

Future Directions in Healthcare *



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** Represents concepts in development that are not products and may never become products. None of these concepts are being offered for sale, or have been cleared or approved by the FDA or other Regulatory Authorities for commercial availability*

Convergence of - Technology, Biology, and IT

Technology:

- See more, do more
- Digital imaging

Biology:

- Proteomics, genomics, metabolomics,
- Systems Biology

Information Technology:

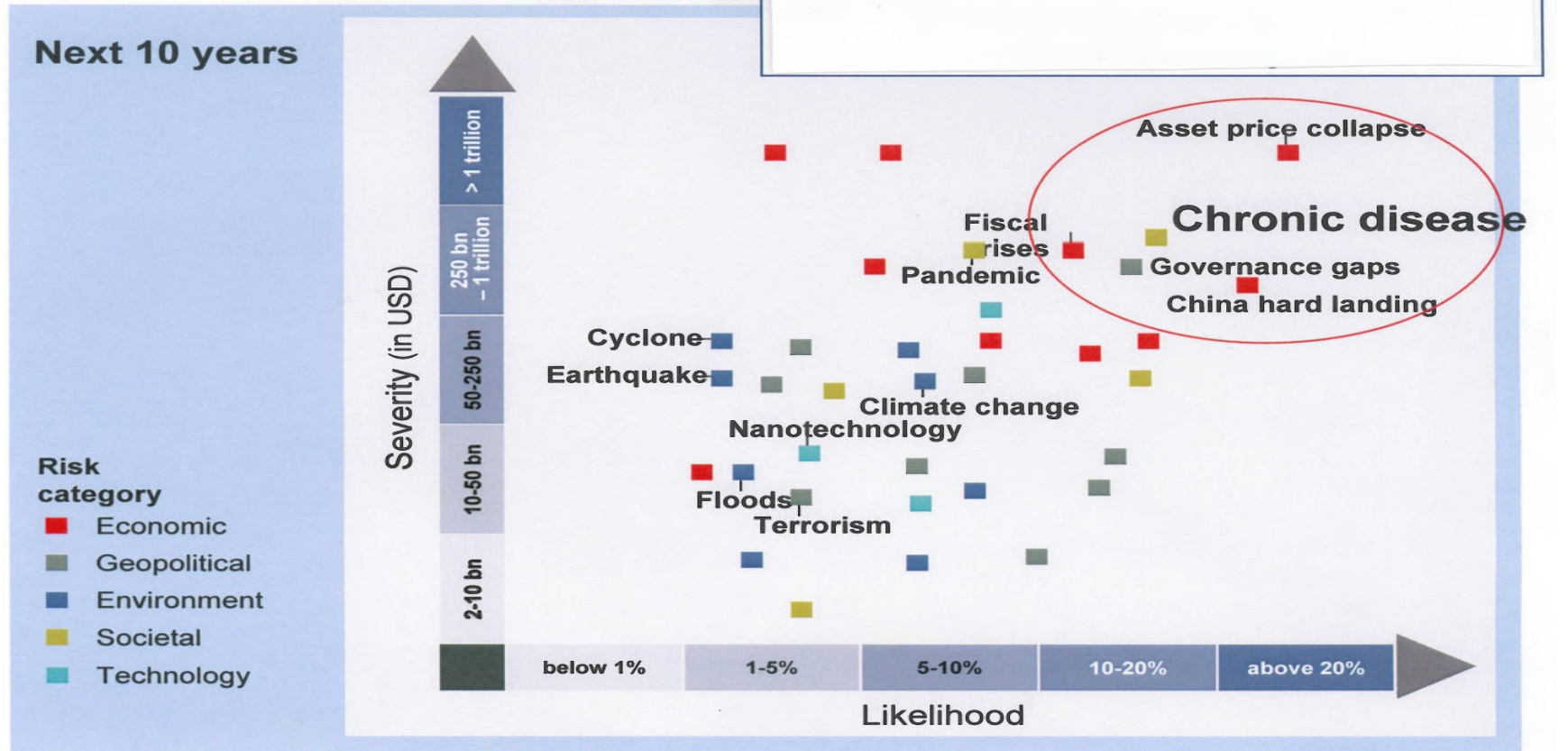
- Mobile, Telemedicine
- Electronic Records

Global Risks... chronic disease

The Global Risks Landscape 2009

FORUM

COMMITTED TO IMPROVING THE STATE



Global healthcare concerns

The issues

Cost

15% ↓

- \$4 trillion global spend
- Reform and cost containment
- Healthcare build-out in emerging markets

· Increasing chronic disease & aging populations

Access

15% ↑

- 45M in U.S. lack insurance
- In China, other markets, rural populations exceeding 500MM people

· Lack of trained professionals - one doctor to every 50,000 people in Africa

Quality

15% ↑

- Variation in healthcare delivery
- Inefficient workflows, patient flows, management processes

· Lack of connectivity for clinical, patient data

Healthy m a g i n a t i o n

Technology “innovation” + Implementation “innovation”

- ✓ HCIT to reduce variation and cost
- ✓ Precision diagnostics to guide therapy
- ✓ Early and preventative healthcare

- ✓ Portability, miniaturization to increase access
- ✓ Remote/home monitoring to bring down cost
- ✓ Hospital productivity tools

Technology innovation is not **the** challenge

Miniaturization

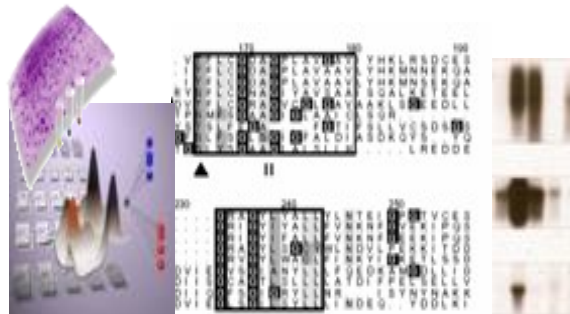
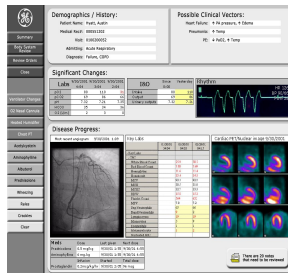
- Simple to use imaging
- Point of care Dx
- Lab on a chip
- Drug delivery
- Water disinfection

Biotech & Genomics

- Targeted therapy
- Biomarkers
- Nutrition/food
- Rapid sequencing
- Vaccines development

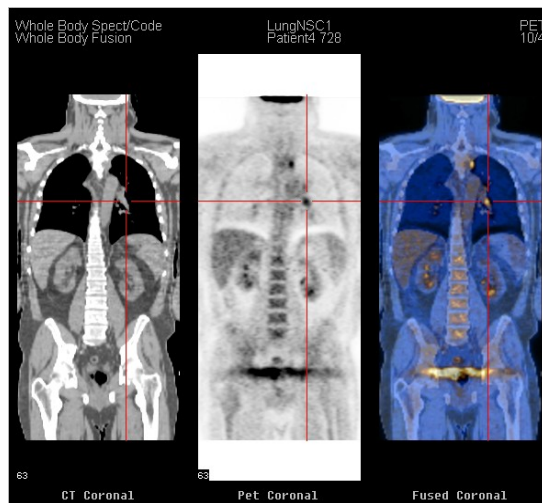
IT & Virtual Reality

- Mobile phones
- Wi-Fi Broadband
- BioSensors
- Robotic surgery
- Decision support



Implementing innovation **is** the challenge

- ✓ Drive processes centred on the patient and disease pathways
- ✓ Rebalance regulatory regime with patient benefits
- ✓ Support procurement of innovative solutions through output-based specs.
- ✓ Lead large-scale change



Cancer
Early detection



Stroke
Time is brain



Rheumatoid Arthritis
Stop disease progression

U K i m p e r a t i v e t o c h a n g e S t r o k e S t r a t e g y

Approx 110,000 strokes in England each year

3rd largest cause of death: 11% of deaths in England (50,000 deaths)

Largest cause of adult disability

£2.8bn direct cost to the NHS

£2.4bn of informal care costs

£1.8bn in income lost to mortality and morbidity

1 in 5 acute hospital beds & 1 in 4 long term beds are occupied by stroke patients.

Time is Brain



U K stroke strategy - views h /c a s investment

- Treat suspected stroke as an emergency - maximizes independent living
- Rapidly assess a TIA - minimizes chances of full stroke

Time is Brain (*Imaging*)

Minimize damage with prompt action

Life after stroke (*Monitoring*)

Improve rehabilitation and support

Working together (*Solns & Training*)

Improve multi-disciplinary clinical networks

Everyone's challenge (*FAST Campaign*)

Improved public awareness

✓ Specialist acute centres integrated care

✓ All patients scanned

✓ Imaging expands treatment window > 3 hours

✓ Hyper-acute urban centres & virtual networks rurally

✓ Education & learning programs

Implementation innovation, enabled by technology

Rheumatoid Arthritis – the economic and quality of life impact

- Direct costs €14 billion pa across Europe
- Indirect costs €17 billion pa across Europe
- Premature mortality
- ☐ stop work at 2 years
- At 10 years 30% severely disabled
- Pain with associated functional disability
- Fatigue, 81% of patients; 41% with severe fatigue
- Depression



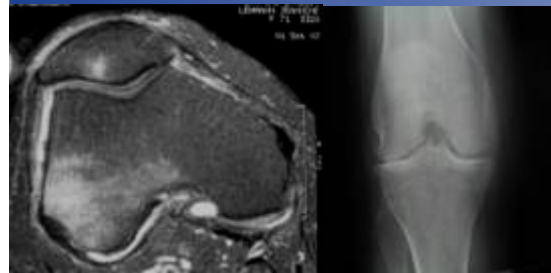
Rheumatoid Arthritis – new care pathway

Early diagnosis & chronic disease management

- ✓ Early diagnosis of ‘synovitis’ with portable Ultrasound – **game changer for Rheumatologists**
- ✓ Treat patients faster: Suppress inflammation using disease modifying anti-rheumatoid drugs... then biologics
- ✓ U/S Monitor to change Rx and reduce drug cost by identifying responders vs non-responders



- Find RA early
- Treat more effectively



Stop disease progression

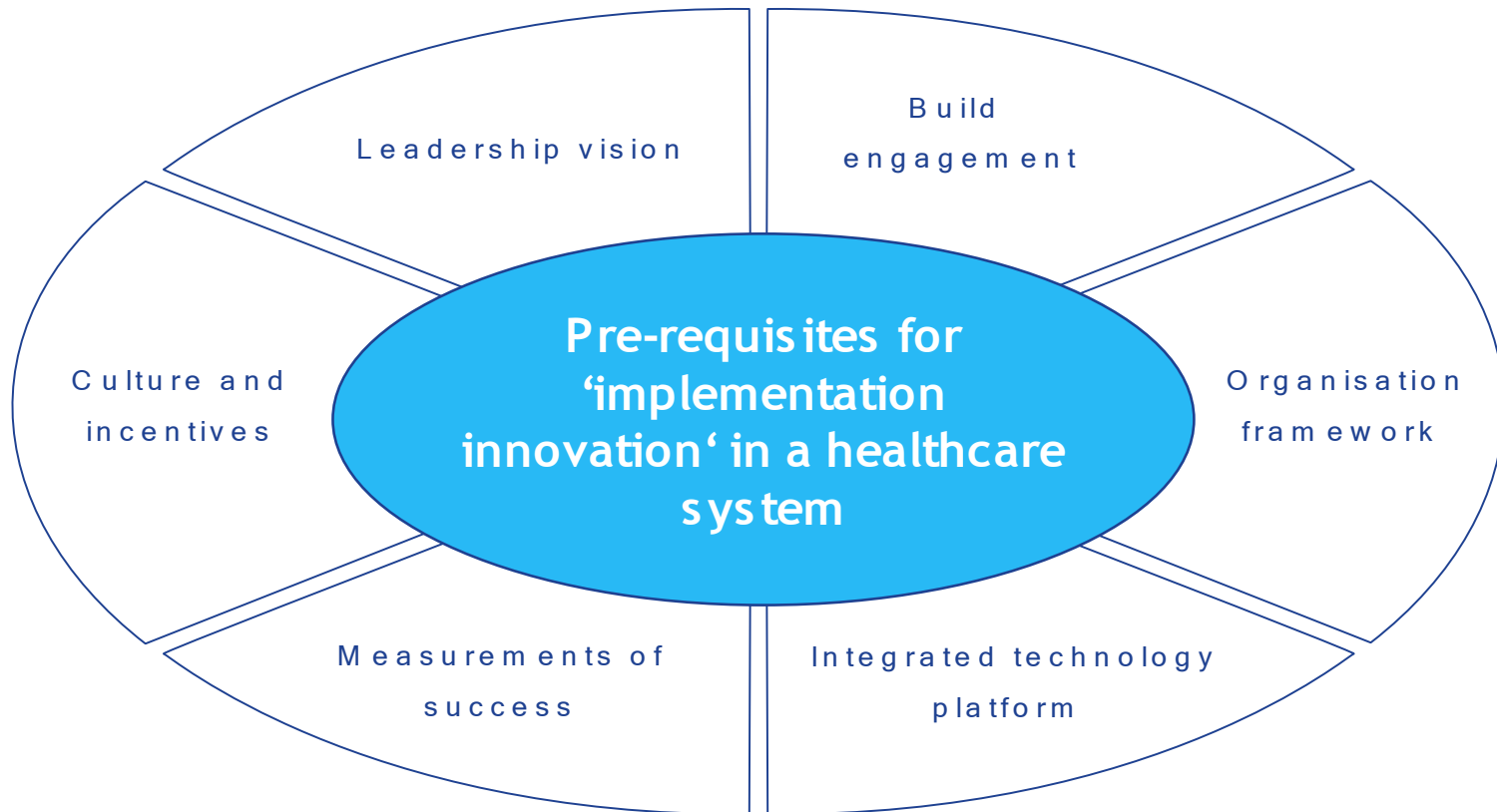
Improved outcomes

Makes Economic Sense

Implementation innovation, enabled by technology

Policy shapes...

... technology enables...

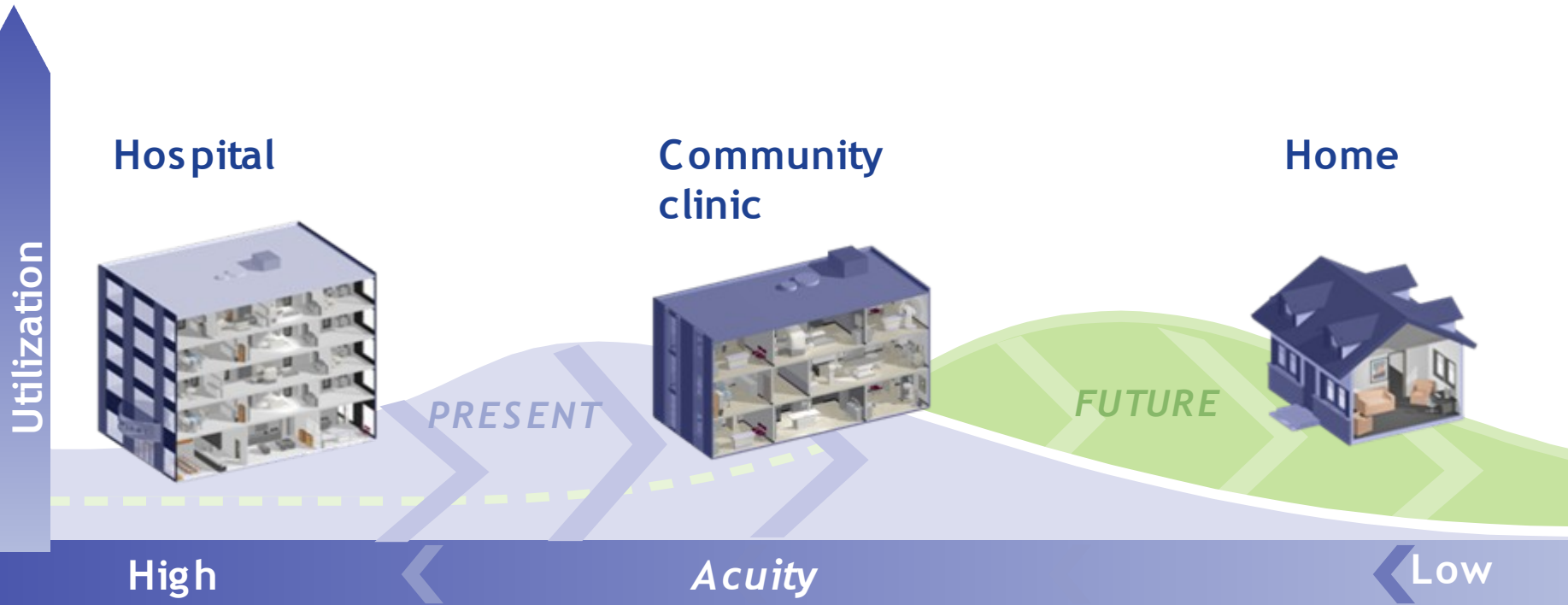


... but people deliver change

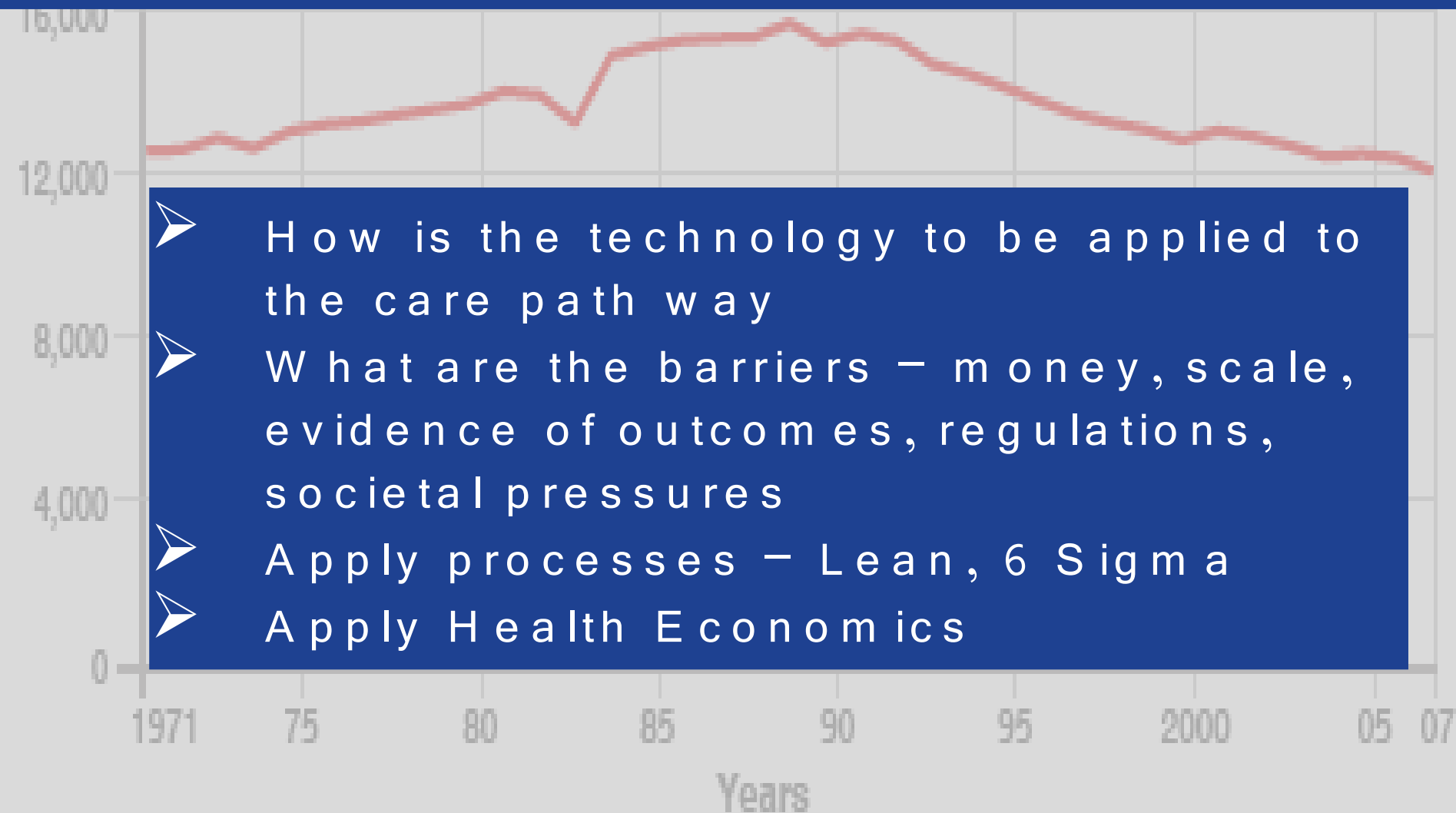
Innovation enabling shift in care

- Focus on acute conditions
- Hospital centred
- Physician dependent
- Episodic, reactive care
- Passive patient
- Low tech silos

- ✓ Focus on acute & long term conditions
- ✓ Community centred
- ✓ Team based
- ✓ Integrated preventive care
- ✓ Knowledgeable patient
- ✓ Localised integrated high tech



Medical Innovation in the 'reset' world



- How is the technology to be applied to the care path way
- What are the barriers – money, scale, evidence of outcomes, regulations, societal pressures
- Apply processes – Lean, 6 Sigma
- Apply Health Economics

h e a l t h y m a g i n a t i o n



cost



quality



access



GE imagination at work

