Disruptive Innovation in Healthcare

Prof Ken Paterson
Chair – MPEP
UK Diagnostics Forum
Oxford – 26 May 2016

Prof Ken Paterson

- Consultant physician with interests in Diabetes Mellitus and Clinical Pharmacology
- Almost 20 years of HTA of new medicines
- Chair of SMC – 2008 – 2011
  - Ongoing consultancy work with NICE
- Founding Chair of Molecular Pathology Evaluation Panel – 2013
- All views/opinions are personal, not SGHD!

Disruptive Innovation

- Concept and definitions
- History
- Current examples
- Approach from a small nearby country
- Wider challenges in healthcare

Disruptive Innovation

- Concept comes from the free market
  - Coined 1995 by Clayton Christensen
- No agreed definition in healthcare
- ‘Disruptive’ carries pejorative connotations
- Innovation that carries challenges to the *status quo* for patients, clinicians and/or healthcare systems

Disruptive Innovation – New?

- Anti-TB therapies in 1950s
  - End of sanatoriums (and their staff)
  - End of surgical interventions
- Cimetidine in 1976
  - End for all other ulcer-healing drugs
  - End of ‘ulcer surgery’
  - Loss of *raison d’être* for many surgeons

Disruptive Innovation – Why?

- Clear benefits seen – or anticipated
  - Patients
  - Clinicians
  - Healthcare system
- Benefits exceed disruption
  - …or simply cannot be ignored
  - ‘Short-term pain, long-term gain’
  - May not be free of ‘casualties’!

Disruptive Innovation – What?

- Medicines
  - …and their administration/delivery
- Non- medicine therapeutic interventions
- Diagnostics
  - New tests
  - New ways with old tests
- Infra-structure

Macular Degeneration

- Major cause of visual loss – no treatment
- Ranibizumab – good evidence of efficacy
- Requires intra-vitreal injection
  - No established services
  - Facilities, training and time issues
- Expensive new medicine
  - Service issues even more costly
  - Significant impact on other ophthalmology

Primary Angioplasty for MI

- Thrombolysis in all UK hospitals
- Angioplasty more effective and safer
- Needs regional cardiac centres
  - Needs 24/7 interventional cardiologists
    - …and supporting staff
  - Requires para-medic re-organisation
- Impacts on the role of DGHs
  - ..and may lead to staff de-skilling

Highly-Sensitive Troponin

- Best early marker of myocardial damage
- Rapid (even PoC) testing available
  - Negative results very useful
- What do very small increases really mean?
  - Does everyone need angiography?
  - What is the risk:benefit for each patient?
- New testing needs to see the clinical context
  - …and educate the ‘testers’

KRAS in Colo-Rectal Cancer

- Predictive of response to anti-EGFR drugs
  - Mutations ‘unlikely’ to respond
- Can save money and toxicity
- May be seen as preventing access to therapy
  - Is testing 100% reliable/predictive?
  - “might I be the exception?”
- Difficult conversations for oncologists
  - …requiring considerably more time

Non-Invasive Prenatal Testing

- Tests cell-free foetal DNA in plasma
  - Diagnosis of Trisomy 21 and others
  - Reduces need for amniocentesis/CVS
  - Cheaper with less infrastructure needed
- Amniocentesis/CVS services in place
  - Need to redeploy relevant staff
  - Need to maintain skills for when needed

Electronic Medical Records

- Clearly an advance on paper records
  - Allows back-up, sharing, analysis …
- Major disruption to the clinical consultation
  - "The doctor is always typing"
  - "The nurse looks at the screen, not at me"
  - A major source of patient dissatisfaction
- Needs education of both professionals and patients – a common understanding

Decision Support Technologies

- Helpful as medicine becomes more complex
- Enhance adherence to guidelines/protocols
- Do not cope with multiple co-morbidities
  - …the norm in older patients
- *Aide-memoire* or instruction to act
  - May lead to reduced autonomy/de-skilling
- Users need help to understand the support
  - …and support on when to ignore it!

Novel Oral Anti-Coagulants

- Replace warfarin in AF, PTE etc
  - No requirement for INR monitoring
  - Acquisition costs higher, but overall…?
- Issues identified 2 years before launch
- Heterogeneous INR services identified
  - Impacts very different across Scotland
- National advice … for local implementation
  - In place when NOACs came to market!

The Scottish Approach - 1

- Horizon scanning for new technologies
- Similar approach across all technologies
  - Medicines better developed and more data
- Led by front-line clinicians
- Multi-stakeholder involvement
  - Clinicians/Patients
  - Healthcare system
  - Healthcare technology industries

The Scottish Approach – 2

- Evidence-based technology assessment
  - All evidence sources acceptable
- Rapid assessment and decisions
  - ‘Quick and clean enough’
  - Excellence the enemy of the adequate
  - Paucity of data the main difficulty
- Focus on the patient experience/outcomes
  - …with and without a new technology

The Scottish Approach – 3

- Cost-effectiveness, not cost-saving, key
  - Aim to maximise efficiency in healthcare
- ‘Spending to save’ accepted
  - Efforts to avoid budget ‘silos’
  - Spend in one ‘area’ to save in another
- Spending for better outcomes is appropriate
  - …if done efficiently and within reason!
- Cost-effectiveness and affordability separated

The Scottish Approach – 4

- Single message to clinicians/patients
  - HTA
  - Guidelines/protocols fully aligned
  - National/local guidance in accord
  - No ‘mixed messages’
- Minimises the ‘postcode lottery’
  - …though local uptake still an issue

The Scottish Approach - 5

- Decisions sometimes dichotomous (Y/N)
  - Medicines, for example
- More often ‘Yes, but…..’
  - Where, when, how quickly, what method?
  - How can we introduce most efficiently?
- Clarification of current treatment pathways
  - Where does the innovation sit?
  - What can we stop doing?

Disruptive Innovation – How? - 1

- Horizon scanning important – no surprises
- Clinician enthusiasm for change
  - Strong clinical leadership important
  - Important to create desire for change
- Evidence base to support change
  - ‘Toys for boys’ not enough!
- Plan and manage adoption – phasing, targeting, roll-out …

Disruptive Innovation – How? – 2

- Assess outcomes in the real world
  - Audit
  - Registries
- Demonstrate benefits of innovation
  - …to encourage the ‘slow adopters’
  - …or make changes if not showing benefits
- Continue to manage until bedded-in
  - Changing behaviours/practice takes time

Wider Healthcare Implications

- Change is the only thing that is stable
- Skill-sets need to reflect this
  - Range of skills v ‘one-trick ponies’
  - Equipped to change focus/direction
- In-service re-training v ‘out to grass’
  - Skills easier to ‘dust down’ than learn
  - Engagement better than antipathy
- Workforce issues very important

Workforce Issues

- Senior clinicians ‘deeply conservative’
  - Motivated by self-interest?
- Senior clinicians key drivers of change
  - Maybe more altruistic than we think!
- Anxiety about change is universal
- Senior clinicians are like ‘gods’
- Change is ‘teaching old gods new tricks’!

The Future - 1

- Increasing pace of new technologies
- Greater opportunities to benefit patients
  - …and to waste limited resource!
- Need to formally assess ‘innovations’
  - Need for better data on impact
  - Work with industry to improve information
- Plan ahead of innovation
  - Proactive rather than responsive

The Future – 2

- Links between NHS and ‘meditech’ better
  - Align needs and activities if possible
  - NHS more than just a passive customer
  - Direct, and then reward, innovation
- Healthcare to become ‘lighter on its feet’!
  - Less averse to (risky) change
  - Less easily bedazzled by ‘breakthroughs’
  - Less fragmented – maybe UK-wide action!

Thank You!