dawson

NPHS Microbiology Carmarthen, West Wales General Hospital, Carmarthen, Wales, SA31 2AF, UK

Received 13 February 2003; accepted 19 March 2003

KEYWORDS
Link nurse; Infection control

Summary Link nurses act as a link between their own clinical area and the infection control team. Their role is to increase awareness of infection control issues in their ward and motivate staff to improve practice. It is essential that they receive training from the infection control team to ensure their competence. They have been shown to be of value to Trusts by improving clinical ward audit scores, helping infection control nurses implement policies and collecting data on hospital-acquired infections. In some hospitals, however, there are operational difficulties for link nurse schemes including high turnover of staff and insufficient time for training and monitoring their effectiveness.

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Infection Prevention and Control Team

PATIENT, CARER AND GP INFORMATION

Going Home After An Episode of Clostridium Difficile (‘C.diff’) Diarrhoea in Hospital

Convalescence
After leaving hospital, it is only to be expected that it will take time to regain your normal energy and strength. A severe bout of diarrhoea often leaves you feeling weak, and possibly off your food, even at home. The information given below offers some basic advice on speeding your recovery and staying well.

If you, your family or your carers have any concerns about your progress, or lack of it, general advice may
MINISTRY OF HEALTH says:--

Coughs and sneezes spread diseases

Trap the germs by using your handkerchief

Help to keep the Nation Fighting Fit
Who are we trying to educate and/or train?

Early infection control committees

1929  Medical Officer of Health
1944  Control of Cross-Infection Committee
1950s  Infection Control Nurse

Hospital superintendent
Everybody
At every level
How do we train?

• Impart knowledge
• Impart skills
• Empower their use
• Assess
  – Skills
  – Results of actions
• Reinforce
• Readjust/learn new skills
EDUCATION

Diploma in hospital infection control (Dip HIC)

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and B. S. Drasar¶

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Agreement among Healthcare Professionals in Ten European Countries in Diagnosing Case-Vignettes of Surgical-Site Infections

Gabriel Birgand1*, Didier Lepelletier2, Gabriel Baron3, Steve Barrett4, Ann-Christin Breier5, Cagri Buke6, Ljiljana Markovic-Denic7, Petra Gastmeier5, Jan Kluytmans8, Outi Lyytikainen9, Elizabeth Sheridan10, Emese Szilagyi11, Evelina Tacconelli12, Nicolas Troillet13, Philippe Ravaud3, Jean-Christophe Lucet1

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Abstract

Objective: Although surgical-site infection (SSI) rates are advocated as a major evaluation criterion, the reproducibility of SSI diagnosis is unknown. We assessed agreement in diagnosing SSI among specialists involved in SSI surveillance in Europe.

Methods: Twelve case-vignettes based on suspected SSI were submitted to 100 infection-control physicians (ICPs) and 86 surgeons in 10 European countries. Each participant scored eight randomly-assigned case-vignettes on a secure online relational database. The intra-class correlation coefficient (ICC) was used to assess agreement for SSI diagnosis on a 7-point Likert scale and the kappa coefficient to assess agreement for SSI depth on a three-point scale.

Results: Intra-specialty agreement for SSI diagnosis ranged across countries and specialties from 0.00 (95% CI, 0.00–0.35) to 0.65 (0.45–0.82). Inter-specialty agreement varied from 0.04 (0.00–0.62) in to 0.55 (0.37–0.74) in Germany. For all countries pooled, intra-specialty agreement was poor for surgeons (0.24, 0.14–0.42) and good for ICPs (0.41, 0.28–0.61). Reading SSI definitions improved agreement among ICPs (0.57) but not surgeons (0.09). Intra-specialty agreement for SSI depth ranged across countries and specialties from 0.05 (0.00–0.10) to 0.50 (0.45–0.55) and was not improved by reading SSI definition.

Conclusion: Among ICPs and surgeons evaluating case-vignettes of suspected SSI, considerable disagreement occurred regarding the diagnosis, with variations across specialties and countries.
Agreement among IP’s: Europe

\[ \text{CI}_{95} (%) \]

Intra specialty agreement for SSI diagnosis: \( 0.04 (0.00-0.62) - 0.65 (0.45-0.82) \)

Intra specialty agreement for depth: \( 0.05 (0.00-0.10) - 0.50 (0.45-0.55) \)

Intra specialty agreement among surgeons: \( 0.24 (0.14-0.42) \)

Intra specialty agreement among IPs: \( 0.41 (0.28-0.61) \)

After reading SSI definitions

Intra specialty agreement among surgeons: \( 0.09 \)

Intra specialty agreement among IPs: \( 0.57 \)

\( \text{c/o T Perl} \)

Birgand et al Plos One 2013:8;1-9
How do we educate?
Education & Events

Conferences

Much of the education that IPS delivers to its members and others is through live events. This form of education provides opportunity for interaction with other delegates, the possibility of listening to and questioning expert presenters and many other benefits. IPS offers events ranging from a large annual international conference which attracts over 1,000 people to less formal local branch meetings and study days.

- Annual Conference ...
- IPS Branches ...

Other Educational Activity

In addition to conferences and study days there are opportunities for education through reading the Journal of Infection Prevention, linking with other colleagues on website forums and more formally through Webinars and Teleclasses.

- Webinars and Teleclasses ...
- Journal of Infection Prevention ...
- IPS Event Diary ...

University Courses

Finally, this section can also ‘support’ individuals wishing to undertake a formal
Courses

IPS is not responsible for the content of the courses listed on this page. Please contact each organisation for further information.

Bsc (Hons) Practice Development (Infection Control)

Northumbria University

Contact:
Joan Cochrane
Tel: 0191 2156078
Email: joan.cochrane@northumbria.ac.uk

Visit Course Website ...

BSC (Hons) Dimensions in healthcare: infection prevention and control pathway.

Birmingham City University

Contact: Shirley Kirnon
Tel: 0121 331 6140
Conferences

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- Webinars and Teleclasses ...
- Journal of Infection Prevention ...
- IPS Event Diary ...

University Courses

Finally, this section can also ‘support’ individuals wishing to undertake a formal
Infection specialties in Europe


Figure: Recognition of clinical microbiology and infectious disease specialties by the European Union
New proposed curriculum of generic competencies for an Infectious Disease Physician (Europe)  http://uems-id.eu/

• Includes more levels of definition of what training is required in each main objective domain
• Defines for each item the expected
  – Knowledge
  – Skills/competencies
  – Professional behaviour
• Does NOT yet specify levels of competence to be achieved at different stages of training
• Suggests possible methods of assessment of each item
  – Workplace based assessments
  – Examinations
Objective 1: To obtain clinical competence at a specialist (consultant) level in the assessment, investigation, diagnosis and management of infection

1.1 History taking
1.2 Clinical Examination
1.3 Investigations and Specific Skills
1.5 Interaction with other Healthcare Teams
1.6 Management of Longer Term Conditions
1.7 Patient Safety
1.8 Communication
1.9 Teaching and Training
1.10 Personal Behaviour
1.11 Management and Healthcare Structure
Further objectives

• **Objective 2:** To obtain competence at consultant level in the management of Community Acquired Infections (CAI)

• **Objective 3:** To obtain competence at consultant level in the management of the HIV infected patient and infections in the non–HIV immunocompromised patient

• **Objective 4:** To acquire the skills necessary at consultant level to recognise, manage and control hospital acquired infection (HAI), including intensive care (ICU) related infections

• **Objective 5:** To achieve competence at consultant level in the diagnosis, investigation and management of imported infection and the provision of pre–travel health advice
### 4.2 Specific Infections Related to Post – Operative Sepsis

#### Recognition and treatment of specific infections related to post operative sepsis

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Assessment Methods</th>
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<tbody>
<tr>
<td>Has a good understanding of the common infections associated with particular surgical procedures</td>
<td>SCE, CbD, mini - CEX</td>
</tr>
<tr>
<td>Has a good knowledge of local and national resistance patterns</td>
<td>CbD, SCE, mini - CEX</td>
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<thead>
<tr>
<th>Skills</th>
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<tbody>
<tr>
<td>Able to differentiate between colonisation and infection</td>
<td>SCE, CbD</td>
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<tr>
<th>Behaviour</th>
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<tbody>
<tr>
<td>Able to maintain good working relationships with surgical colleagues</td>
<td>MSF</td>
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</table>
Complex document

• Defines in great detail a wide variety of competencies to be achieved
• Both technical and behavioural
• For a variety of practitioners
• Encourages repeated cycles of self education, self assessment and resetting of personal goals
<table>
<thead>
<tr>
<th></th>
<th>1. Foreword</th>
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<tbody>
<tr>
<td>1</td>
<td>2. Introduction</td>
</tr>
<tr>
<td>2</td>
<td>3. Why do we need competences for infection prevention and control practitioners?</td>
</tr>
<tr>
<td>2</td>
<td>4. Who are these competences for?</td>
</tr>
<tr>
<td>2</td>
<td>5. Who employs infection prevention and control practitioners?</td>
</tr>
<tr>
<td>2</td>
<td>6. Who works in infection prevention and control?</td>
</tr>
<tr>
<td>3</td>
<td>7. How do these competences link to other frameworks?</td>
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<tr>
<td>3</td>
<td>8. What competences are included?</td>
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<tr>
<td>3</td>
<td>9. How can the competences be used?</td>
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<tr>
<td>4</td>
<td>10. How can the competences be applied in workforce development and management?</td>
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<tr>
<td>5</td>
<td>11. How are the competences structured?</td>
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<tr>
<td>6</td>
<td>12. The competences' statements and performance indicators structured against the four domains</td>
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<tr>
<td></td>
<td>1. Clinical practice</td>
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<td>2. Education</td>
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<td></td>
<td>3. Research</td>
</tr>
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<td></td>
<td>4. Leadership and management</td>
</tr>
<tr>
<td>13</td>
<td>13. Examples of career paths for infection prevention and control practitioners</td>
</tr>
<tr>
<td>19</td>
<td>14. Example of assessing oneself against the competences and planning learning</td>
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<tr>
<td>23</td>
<td>15. Websites for addition information</td>
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<tr>
<td>23</td>
<td>16. Glossary</td>
</tr>
<tr>
<td>24</td>
<td>17. Competency Steering Group</td>
</tr>
</tbody>
</table>
Box 1: Domains and competences

Clinical practice
1. Improve quality and safety by developing and implementing robust, high-quality policies and guidelines that prevent and control infection
2. Collate, analyse and communicate data relating to preventing and controlling infection for surveillance purposes
3. Manage incidents and outbreaks
4. Improve quality and safety through the application of improvement methodologies
5. Advise on the design, construction and modification of facilities to prevent and control infection in the built environment
6. Evaluate, monitor and review the effectiveness of decontamination processes for equipment and environment

Education
7. Develop own knowledge, skills and practice
8. Lead the development of the knowledge, skills and practice of the infection prevention and control team
9. Develop and implement learning and development opportunities and solutions to improve infection prevention and control
10. Work with others to develop, implement, evaluate and embed infection prevention and control within workforce development strategies

Research
11. Access, appraise and apply robust evidence of all types from a range of research and other sources, to the domains of the role
12. Lead high quality infection prevention and control services
13. Share best practice through the dissemination of evidence and knowledge

Leadership and management
14. Improve quality and safety through networking, influence, proactivity and challenge
15. Improve quality and safety through the design, planning, monitoring and development of services
16. Lead high quality infection prevention and control services
17. Lead and manage the work of the infection prevention and control team to achieve objectives
1 **Domains of practice** – the four domains that describe the major components of advanced-level practice, that is:
   a. clinical practice
   b. education
   c. research
   d. leadership and management

2 **Competence statements** – these are the broad role expectations of practitioners working at an advanced level of practice in IPC. They describe the ‘what has to be done’.

3 **Performance indicators** – aligned to each of the competence statements, the performance indicators describe what competent performance in advanced-level practice in IPC looks like. The indicators describe the level and scope of competent practice – that is, the indicator against which competence would be judged.

4 **Knowledge, understanding and skills** – these descriptions identify the knowledge, understanding and skills that a practitioner would need to develop in order to achieve the competences to the level of performance required in the indicators. These statements do not have a one-to-one relationship with the performance indicators, because to achieve one indicator it is often necessary to use a range of different knowledge and apply different skills.
The outcome competency framework for practitioners in infection prevention and control: use of the outcome logic model for evaluation

E Burnett¹, E Curran², HP Loveday³, MA Kiernan⁴, M Tannahill⁵

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2. Infection Control, Health Protection Scotland, Glasgow, UK
3. Director of the Richard Wells Research Centre, University of West London, London, UK
4. Infection Prevention Consultant, Southport and Ormskirk Hospital NHS Trust, Merseyside, UK
5. Consultant nurse infection control, Care Inspectorate, Paisley, UK

*Corresponding author

*Accepted for publication: 21 October 2013

Key words: Education and training, guidance, healthcare workers, infection prevention and control, knowledge, patient safety, practice development, professional development, role development, staff development

http://bji.sagepub.com/content/early/2013/11/18/1757177413512387
43% of 242 IPC members had used it (response 13.4%)
Around half of these found it useful

The outcome competency framework for practitioners in infection prevention and control: use of the outcome logic model for evaluation

E Burnett1*, E Curran2, HP Loveday3, MA Kiernan4, M Tannahill5

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• General practitioners
• Public
  – Adults
  – Children
UK PRESCRIBING
What is happening to GP prescribing?

Trends in prescribing of antibacterial items (excluding penicillins) in English General Practices

Changes since 2007/08
- Macrolides ↑ 23%
- Tetracyclines ↑ 52%
- Sulphonamides & Trimethoprim ↑ 23%
- Co-Amoxiclav ↑ 21%
- Nitrofurantoin ↑ 178%
- Cephalosporins ↓ 128%
- Quinolones ↓ 53%
- Metronidazole & Tinidazole

© NHSBSA 2012
Effect of public campaigns: 2003

‘May I check, have you seen this leaflet before or have you seen or heard anything about the Andybiotic campaign?

England 20%
Wales 22%
Scotland 14%
(in papers but not GP practices)
Greatest difference was for ‘antibiotics work on most coughs & colds’ which was key message of campaigns: incorrect responses
24% if aware vs 42% if not aware  \( P < 0.0005 \)
2008 poster campaign refreshed!

Before and after survey in England and Scotland

In the past year:

- Of 70% visiting a GP surgery
- 14.7% English and 13% of Scots remembered posters
Welcome to e-Bug
a place to play games and learn about microbes
1. Micro-organisms
   i. An Introduction
   ii. Useful Microbes
   iii. Harmful Microbes

2. Spread of Infection
   i. Hand Hygiene
   ii. Respiratory Hygiene
   iii. Food Hygiene (Junior)
   iv. Sexual Transmission (Senior)
   v. Farm visits

3. Prevention of Infection
   i. The Body’s Natural Defences
   ii. Vaccinations

4. Treatment of Infection
   1. Antibiotic Use and Medicine
Conclusions

• Why important?
• Patient safety and financial savings
• Who should be targeted?
• Train the infection control team and educate everyone
• How?
• Formal training using multiple approaches to empower people to educate themselves. Constantly innovate and reinforce
Conclusions

• How to assess
• Examinations, reflective portfolios and multiple competency assessments
• How to measure the effect?
• More difficult – protocol adherence, engagement of interacting healthcare teams improved patient outcomes etc
• Who else to educate?
• Whole health team; the public, young and old
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Thank you for your attention