

Innovation Network

Cardiff University

Innovation – Medical Technology Industry Perspective

Sir Christopher O'Donnell
October 2007

Healthcare system demands innovation

Market dynamics

- Demographics
- Active lifestyle
- Better-informed patients
- Declining surgeon income
- Nurse shortage
- Healthcare Spending
- Specialization
- New technologies



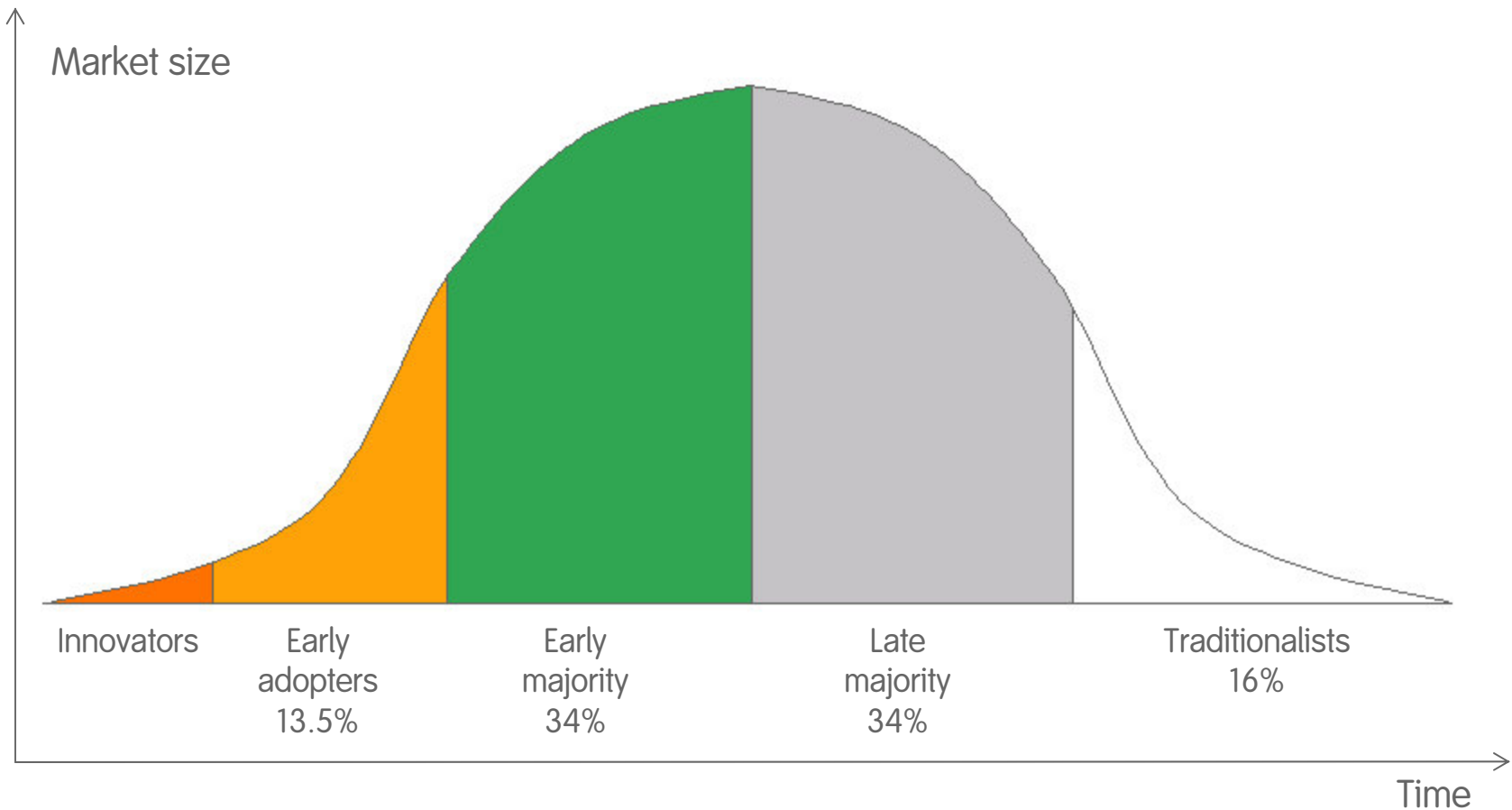
DEMANDS

Value added innovations

- Longer lasting materials
- Less invasive (MIS) procedures
- Accelerated healing
- Alternative therapies
 - Unicompartmental knees
 - Hip resurfacing
 - Joint fluid therapy

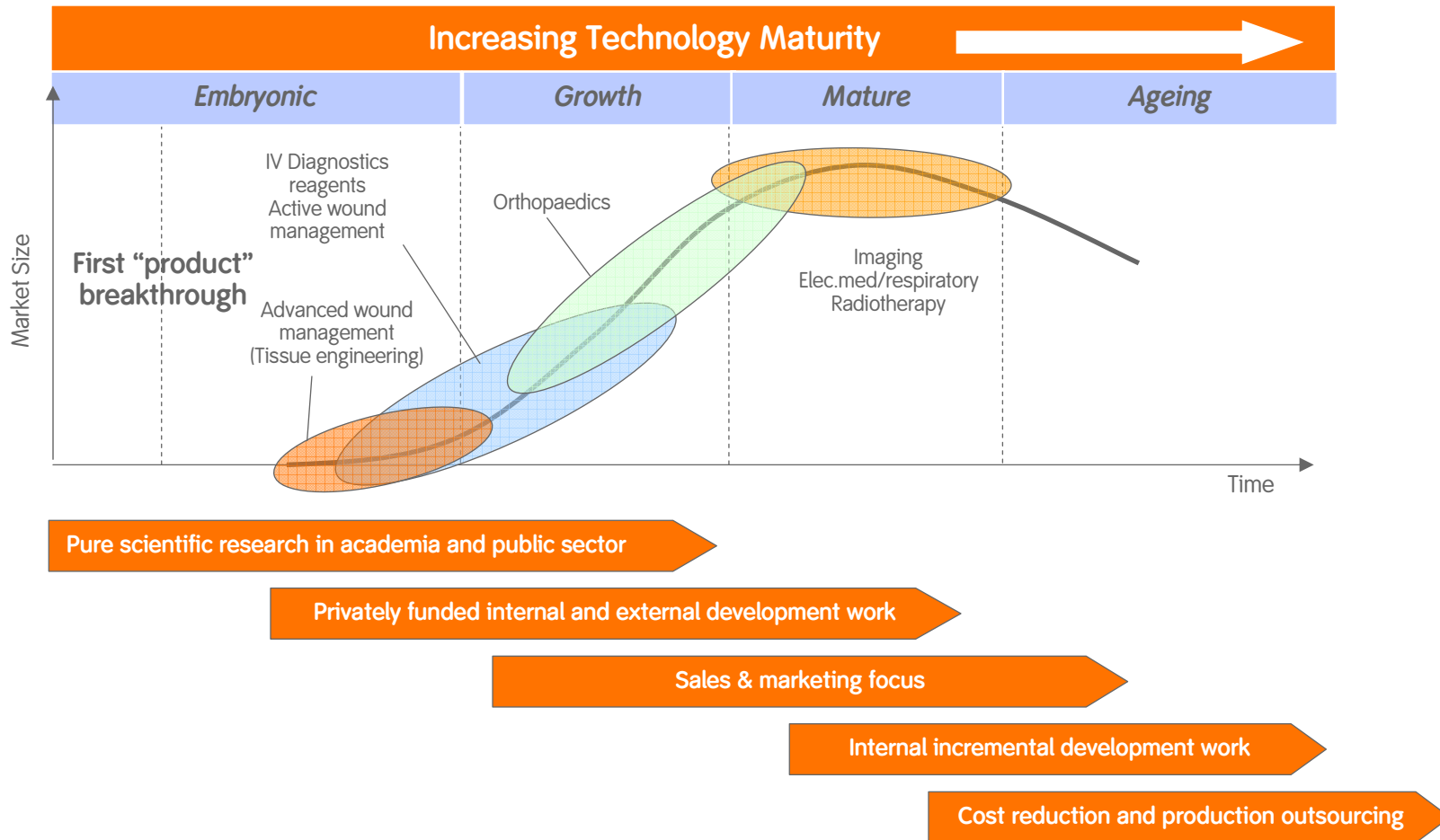
Focus on healthcare economics!

Technology adoption life cycle



Bell shaped curve representing Rogers' (1995) findings on categories of individual level of innovation with percentages for each category

Technology maturity curve – medtech sectors



Source: Arthur D. Little

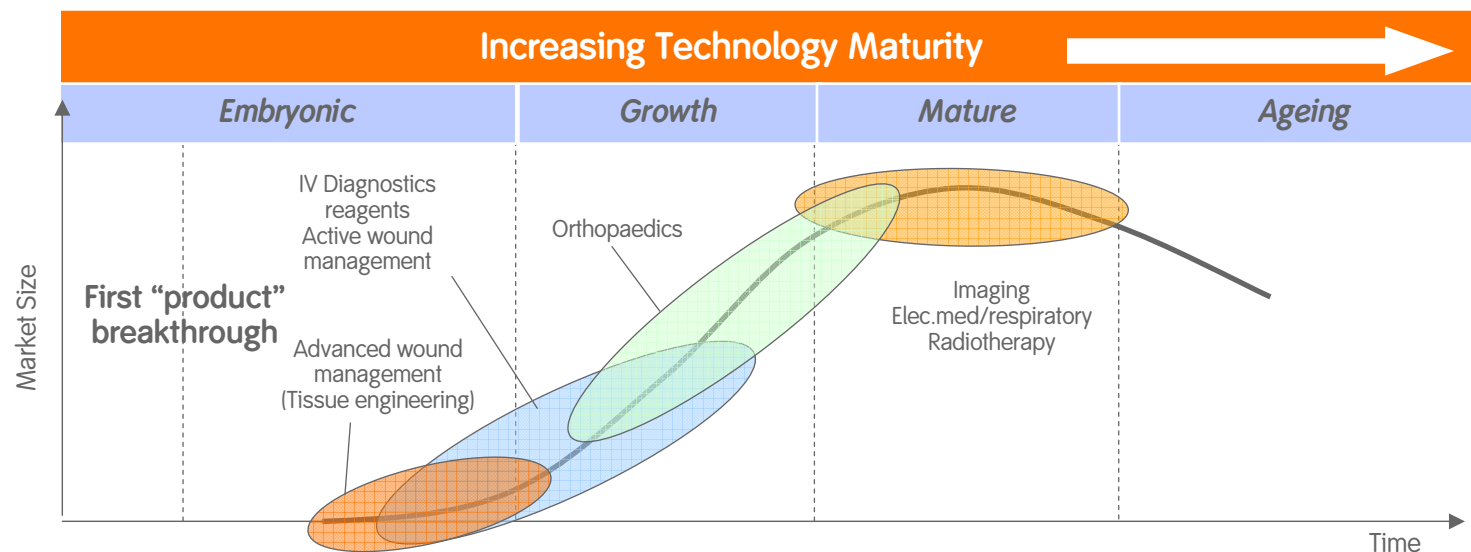
Factors affecting national ability to innovate/differentiate products

1. Differences in customer demand:
 - Levels of healthcare spend per capita
 - Approval, procurement and reimbursement practices
 - Clinical practice, medical training and healthcare philosophies

Factors affecting national ability to innovate/differentiate products

2. Access to scientific/ clinical knowledge:

- Varies according to maturity of technology
- Clinicians have multiple linkages with innovation process



Source: Arthur D Little/ DTI report 2004

Factors affecting national ability to innovate/differentiate products

3. Global suppliers access scientific knowledge globally:

- Top four suppliers have 50-75% of global sales in each sector
- Top tier suppliers utilise global outreach to scientific community
- Reduces markedly product differentiation between countries

Medtech innovation

At Smith & Nephew we have:

- A deep knowledge of materials science
- Strong biomaterials competence
- Active market scanning
- Increased customer insights
- State-of-the-art development processes
- Robust technology planning

Lead to:

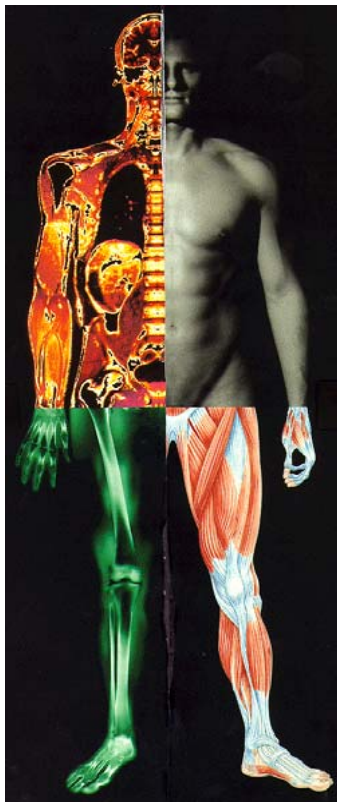
- Genuine innovations and portfolio value



Smith & Nephew targeted innovation

Focused on tissue

Focused on customer solutions

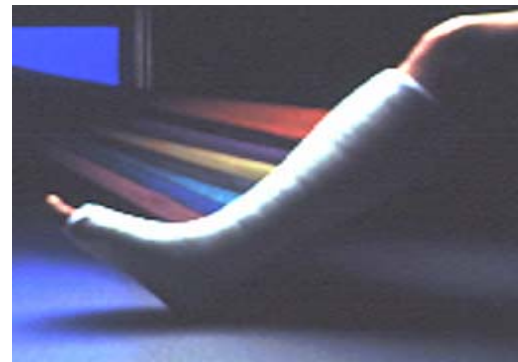


Skin

Soft tissue

Joint

Bone

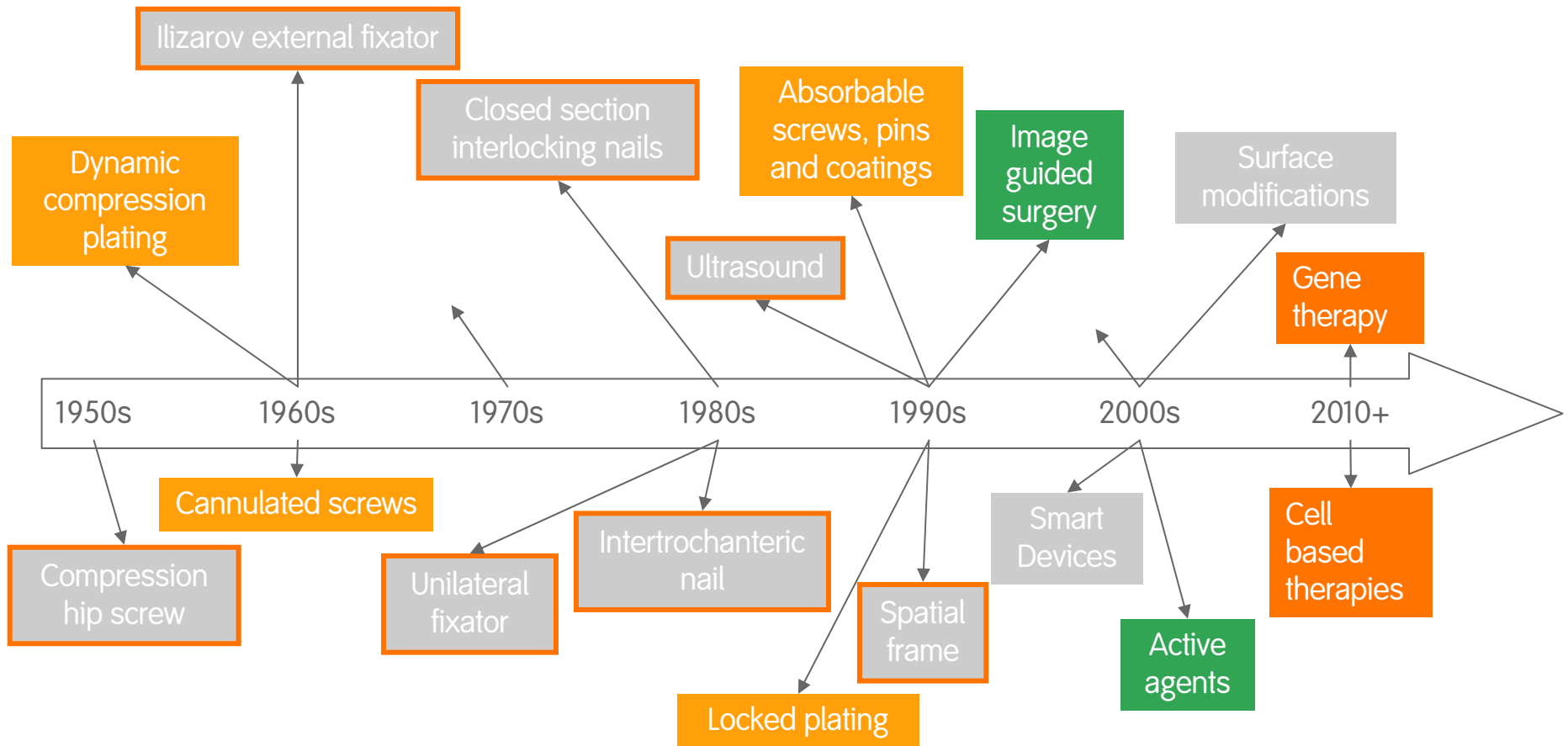


“Repair and heal the human body”

Innovation sourcing strategy

- Traditional, 'transactional' approach:
 - Ad hoc, opportunistic collaboration without analysis of alternative ways to reach the same goals
 - Failure to leverage organisational learning
- 'Holistic' approach
 - Overall innovation strategy including customer needs, technology trends, product portfolio management
 - Plan for use of internal and external sources to execute strategy
 - Sourcing principles to guide decision making
- S&N current practice:
 - Innovations are design, research or insights based
 - Technology plan communicates priorities
 - Moving towards customer focus – matching customer insights with technology mining and planning

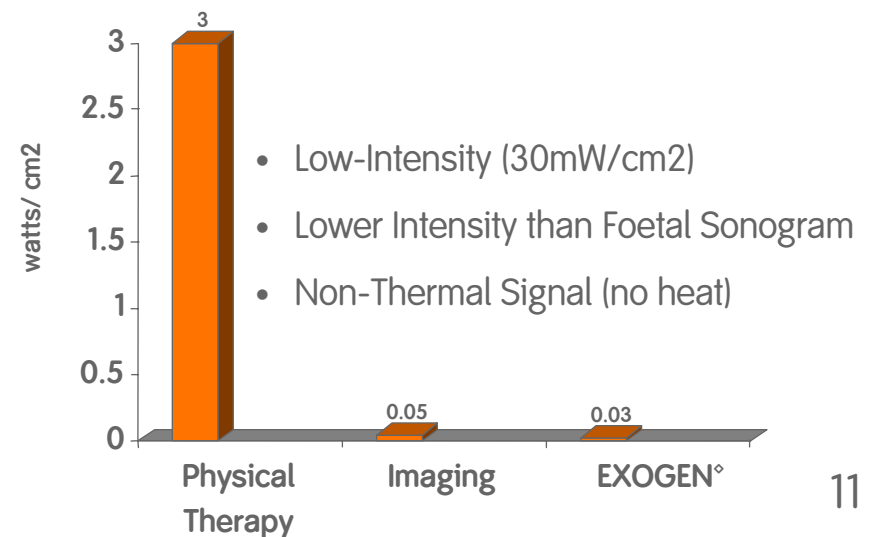
Trauma innovation timeline



Smith & Nephew	US Innovations	European Innovations	World-wide Innovations	Future possibilities
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An innovative advance in fracture treatment - EXOGEN[®]

- Non-invasive therapy for improving the healing of fractures
- Low intensity pulsed ultra-sound applied for 20 minutes per day
- Supported by two randomised, double blind, placebo controlled, multi-centred clinical studies
- Efficacious in both cortical and cancellous bone
- Over 80,000 patients treated

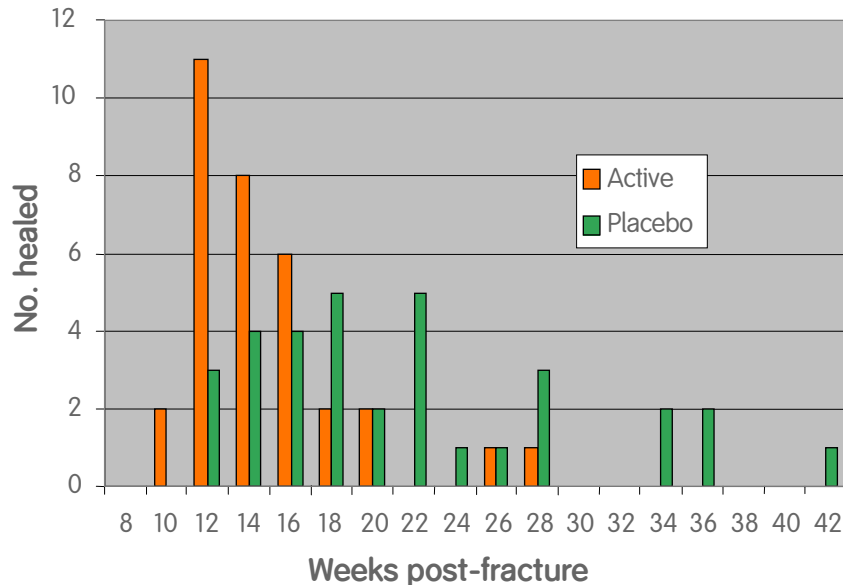


Clinical data

Tibial diaphysis fractures were treated in a prospective, randomised, double-blind, placebo-controlled, multi-centre study*.

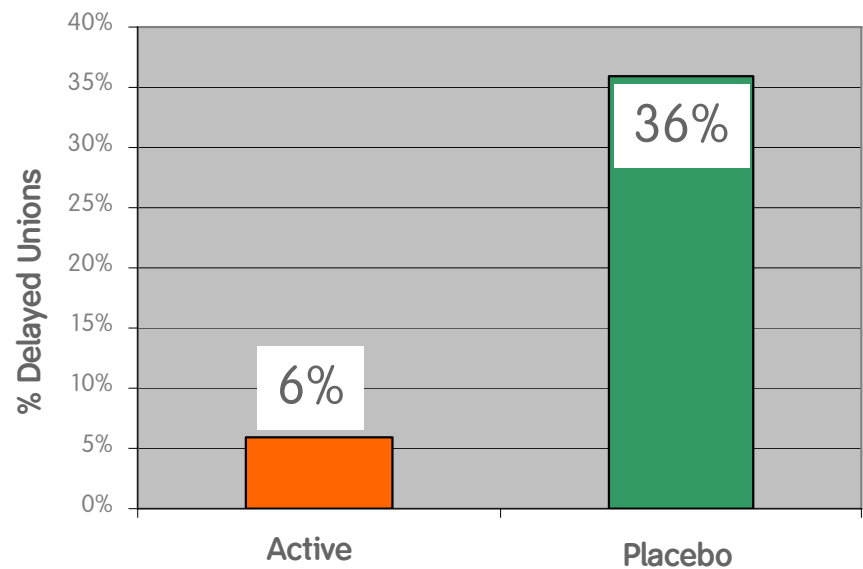
33 patients had the ultrasound treatment; 34 had placebo

38% faster time to healed fracture:
active - 96 days; placebo 154 days (P<0.0001)



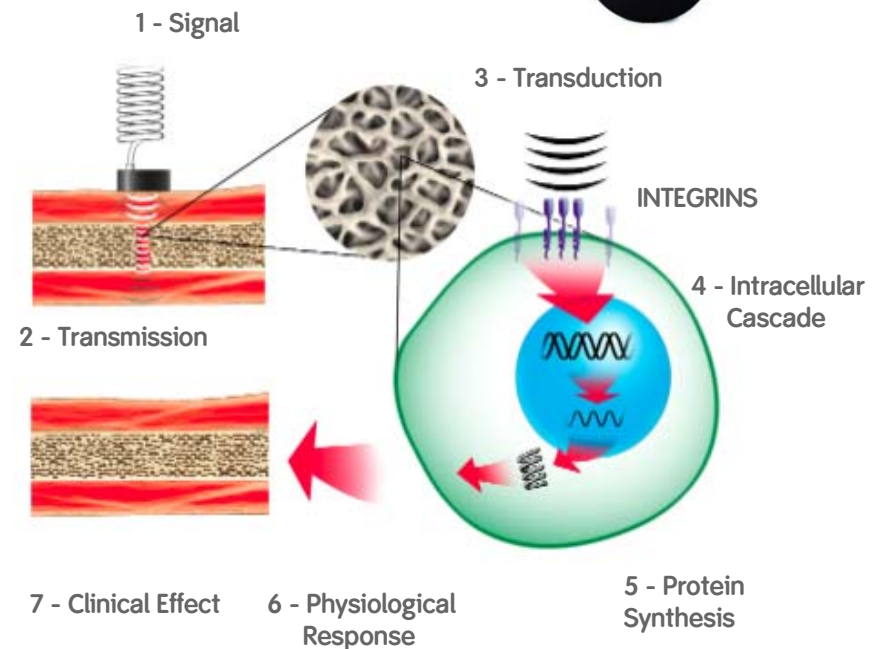
Heckman J., MD: JBJS, Vol 76A, No. 1, pp 26-34, January 1994

83% reduction in incidence of delayed unions



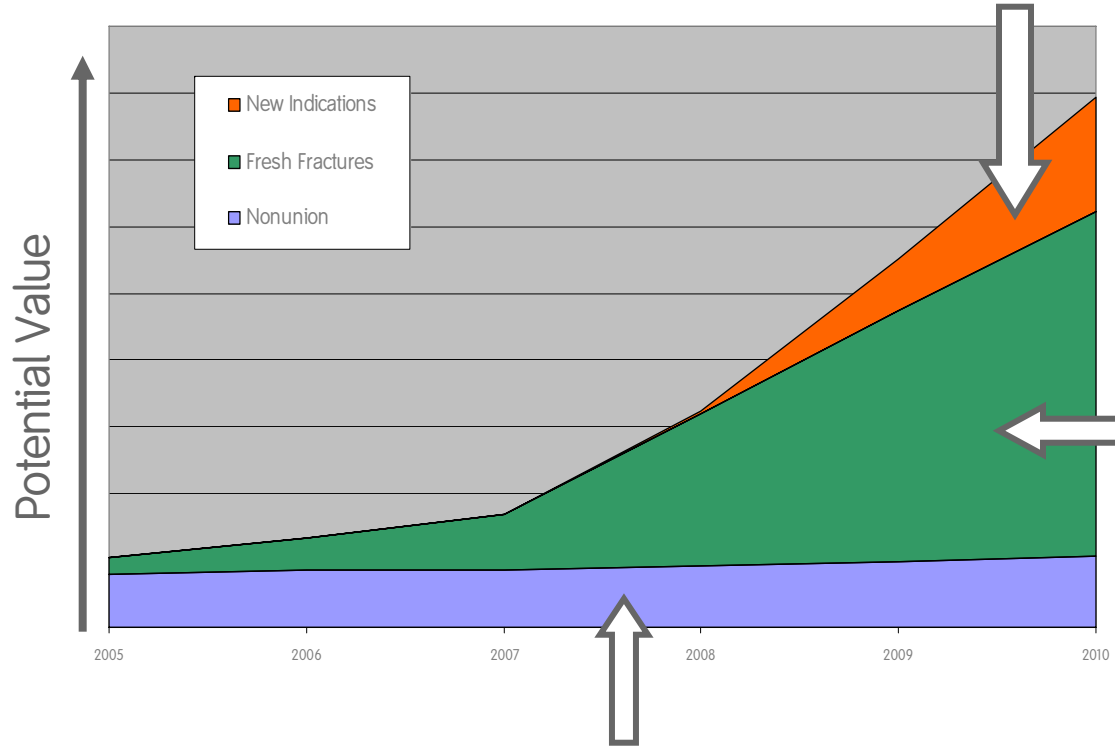
EXOGEN[◇] mechanism of action

- Produces a mechanical signal (vibration)
- Transmits through soft tissue and through and around the bone
- Produces nano-motion at the fracture site
- Detected by integrins at the cell surface
- Affects a range of cells important to fracture healing
- Initiates an intra-cellular cascade resulting in a range of key proteins being produced
- Accelerates or re-initiates the natural fracture healing process
- Beneficial at all stages of the fracture repair process
- Maximum impact when applied throughout the healing process



EXOGEN[◇] market potential

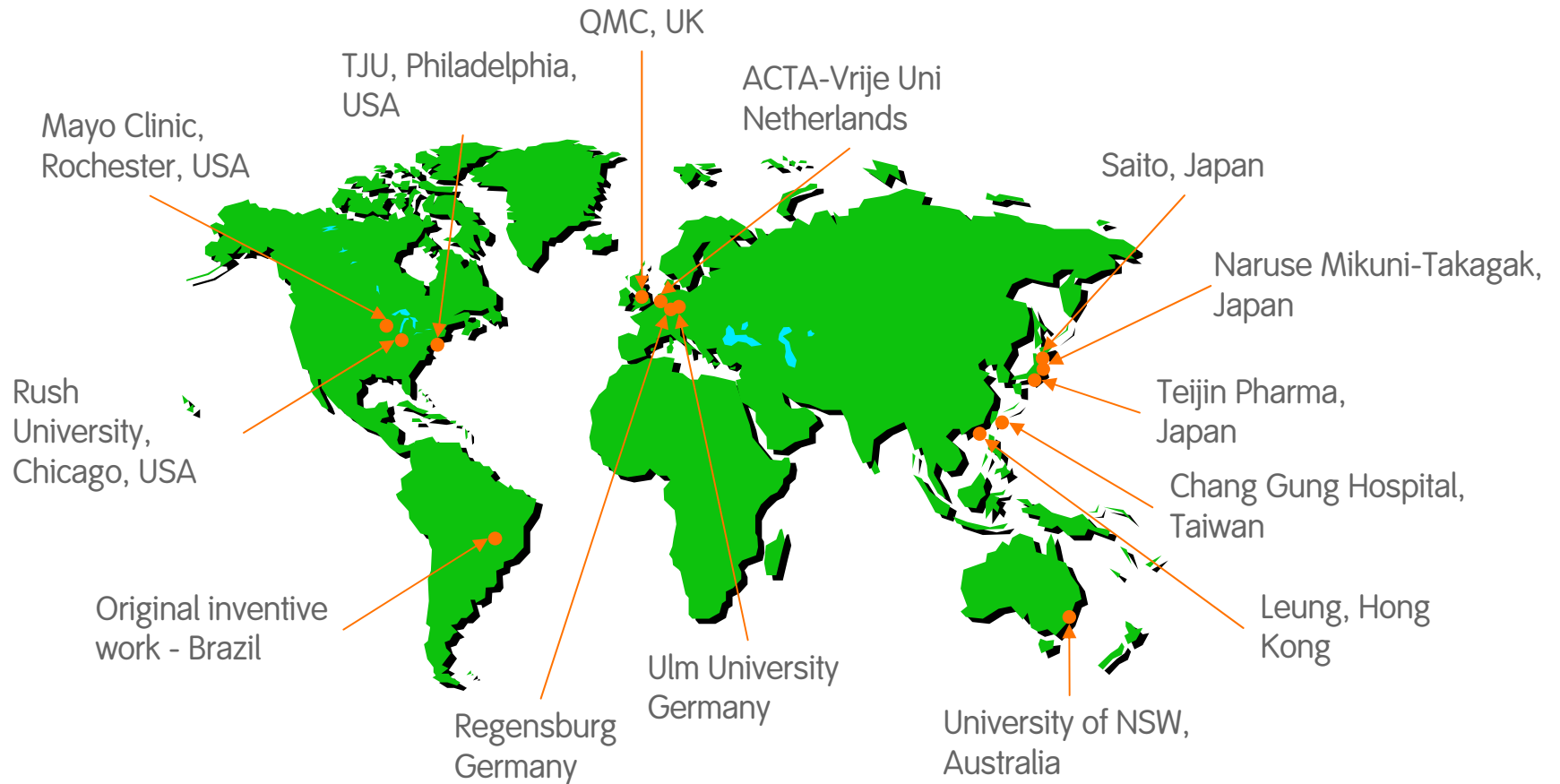
Exploit understanding of mechanism and extend into soft tissue indications



Capitalise on fresh fracture opportunity through effective clinical, regulatory and reimbursement programmes supported by basic science

Continue market share growth in non-unions through effective sales and marketing

Innovation is global – we think about it and deliver it globally



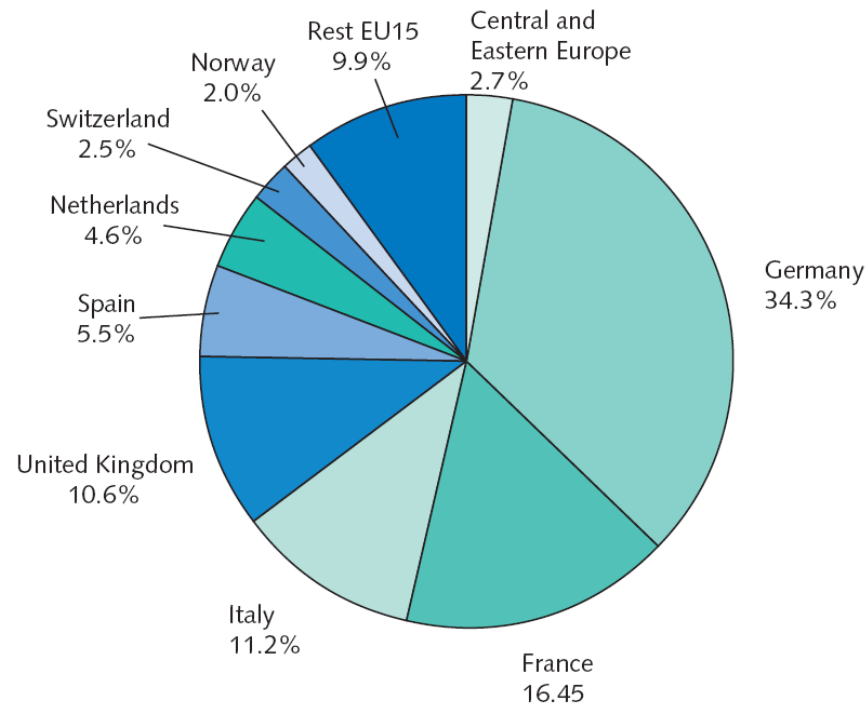
EXOGEN[®] mode of action - academic collaborators

Innovation – the way forward in the UK

- Medical technology is a large and growing global industry
- Innovation is the key driver of growth and is global in nature
- Technology plays a major role in driving this innovation – but needs strong industry/clinician/health service collaboration to succeed
- The UK market is small (3%) in a global context – and the UK is a “slow and late adopter of medical technology”
- Government and industry have established a partnership to try to accelerate innovation in the NHS and the UK medtech industry – Healthcare Industries Task Force (HITF)

Healthcare Industries Task Force final report: Market breakdown

Figure 1: The European medical technology industry by market share (2002)



What benefits would improved innovation & adoption bring?

- Improved patient care and quality of life
- Faster diagnosis and treatment
- Higher staff productivity (Wanless estimates 3%)
- Likely lower life-time costs (but may shift current cost impact across departments)

HITF & SIG - perspective

- Key focus on “innovation” activity/process
 - in the NHS
 - in medical technology industry
- Outcomes – multiple enablers (NIC, CEP, R&D capacity, HTC)
- Potential benefits
 - patients
 - system/unit costs
 - strength of UK industry
- Next stage - MMTSG
[Ministerial Medical Technology Strategy Group]
 - look for the big innovation paybacks
 - biggest opportunity in early/less invasive interventions