Our mission – translate cutting-edge research into patient care, delivering **improved outcomes for patients** locally and globally
Delivered through clinical academic groups – focus on integrating **mind and body** and implementing **value based healthcare**

King's Health Partners

We have...

- **22** Clinical Academic Groups
- **4.8 million** patient contacts per year
- Plans to bring together our collective strength in key areas to form a number of **Clinical Academic Institutes & Networks**
- **600** clinical trials running at any one time
- A patient population of **8 million** in south London and south east England
A value-driven NHS can only be achieved through sharing and use of high quality data with clinical teams and with patients.

“We want to improve health for all patients by ensuring that the quality of clinical outcomes and access to care are not affected by deprivation, geography or demographic profile. Value based healthcare will drive quality and sustainability by continually focussing on, and measuring, outcomes that matter to patients and carers alongside understanding the true cost of care.”
Value in Practice – sharing lessons and challenges from our experience in orthopaedics

Mr Toby Colegate-Stone
Our healthcare conundrum

All providers, commissioners and payers of healthcare face escalating costs:

- Population size
- Ageing population
- Increasing complex co-morbidities
- Increasing technology & ability potential to treat disease
Musculoskeletal disorders – the value challenge

- MSK related disorders impact us from every perspective
- Approximately 15 million people in the UK have a MSK condition
- MSK annual NHS budget circa £10 billion
- Greatest cause of sick leave & related loss of productivity to the economy
  - Estimated annual cost of £18 billion
  - Over 30% of all disability allowance claims are related to MSK disorders, which is greater than the sum of mental health, cardiovascular disease, stroke and respiratory disease
- 25% of the population consults at least once a year with a MSK problem
- More than 25% of all surgical interventions undertaken by the NHS are for MSK issues
- Trauma
  - In the guise of major trauma it also accounts for the greatest cause of mortality in the under 40’s
  - Hip fracture is the 2nd ranking cause mortality at 30 days after emergency admission
- The demands that MSK disorders place on healthcare are increasing at every point of clinical contact, and unfortunately they only have an upward trajectory
Orthopaedics – a growth business

Estimated and projected age structure of the UK population, mid-2010 and mid-2035
Medical concerns of an aging population

England – Annual Prevalence Rates (per 10,000) for diseases which increase with Age – 2005

Source: RCGP, Birmingham Research Unit, 2006
Value in healthcare

- **Value** is defined as Outcomes relative to the real costs it takes to deliver those outcomes.
- **Outcome improvement** without understanding the true costs of care is unsustainable and does not help effective allocation of limited resources.
- **Cost reduction** without regard to the Outcomes achieved is dangerous and self-defeating.

Value = \frac{\text{Health outcomes}}{\text{Cost}}

To reduce cost, the best approach might be to spend more on some services to reduce the need for others.

Excellent care is frequently lower cost.

The full set of outcomes that constitute the quality of care for the patient over the complete care cycle.

Refers to total costs of the full cycle of care for the patient's medical condition, not the cost of individual services.

Michael Porter & Elizabeth Teisberg, Redefining Health Care (2006)
Engaging with our patients – what do they deserve?

- Deserve to be placed first and at the centre of their care
- Deserve integrated multidisciplinary care
- Deserve good outcomes
- Deserve organised care
PATIENT'S PERSPECTIVE
Tailored treatment & improved outcomes

COMMISSIONER'S PERSPECTIVE
Bespoke care cycle offering better value & outcomes

CLINICIAN'S PERSPECTIVE
Delivering better outcomes in a less cluttered system

PROVIDER'S PERSPECTIVE
Stream-lining infrastructure & delivering efficiencies
Value based healthcare models in trauma and orthopaedics

- Conditions that lend themselves to a more linear pathway are easier wins
- Complex care is less linear
- Non-Major Trauma: Hip Fracture (FNOF), Ambulatory Trauma Surgery
- Routine Elective Orthopaedics
Value in Practice – *hip fracture case study*

*Mr Toby Colegate-Stone*
Hip Fracture – how big is this problem?

- Upward trajectory of our ageing population

- Population aged 65 and over is predicted to increase from 17% to 23% by 2035

- UK annual number of patients with FNOF is projected to rise to 101,000 by 2020

- Health and social care information centre (HSCIC) data indicates FNOF patients to have the second highest 30-day mortality rates following emergency admissions, just after stroke patients

- It has significant fiscal consequences. The approximate annual expenditure relating to FNOF alone is £2.2 billion by 2020
Who is the average fractured neck of femur patient?

- In their 80's
- Have multiple chronic medical co-morbidities
  - i.e. someone with complex chronic medical & social needs that also has a FNOF
- Acutely physiologically vulnerable due to both the fracture and surgery
- Is admitted to an outlier ward
- Has to wait for a bed on the specialist Trauma & Orthopaedics / Ortho-geriatric ward
30 day mortality comparisons

<table>
<thead>
<tr>
<th>Rank</th>
<th>Diagnosis</th>
<th>Mortality rate per 100,000 circa</th>
<th>Admission location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>Stroke</td>
<td>18,000</td>
<td>Acute Stroke Unit</td>
</tr>
<tr>
<td>2nd</td>
<td>FNOF</td>
<td>7,000</td>
<td>? 67% ADMITTED TO OUTLIERWARDS</td>
</tr>
<tr>
<td>3rd</td>
<td>MI</td>
<td>5,000</td>
<td>Coronary Care/ Acute medical unit</td>
</tr>
</tbody>
</table>
Reconfiguring Stroke Care in North Central London

I have heard such great things about the way we treat stroke patients in London and the role that this hospital plays that I wanted to come to see it for myself.

- Prime Minister David Cameron, speech at UCLH, 7 June 2011

In 2011, Dr. Charles Davie, consultant neurologist and clinical lead for the North Central London Stroke Network, reflected on the progress made in reconfiguring stroke care in London. Two years earlier, as stroke lead for The Royal Free Hospital, he brought together Royal Free Hospital and University College London Hospital (UCLH), two historically competitive institutions, to create a single, shared hyper-acute stroke center serving all of North Central London. Staffed by stroke specialists drawn from all four acute stroke providers in North Central London, the unit saw higher volumes and achieved better outcomes compared to the units that existed previously.

Dr. Davie wondered how this new model could be spread to benefit patients from areas outside of London. In addition, the next step was to examine ways to extend the model earlier in the stroke care cycle.
Aim

- VBHC re-orientation of service about the condition

- Formation of an integrated practice unit for patients with FNOF

- Managing this cohort on a condition rather than departmental basis and wrap the complex multidisciplinary care that they require about them
Process map overview

ACCESS & RESUS

ACUTE RECOVERY

SURGERY

REHAB
Actual number of FNOF patients

PRUH Number of #NOF Patients

- Jul 15: 29
- Aug 15: 30
- Sep 15: 28
- Oct 15: 28
- Nov 15: 30
- Dec 15: 31
- Jan 16: 28
- Feb 16: 28
- Mar 16: 29
- Apr 16: 36
- May 16: 33
- June 16: 27
- July 16: 30
- Aug 16: 30
- Sep 16: 30
Crude in-hospital mortality as a percentage
Time to specialist ward
Length of Stay
Figure 1.2: Poisson Distribution (PD) Funnel Plot

Please note that funnel plot is only valid when SHMI score is 100 for all the organisations (shown below) as a whole. It can be verified through highlighting all data items and checking grand total in Tab 3 breakdown table.
Costs

- Change of practice associated with annual savings of approximately £1.5 million
Value in Practice – *major trauma case study*

*Mr Toby Colegate-Stone*
Trauma care in the UK

- 48,000 people experience severe injury each year
- Traumatic injury is the major cause of death for people under the age of 44
- **2007**: National Confidential Enquiry into Patient Outcome and Death (NCEPOD) report: “60% of trauma patients in England had suboptimal management in relation to quality, clinical intervention and organisation of care.”
- **2010**: National Audit Office report cited unacceptable variation in major trauma care in England, and called for action to coordinate care between institutions.
- **2010**: Trauma Network starts
- Trauma Audit and Research Network suggested that the probability of a major trauma patient surviving in NHS England was 63% better in 2014–15 than in 2008–09
- London Trauma System has improved quality and outcomes for the majority of severely injured patients. Survival rates increased by up to 50% over 5 years
Trauma – logistical issues

- King’s College Hospital Major Trauma Centre receives all trauma patients simple and complex polytrauma

- Complex poly trauma is unpredictable & needs urgent attention

- Timeliness of care is linked to outcomes

- Finite capacity

- Patients with lower acuity injuries still need urgent care

- They often lose out those to the more complex patients
Ambulatory trauma patients: day surgery versus in-patient care delivery

- A pragmatic response
- Provide fixed guaranteed slot for trauma patients
- Converts the trauma service:
  - From unpredictable to predictable
  - Provides extra in-patient theatre capacity for those that need it the most
  - Is a more patient-centred approach
- We assessed this from a VBHC perspective to assess Value of DSU versus in-patient surgery
- Question: Does the DSU pathway offer better Value than an in-patient one?
- Time drive activity based costing (TDABC) and basic patient outcome assessments
Increasing value: The King’s College Hospital Experience

Toby Colegate-Stone, Adel Tavakkolizadeh, John Moxham, Joydeep Sinha

ABSTRACT
The increasing trauma demands imposed by our population require innovative practice. A day surgery trauma service is a pragmatic response for those patients with less severe, more ambulatory trauma, and whose surgery has a lower risk profile. By using the principles set out in the value-based healthcare (VBHC) agenda, such a re-orientation of service offers opportunities in improving outcomes and reducing costs, this study assessed the impact of the day surgery trauma service in its current activity, the outcomes generated, its potential development and its fiscal footprint. The average patient satisfaction was very good with 92% preferring their surgery performed as day surgery rather than as an inpatient. Day surgery was noted to have a higher run rate of cases per unit of time, lower costs and subsequently a better margin generation per minute. The additional annual profit generated by performing a single whole day trauma list in day surgery was approximately £293,000. By focusing on the needs of the patients and placing them at the centre of service re-design constructive change is seen to be possible. The day surgery trauma service can be shown to deliver higher value care. Triaging the locus of surgery in this way helps to get patients to the best place for the best outcome.

Key Words: Day surgery • Trauma • Value-based care

The trauma backdrop
The impact that trauma and musculoskeletal (MSK) related disorders have on society are significant and increasingly burdensome. Major trauma is the greatest cause of mortality in people under 40 (Trauma Audit and Research Network [TARN], 2015) while fractures to the proximal femur (such as neck of femur) are the second-ranking cause of 30-day mortality following emergency hospital admissions (Health and Social Care Information Centre, 2014). MSK-related conditions represent the greatest cause of sick leave and health-related loss of productivity to the economy at an estimated annual cost to the UK of £18 billion (Department for Work and Pensions, 2002). Over 30% of all disability allowance claims are related to MSK disorders. This is greater than the sum of mental health, cardiovascular disease, stroke and respiratory disease (Arthritis Research UK, 2016). The annual trauma budget alone is approximately £4 billion and rising. The demands that these disorders place on our healthcare system are increasing at every point of clinical contact, and they only have an upward trajectory. It is important that clinicians, as the
Value assessment

- **Patient outcomes**
  - 9/10 – average DSU patient satisfaction
  - 92% preferred their surgery in DSU over in-patient admission
  - No adverse clinical outcomes

- **Logistics**
  - DSU had better patient flow and case load delivery as compared to in-patient

- **Finances**
  - DSU had lower costs per patient & better margin generation per minute on TDABC analysis
  - Additional annual profit generated by performing a single whole day trauma list in DSU rather than as an in-patient approx. £293,000
Improved Cost Utilization

- Day Surgery Trauma
- In-Patient Surgery Trauma

Better Outcomes

Increased Quantity of appropriately performed procedures
Value in Practice – elective orthopaedics work in progress

Dr Lucinda Gabriel
Elective orthopaedics – the value challenge?

- 45-65 year olds are the most common to complain of musculoskeletal conditions
- Upward trajectory in volume of our ageing population
  - 65 year olds and over increasing from 17% to 23% by 2035
- Average age for primary knee replacement has dropped from 71 to 69 between 2004 and 2013
  - 35% of all patients undergoing joint replacement are under 65 years old
- Joint replacement surgery alone costs the NHS approximately £1 billion per year
- Ticking time bomb of revision surgery
- Specialist centres have lower revision rates
  - Whittington by 50% and lower mortality than peers
  - If infection rates were at the levels seen in specialist centres the NHS would be able to save approximately £300 million per year
  - At current costing this equates to funding for an extra 55,000 joint replacements
Elective orthopaedics – Darzi Fellowship in VBHC

• Aim: develop a value calculator

• Applying lessons:
  – Define a cohort/s
  – Outline pathway
  – Outcome measures
  – Costing models

• Identifying challenges, now and in the future…
Value for the elective orthopaedics pathway?

\[
\text{Value} = \frac{\text{Outcomes that matter to patients, service users and carers}}{\text{Costs of achieving those outcomes Over the complete pathway of care}}
\]
Elective orthopaedics pathway – outcome measures?

**Tier 1. Health status achieved/retained**
- Mortality rate
- HRQOL (0/12, 6/12, 12/12, 36/12)

**Tier 2. Process of recovery**
- Return to regular activity
- Return to work
- Treatment delays
- LOS
- PE/DVT/MI/Redo/Delirium

**Tier 3. Sustainability of health**
- Revision/replacement
- Susceptibility to infection
- Ongoing pain
- Risk of fracture

Value = \[
\frac{\text{Outcomes that matter to patients, service users and carers}}{\text{Costs of achieving those outcomes}} \]
Over the complete pathway of care
## Elective orthopaedics pathway – outcome measures?

<table>
<thead>
<tr>
<th>Tier 1. Health status achieved/retained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality/morbidity</td>
</tr>
<tr>
<td>LOS/discharge info</td>
</tr>
<tr>
<td>EPR</td>
</tr>
<tr>
<td>Clerical admin data</td>
</tr>
<tr>
<td>Complications SAI reporting</td>
</tr>
<tr>
<td>Complaints reporting</td>
</tr>
<tr>
<td>Surgical events - revision</td>
</tr>
<tr>
<td>PROMS (EQ5D/VAS, OHS)</td>
</tr>
<tr>
<td>Pt engagement/experience</td>
</tr>
</tbody>
</table>

### Tier 1. Health status achieved/retained

- Mortality rate
- HRQOL (0/12, 6/12, 12/12, 36/12)

### Tier 2. Process of recovery

- Return to regular activity
- Return to work
- Treatment delays
- LOS
- PE/DVT/MI/Redo/Delirium

### Tier 3. Sustainability of health

- Revision/replacement
- Susceptibility to infection
- Ongoing pain
- Risk of fracture

\[
\text{Value} = \frac{\text{Outcomes that matter to patients, service users and carers}}{\text{Costs of achieving those outcomes}}
\]

\[
\text{Value} = \frac{\text{Costs of achieving those outcomes}}{\text{Over the complete pathway of care}}
\]
Elective orthopaedics pathway – cost measures?

\[ \text{Value} = \frac{\text{Outcomes that matter to patients, service users and carers}}{\text{Costs of achieving those outcomes over the complete pathway of care}} \]

- **Costs**
  1. Primary care/referral
  2. Inpatient care
  3. Imaging
  4. Allied health
  5. Medications
  6. Post op follow up
  7. Outpatient physio
Elective orthopaedics pathway – cost measures?

**Value** = \[
\text{Outcomes that matter to patients, service users and carers} \div \text{Costs of achieving those outcomes}
\] \
\text{Over the complete pathway of care}

**Costs**
1. Primary care/referral
2. Inpatient care
3. Imaging
4. Allied health
5. Medications
6. Post op follow up
7. Outpatient physio

1. PLICS
2. EPR
3. PIMS
4. ICD-10 codes
5. HRG
Elective orthopaedics pathway – Define cohort

Inclusion criteria:

- THR for primary hip OA
- Routine surgery KCH Consultant
- ASA 1-3
- Grouped by clinic referral (QMS/DH)

Exclusion criteria:

- Paediatric history
- Hip dysplasia
- Trauma history
- Trauma as surgical indication
- Presence of infection
- Intra-op periprosthetic fracture
- Complex medical/surgical patient
- Revision surgery
Elective orthopaedics pathway – Queen Mary Sidcup

1. **Patient presents with pain**
2. **GP appt / referral**
3. **Imaging**
4. **MSK / Physio**
5. **Surgical Consultation (listed)**
6. **Pre Assessment Clinic (valid 3 months)**
7. **Surgery**
8. **IP recovery 2-5 days**
9. **Discharge**
10. **Post-operative consultant follow-up clinic**

**Single point of referral**

- **Physio / OT**
- **Physio / OT (4-6 week wait)**
- **GP check (6 weeks)**
- **Meds and equipment**
- **6 months 12 months with repeat x-ray**

**Patient conservative management**

**Joint School**

**Bloods**
Elective orthopaedics pathway – Denmark Hill

- Patient presents with pain
- GP app / referral
- Imaging
- MSK / Physio

Consultation
- Preparation for surgery / final consultation
- Surgery
- IP recovery
- Discharge
- Post-operative consultant follow-up

↑ waiting times
↑ waiting times
↑ LOS
Physio post-op not universal

↑ Complex referral path

Joint School
Bloods
Repeat imaging / bloods post-op
Meds and equipment

6 months 12 months with repeat x-ray

↑↑ waiting times
↑↑ LOS
Elective orthopaedics pathway – Denmark Hill

1. Patient presents with pain
2. GP appt / referral
3. Imaging
4. MSK / Physio
5. Consultation
6. Preparation for surgery / final consultation
7. Surgery
8. IP recovery
9. Discharge
10. Post-operative consultant follow-up

- ↑ waiting times
- ↑ waiting times
- ↑ LOS
- Physio post-op not universal

- ↑ Complex referral path
- 6 months 12 months with repeat x-ray
- ORPINGTON
- Joint School
- Bloods
- Meds and equipment
- Repeat imaging / bloods post-op
Elective orthopaedics pathway – Outcome Measures

Patient presents with pain

GP appt / referral

Imaging

MSK / Physio

Consultation

Preparation for surgery / final consultation

Surgery

IP recovery

Discharge

Post-operative consultant follow-up

EQVAS EQ5D OHS

Physio / OT

Repeat imaging / bloods post-op

Meds and equipment

6 months 12 months with repeat x-ray

EQVAS

EQ5D

OHS

6M/12M

Patient self management

Joint School

Bloods

6 months

12 months

with repeat x-ray
Elective orthopaedics pathway – Outcome Measures

Patient presents with pain

- Patient self management
- Imaging
- MSK / Physio
- GP appt / referral

Consultation

Preparation for surgery / final consultation

Surgery

IP recovery

Discharge

Post-operative consultant follow-up

6M EQVAS EQ5D OHS

Physio / OT

Repeat imaging / bloods post-op

Meds and equipment

6 months 12 months with repeat x-ray

6M EQVAS EQ5D OHS

EQVAS

EQ5D

OHS

6 months

18M EQVAS EQ5D OHS phone consult

6M EQVAS EQ5D OHS

EQVAS

EQ5D

OHS

18M
Elective orthopaedics pathway – Obstacles

- Ethics
  - Service delivery improvement program vs research program/audit

- IT
  - KHP Passport
  - Local care record
  - PROMS data

- Data
  - Incomplete
  - Incompatible (NHS no vs Hospital no)
Elective orthopaedics pathway – Obstacles

• Collaboration between silos
  – Inter-departmental
    • Clinical (Orthopaedics, physiotherapy)
  – Intra-organisational
    • Within FT (DH/QMS/Orpington)
  – Inter-organisational
    • Between FT (Kings vs GSTT)
    • KHP & HIN
    • KHP & CCG & local authorities
    • KHP & primary care

• Health: interdependent conditions that occur along a continuum
  – Define ‘complete’ patient pathway
Elective orthopaedics pathway – Complete pathway

- EQVAS
- EQ5D
- OHS
- 6M
- EQVAS
- EQ5D
- OHS
- 12M
- EQVAS
- EQ5D
- OHS

- GP assessment
- Referral
- Imaging
- Patient presents with pain
- Patient consent management
- Joint survey
- Bloods
- Physio / OT
- Physio / OT (6-8 week)
- GP check
- Postoperative consultant follow-up clinic
- Social care
- ???
- 6 months
- ???
- 12 months
- ???
- ???
Questions
Discussion
Overcoming the challenges of *value in practice*

How *important* are the following to delivering value in practice? And how *challenging* are the barriers to implementation?

1. Measuring and sharing outcomes that matter to patients, carers and staff?
2. Defining whole pathways of care across health and care – where to start / stop?
3. Accurate and meaningful cost information for whole pathways of care?
4. Collecting and sharing patients’ and clinicians’ data - information governance and ethics?
5. Data linkage and systems interoperability?
6. Commissioning and payment perverse incentives?
7. Having time and energy need to develop a value culture?
For more information:
Kings Health Partners
Ground Floor, Counting House
Guy’s Hospital
London SE1 9RT

0207 188 2892

kingshealthpartners@kcl.ac.uk

www.kingshealthpartners.org

@kingshealth @joseph_w_casey