Innovation and Impact

Tuesday 16 May 2017

Oxford University Hospitals
South Central Ambulance Service

Accelerating health and economic gains for our region by working together
## Agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Presenter(s)</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.00</td>
<td>Dr Paul Durrands, Chief Operating Officer, Oxford AHSN</td>
<td>Innovation and Impact</td>
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<tr>
<td>16.15</td>
<td>Dr Clare Dollery, Deputy Medical Director, Oxford University Hospitals NHS FT</td>
<td>Patient Safety and Sepsis in the acute sector</td>
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<td></td>
<td>Dr Andrew Brent, Sepsis clinical lead and Consultant in Infectious Diseases</td>
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<td></td>
<td>Mark Ainsworth-Smith, Consultant Pre-Hospital Care Practitioner, South Central Ambulance Service FT Trust</td>
<td>Sepsis recognition in the Ambulance service</td>
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<td>16.55</td>
<td>Dr Kassim Javaid, Consultant Rheumatologist and the team, Oxford University Hospitals</td>
<td>Fractures Liaison Service – impact and value (presentation to follow)</td>
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<tr>
<td>17.15</td>
<td>Professor Simon Travis, Consultant Gastroenterologist, Oxford University Hospitals</td>
<td>ICHOM and Inflammatory Bowel Disease PROMs</td>
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<tr>
<td>17.35</td>
<td>Professor Ian Pavord, Professor of Respiratory Medicine, University of Oxford</td>
<td>The Precision medicine approach to the diagnosis of Asthma</td>
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<tr>
<td>17.50</td>
<td></td>
<td>Closing remarks, networking and light refreshments</td>
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</table>
Innovation and Impact

Dr Paul Durrands
Chief Operating Officer, Oxford AHSN

Accelerating health and economic gains for our region by working together
Oxford AHSN

- 7 programmes and themes
- 100+ collaborative projects
- 50+ innovations
- 30+ industry partnerships
- 3 million people
- 11 NHS Trusts
- 65,000 NHS staff
- 9 universities
- 3 STPs and 3 accountable care organisations
- 750 life science companies
- 1 information governance framework – all 12 trusts signed up
- 2,020 newsletter subscribers and 2,925 Twitter followers
ComRes independent stakeholder survey

• 563 respondents to survey (26% of those contacted) – more than 50% from NHS frontline
• 80% said network building culture of collaboration and partnership
• 64% said network adds value to their work
• “They’re listening, identifying challenges and trying to help us solve problems” NHS provider
• “Without the likes of the AHSN small companies would really, really struggle to get any traction with the NHS”

You can read the full report here: http://bit.ly/OxfordAHSNsurvey
Leading Together Programme

“What you've been doing here is the way to go: professionals and citizens working together to make health and wellbeing better. Just being in the room the patient or lay person changes the conversation.”

Jeremy Taylor, Chief Executive, National Voices
“Physical activity reaches the very foundation of illness and helps prevent 23 diseases including depression, diabetes and dementia. An active workforce results in 27% fewer days lost to sickness with productivity increasing by up to 15%”
Dr William Bird, Intelligent Health

“No effort is too small. Start wherever you can and keep going”
"The Thames Valley Neonatal Network is delighted to see that there has been a dramatic reduction in preterm babies being born outside a tertiary centre. This is a major achievement in a short space of time and the whole network is to be congratulated on all the hard work and co-operation that has gone into making this project a success."

Dr Eleri Adams, Vice Chair, National Neonatal Clinical Reference Group; Clinical Lead, Thames Valley Neonatal Network
Highlight
Data sharing across the region

“The Oxford AHSN team has created an exemplar for information-sharing between partner organisations”

Dr Chris Bunch, Oxford University Hospitals Caldicott Guardian
# Innovation

Wide range of clinical areas and technologies examples

<table>
<thead>
<tr>
<th>Clinical Area</th>
<th>Medicines</th>
<th>Medical Devices</th>
<th>Digital Health</th>
<th>Diagnostics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke</td>
<td>• NOACs</td>
<td>• Intermittent Pneumatics Compression Sleeves</td>
<td></td>
<td>• Point of care</td>
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<tr>
<td>Diabetes</td>
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<td>• Gestational Diabetes Monitoring</td>
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<td>Sepsis</td>
<td></td>
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<td>• Curetis Unyvero™ system</td>
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<tr>
<td>Safety</td>
<td>• Pneux</td>
<td>• Wiresafe</td>
<td>• Intelligent Ultrasound</td>
<td></td>
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<tr>
<td></td>
<td>• Non-injectable connectors</td>
<td></td>
<td></td>
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<tr>
<td>Respiratory</td>
<td></td>
<td></td>
<td></td>
<td>• Circassia NIOX® FeNo Point of Care (PoC)</td>
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<tr>
<td>Patient mobility</td>
<td>• Gyroset</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Ambulatory care</td>
<td></td>
<td></td>
<td>• ISanSys patient monitoring</td>
<td></td>
</tr>
<tr>
<td>Prevention</td>
<td></td>
<td></td>
<td></td>
<td>• Somascan</td>
</tr>
</tbody>
</table>
Adoption example

Intermittent Pneumatic Compression Sleeves

- AHSN approach has significantly increased IPC sleeve utilisation rates compared to the rest of the country.

- Over 16/17 performance across the region remained steady, increasing to an average of 68% for Oct-Dec 2016.

- OHE independent study found that driving adoption beyond national average prevented an additional 22 DVTs, 2 PEs and 12 deaths over first 18 months of project.

- Assuming utilisation maintained by end of AHSN licence, 2500 patients across the region will have received IPC sleeves. This represents the potential for 125 fewer DVTs, 75 fewer deaths and 13 fewer PEs over the lifetime of the project.
Examples of innovation – latest projects to improve patient safety

- Read more in our Patient Safety annual report – copies available here today

### Non-injectable arterial connector

This improves safety for all patients requiring an arterial line in operating theatres and intensive care by preventing drug administration via the wrong route, bacterial contamination of the arterial line and blood spillages.

### WireSafe

This is an engineered solution to prevent retention of the central line guidewires that are used when inserting large catheters into central veins.

### PneuX System

A cuffed ventilation tube and an electronic cuff monitoring and inflating device that prevents leakage of bacteria-laden oral and stomach contents to the lung.
Impact

47,000 Patients recovered or avoided harm

200 Lives saved

£31m New investment and savings brought into the economy

Return = 2.5 times the cost of the Oxford AHSN

100s of projects

2,500 networked clinicians

300+ innovations assessed

33 innovations implemented across medicines, devices, digital and diagnostics

2,500 people attended events organised by or sponsored by Oxford AHSN
<table>
<thead>
<tr>
<th>Sector</th>
<th>Indication</th>
<th>Product</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostics</td>
<td>Range of markers</td>
<td>iStat (PoC)</td>
<td>Out of Hours</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>Infection</td>
<td>FBC, CRP Microsemi</td>
<td>Acute</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>Cardiovascular</td>
<td>SomaScan CV</td>
<td>Primary</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>Stroke</td>
<td>PoC</td>
<td>Ambulance</td>
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<tr>
<td>Diagnostics</td>
<td>IBD</td>
<td>Calprotectin</td>
<td>Acute</td>
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<tr>
<td>Diagnostics</td>
<td>Pre-eclampsia</td>
<td>Elecsys</td>
<td>Acute</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>Asthma/COPD</td>
<td>NIOX FeNo</td>
<td>Primary</td>
</tr>
<tr>
<td>Digital</td>
<td>Oncology</td>
<td>Digital stratification tool</td>
<td>Primary/Acute</td>
</tr>
<tr>
<td>Digital</td>
<td>Digital audit</td>
<td>Ultrasound</td>
<td>Secondary</td>
</tr>
<tr>
<td>Digital</td>
<td>Vital signs</td>
<td>Patient Status Engine</td>
<td>Ambulatory</td>
</tr>
<tr>
<td>Medtech</td>
<td>Wheelchair control</td>
<td>Gyroset for quadraplegics</td>
<td>Rehab/Home</td>
</tr>
</tbody>
</table>
Examples of Diagnostic Projects

**In Progress**

- Extension from using point of care diagnostics in the EMUs to Out of Hours GP vehicles for use in the community sponsored by a health foundation grant
- Study will assess the benefits of PoC in an Out of Hours setting using Abbott iStat

- Evaluation of Horiba Microsemi\textsuperscript{CRP*} in Oxford University Hospitals NHS FT, Stoke Mandeville Hospital and Wexham Park
- Testing of a CRP and whole blood assay in emergency departments to better diagnose those children with severe infection and to reduce unnecessary admissions

**In Planning**

- Assessment of proteomic profiles using SOMAScan\textsuperscript{®} of NHS Health Check participants in collaboration with GP practices in Bucks
- Develop a model of risk across the study population that assesses the impact of pharmacological and lifestyle interventions

- Offers a single protocol for sample preparation with potential to assess a 100 analytes within a few hours in a PoC setting
- Assessment of Unyvero system in infectious diseases in Oxford University Hospitals NHS FT and Royal Berkshire Hospital about to start
Evaluation example
Fractional Exhaled Nitric Oxide testing in Primary Care

• FeNO testing allows GPs to determine whether a patient's asthma is “inflammatory” and likely to respond to inhaled corticosteroids

• AHSN are working with Circassia and University of Oxford to drive adoption of FeNO diagnostic devices across the region

• Currently working with a number of evaluative practices to generate real world evidence of cost savings to CCGS

Source: http://www.niox.com/en/feno-asthma/
### Examples of projects you are leading/involved with:

<table>
<thead>
<tr>
<th>Programme</th>
<th>Example</th>
</tr>
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<tbody>
<tr>
<td><strong>Best Care</strong></td>
<td>Maternity clinical network – <em>pre-term babies, SGA</em>, reducing never events</td>
</tr>
<tr>
<td><strong>Clinical Innovation Adoption</strong></td>
<td><strong>GDm-Health</strong> adoption across region&lt;br&gt;<strong>CAUTI</strong> (bladder scanners)&lt;br&gt;<strong>Early Inflammatory Arthritis</strong> (biosimilars)</td>
</tr>
<tr>
<td><strong>Industry Partnerships</strong></td>
<td><strong>TheHill</strong> established for innovation in digital health&lt;br&gt;<strong>Horiba</strong> – paediatric sepsis diagnostic&lt;br&gt;<strong>SEND</strong> – support on commercialisation&lt;br&gt;<strong>Abbott</strong> – iSTAT point of care diagnostic panel for geriatric patients&lt;br&gt;<strong>Drayson Technologies, Oxford University</strong> and <strong>OUH</strong> have signed agreements to collaborate on the development, testing and future commercialisation of <strong>GDm-Health</strong></td>
</tr>
<tr>
<td><strong>Patient Safety</strong></td>
<td><strong>Sepsis</strong> (with SCAS)&lt;br&gt;<strong>AKI</strong></td>
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Bicester Healthy New Town Partnership

- 1st wave 393 new homes
- 6,500 homes NW Bicester development
- Obesity & social isolation
Future

• Innovations need to get into the NHS more quickly and cheaply

• The AAR identified AHSNs as playing a key role in identifying and adopting new transformative products

• Oxford AHSN focus on Innovation Adoption, Industry Partnerships and Patient Safety

• Innovation – medicines, medical devices, digital technology and diagnostics

• Different challenges to adoption even for innovation with strong case for adoption – eg need for pathway changes, funding changes, affordability, clinical leadership capacity
Innovation and Impact
Patient Safety Collaborative
Sepsis Programme
OUH Roadshow 16th May 2017

Clare Dollery, Stakeholder Group Chair
AHSN Mission

• Bringing together universities, industry and the NHS to improve the health and prosperity in our region through rapid clinical innovation adoption.
AHSN Aims

• Focus on the needs of patients and local populations support and work in partnership with commissioners and public health bodies
• Speed up adoption of innovation into practice to improve clinical outcomes and patient experience
• Build a culture of partnership and collaboration – promote inclusivity.
• Create wealth
AHSN Aims

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• Create wealth
Sepsis Stakeholders

- CARE HOMES
- COMMUNITY NURSES
- GP OUT OF HOURS
  - Oxford Health West Berkshire
- COMMUNITY HOSPITALS
  - Oxford Health West Berkshire
- PRIMARY CARE
- CCGs
  - Oxford Aylesbury & Chiltern
- ACUTE
  - Bucks GWH
  - Frimley inc H&W Milton Keynes
  - OUH RBH Manor Hospital
- PATIENTS
  - Via local groups
- SCAS
Sepsis Programme Focus

• This programme focuses on standardising sepsis management across the whole care pathway throughout the Oxford AHSN region

Aims:
• to help organisations improve their outcomes with septic patients,
• to share best practice in sepsis management, measurement, education and improvement,
• to standardise sepsis management across the whole care pathway
• to share outcomes performance
Oxford AHSN Sepsis Group Aims

- **Share experience** of QI initiatives
- **Share resources** (e.g. for training)
- **Share data** (process & outcome; combine to max learning)
- **Collaboratively review & apply guidelines**
- **Joint QI projects** (± research)
Patient Safety Collaborative
Sepsis Programme

OUH Roadshow 16\textsuperscript{th} May 2017

Andrew Brent, Sepsis Clinical Lead
Geoff’s Story

- Patient story: 8 min film
- OUH intranet
- Oxford AHSN PSC website
- >1000 views
- Health Education England
Oxford AHSN Approach

• Regional approach to implementation

• Integrate into existing pathways
  • Community
  • Acute admissions
  • Deteriorating patients (Track & Trigger / Early Warning Scores)

• Build on progress already made
  • ‘Red Flag’ Sepsis
  • Sepsis Six
  • Neutropaenic Sepsis
Oxford AHSN Regional pathway
Paediatric screening tool

- **Regional Collaboration**
  - Paediatric Critical Care Network (PCCN)
  - Children’s Network
  - Oxford & Wessex AHSNs

- **Validated** against NICE guideline
  - Audit of 227 notes (PCCN)
  - Equally sensitive, more specific

- **Adopted by Oxford AHSN Sepsis group**

- **Implemented across Thames Valley**
  - including Oxford, Buckinghamshire, Milton Keynes, Frimley Health [Swindon agreed in principle]
Technological innovation (OUH)
Sepsis Working Together event

Oxford, 19 Sep 2016

• 110 delegates
• Acute Trusts (6)
• Community Trusts (2)
• Clinical Commissioning Groups (2)
• South Central Ambulance Service

• Private Hospitals (3)
• Care home providers
• NHS England
• Oxford AHSN
• Oxford University
Sepsis Working Together event

Oxford, 19 Sep 2016

Patient stories
Sam’s story (Sue Morrish)
Geoff’s story (film)

Policy
Celia Ingham Clarke: National sepsis update
Nice Sepsis Guideline

Solutions
Sepsis recognition, Early Warning Scores
Ambulance Service, Acute Trusts
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Oxford, 19 Sep 2016

Very well run course, different from usual ones

Very interesting and stimulating day

Excellent day, thought provoking

All speakers excellent, many new things learnt

Thank you for this amazing conference!
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Honoured to hear Sue’s story

Sue’s talk made me think about being more clear and specific in giving instructions to patients in future

I need to return to the basics of listening to patients and clinical judgement
National Collaboration

National Meetings

- NICE guideline launch, July 2016
- ‘Sepsis Unplugged’, Oct 2017
- ‘Think Sepsis’, Sir Bruce Keogh, Nov 2016
- National PSC Meeting, May 2017

PSC Sepsis Cluster

- National stakeholder survey
- Oxford AHSN Sepsis Pathway
- Stakeholder input nationally
Measurement & Publication

Surveillance challenges

- HES sepsis codes insensitive
- QI initiatives ➔ ascertainment bias
- Need improved case definition

HES Bacterial infection (‘SOS’) codes

- More sensitive, less ascertainment bias
- Temporal and geographic trends

- Inada-Kim et al. BMJ Open (in press)
- Presented at Sepsis Unplugged 2016
- NHSE collaboration to extend nationally
Ongoing work

- Coding standardisation
- Validation of HES data using microbiology data
- Standardized assessment & safety netting
- Community sepsis pathway analysis
- Point of care testing
- Patient information leaflets
- Patient engagement exercise
- Ambulance interface (community & acute Trusts)
Paediatric screening tool

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Sepsis in SCAS
Oxford AHSN Presentation

Mark Ainsworth-Smith
‘MaS from SCAS’
Consultant Pre-Hospital Care Practitioner

3rd May 2017
The types of incident that we attend...

Sepsis can sit in any one of these

560,000 x 999
1.25 million x 111
Response Categories

- Where an Emergency Ambulance response is required, **NHS Pathways** clinically categorizes the calls into:
  - **RED 1 Calls** – 8 minute first response
  - **RED 2 Calls** – 8 minute first response
  - **GREEN 30 Calls** – 30 minute first response
  - **GREEN 60 Calls** – further assessment by a clinician over the telephone OR 60 minute response
HCP Admission Time Frames

1 hour response
- Respond at normal road speed
- Target Response for Arrival at Patient: 1 hour
  - At 30 min, if not dispatched, we will upgrade to Emergency

2 & 4 hour responses
- Respond at normal road speed
- Target Response for Arrival at Patient: 2 or 4 Hours

Emergency
- Respond on blue lights and sirens
- Target Response for Arrival at Patient: 8 mins / 19 mins (as Public Emergencies)
  - Which means this will usually be the nearest response unit – including RRV (single operator)
Our challenges
Our challenges......

External challenges

• No standardisation / 2 networks
• Varied reception at hospitals
• Variation in HCP requests
• DSAs

Internal Challenges

• Release of staff for training
• Reliance on individuals
• Private Providers
• Cascade of information to staff
<table>
<thead>
<tr>
<th></th>
<th>Oxygen</th>
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<tbody>
<tr>
<td>1</td>
<td>Blood Cultures, FBC, U+E, LFT, clotting screen, glucose</td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>IV Antibiotics</td>
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<tr>
<td>4</td>
<td>Fluid Resuscitation</td>
</tr>
<tr>
<td>5</td>
<td>Lactate</td>
</tr>
<tr>
<td>6</td>
<td>(Catheterisation) Fluid Balance</td>
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Sepsis Screening

There have been a wide variety of sepsis screening tools........
Sepsis Screening Tools

- SIRS
- CURB65 (Respiratory)
- qSOFA
- NICE 2016
- SCAS Sepsis screening tool
Currently SCAS crews are using a sepsis recognition tool. The tool has been designed to help you identify sepsis cases. Please select an option to begin.
Adult Sepsis Screening Tool

Pre-hospital Sepsis Screening and Action Tool

**Adult**

Are any 2 of the following present?
- Temperature > 38.8°C or < 35°C
- Respiratory rate > 20 per minute
- Heart rate > 90 per minute
- Acute confusion/reduced conscious level
- Glucose > 7.7 mmol (unless known diabetics)

Y

Could this be a severe infection?
- For example: Pneumonia
- Urinary Tract infection
- Indwelling medical device
- Abdominal pain or distension
- Meningitis
- Other: Sepsis/abruptly infected wound
- Chemotherapy < 6 weeks (micronvasive sepsis)
- Recent organ transplant

N

Possible Sepsis
- Ensure same-day assessment by medical professional
- Sepsis Present
- Transport to designated destination
- Communicate presence of sepsis at handover

Y

Are there any signs of shock?
- Systolic BP < 90 mmHg
- Heart Rate > 100 bpm
- Respiratory rate > 20 breaths per minute
- Oxygen 94%+ on 4 litres
- Respnoes only to voice or pain
- Mottled cool peripheries
- Central capillary refill time > 2 seconds
- Purpuric rash
- Absent radial pulse

High Risk
- Patients who have been in contact with a number of health care professionals or services with no apparent resolution or improvement. Consider escalation to an assessment facility / ED

**South Central Ambulance Service**

NHS Foundation Trust
NEWS2

Paper submitted to NASMeD / AACE recommending that NEWS2 is adopted across all UK ambulance services.

Benefits:
• Consistency of care
• Standardised training
• Development of national guidelines
• Creation of CPIs:
  – Administration of oxygen
  – IV Fluids
  – Pre-alert
Likely to be identical to NEWS score but:

• Change in Mental State from AVPU to ACVPU
• No red flags
• Guidance for COPD

Limitations in pregnancy and paediatrics
Expansion to Primary Care and RCHs
### National Early Warning Score (NEWS)*

<table>
<thead>
<tr>
<th>PHYSIOLOGICAL PARAMETERS</th>
<th>3</th>
<th>2</th>
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<th>2</th>
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<tbody>
<tr>
<td>Respiration Rate</td>
<td>≤8</td>
<td>9 - 11</td>
<td>12 - 20</td>
<td>21 - 24</td>
<td>≥25</td>
<td></td>
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<tr>
<td>Oxygen Saturations</td>
<td>≤91</td>
<td>92 - 93</td>
<td>94 - 95</td>
<td>≥96</td>
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<td></td>
<td></td>
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<tr>
<td>Any Supplemental Oxygen</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>≤35.0</td>
<td>35.1 - 36.0</td>
<td>36.1 - 38.0</td>
<td>38.1 - 39.0</td>
<td>≥39.1</td>
<td></td>
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<tr>
<td>Systolic BP</td>
<td>≤90</td>
<td>91 - 100</td>
<td>101 - 110</td>
<td>111 - 219</td>
<td>≥220</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heart Rate</td>
<td>≤40</td>
<td>41 - 50</td>
<td>51 - 90</td>
<td>91 - 110</td>
<td>111 - 130</td>
<td>≥131</td>
<td></td>
</tr>
<tr>
<td>Level of Consciousness</td>
<td>A</td>
<td>C</td>
<td>V, P, or U</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

*The NEWS initiative flowed from the Royal College of Physicians' NEWS Development and Implementation Group (NEWSDIG) report, and was jointly developed and funded in collaboration with the Royal College of Physicians, Royal College of Nursing, National Outreach Forum and NHS Training for Innovation.

Please see next page for explanatory text about this chart.

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<table>
<thead>
<tr>
<th>NEWS</th>
<th>Mortality</th>
</tr>
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<tbody>
<tr>
<td>0</td>
<td>0.5%</td>
</tr>
<tr>
<td>&lt;5</td>
<td>5.5%</td>
</tr>
<tr>
<td>≥5</td>
<td>22%</td>
</tr>
<tr>
<td>≥7</td>
<td>27%</td>
</tr>
<tr>
<td>≥9</td>
<td>38%</td>
</tr>
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</table>
Important

NEWS2 is NOT a replacement for clinical judgement
Likely to be:
NEWS2 = 5+ Pre-alert / BLT
NEWS2 = 3-4 Convey to hospital
NEWS2 = Below 3 GP triage

No sepsis screening tool is infallible
If sepsis is suspected.....

• Administration of IV fluids / Oxygen
• Minimal time ‘on scene’ (CPI)
• Pre-alert to nearest hospital
• Blue light transfer

Unlike the IoW we will not be taking blood cultures or administering antibiotics except in cases of suspected meningococcal meningitis (no blood cultures required)
### NEWS Score

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<tr>
<th>Physiological parameters</th>
<th>3</th>
<th>2</th>
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<tr>
<td>Pulse Rate</td>
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<td>Respiratory Rate</td>
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<td>Supplemental oxygen used</td>
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<tr>
<td>Temperature</td>
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<tr>
<td>AVPU</td>
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Close
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<td>Shocks</td>
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<td>Vital Signs</td>
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<td>Snapshots</td>
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<td>Blood Test</td>
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<td>Capnography</td>
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<td>Resp Rate</td>
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<td>SpO2 (on air)</td>
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<td>SpO2 (on oxygen)</td>
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<td>Temperature</td>
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<td>AVPU</td>
<td>Pain</td>
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<tr>
<td>POPS Breathing</td>
<td>Stridor</td>
</tr>
<tr>
<td>POPS Other</td>
<td>Diabetes</td>
</tr>
<tr>
<td>Gut Feeling</td>
<td>Looks unwell</td>
</tr>
<tr>
<td>NEWS</td>
<td>10</td>
</tr>
</tbody>
</table>
RTC – not sepsis

Map shows the distribution of incidents where the Trauma group is RTC.
Questions / Discussion
Fractures Liaison Service

• Dr Kassim Javaid, Consultant Rheumatologist
• (presentation to follow)
ICHOM and Inflammatory Bowel Disease PROMs

- Professor Simon Travis, Consultant Gastroenterologist
International Consortium for Health Outcomes Measurement

ICHOM and the IBD Standard Set

Wednesday 29th March 2017
ICHOM is founded on the principle of value-based health care

We believe in a model where value is at the center of health care...

... which will impact every stakeholder

**Providers**
"Compete to deliver high-quality results at competitive prices"

**Payors**
"Contain costs by paying for results achieved"

**Value**
\[
\text{Value} = \frac{\text{Patient health outcomes achieved}}{\text{Cost of delivering those outcomes}}
\]

Patients will **choose their provider** based on its expected outcomes and their share of the cost.

Providers will **compete** to deliver superior outcomes at competitive prices.

Payors will **negotiate contracts based on results** and encourage innovation to achieve those results.

Suppliers will **market their products on value**, showing improved outcomes relative to costs.
The starting point for value-based health care reform is to measure meaningful outcomes

5 reasons why outcome measurement is essential:

1. Outcomes define the **goal of the organization** and its accountability to patients.

2. Outcomes inform the **composition** of integrated care teams.

3. Outcomes motivate clinicians to collaborate and **improve together**.

4. Outcomes highlight **value-enhancing cost reduction**.

5. Outcomes enable payment to shift **from volume to results**.

This is why measuring and reporting meaningful outcomes matters
Comparing outcomes of prostate cancer care

Focussing on mortality alone…

…may obscure large differences in outcomes that matter most to patients

<table>
<thead>
<tr>
<th></th>
<th>Germany</th>
<th>Sweden</th>
<th>Best-in-class: Martini Klinik</th>
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<tbody>
<tr>
<td>5 year survival</td>
<td>94.0</td>
<td>94.0</td>
<td>95.0</td>
</tr>
<tr>
<td>1 yr incontinence</td>
<td>43.3</td>
<td>50.0</td>
<td>6.5</td>
</tr>
<tr>
<td>1 yr severe erectile dysfunction</td>
<td>75.5</td>
<td>80.0</td>
<td>34.7</td>
</tr>
</tbody>
</table>

Swedish data rough estimates from graphs; Source: National quality report for the year of diagnosis 2012 from the National Prostate Cancer Register (NPCR) Sweden, Martini Klinik, BARMER GEK Report Krankenhaus 2012, Patient-reported outcomes (EORTC-PSM), 1 year after treatment, 2010
Support for our work is growing rapidly

32 Countries

>450 Organizations

13 National Registries
We have completed 21 Standard Sets thus far, covering >45% of the disease burden.

**Our current 21 Standard Sets**

1. Chronic kidney disease
2. Inflammatory arthritis
3. Oral health
4. Congenital hand and upper limb malformations
5. Paediatric facial palsy
6. Hypertension*
7. Type II diabetes
8. Atrial fibrillation

*Focused on low and middle income countries

**2016-2017 commitments**

1. Chronic kidney disease
2. Inflammatory arthritis
3. Oral health
4. Congenital hand and upper limb malformations
5. Paediatric facial palsy
6. Hypertension*
7. Type II diabetes
8. Atrial fibrillation

In discussions to launch:

1. Overall adult health
2. Mental health package
3. Type I diabetes
4. Overall child health
5. Overall cancer
6. Pediatric epilepsy
7. Multiple sclerosis
8. COPD
9. Morbid obesity

*Numbers not representing prioritization/likelihood*
ICHOM organises Working Groups to define Standard Sets of outcomes we recommend all care providers track.

ICHOM facilitates a process with international clinical and registry leaders and patient representatives to develop a global Standard Set of outcomes that really matter to patients, along with corresponding case-mix factors.
The Inflammatory Bowel Disease Standard Set was developed by a team representing 10 countries.
We research key elements when selecting the best PROM tools for our Standard Sets

- Our PROM selection is based on 5 key elements:
  1. Coverage of outcome domains of importance
  2. Psychometric Quality - ISOQOL standards
  3. Feasibility - Burden of assessment
  4. Financial - Licensing aspects
  5. Established - Locations in use/# translations

We research key elements when selecting the best PROM tools for our Standard Sets.

ICHOM Standard Set for Inflammatory Bowel Disease: Outcomes

Treatment Approaches
- Surgical
- Medical
- Supportive and nutritional

Sponsored by:

Oxford Academic Health Science Network
**IBD Control**

1. **Do you believe that:**
   - a. Your IBD has been well controlled in the past two weeks?
   - b. Your current treatment is useful in controlling your IBD?
   (If you are not taking any treatment, please tick this box)

2. **Over the past 2 weeks, have your bowel symptoms been getting worse, getting better or not changed?**
   - Better
   - No change
   - Worse

3. **In the past 2 weeks, did you:**
   - a. Miss any planned activities because of IBD?
   (e.g., attending school/collage, going to work or a social event)
   - b. Wake up at night because of symptoms of IBD?
   - c. Suffer from significant pain or discomfort?
   - d. Often feel lacking in energy (fatigued)
   (by ‘often’ we mean more than half of the time)
   - e. Feel anxious or depressed because of your IBD?
   - f. Think you needed a change to your treatment?

4. **At your next clinic visit, would you like to discuss:**
   - a. Alternative types of drug for controlling IBD
   - b. Ways to adjust your own treatment
   - c. Side effects or difficulties with using your medicines
   - d. New symptoms that have developed since your last visit

5. **How would you rate the OVERALL control of your IBD in the past two weeks?**

   - Please draw a vertical line (||) on the scale below

---

Ormerod, C., Shackcloth, D., Harrison, M., Brown, E. and Bodger, K. *The IBD-Control Questionnaire: Development and Psychometric Validation of a Tool for Capturing Disease Control From the Patient Perspective for use in Routine Care.* (2012) Gastroenterology, 142 (5 (Sup)). S-658.
ICHOM Timeline for Inflammatory Bowel Disease

- Baseline (e.g. diagnosis or start of treatment)
- 6 months
- 1 year
- 18 months
- Continue on a 6 monthly and annual basis

- Patient-Reported Form Baseline, 6 months and Annually
- Clinical Form Baseline and Annually
- Clinical Form 6 months
The Standard Set includes baseline data to assess outcomes and perform risk adjustment for comparability.

<table>
<thead>
<tr>
<th>Patient Population</th>
<th>Measure Details</th>
<th>Supporting Information</th>
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</thead>
<tbody>
<tr>
<td><strong>Demographics</strong></td>
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</tr>
<tr>
<td>All patients</td>
<td>Year of birth</td>
<td>N/A</td>
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<tr>
<td></td>
<td>Male or female</td>
<td></td>
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<tr>
<td></td>
<td>Education level</td>
<td>Highest level of schooling completed using the International Standard Classification of Education</td>
</tr>
<tr>
<td></td>
<td>Smoking status</td>
<td>(of cigarettes, cigars or tobacco)</td>
</tr>
<tr>
<td></td>
<td>Patient height</td>
<td>To calculate BMI</td>
</tr>
<tr>
<td></td>
<td>Patient weight</td>
<td></td>
</tr>
<tr>
<td><strong>Baseline clinical factors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All patients</td>
<td>Comorbidities including autoimmune conditions</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Previous infection</td>
<td>HIV, HBV or TB</td>
</tr>
<tr>
<td><strong>Baseline condition factors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All patients</td>
<td>Diagnosis</td>
<td>Crohn's disease, ulcerative colitis, indeterminate IBD or colitis unclassified</td>
</tr>
<tr>
<td></td>
<td>Date of diagnosis</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Disease phenotype</td>
<td>Tracked via Montreal Classification</td>
</tr>
<tr>
<td></td>
<td>Presence of extra-intestinal manifestations</td>
<td>Eye, skin, joint, hepatobiliary or other</td>
</tr>
</tbody>
</table>
ICHOM is driving implementation across a number of fronts to prepare more organisations for value-based health care
A collection of testimonials and stories on the Why, How, and What of outcome measurement

Partner with innovative providers to push the frontier of outcomes measurement and pave the way for others to follow

Provide guidance and action items to global institutions implementing Standard Sets with a goal of benchmarking

Accelerate with the innovators

Equip with knowledge and connect to peers

Inspire with success stories

Cleft Lip and Palate Implementation Community
We have recently launched a global benchmarking program

Objectives of Global Comparisons project

- Pool health outcomes data from 10-15 leading provider organizations – 2 conditions for pilot
- Risk-adjust raw data and organize comparisons on key indicators
  - Particular focus on patient-reported outcomes
- Provide individual – and confidential – reporting to participating organizations
- Identify the “best-in-class” and publish about their performance

Sample output – Hip and Knee

Case mix complexity (risk-adjusted)

Acute complications

Patient-reported health status

Disease progression

Other organizations

Your organizations

World average (for participants)
Breaking boundaries in IBD

Oxford AHSN IBD Network
Funding from Takeda UK, JNJ and Norman Collison Foundation
Aim to collect ICHOM outcomes for IBD across the Thames Valley
TrueColours Ulcerative Colitis

Patient recorded outcome measures
TrueColours outcome data collection

- Quality of life (IBD Control)
- Disease activity (Manitoba index, 0-5 point scale)
- Steroids within past 12 months
- ED visit
- Hospital admission ≥1 night (duration)
- Nutrition (BMI and change in weight)
- Anaemia
- Complications
  - Therapy (medical/endoscopic/surgical)
  - Cancer
  - Death
What do we need now?

• Secure global funding for ICHOM implementation
  • $200k from Takeda, Ferring, +/-Celgene
• **OUHFT** to be one of two implementation sites
  • The other is likely to be Leuven
  • Worth speaking to Aneurin Bevan Health Board (done it for Parkinson’s)
• **OUHFT** to work with ICHOM implementation team
  • Adapt ePR to collect ICHOM data (eg Hb, admissions etc)
  • Enable downloading of TrueColours data to ePR (patient portals – similar to Cleveland Clinic)
  • Allow de-itemised (anonymised) data from patients to be stored in a secure cloud
• Consider implementing other ICHOM standard sets – hip and knee, prostate cancer, dementia, etc
Are we better than, as good as, or worse than others?
Precision medicine approach to Asthma diagnosis and management

Driving the adoption of Fractional exhaled Nitric Oxide testing in Primary care

Prof Ian Pavord
University of Oxford,
Honorary Consultant Physician, University of Oxford Hospitals
Time to reform taxonomy of chronic disease

Many common human diseases are still diagnosed as if they are homogeneous entities, using criteria that have hardly changed in a century...

…the treatment for diseases that are diagnosed in this way is generic, with empiricism as its cornerstone

Precision Medicine Approach

Positive effect
Not toxic

Positive effect
Toxic

Same diagnosis

Same treatment

No effect
Toxic

No effect
Not toxic
New insights from novel assessment techniques

<table>
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<tr>
<th>Cells</th>
<th>Effector mediators</th>
<th>Cellular markers</th>
<th>Cytokines</th>
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<td>Eosinophils</td>
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<td>ECP</td>
<td>IL-8</td>
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<td>Neutrophils</td>
<td>PGD2</td>
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<td>Macrophages</td>
<td>Histamine</td>
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<tr>
<td>Lymphocytes</td>
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<tr>
<td>Epithelial cells</td>
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</table>
What we have learnt from studying airway inflammation

- Eosinophilic airway inflammation is present in 50-60% of patients with asthma and 30-40% of patients with COPD
- The presence and severity of eosinophilic airway inflammation is not associated with symptoms or abnormalities of lung function
- Eosinophilic airway inflammation is associated with an increased risk of severe attacks
- Patients with eosinophilic airway inflammation respond well to inhaled and oral steroids; those without do not
- The major benefit of control of eosinophilic airway inflammation is a reduced risk of attacks
Need to differentiate between airway inflammation and dysfunction

- Eosinophilic inflammation
  - Exacerbations
  - Airway remodelling

- Airway dysfunction

Cough, breathlessness and wheeze
Barriers to uptake of biomarker directed, phenotype specific management

1. Traditional disease labels and guidelines are deeply embedded

2. The validity and feasibility of assessing airway inflammation using induced sputum is not widely accepted

3. Industry not engaged
Mepolizumab (anti-IL-5): effect in ‘asthma’ and eosinophilic airways disease management

Flood-Page et al. AJRCCM 2007;176:1062-71

Halder et al. NEJM 2009;360:973-84
GSK announces outcome of US FDA Advisory Committee recommending approval of mepolizumab for the treatment of adults with severe asthma

11 June 2015
Issued: London UK

GlaxoSmithKline plc (LSE: GSK) today announced the outcome of the meeting of the Pulmonary Allergy Drugs Advisory Committee of the United States (US) Food and Drug Administration (FDA) regarding the Biologics Licence Application (BLA) for mepolizumab as an add-on maintenance treatment for severe asthma with eosinophilic inflammation.
Concern about stalling of outcomes

Asthma

COPD

Flu vaccination £1,000/QALY in “at risk” population

Pulmonary Rehabilitation £2,000-8,000/QALY

Stop Smoking Support with pharmacotherapy £2,000/QALY

Tiotropium £7,000/QALY

LABA £8,000/QALY

Nebulisation on chronic disease £9,000/QALY

Yearly Review (PCC) £100/QALY

Total Review (PCC) £130/QALY

Source: HESonline

Increasing recognition of adverse effects

Simple biomarker diagnostics now accessible

Fractional Exhaled NO (FeNO) testing

- Easy to measure
- Acceptable to patients
- Immediate result
- Easy to obtain accurate results, even in children
Simple biomarker diagnostics now accessible

Asthma
ROC 0.62; p=0.09

ICS responsive airway disease
ROC 0.89; p<0.0001

Martin et al. Thorax 2016;71:562-64
FeNO to guide ICS treatment in pregnant women with asthma

Number of exacerbations

- FE\textsubscript{NO} group; n=111
- Control group; n=109

ICS dose

- FE\textsubscript{NO} group
- Control group

\( p<0.001 \)

- 0.62 attacks/patient/pregnancy
- 16.5\% neonatal hospitalisation

- 0.29 attacks/patient/pregnancy
- 7.6\% neonatal hospitalisation

Powell et al. Lancet 2011;373:983–90
What are we doing as part of the Oxford AHSN?

- Can we use FeNO and blood eosinophils to guide management in ordinary clinical practice and does this improve outcomes?
  - FeNO based diagnosis
  - Primary and secondary care based management of acute wheezing illnesses
  - Long-term use of inhaled steroids in asthma and COPD (i.e. can we withdraw high dose steroids in patients with low biomarkers)
  - The enigma of ‘mild’ episodic asthma
What are we doing as part of the Oxford AHSN?

- Regional CCGS will identify key test practices to demonstrate the Proof of Concept of FeNO testing
- Outcomes around patient healthcare visits (exacerbations) and medication usage (Inhaled corticosteroids) will be recorded
- Outcomes data will be used to make the case for CCG investment in FeNO equipment and consumables across the locality
- Data collected on effectiveness of implementation analysed (health economics/stats)

**Phase 1**
Evaluation of FeNO testing in primary care at key practices in region

**Phase 2**
Dissemination of FeNO testing across Oxford AHSN region

**Phase 3**
Capturing learning and processes to scale dissemination nationally through other AHSNs

- A dissemination pack for national adoption will be developed
- Oxford AHSN will engage other AHSNs as well to spread tools and resources nationally
For more Info

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Honorary Consultant Physician,
University of Oxford Hospitals

ian.pavord@ndm.ox.ac.uk

**Dr James Rose**
Clinical Innovation Adoption Manager
Oxford AHSN

James.Rose@oxfordAHSN.org