Improving outcomes, cutting costs: Procuring NIA innovations via the NHS Innovation and Technology Tariff
The role of England’s 15 AHSNs in supporting and spreading innovation

Dr Chris Parker CBE
Managing Director, West Midlands AHSN
How England’s 15 AHSNs make a difference...

- **We connect:** bringing together academics, NHS, researchers and industry to accelerate innovation and facilitate the adoption and spread of proven ideas

- **We are catalysts:** helping facilitate change across whole health and social care economies - with a focus on improving outcomes for patients

- **We create:** the right environment for relevant industries to work with the NHS and other parts of the healthcare sector
Since April 2013...

6.3M people have benefited from AHSN activity

226 innovations have been adopted via significant AHSN involvement

Over £330M in innovation funding has been leveraged by AHSNs

AHSN-enabled innovations have been implemented in over 11,400 sites
The NHS Innovation Accelerator

- NHS England initiative delivered in partnership with the country’s 15 AHSNs, hosted by UCLPartners
- Supporting delivery of FYFV by accelerating uptake of high impact, evidence-based innovations for patient, population and NHS staff benefit
- Currently supporting 25 Fellows representing 26 innovations aimed at: activating people to self-manage; earlier intervention; long term conditions management; improving safety
- 469 additional NHS commissioners and providers now using NIA innovations; £28.6m in external funds secured; 14 awards won; 10 selling internationally
- Impact data demonstrates earlier intervention, reductions in complications and emergency admissions, cost savings
Introducing NHS England’s Innovation and Technology Tariff

Rob Chesters
Senior Innovation and Research Manager, NHS England
Accessing the zero cost NHS Innovation and Technology Tariff 2017-19

• ITT was introduced to incentivise the adoption and spread of transformational innovation in the NHS. It aims to remove the need for multiple local price negotiations and guarantee automatic reimbursement when an approved innovation is used. At the same time the ITT allows NHS England to optimise its purchasing power and negotiate national “bulk buy” price discounts where applicable on behalf of the NHS.

• For 2017-19 as the first year of the ITT this is a pathfinder year and 6 themes have been identified which could provide innovation benefits to the NHS at scale.
<table>
<thead>
<tr>
<th>Theme</th>
<th>Example product</th>
<th>How will it operate (currency)</th>
</tr>
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<tbody>
<tr>
<td>1) Guided mediolateral episiotomy to minimise the risk of obstetric anal sphincter injury</td>
<td>Episcissors-60</td>
<td>Incentive based on activity. The price 16.00 per use.</td>
</tr>
<tr>
<td>2) Reduction of bacterial contamination and accidental administration of medication</td>
<td>Non-injectable arterial connector (NIC)</td>
<td>Provided under the zero cost model. The value of this device per patient is £2.</td>
</tr>
<tr>
<td>3) Prevention of ventilated associated pneumonia in critically ill patients</td>
<td>Pnuex</td>
<td>Provided under the zero cost model. NHS England is covering the cost of the tubes valued at £150 each.</td>
</tr>
<tr>
<td>4) Applications for the self-management of Chronic Obstructive Pulmonary Disease</td>
<td>myCOPD</td>
<td>Provided under the zero cost model. NHS England is covering the cost of licences valued at £20.00 per patient.</td>
</tr>
<tr>
<td>5) Frozen Faecal microbiota transplantation (FMT) for recurrent Clostridium difficile infection rates</td>
<td>Frozen Faecal Microbiota Transplants for Chronic C.difficile Infections</td>
<td>Provided under the zero cost model. NHS England is covering the cost of FMT aliquots valued at £95.00 per patient.</td>
</tr>
<tr>
<td>6) Management of Benign prostatic hyperplasia as a day case</td>
<td>Urolift</td>
<td>Re-imbursement automated via tariff recoded under a new OPCS code.</td>
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In parallel, but separately from the ITT, NHS England is centrally funding a 7th theme “Identification and measurement of atrial fibrillation through mobile ECG technology”. Further information on this programme of work will be published in due course.
Themes “Guided mediolateral episiotomy to minimise the risk of obstetric anal sphincter injury” and “The Management of Benign prostatic hyperplasia as a day case” operate under separate arrangements.
Accessing the zero cost NHS Innovation and Technology Tariff 2017-19

• For 5 of the 6 themes require the completion of a Minimum Data Set to NHS via Arden Gem CSU.

• Theme 6: Prostatic urethral lift systems to treat benign prostatic hyperplasia is covered by National Tariff. Data about use of the procedure will be collected through National Tariff audit processes and specific data reporting requirements are not included in the ITT.
Accessing the zero cost NHS Innovation and Technology Tariff 2017-19

For further information please contact the NHS England Innovation and Research Unit here england.innovation@nhs.net
myCOPD

Ian Thompson, Strategic Director, my mhealth

(Representing NIA Fellow, Dr Simon Bourne)
my mhealth

myCOPD helps people with COPD to better manage their condition. Use it to perfect your inhaler technique, improve your breathing, reduce exacerbations, track your medication and more.

Category: COPD  Price: £2.99  Free in some areas

Visit website

Available from

Screenshots
myCOPD – Patient Interface

- Simple registration
- Symptoms Collections
- Self management
- Rehab
- Inhaler videos
- Comprehensive education
- Mindfulness
- Chest clearance
- Notifications
- ...and much more
System wide integration

Management Application

Patient Application

Clinician Application

EMIS

System 1

Vision

Hospital EHR

Wearables Equipment

(C) my mhealth limited 2017 - Not for distribution outside agreements
Example – inhaler videos

- Only your device shown
- Every device
- Correct education any time
- Inhalers, nebulisers, spacers
- Correct 98% of inhaler errors

(C) my mhealth limited 2017 - Not for distribution outside agreements
Education

• Anatomy of the lungs and what is COPD
• Exercise
• Smoking cessation
• Breathlessness part 1 & 2
• Medication and treatment
• Pacing Part 1 & 2
• Oxygen
• Chest Clearance
• Exacerbations
• Anxiety and depression
• Nutrition
• Travelling
• Benefits
• Sex and breathlessness
• Self-management
• Weather
• Pollution
Rehabilitation

• Full 6 week course

• Maintenance class

• Full exercise instruction

• Coming soon – exercise prescribing!
The TROOPeR Study
A Randomised Controlled Research Study Comparing Online Versus Conventional Pulmonary Rehabilitation for Patients with COPD

Short Title: The Trooper Study

6 MWT

Class: 40.8
Online: 60.7

CAT

Class: 2.1
Online: 2.9

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FOR RELEASE

FOR MORE INFORMATION, CONTACT:
Dacia Morris
dmorris@thomacic.org
ATS Office 212-315-8620 (until May 17)

Session
DAY, DATE, TIME
Location:

Online Pulmonary Rehabilitation Not Inferior to Face-to-Face Rehab

ATS 2017, WASHINGTON, DC — Online pulmonary rehabilitation for patients with chronic obstructive pulmonary disease (COPD) was found to be as effective as face-to-face rehabilitation programs at improving patients’ exercise capacity and symptom control, according to new research presented at the 2017 American Thoracic Society International Conference.

““For many patients, attending in-person classes isn’t easy and we know that attendance rates are variable,” said lead author Tom Wilkinson, MA, Cantab, MBBS, PhD, FRCP, of the Southampton University Faculty of Medicine at Southampton General Hospital, United Kingdom. “This study challenges the paradigm that pulmonary rehabilitation needs to be delivered using a conventional face-to-face class-based approach.”

The study involved 90 patients with moderate COPD who were referred for pulmonary rehabilitation. Study participants were assigned randomly to either online or face-to-face rehabilitation. Patients were well-matched between treatment arms for age, disease severity and smoking status. Approximately twice as many (n=64) study participants were assigned to the online group as were assigned to in-person classes (n=26). The researchers were blinded to which group each person was in.

Those in the face-to-face group participated in six-week group sessions at a local rehabilitation center, while online subjects logged in to the MyPR application from their home computers. MyPR, which is part of the larger MyCOPD software application (app), is the first to be supported in the UK by the National Health Service Innovation and Technology Tariff, and is free for UK patients with advanced COPD.

Outcome measures for the study were patients’ six-minute walking distance and scores on the COPD Assessment Test (CAT). At the completion of the study, the walking distance for online participants was not significantly less than for face-to-face study subjects. Improvements in pulmonary rehabilitation scores on the CAT were higher for the online group in all domains. (See study abstract below for statistical analyses.)
Examples where mhealth products are being used?
Business Model – COPD Example

Based on an average CCG with 5000 patient with COPD

25% reduction in exacerbations and hospital admissions

Delivery of evidence based PR at scale with reduced costs

In year savings of >£200k
Co morbidities are present in 25% of patients with long-term conditions.

Each patient receives on average just 15mins clinician time/yr/morbidity.

- Diabetes
- COPD
- Heart failure
- Cardiac Rehabilitation
- Asthma
Episcissors-60
Alex Fisher, Director, Advanced Global Health Ltd

(Representing NIA Fellow, Dr Dharmesh Kapoor)
Achieving Innovation at Scale in the NHS: EPISCISSORS-60

ALEX FISHER
DIRECTOR, ADVANCED GLOBAL HEALTH LTD
EPISCISSORS-60

FIRST SCISSORS DESIGNED TO GIVE AN ACCURATE MEDIOLATERAL EPISIOTOMY; PATENT OWNED BY PLYMOUTH HOSPITALS NHS TRUST
# Obstetric Anal Sphincter Injuries (OASIS)

## Incidence
- 30,000 new cases each year in UK
- 6% in first vaginal births
- Leading cause of anal incontinence in women (9:1 F:M)

## Direct costs
- £1625 per case for repair + postoperative care
- £48.75 million each year

## Indirect costs
- 25% of women choose elective caesarean delivery (extra £1100 per birth; £4.9 million each year)
- £2500 per year/person for fecal incontinence
LITIGATION COSTS

- Perineal trauma is the 4th highest reason for claims made in obstetrics over 10 years.
- £31 million in legal payouts alone.
- OASIS being mooted as a patient safety indicator.
- £1.6 million damages for OASIS due to an acutely angled episiotomy.
“WHERE EPISIOTOMY IS INDICATED, THE MEDIOLATERAL TECHNIQUE IS RECOMMENDED, WITH CAREFUL ATTENTION TO ENSURE THE ANGLE IS 60 DEGREES AWAY FROM THE MIDLINE WHEN THE PREINEUM IS DISTENDED. (D)’’
SUMMARY OF CURRENT PRACTICE: HOW GOOD ARE WE AT ‘EYEBALLING’ EPISIOTOMY ANGLES?

**Draw on paper**
- 1/3rd doctors & midwives drew episiotomies >40°
- (Tincello 2003)

**Cut on paper**
- 15% cut 58-62 degrees
- 37% cut 55-65° when asked to cut at 60°
- 63% cut below or above this range (Naidu 2014)

**Actual patients**
- No midwife & 22% doctors performed episiotomies with suture angle >40° (Andrews 2005)
- 43% episiotomies were not mediolateral/lateral (Fodstad 2014)
“SPECIAL SCISSORS DESIGNED TO ENSURE AN INCISION ANGLE OF 60 DEGREES HAVE BEEN SHOWN TO BE EFFECTIVE IN ACHIEVING THE CORRECT ANGLE\textsuperscript{29,30}. EVIDENCE LEVEL 3”
RESULTS FROM UK HOSPITALS THAT COMPLETELY REPLACED ALL OLD EPISIOTOMY SCISSORS WITH EPISCISSORS-60

- 20% REDUCTION IN CHILDBIRTH ANAL SPHINCTER INJURIES (OASIS) AT POOLE AND HINCHINGBROOKE HOSPITALS (VAN ROON ET AL. 2015)

- 40-50% REDUCTION AT CROYDON UNIVERSITY HOSPITAL (LOU, 2016)

- 40-50% REDUCTION AT ROYAL FREE AND BARNET HOSPITALS (MYERS, 2016, UNPUBLISHED AUDIT).
EPISCISSORS-60 BY NHS ACUTE TRUSTS

PURCHASED/LOOKING TO PURCHASE = 63
TRIALLING AND DISCUSSING INTERNALLY = 15
DECLINED = 34
NO RESPONSE = 31
BARRIERS TO ADOPTION - 1

DIFFICULT IN MAKING A COGENT BUSINESS CASE

- SINCE THESE INJURIES ATTRACT REIMBURSEMENT VIA PAYMENT BY RESULTS, THE HOSPITAL WOULD LOSE INCOME IF THE INJURY RATE WENT DOWN.

SOLUTION

- ITT TO PROVIDE FUNDS TO BUY SCISSORS

- MAKING CCG’S AWARE OF THE COST IMPLICATIONS TO THEM OF CONTINUED HIGH RATES OF OASIS (DETAILED IN THE UNIVERSAL GUIDANCE FROM NHS ENGLAND)
BARRIERS TO ADOPTION – 2

SINGLE USE INSTRUMENTATION
- ONE-THIRD OF ENGLISH TRUSTS USE SINGLE-USE BIRTH PACKS
- HAVE OFF-SITE SHARED STERILISATION FACILITIES
- REPORT A 40% REUSABLE INSTRUMENT LOSS RATE OVER 5 YEARS FROM THESE FACILITIES

SOLUTION
- ?
BARRIERS TO ADOPTION – 3

MIDWIVES CONCERNS ABOUT IT LEADING TO RISING EPISIOTOMY RATES

SOLUTION

- STRESSING THAT OVERALL PERINEAL BURDEN REMAINS UNCHANGED; I.E. WE ARE SWAPPING FIRST AND SECOND DEGREE TEARS THAT OCCUR ANYWAY IF EPISIOTOMIES ARE NOT PERFORMED

- EPISIOTOMIES DO NOT LEAD TO MORE PAIN, BLEEDING IN HEAD-TO-HEAD COMPARISONS
BARRIERS TO ADOPTION - 4

CLINICAL APATHY
- STATUS QUO IS SATISFACTORY
- NOT ENOUGH ROBUST EVIDENCE ABOUT THE SCISSORS
- NEED A RANDOMISED CONTROL TRIAL (RCT)

SOLUTIONS
- CCG’S SHOULD CHALLENGE TRUSTS TO COME UP WITH OASIS REDUCTION PLANS BY 20-50% OTHERWISE PBR PAYMENTS SHOULD BE CURTAILED BY THIS LEVEL
- USE ANY OTHER VALIDATED MEANS TO PERFORM 60 DEGREE ANGLED EPISIOTOMIES (AS PER RCOG RECOMMENDATION)
- RCT WOULD COMPARE EPISCISSORS-60 WITH WHAT? NO OTHER PROVEN METHOD EXISTS
- RCT WOULD COST MORE THAN REPLACING ALL EPISIOTOMY SCISSORS IN ENGLAND WITH EPISCISSORS-60
WHY HINCHINGBROOKE DECIDED TO ADOPT EPISCISSORS-60

A 60 DEGREE EPISIOTOMY WAS RECOMMENDED AS A WAY TO PREVENT CHILDBIRTH ANAL INJURIES BY THE RCOG

EPISCISSORS-60 WERE MENTIONED IN THAT GUIDANCE AS BEING A FIXED ANGLE DEVICE THAT TAKES AWAY THE GUESSWORK AND HUMAN ERROR IN TRYING TO ESTIMATE THE ANGLE AT THE TIME OF BIRTH

“NO-BRAINER” TO PREVENT AVOIDABLE HARM
BARRIERS TO ADOPTION

MAKING THE CASE INTERNALLY FOR INVESTMENT

- WHICH BUDGET TO DIP INTO FOR FUNDS? CAPITAL OR OPERATIONAL?
- HOSPITALS WOULD LOSE INCOME IF INJURY RATE IS REDUCED
- NO INCENTIVE TO REDUCE INJURY RATE

CHANGING CLINICAL PRACTICE

- INTRODUCING THE COMPREHENSIVE SUPPORT TRAINING PROGRAMME LED TO ‘BUY-IN’ FROM THE MIDWIFERY AND MEDICAL STAFF
- REPLACEMENTS OF ALL EPISIOTOMY SCISSORS WITH EPISCISSORS-60
BENEFITS SEEN BY THE TRUST POST-IMPLEMENTATION

- 20% REDUCTION IN CHILDBIRTH ANAL SPHINCTER INJURIES WITHIN 5 MONTHS OF INTRODUCTION

- CORRESPONDING INCREASE IN NUMBER OF EPISIOTOMIES PERFORMED DUE TO INCREASED CONFIDENCE AMONG DOCTORS AND MIDWIVES

- NOW IT HAS BECOME THE NORM

- HAS INFLUENCED NEIGHBOURING TRUSTS LIKE CAMBRIDGE TO ADOPT EPISCISSORS-60

- FUNDING REMAINS A HUGE OBSTACLE

- INNOVATION TARIFF WILL GREATLY HELP.
Non-injectable arterial connector (NIC)

Dr Maryanne Mariyasilvam, NIA Fellow
NIC
Non-injectable arterial connector
Inadvertant injection into the arterial line

*Never* give medication into the arterial line
Inadvertant injection into the arterial line

• As common as 1:3400 procedures\(^1\)
• Since 2008 NPSA Arterial safety alert
  >150 incidents\(^2\)
  ~ 2/month in the NHS

• Catastrophic error
  – Patients suffer
  – Nurses suffer

2. Reported incidence of arterial line errors. 2006 – 2015. Personal correspondance, Medical Director, NHS England
Need a solution that always allows:

• Take a blood sample
• Never inject
NIC: Non-injectable arterial connector

- Arterial connector
  - One way valve

- Prevents
  - accidental injection
  - bacterial contamination
  - blood spillage during sampling
NIC: Non-injectable arterial connector

• Arterial connector
  – One way valve
• Prevents
  • accidental injection
  • bacterial contamination
  • blood spillage during sampling

• Safety innovation – STOPS the problem
• Safety innovation – PROTECTS patients & staff
Simple to implement

1. Use NIC instead of standard arterial connector

2. NIC stays on for the life time of the arterial line (3-7 days)
NIC – use blood conserving sampling

1. Aspirate at the transducer port
NIC – use blood conserving sampling

2. If desired, withdraw 0.2 ml deadspace from sampling port
NIC – use blood conserving sampling

3. Aspirate ABG sample from the NIC
NIC – use blood conserving sampling

4. Replace waste syringe, flush both NIC and arterial line by pinching the transducer
NIC: Studies

• **Laboratory study**
  – 0% bacterial contamination of the arterial line

• **Simulation study**
  – 10/15 gave medication into the arterial line (standard systems)

• **Clinical evaluation (250 healthcare staff)**
  – 98% believe it is important to use the NIC
  – 26% had personally seen an incident which could have been prevented by the NIC
NIC: Studies

• Health Economic Analysis - **cost saving** for the NHS
  – £2 per unit

• Patient feedback (NHS England Citizen Senate):
  – 100% (13/13) agreed the NIC should be used in hospitals

  “Excellent idea, feel confident this would benefit my family, myself and the NHS”

  “making mistakes impossible keeps people alive and reduces cost per episode”
Awards

• Winner: National Patient Safety and Care Award (2012)

“The non-injectable arterial connector (NIC) is a great patient safety device and is an easily implementable solution, which makes wrong route drug administration into the arterial line impossible.

For the safety and best practice for our patients, I heartily recommend this device should be used on all arterial lines in the NHS”

Professor Sir Bruce Keogh, 
Medical Director NHS England
**SUGGESTED ACTIONS:**

The following strategies should be considered by WHO Member States.

1. Ensure that health-care organizations have systems and procedures in place which:

   **Require the labeling of high-risk catheters** (e.g. arterial, epidural, intrathecal). Use of catheters with injection ports for these applications is to be avoided.
NHS England announces first medtech devices and apps to join fast track payment scheme for innovation

2 November 2016 - 00:01

Medtech devices and apps will for the first time be included under NHS national payment rules helping to accelerate uptake, NHS England Chief Executive Simon Stevens has announced today. The commitment to create a new Innovation and Technology Tariff was announced by Mr Stevens in June.

Full reimbursement for the NIC – starts 1 April 2017
NHS Innovation and Technology Tariff

• Starts 1st April 2017 – for 2 years

• Order from Amdel Medical Ltd
  – http://www.amdelmedical.com

• Soon available on the NHS supply chain
www.KLIPSuk.com
KLIPSuk@gmail.com

Peter Young – peteryoung101@gmail.com
Maryanne Mariyaselvam – m.mariyaselvam@nhs.net
PneuX
Peter Young, NIA Fellow
PneuX Pneumonia Prevention System
PneuX System

Preventing VAP

Ventilation Tube
Ventilator Associated Pneumonia (VAP)

• Leading cause of infective hospital-acquired mortality in ICU
• Affects up to 20,000 patients per year in the UK
• Up to 30% of these patients will die from VAP
  = 6,000 people

• Patient contracts VAP increases
  – Complications
  – Length of mechanical ventilation
  – Length of stay
  – Antibiotic use

• 1 episode of VAP costs the NHS £10,000 to £20,000
Case Study

Intubated patient transferred to our ICU
Oral Cavity Full of Bacterial Laden Fluid

Videolaryngoscopy of larynx
Patient was transferred to our ICU

**Standard leaky cuff in place**

- Patient had developed a pneumonia
  - On arrival:
    - Growth of staph aureus, coliforms and candida
    - From both mouth and the lungs

- Tube exchange to PneuX
  - PneuX care plan instituted
  - Patient recovered in 7 days
Pathophysiology: after intubation

- Rapid colonisation with pathogenic bacteria of oropharynx
- Gastric contents reflux into the oropharynx
- Secretions accumulate above the cuff
- Standard tubes allow aspiration of secretions
- Leads to microbial colonisation of the lungs
- Ventilator-associated Pneumonia

Standard leaky cuffs v PneuX
Leakage of bacteria past ALL ICU tube cuffs

University of Wales, Cardiff

Endotracheal tubes and fluid aspiration. *BMC Anaesthesiology* 2017; 17(1):36
Leakage of bacteria past ALL ICU tube cuffs

University of Wales, Cardiff

Endotracheal tubes and fluid aspiration. *BMC Anaesthesiology* 2017; 17(1):36
Ability of five endotracheal tube cuffs to prevent leaks

Massachusetts General Hospital

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Performance of the PneuX system: a bench study comparison with 4 other endotracheal tube cuffs. *Respiratory Care* 2017;62:102–12
### Ability of five endotracheal tube cuffs to prevent leaks

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**EXCEPT ONE**

Performance of the PneuX system: a bench study comparison with 4 other endotracheal tube cuffs. *Respiratory Care* 2017;62:102–12
LoVAP study
New Cross Hospital

PneuX halves Post-Operative Pneumonia rates\(^1\) \(p = 0.03\)

Independent Cost Evaluation (RCS & University of Birmingham)

£700 saving per PneuX used\(^2\)

2. VAP cost effectiveness study. Presented at the 29\(^{th}\) European Association for Cardio-Thoracic Surgery. 2015, Amsterdam
LoVAP study
New Cross Hospital

PneuX halves Post-Operative Pneumonia rates\(^1\)  \(p = 0.03\)

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2. VAP cost effectiveness study. Presented at the 29th European Association for Cardio-Thoracic Surgery. 2015, Amsterdam
Multi-Drug Resistance with leaky cuffs

ICUs breed MDR bacteria
Repeated antibiotics and re-infection drives resistance

• Tracheal colonisation in 87% of ventilated ICU patients with standard tubes\(^1\)
• “50% of all antibiotics administered in ICU are for treatment of VAP”\(^2\)
• 14 months use of PneuX showed:
  – zero colonisation
  – zero VAP
  – zero antibiotics used for new lung infection or colonisation\(^3\)

1. Implications of Endotracheal Biofilm in VAP. Critical Care 2012.16(3):R93
2. Ventilator-associated Pneumonia in the ICU. Critical Care 2014. 18:208
Optimising the design
PneuX: Protect the lungs, larynx & trachea
Tubes with one subglottic drainage port don’t work effectively
Suck tracheal mucosa into channel

PneuX

Triple ports prevent unopposed suction on the tracheal wall
PneuX – subglottic suction
Subglottic irrigation is only possible with the PneuX
TSM – maintains the cuff pressure at all times
Citizens’ Senate: Patient’s Perspective

We are hugely impressed with the benefits to patient safety”

We urge organisations to ensure the PneuX system is adopted

This is an opportunity that cannot be ignored

Having reviewed the costs & benefits, we are keen for wide scale adoption

100% approval. Data collected: NHS England Citizen Senate 2015
The Most Disturbing Slide You May Ever See
Barriers
Perverse Financial Incentives

“we generate an income from patients that develop VAP because of their increased length of stay”

“The CCG pay …… if we shorten the time that patients spend in ICU this will reduce the income”

“…..150 bed days so a loss of income of £199,096.50.”

Managerial response to business case in a hospital with a clinical request for the PneuX. NHS 2016
Innovation and Technology Tariff

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• Order from Qualitech Healthcare Ltd
  – https://www.qualitechhealthcare.co.uk/the-pneux-system.html

• Order directly from the company
  – Ordering set up through normal procurement process
  – £0 cost to you
  – (company paid by NHS England)
  – You will need 24 ETT per TSM
www.KLIPSuk.com

KLIPSuk@gmail.com

Peter Young – peteryoung101@gmail.com
Maryanne Mariyaselvam – m.mariyaselvam@nhs.net
AliveCor’s Kardia
Francis White, NIA Fellow
Kardia Mobile

A pulse check with a difference?
Healthcare costs a crisis
A Major Cause of Stroke

• 1 in 4 over 40 will have AF*
• AF effects >2m in UK
• Leading cause of stroke

*Atrial Fibrillation
How do you find AF?

Two appointments? More?
Why not just 1?

• Make diagnosis
  • Rhythm strip PDF
  • (email Cardiologist if uncertain)
Who says this is OK?

European Society of Cardiology

The future: Self-Care
UroLift

Justin Hall, General Manager of NeoTract
The LUTS / BPH Cycle – Burden of Care

- Primary Care (Medication / GP Consultations)
- Emergency Admission
- Surgery
- Post-operative Complications
Current situation

- Men with moderate or severe symptoms are generally offered a surgical procedure (TURP or laser)
- TURP and laser involves cutting away or removing existing tissue
- Length of stay = 2-3 days
- Theatre time (general anaesthetic) = 80 mins (significantly longer for HoLEP laser)
- TURP: Complex and persistent complications, including:
  - Bleeding
  - Infection
  - Incontinence
  - Sexual dysfunction

- Excellent disobstruction
- Serious adverse events
- Lengthy recovery

Prolong length of stay and place further burden on the NHS
LUTS due to BPH – Cost burden to the NHS

BPH drug treatment¹
£107 Million/yr

Primary Care Consultations
1.6 million consultations²
£44 Million/yr³

BPH-related hospital episodes⁴
£321 Million/yr
Average length of stay: 9 days
50% of acute care is non-elective

Elective BPH surgery⁴
£43 Million/yr
20,000 TURP procedures/yr
60,000 inpatient bed days/yr
27,000 theatre hours/yr

Surgery-related complications⁵
£109 Million
70,000 hospital spells
*cumulative over 5 year pathway
£55 Million in Year 1

LUTS due to BPH – Cost burden to the NHS

National

BPH drug treatment\(^1\)
£107 Million/yr

Primary Care Consultations
1.6 million consultations\(^2\)
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27,000 theatre hours/yr

Surgery-related complications\(^5\)*
£109 Million
70,000 hospital spells
*cumulative over 5 year pathway
£55 Million in Year 1

Primary Care

E & W Midlands

BPH drug treatment\(^1\)
£20.3 Million/yr

Primary Care Consultations
305,000 consultations\(^2\)
£7 Million/yr\(^3\)

BPH-related hospital episodes\(^4\)
£61 Million/yr

Elective BPH surgery\(^4\)
6.8 Million/yr
3,200 TURP procedures/yr
9,600 inpatient bed days/yr
4,200 theatre hours/yr

Surgery-related complications\(^5\)*
£15.4 Million
9,400 hospital spells
*cumulative over 5 year pathway
£8 Million in Year 1

LUTS due to BPH – Cost burden to the NHS

**National**

- **BPH drug treatment**
  - £107 Million/yr

- **Primary Care Consultations**
  - 1.6 million consultations
  - £44 Million/yr

- **BPH-related hospital episodes**
  - £321 Million/yr
  - Average length of stay: 9 days
  - 50% of acute care is non-elective

- **Surgery-related complications**
  - £109 Million
  - 70,000 hospital spells
  - £55 Million in Year 1

**E & W Midlands**

- **BPH drug treatment**
  - £20.3 Million/yr

- **Primary Care Consultations**
  - 205,000 consultations
  - £7 Million/yr

- **BPH-related hospital episodes**
  - £61 Million/yr

- **Surgery-related complications**
  - £15.4 Million
  - 9,400 hospital spells
  - £8 Million in Year 1

**Complications (hospital episodes) from current surgical procedures**

- £4,800 per patient over 5 years
- >£2,500 costs in Year 1

---

The Key Patients & Urologists Are Seeking

- **Straightforward Procedure**
  - Quick, reliable, reproducible
  - Local anesthesia
  - Day case

- **Safe**
  - No complex and persistent complications

- **Rapid Relief**
  - Patients quickly return to normal living

- **Preserve Function**
  - Bladder function
  - Sexual function

- **Durable**
  - Years of relief

- **Cost Effective**
  - Less expensive for system
A NEW View: What is BPH, really?

• BPH is a *mechanical problem*.

• Benign Prostate Hyperplasia is, by definition, *benign tissue*.

• Removing or destroying this benign tissue can cause *complications*.

• Why not just *move it out of the way*?
Enter Prostatic Urethral Lift! (The Urolift® System)

- **Ambulatory** day-case treatment – patients return home within a few hours
- Permanent intra-prostatic UroLift® implants are delivered to separate encroaching lateral prostate lobes and expand the urethral lumen
- **Minimally invasive**
  - Does not cause tissue injury
  - Avoids the complex and persistent complications associated with removing tissue, and also avoids permanent side effects, such as sexual dysfunction.¹-⁶
- **Short**, <30-min procedure, performed under local anaesthetic or occasionally light sedation
- Patients return home after a few hours without a catheter, and follow-up can be by telephone
- The treatment effect of Urolift has been shown to be durable, with published data out to 5 years¹,⁶

Minimally Invasive Safety Profile

Most common AE were mild to moderate, typically resolve by 2-4 weeks:

<table>
<thead>
<tr>
<th>Condition</th>
<th>PUL Subjects</th>
<th>Control Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dysuria</td>
<td>34%</td>
<td>17%</td>
</tr>
<tr>
<td>Hematuria</td>
<td>26%</td>
<td>5%</td>
</tr>
<tr>
<td>Pelvic pain</td>
<td>18%</td>
<td>5%</td>
</tr>
<tr>
<td>Urgency</td>
<td>7%</td>
<td>0%</td>
</tr>
<tr>
<td>Urge Incontinence</td>
<td>4%</td>
<td>2%</td>
</tr>
<tr>
<td>UTI</td>
<td>3%</td>
<td>2%</td>
</tr>
</tbody>
</table>

No incidence (0%) of de novo sustained ejaculatory or erectile dysfunction.

Roehrborn et al. Can J Urol 2015
Improved Quality of Care

- UroLift patients recover more quickly
  - TURP catches up only between 6 to 12 months
- UroLift patients satisfied sooner and to greater extent

Recently- 5-year durability data (confidential)

### Five Year Outcomes

<table>
<thead>
<tr>
<th></th>
<th>1 Month</th>
<th>1 Year</th>
<th>2 Years</th>
<th>3 Years</th>
<th>4 Years</th>
<th>5 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>QOL</strong> (paired)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>135</td>
<td>123</td>
<td>103</td>
<td>93</td>
<td>76</td>
<td>72</td>
</tr>
<tr>
<td>Baseline</td>
<td>4.6±1.1</td>
<td>4.6±1.0</td>
<td>4.5±1.0</td>
<td>4.5±1.0</td>
<td>4.5±1.0</td>
<td>4.5±1.0</td>
</tr>
<tr>
<td>Follow-Up</td>
<td>2.6±1.7</td>
<td>2.2±1.6</td>
<td>2.3±1.6</td>
<td>2.2±1.6</td>
<td>2.1±1.4</td>
<td>2.2±1.5</td>
</tr>
<tr>
<td>Change</td>
<td>-2.0 (-42%)</td>
<td>-2.3 (-51%)</td>
<td>-2.2 (-47%)</td>
<td>-2.2 (-49%)</td>
<td>-2.4 (-52%)</td>
<td>-2.3 (-50%)</td>
</tr>
<tr>
<td>P-value</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>1 Month</th>
<th>1 Year</th>
<th>2 Years</th>
<th>3 Years</th>
<th>4 Years</th>
<th>5 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IPSS</strong> (paired)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>135</td>
<td>123</td>
<td>103</td>
<td>93</td>
<td>76</td>
<td>72</td>
</tr>
<tr>
<td>Baseline</td>
<td>22.3±5.5</td>
<td>22.1±5.6</td>
<td>21.8±5.6</td>
<td>21.6±5.9</td>
<td>21.4±5.9</td>
<td>21.5±6.0</td>
</tr>
<tr>
<td>Follow-Up</td>
<td>12.3±5.9</td>
<td>11.5±7.3</td>
<td>12.7±7.8</td>
<td>12.7±7.9</td>
<td>12.6±7.9</td>
<td>13.9±8.4</td>
</tr>
<tr>
<td>Change</td>
<td>-10.0 (-44%)</td>
<td>-10.6 (-47%)</td>
<td>-9.1 (-41%)</td>
<td>-8.8 (-41%)</td>
<td>-8.8 (-41%)</td>
<td>-7.6 (-36%)</td>
</tr>
<tr>
<td>P-value</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
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<td>&lt;0.001</td>
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<table>
<thead>
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<th></th>
<th>3 Months</th>
<th>1 Year</th>
<th>2 Years</th>
<th>3 Years</th>
<th>4 Years</th>
<th>5 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Qmax</strong> (paired)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>122</td>
<td>102</td>
<td>86</td>
<td>69</td>
<td>50</td>
<td>52</td>
</tr>
<tr>
<td>Baseline</td>
<td>8.0±2.4</td>
<td>8.0±2.4</td>
<td>8.3±2.4</td>
<td>8.3±2.4</td>
<td>8.4±2.4</td>
<td>8.5±2.1</td>
</tr>
<tr>
<td>Follow-Up</td>
<td>12.5±5.3</td>
<td>12.1±5.3</td>
<td>12.5±5.4</td>
<td>11.8±4.8</td>
<td>12.7±5.6</td>
<td>12.0±4.9</td>
</tr>
<tr>
<td>Change</td>
<td>4.3 (64%)</td>
<td>4.0 (58%)</td>
<td>4.2 (59%)</td>
<td>3.5 (63%)</td>
<td>4.3 (63%)</td>
<td>3.6 (44%)</td>
</tr>
<tr>
<td>P-value</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

### CONCLUSIONS

- **Prostatic Urethral Lift shows 5 year durable effect:**
  - IPSS remains improved 7.6 or 36% from baseline
  - Quality of life remains improved 2.3 or 50% from baseline
  - Qmax remains improved 3.5 mL/s or 44% from baseline
  - Retreatment is 2-3% per year over 5 years
- **PUL achieves minimally invasive treatment goals:**
  - All primary and secondary endpoints met
  - Local anesthesia tolerated in day case
  - 68% of tested subjects received no post-operative catheter
  - Rapid symptom relief, return to normal in 8.6 days
  - Sexual function preserved
NICE Guidance

IPG
Established safety and efficacy. Recommended with normal arrangements for clinical governance, consent and audit

MTG
Established value to NHS. Recommended as a cost saving alternative to current surgical options

Adoption Support
Health technology adoption programme: Provided practical information and advice on the adoption of Urolift by the NHS

NICE Shared Learning
Case studies showcasing the adoption experience at 3 NHS Trusts

Jan 2014

Sept 2015

Nov 2015

Aug - Nov 2016
Implementation and Activity

- Urolift is an easy and rapidly deployable technology
- True day case procedure that does not rely on capital purchase, infrastructure or staff changes
- Patients return home and can be followed up by telephone
- Eligible patients can be recruited from the urology waiting list or from outpatient clinics

At least 40% patients currently being treated with TURP or laser would be clinically eligible for Urolift
### Prostatic Urethral Lift is included in the National Tariff

<table>
<thead>
<tr>
<th>Service Description</th>
<th>OPCS</th>
<th>National Tariff 2017/18</th>
<th>Average tariff used for comparative purposes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prostatic Urethral Lift (Urolift)</td>
<td>M68.3</td>
<td>£2,107 - £2,538 depending on CC</td>
<td>£2,354</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Endoscopic Insertion of prosthesis to compress lobe of prostate</td>
<td></td>
</tr>
<tr>
<td>TURP / laser</td>
<td>M65.1 / M65.3 / M65.4</td>
<td>£2,127 - £2,893 depending on CC</td>
<td>£2,271</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Best Practice Day Case Tariff</td>
<td></td>
</tr>
</tbody>
</table>

For comparative purposes, in 2015/16:
- 43% of TURP/laser procedures had no CC
- 56% of TURP laser procedures had intermediate CC
- 1% of TURP/laser procedures had major CC

Comparable price to Best Practice Tariff for current standard of surgical care.
Benefits - Patients

Compared with the current standard of surgical care, Urolift offers:

- Rapid and sustained improvement in symptoms and flow
- Durable benefits, with published data out to 5 years
- Improved safety and side effect profile
- Preservation of sexual function
- Significantly reduced post-operative complications - more rapid return to daily living

Benefits - NHS

**Efficiency and productivity savings**

- **Improved safety and reduced risk of complex and persistent complications**
  - Estimated savings of at least £2,400 per patient over 5 years (£1,200 in year 1) in reduced complications requiring hospital care¹

- **Improved bed capacity and no risk of delayed transfer of care**
  - No overnight stay compared with 3 bed days with TURP

- **Reduced re-admission rates**
  - Not associated with any of the persistent or complex complications seen with current surgical treatments²-⁵

- **Reduced catheterisation-associated urinary tract infection (CAUTI)**
  - Patients are rarely catheterised, compared with routine catheterisation for many days following a TURP procedure.

- **Reduced requirement for outpatient follow-up**
  - A Urolift procedure follow-up can be by telephone, reducing pressure on outpatients clinics

---

Cost impact across East & West Midlands*

**National**
- BPH drug treatment\(^1\)
  - £107 Million/yr
- For each annual cohort of patients treated:
  - **Saving £3.1 Million over 5 years**
    - in surgery related complications that require hospital treatment
    - (£1.6 Million saving in Year 1)
  - Per patient saving = £2,400 over 5 years
    - (£1,300/patient saving in Year 1)
- Saving 3,900 inpatient bed days/year

**E & W Midlands**
- BPH drug treatment\(^1\)
  - £20.3 Million/yr
- Primary Care Consultations
  - 305,000 consultations\(^2\)
  - £7 Million/yr\(^3\)
- BPH-related hospital episodes\(^4\)
  - £61 Million/yr
- Elective BPH surgery\(^4\)
  - 6.8 Million/yr
  - 3,200 TURP procedures/yr
  - 9,600 inpatient bed days/yr
  - 4,200 theatre hours/yr
- Surgery-related complications\(^5\)
  - £15.4 Million
  - 9,400 hospital spells
    - *cumulative over 5 year pathway
  - £8 Million in Year 1

*cumulative over 5 year pathway

---

Summary

Benefits of Urolift are in line with:

- Five year forward view and STP objectives around addressing:
  - Care & quality gap
    - Improved safety and reduced burden of care
    - Durable benefit
  - Funding and efficiency gap
    - No delayed transfer of care
    - In-year cost savings
  - Accelerated Access Review: “an innovative medical technology with cost saving potential”

Innovation & Technology Tariff

Affordability: cost and net cost to the NHS based on estimated demand, potential savings and procurement routes

Return on Investment: based on scale, likelihood and time taken to realise

Suitability for Tariff: The potential tariff routes

Impact: Scalability, including feasibility and speed of realisation of benefit

Strategic fit with NHS England priorities
Thank you
Q&A
Thank you for your participation in ‘Improving outcomes, cutting costs’

For more information about the innovations showcased at today’s event: NIA@uclpartners.com

For more information about the NHS Innovation and Technology Tariff (ITT): innovation.england@nhs.net