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MATCH

Connecting health assessment to business decisions.

Professor Terry Young
Brunel University
on behalf of the MATCH Team

With contributions by Professors Julie Barnett and Richard Lilford, Alan Girling and Amanda Chapman.

UNIVERSITY OF BIRMINGHAM

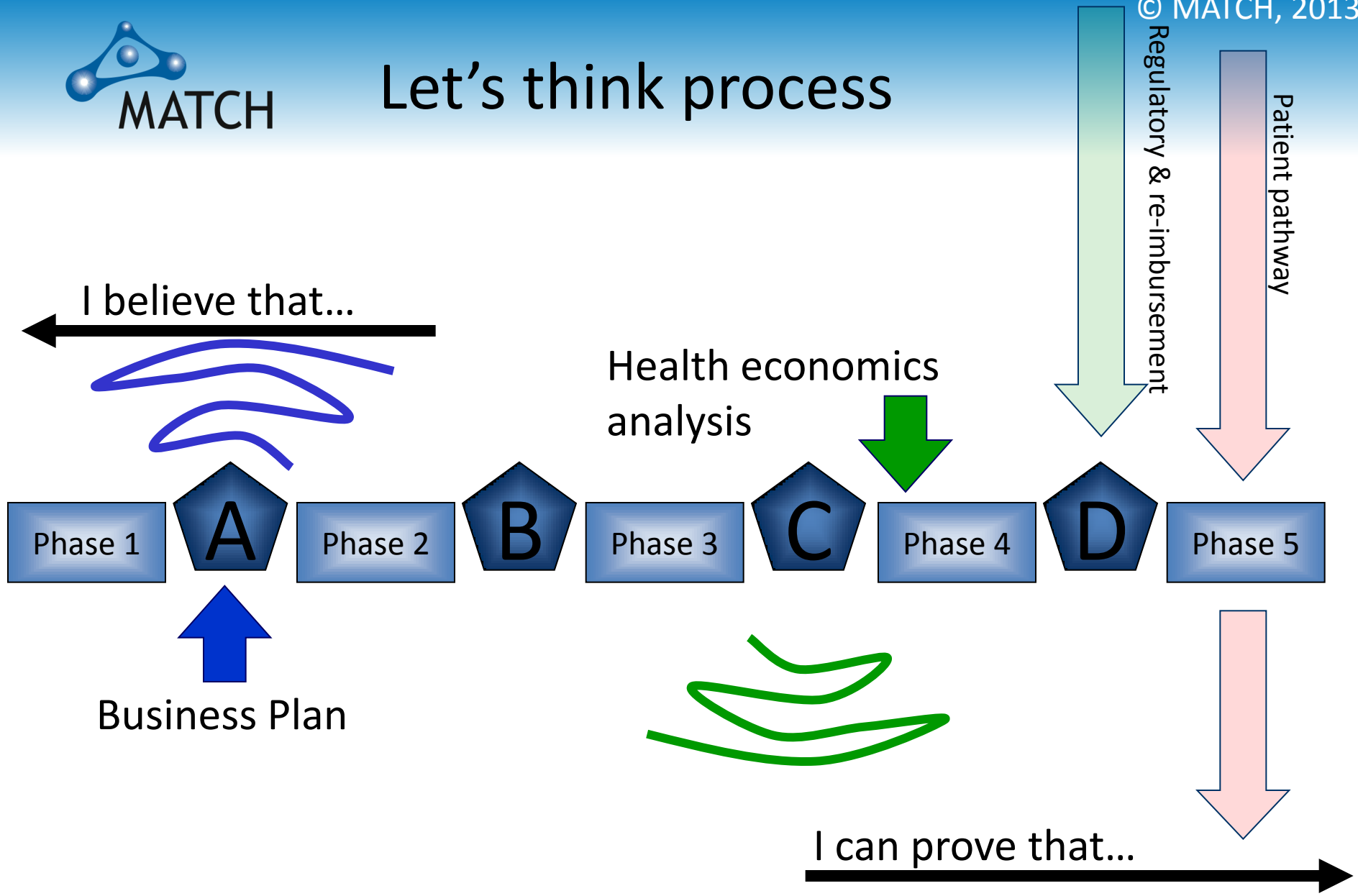
Brunel UNIVERSITY LONDON

The University of Nottingham

University of ULSTER

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Let's think process



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A (dis)integrated process

Estimates of market size (may connect to epidemiology)
Estimates of securable market & rate of market penetration
List of putative benefits (usually against competition)
Basic cost/price modelling
Wider rationale

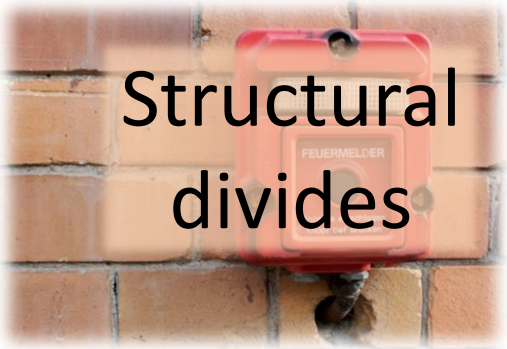
Health economics

Phase 1 | A | Phase 2 | B | Phase 3 | C | Phase 4 | D | Phase 5

Business Plan

- Rigorous epidemiology
- Trials results
- Modelling based on RCTs outcomes
- Cost-benefit analysis
- Assessment of economic benefit

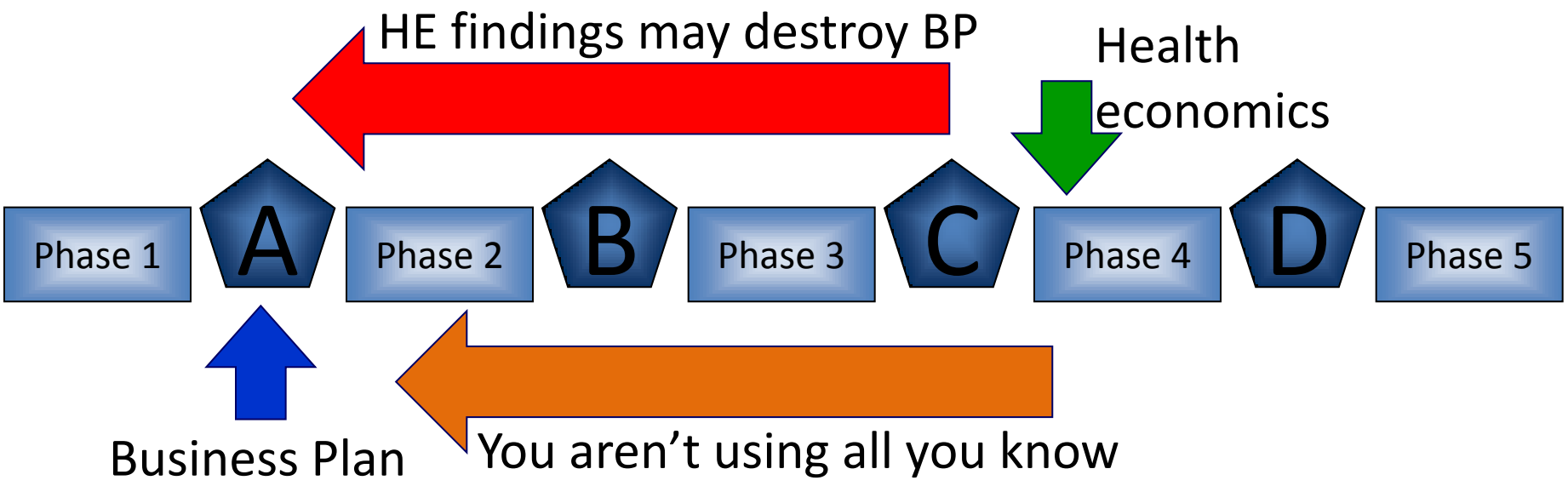
Marketing Department



Specialist or Outsourced

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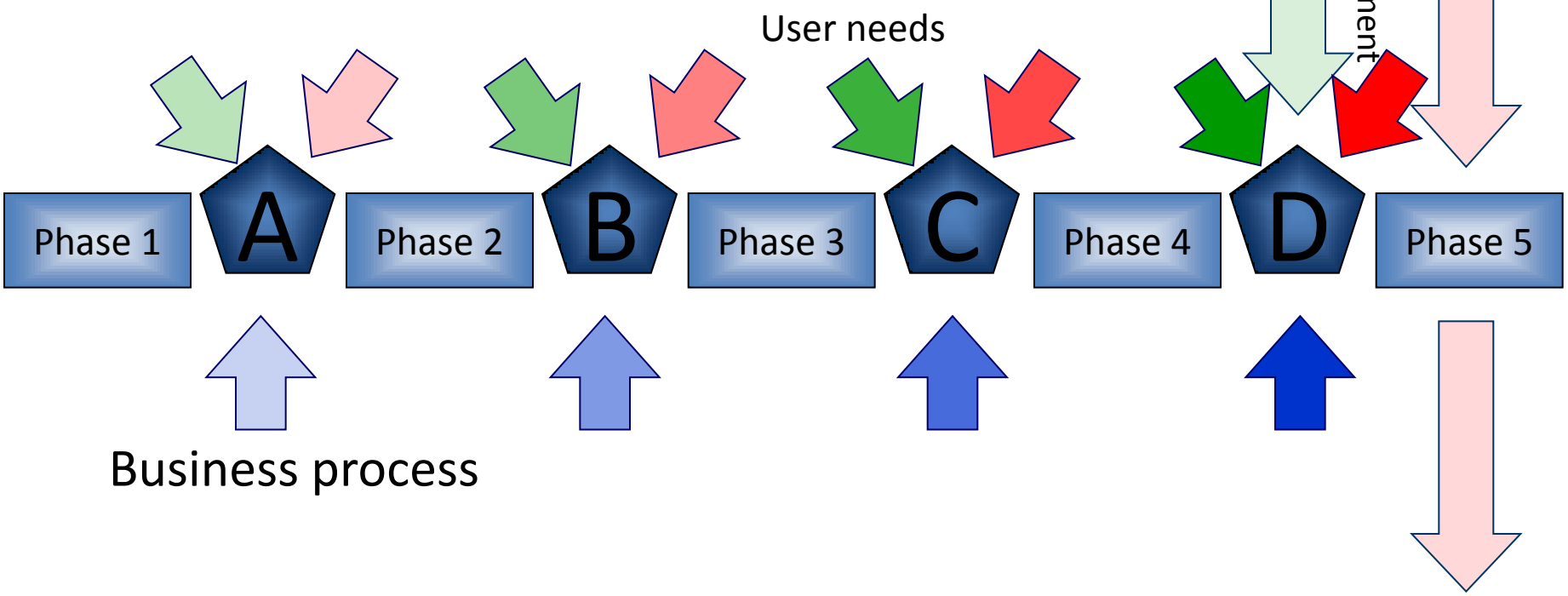
The cost of a lack of integration



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An iterative approach

Create a graded set of tools that revisit the key issues in greater depth each time there is a new decision to be made



M Sculpher, M Drummond, **M Buxton** (1997) The iterative use of economic evaluation as part of the process of health technology assessment. *J Health Serv Res Policy* **2**(1):26-30.

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A simple example: the User angle

Money, A., Barnett, J., Kuljis, J. Lucas, J.S. (*in press*) Patient Perceptions of Epinephrine Auto-Injectors: Exploring Barriers to Use, *Scandinavian Journal of Caring Sciences*,







Would you carry this at all times?

#12, Moderate: *I mean, it is a drug...and people will do...do anything for a quick, you know, especially for a shot of adrenalin to… So em, you know, I don't like to declare*

#14, Severe: *Well, when I go to football, once a week... you get searched going into every away game, these days, and I didn't want to be sitting there causing a scene because I've got an EpiPen, you know, in case I'm going to sort of run on the pitch and stab one of the players with it. That's obviously what they think. You're not allowed knives, not allowed anything in, so why not this, you know?*

#15, Severe: *…embarrassment, mm, embarrassment, definitely...it makes me feel like I'm a bit labelled as, oh, there's something wrong with her – it's obvious there's something a little bit wrong with me.*

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Companies struggle with users

#1: R&D committees. That's another thing. You start a study and surgeon wants to collect clinical data to be sure that they want to use this. Their experience that this is the product they want to use. You have to notify the hospital R&D and then suddenly they see it as an R&D project, so they throw on their overheads and it's an extra hurdle to go through. They start reviewing it in addition to ethical board.

Ethics, etc

#11: "but, by and large, most of our market research is done with the surgeons, not with the end users, rightly or wrongly...but how it will be marketed will be through the healthcare professional, who will have to sell it effectively to the patient, show them how to use it."

Indirect access

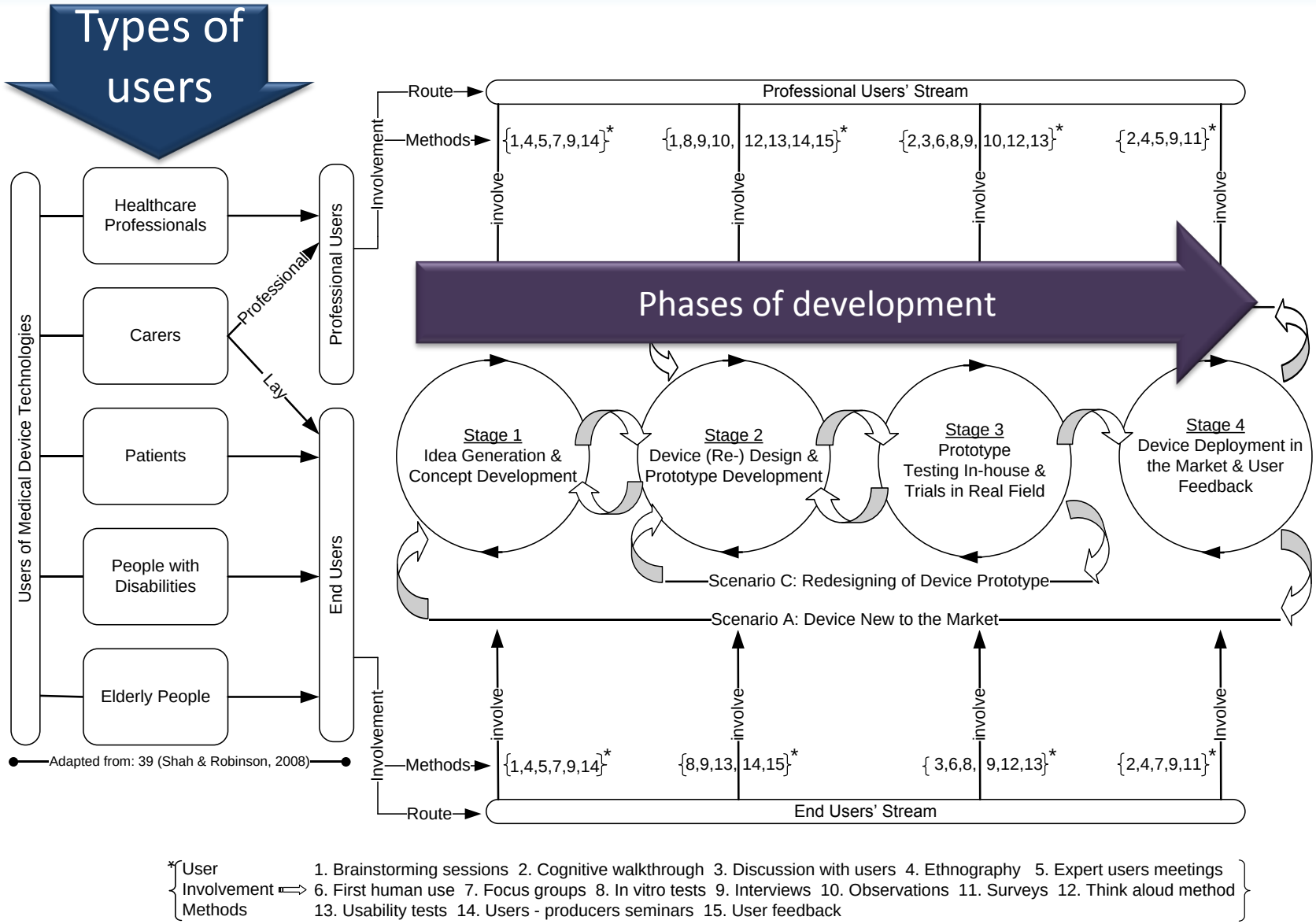
Work involved

#2: "There is the formal method of gaining patient data which means at the moment for example we have conducted clinical trials, clinical investigations. All sorts of clinical information gathering is going on at the [hospital name]. We are also... we tend to gather information first of all on the effectiveness or efficacy of it...Any advance, any variation that is likely to happen to the unit, any proposals for change that are going to improve the machine are all tested out in the clinical environment."

Money, A.G., Barnett, J., Kuljis, J., Craven, M.P., Martin, J.L. and Young, T. (2011) The Role of the User within the Medical Device Design and Development Process: Medical Device Manufacturers' Perspectives, *BMC Medical Informatics and Decision Making, 11:15*

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A Framework under MATCH

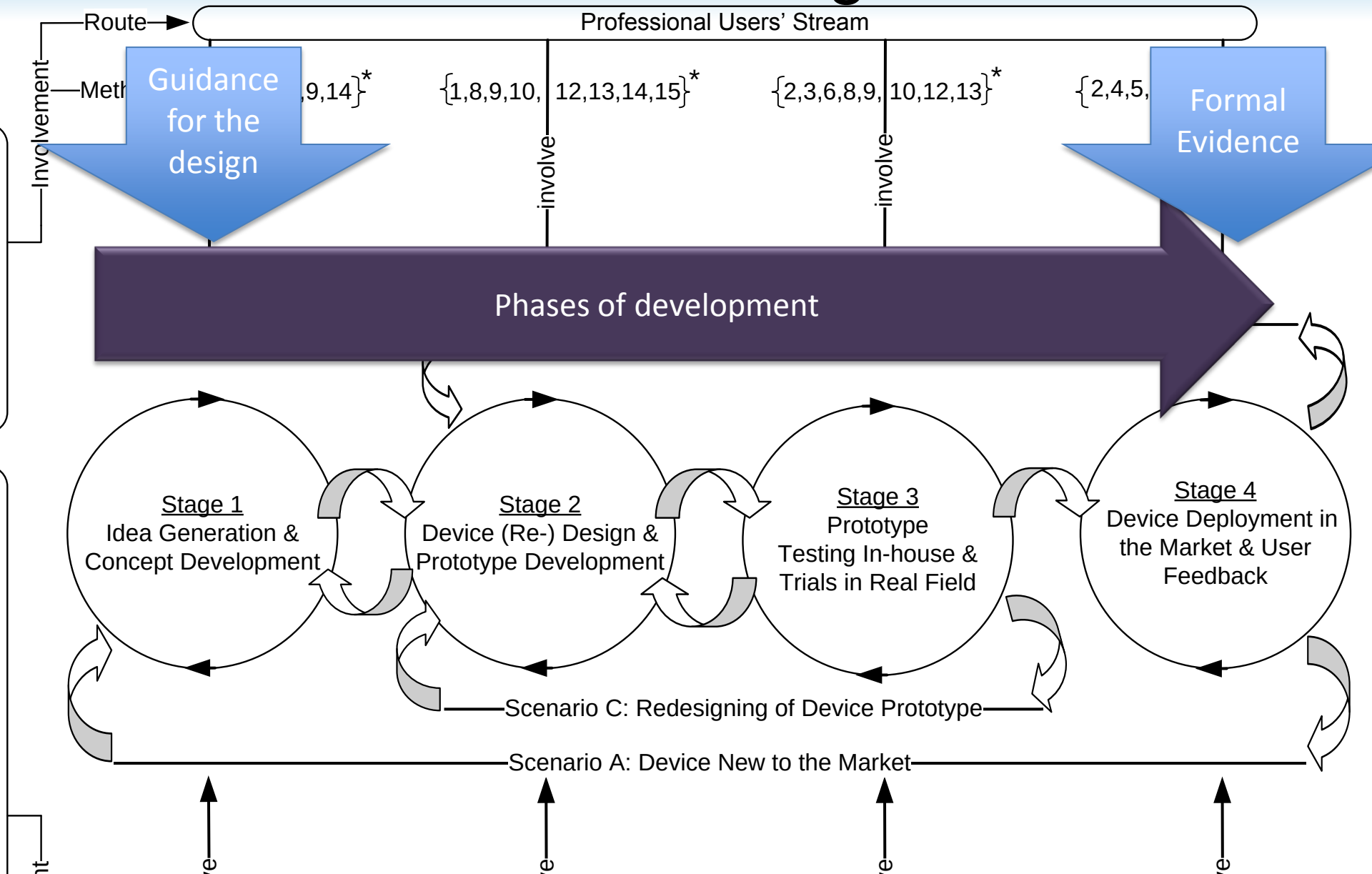


*User Involvement Methods ⇨ 1. Brainstorming sessions 2. Cognitive walkthrough 3. Discussion with users 4. Ethnography 5. Expert users meetings 6. First human use 7. Focus groups 8. In vitro tests 9. Interviews 10. Observations 11. Surveys 12. Think aloud method 13. Usability tests 14. Users - producers seminars 15. User feedback

(2009) Shah, S.G.S., Robinson, I., and AlShawi, S., Developing Medical Device Technologies from Users' Perspectives: A Theoretical Framework for Involving Users in the Development Process. *International Journal of Technology Assessment in Health Care*, 25(4): 514-521.

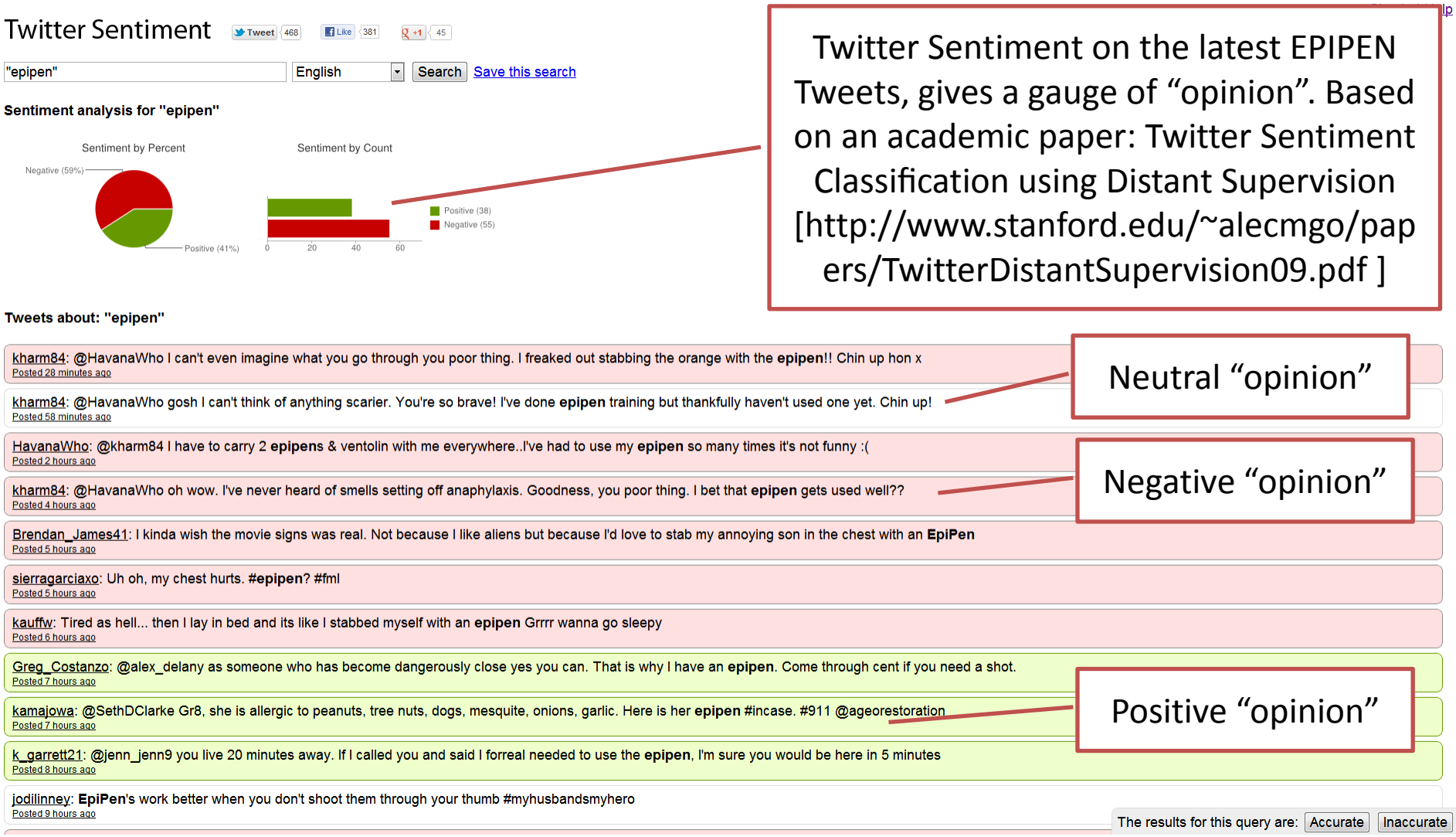
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Zooming in….



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Use of social media



Twitter Sentiment on the latest EPIPEN Tweets, gives a gauge of "opinion". Based on an academic paper: Twitter Sentiment Classification using Distant Supervision [http://www.stanford.edu/~alecmgo/papers/TwitterDistantSupervision09.pdf]

Neutral "opinion"

Negative "opinion"

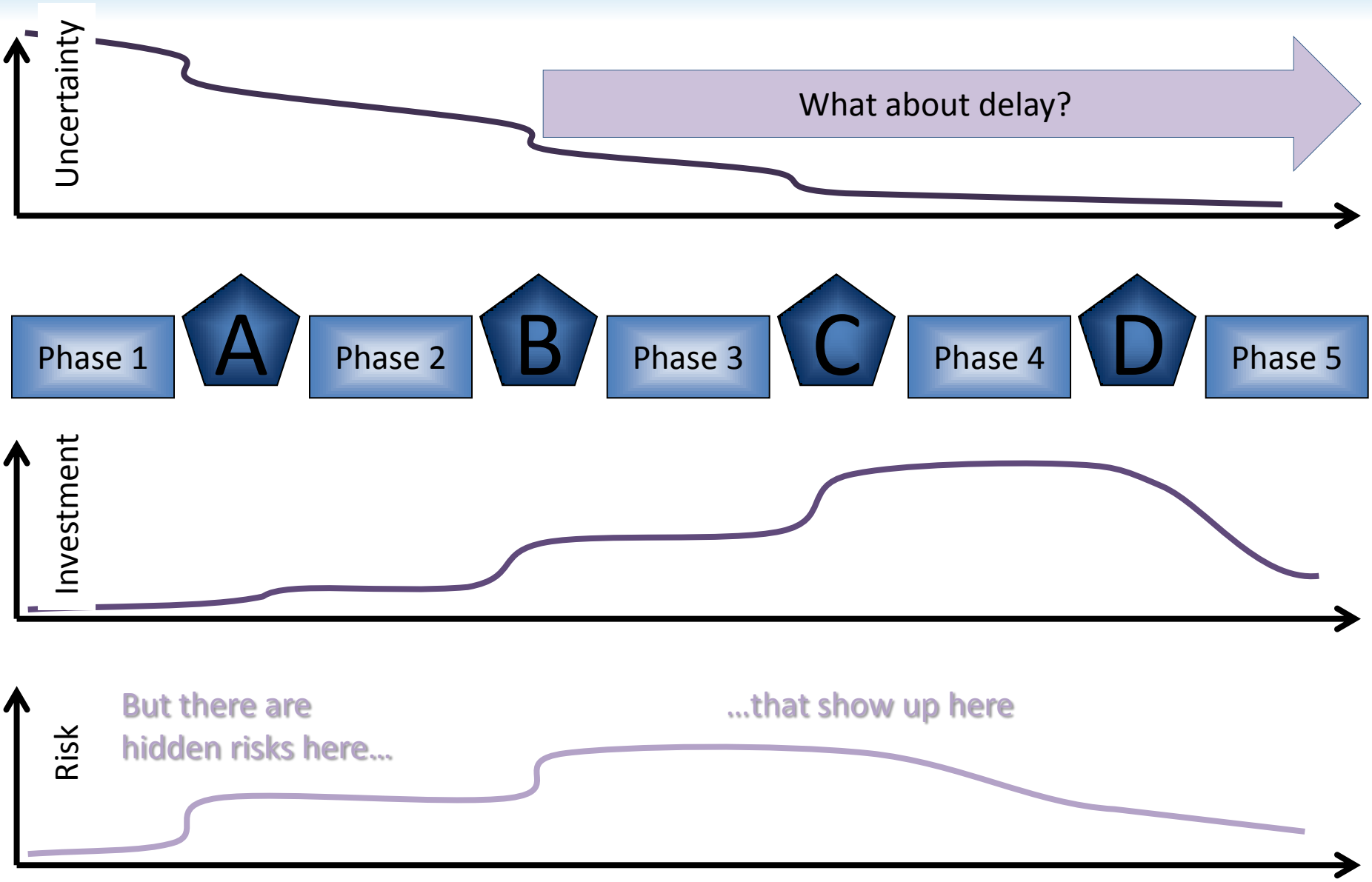
Positive "opinion"

With thanks to Hiran Basnayake, and Tim Cribbins

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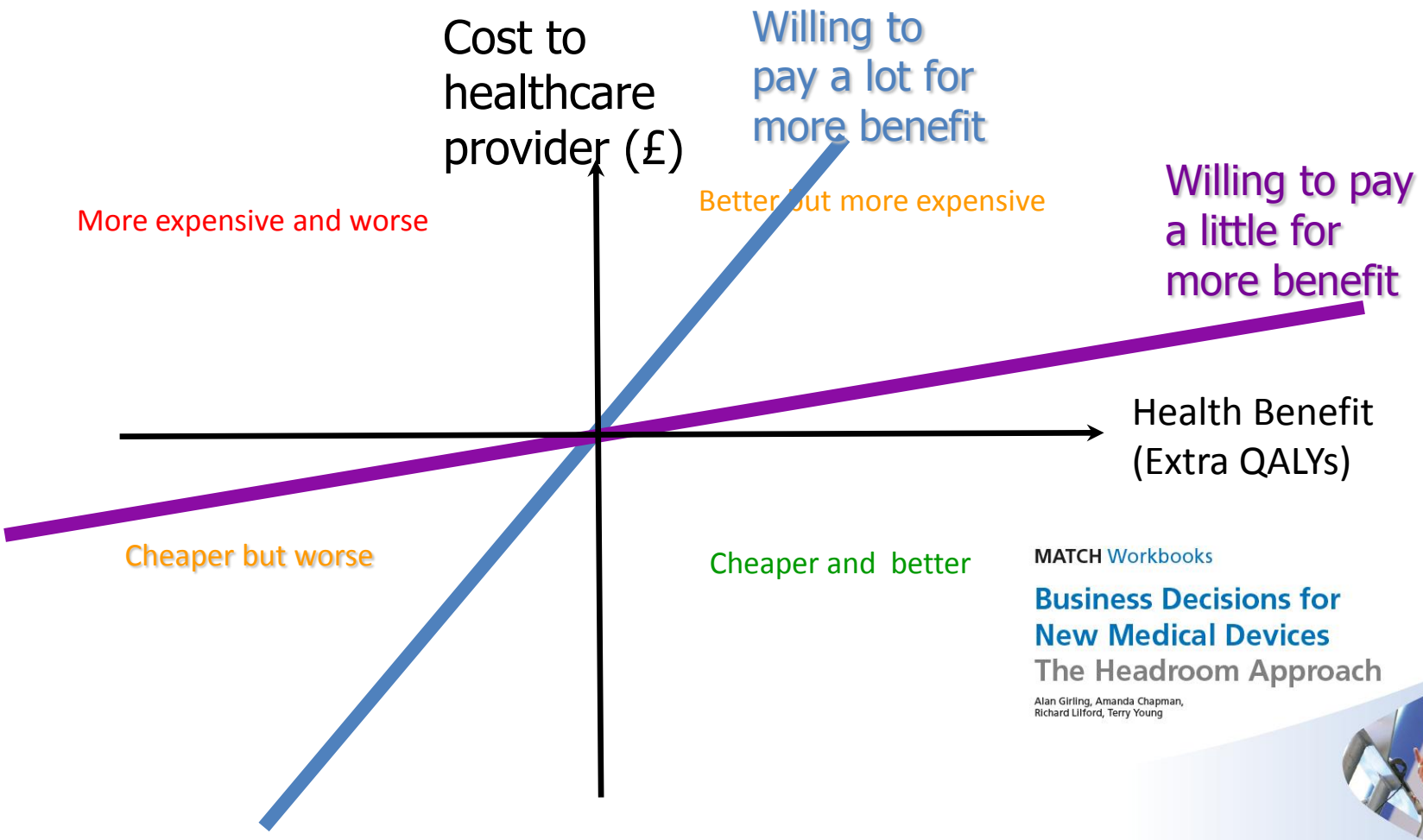
MATCH

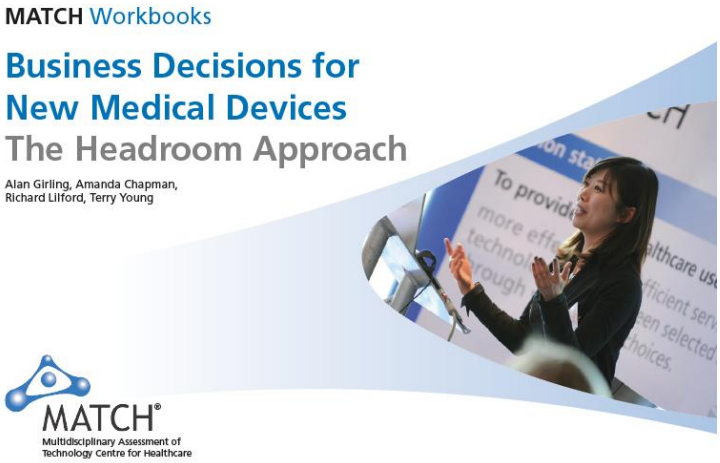
Let's think about…



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Buy the book, or take the course!





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Costs and QALYs

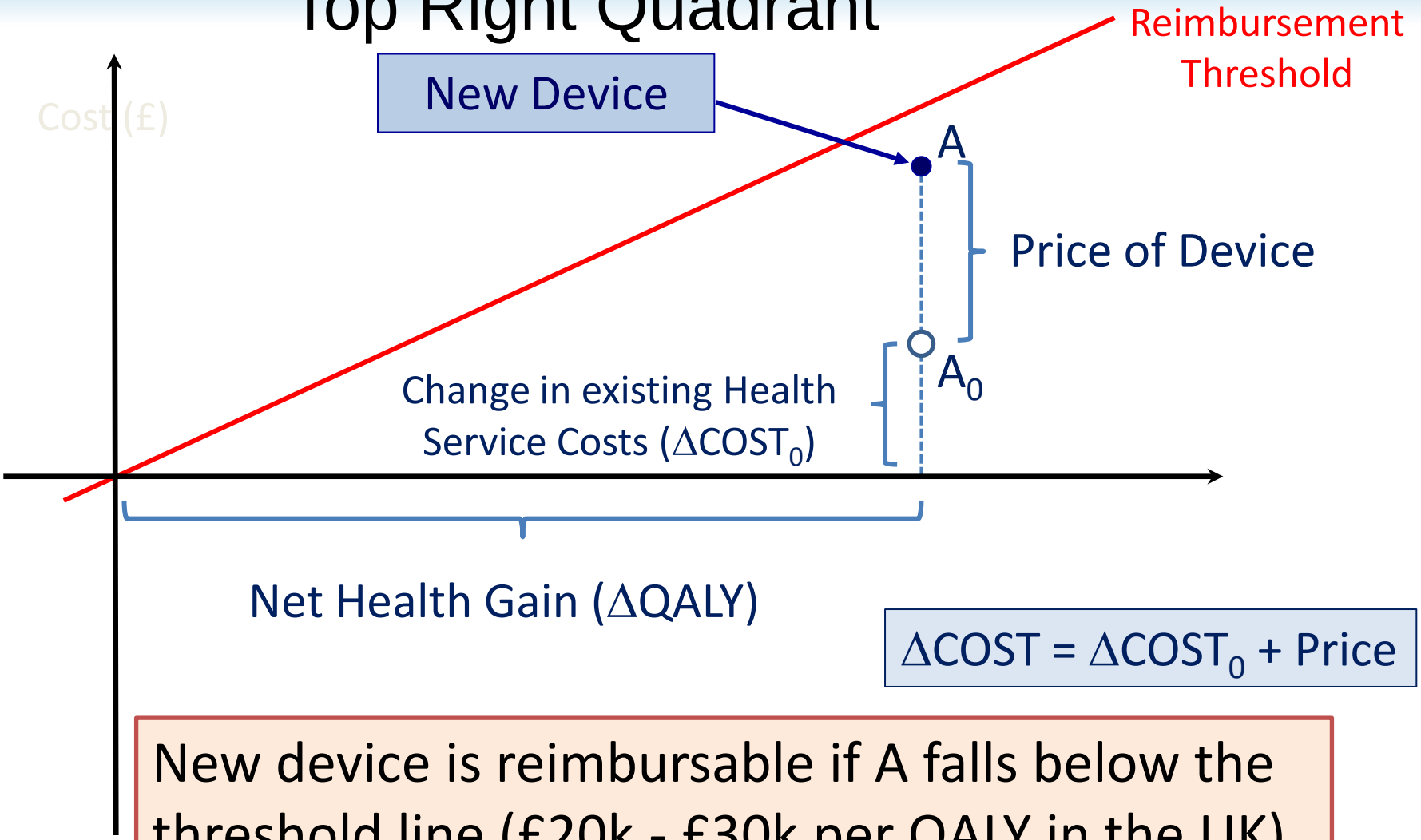
- Service Costs
  - Staff, Hospital, Equipment, Drugs & all other treatment costs, including Costs of follow-up and downstream treatments
- Health Gain
  - Extra years of life (compared to existing treatment), down-weighted for impact of less than perfect health

    (Quality-Adjusted Life-Years “QALYs”)
- Reimbursement depends on Cost/QALY threshold
  - Traditionally (£20,000 – £30,000).

    I.e. OK if (Extra Costs) ÷ (Extra QALYs) < £20,000 + ?

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Mainstream HTA: Top Right Quadrant



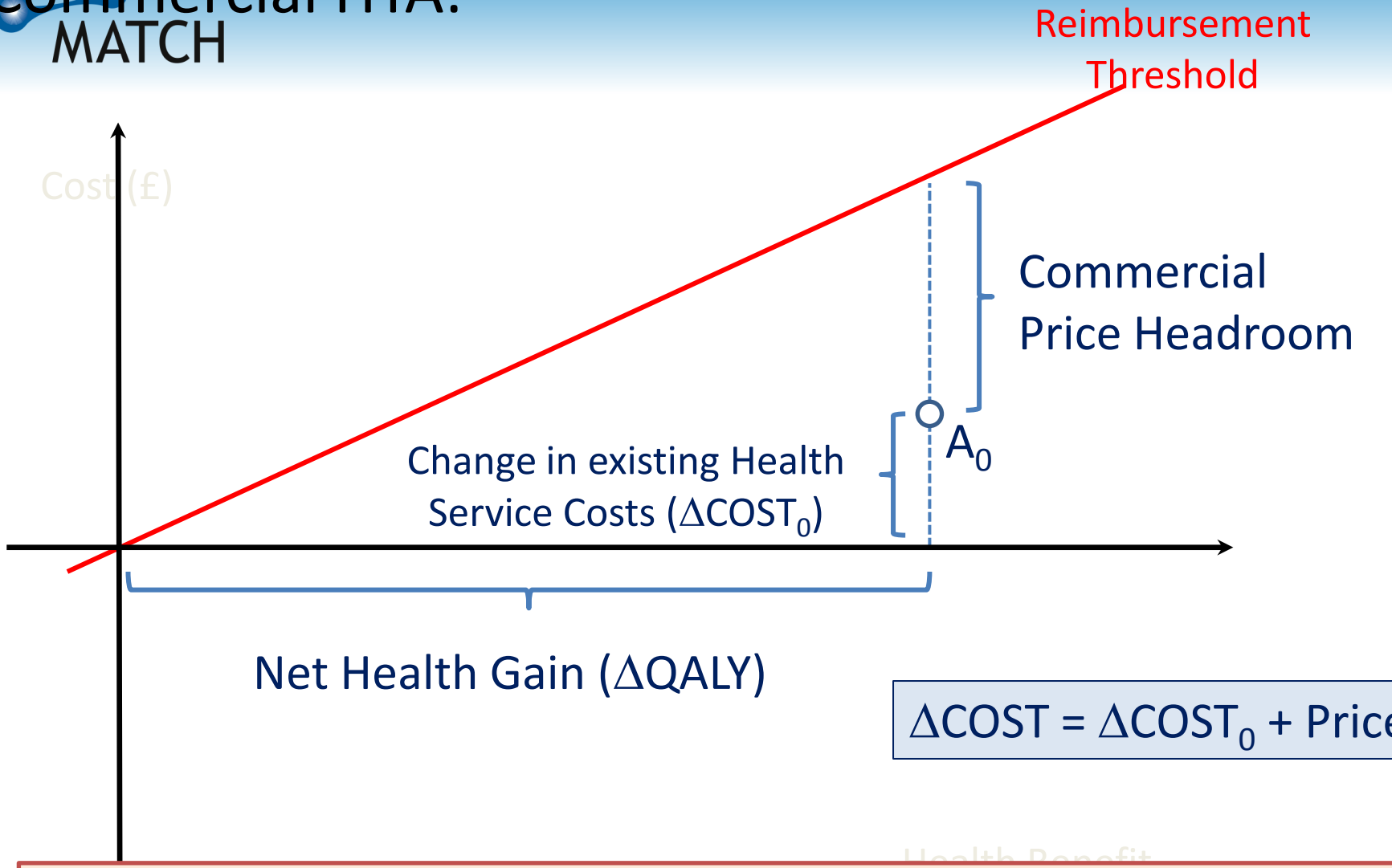
$\Delta COST = \Delta COST_0 + Price$

New device is reimbursable if A falls below the threshold line (£20k - £30k per QALY in the UK)

i.e. if $\Delta COST \div \Delta QALY < \lambda$ with £20k < λ < £30k

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Commercial HTA: MATCH

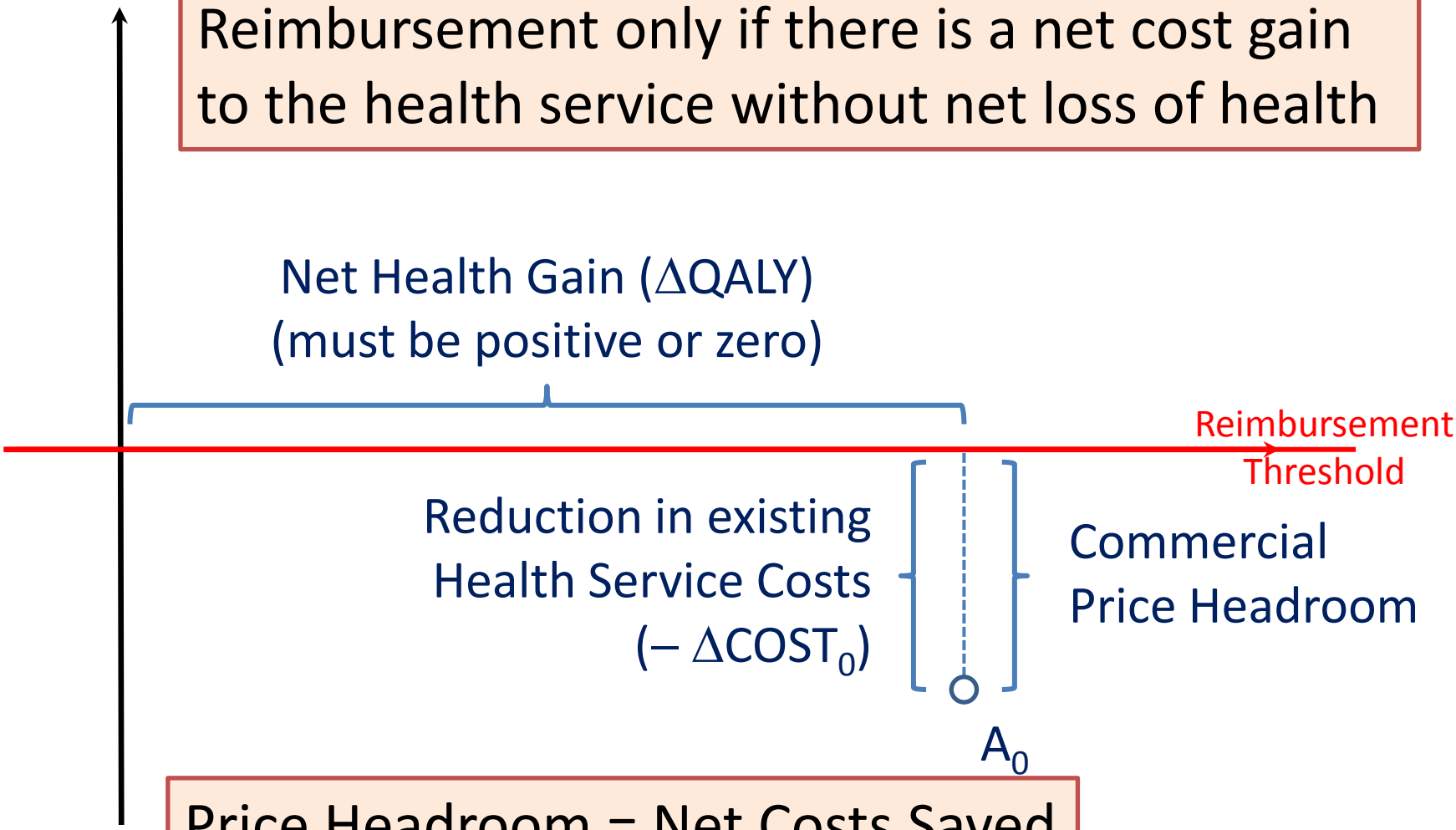


New device is not viable unless the price headroom is sufficient to cover costs of development and production

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What if it saves service costs?

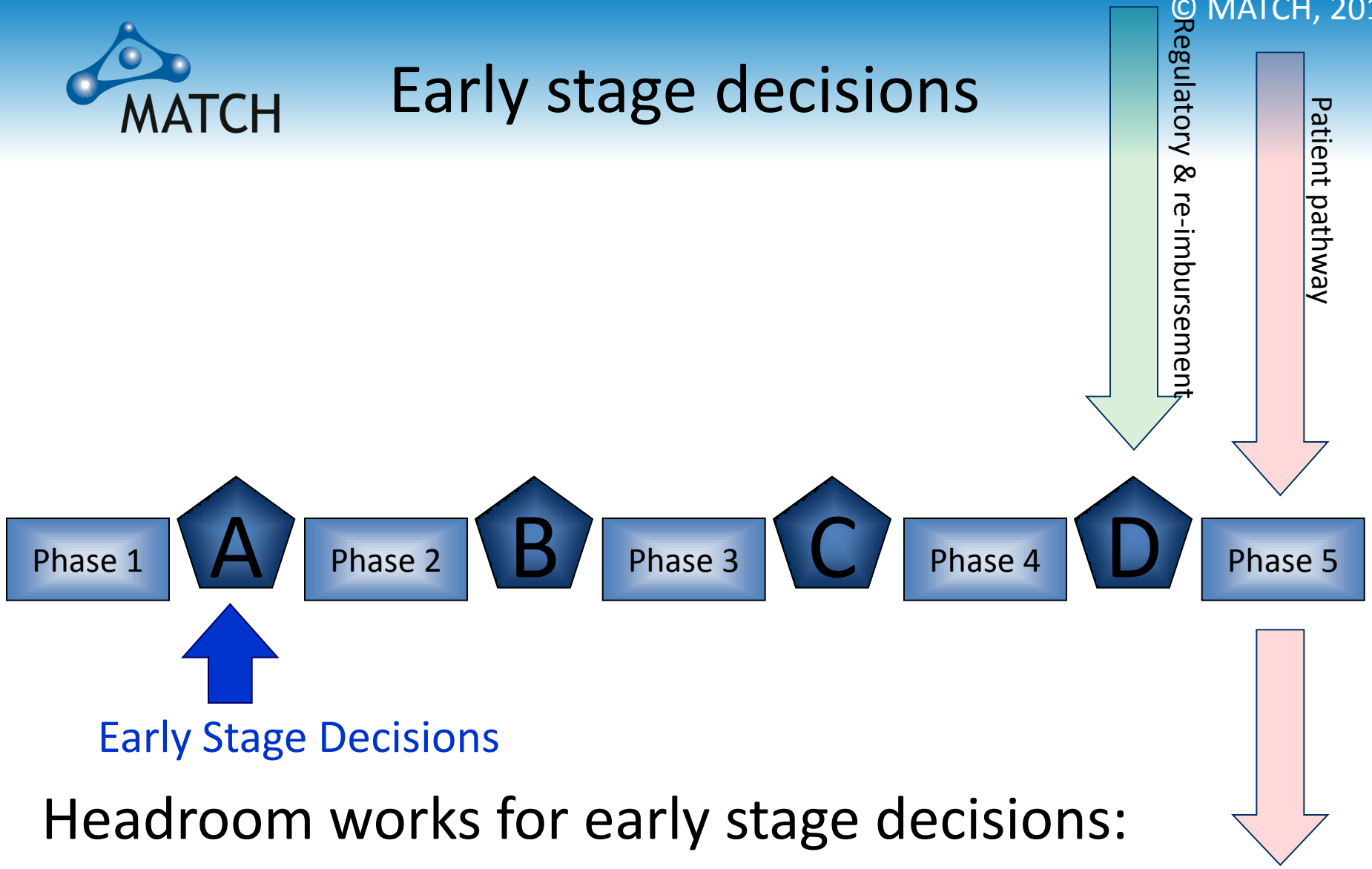
Reimbursement only if there is a net cost gain to the health service without net loss of health



Price Headroom = Net Costs Saved

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Early stage decisions



Headroom works for early stage decisions:

- Stop-go with an idea
- Picking a few ideas from a larger selection

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Simple Example

- Standard treatment (Comparator) uses tissue from inside mouth (Buccal Mucosa)
- Side-effects (in mouth) last 5-6 weeks (0.1 years)
  - Quality of life with side-effects ~ 0.94†
- Headroom is

£30,000 x 0.1 x (1 – 0.94) = £180 per patient

i.e. Not enough!

(†From a time trade-off elicitation with members of the public)

Tissue engineering for Urethral stricture

See also: McAteer H, Cosh E, Freeman G et al. (2007) Cost-Effectiveness Analysis at the Development Phase of a Potential Health Technology: Examples Based on Tissue Engineering of Bladder and Urethra. Journal of Tissue Engineering and Regenerative Medicine **1**:343-9.

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A structured way of looking at this

Description	

Comparator	

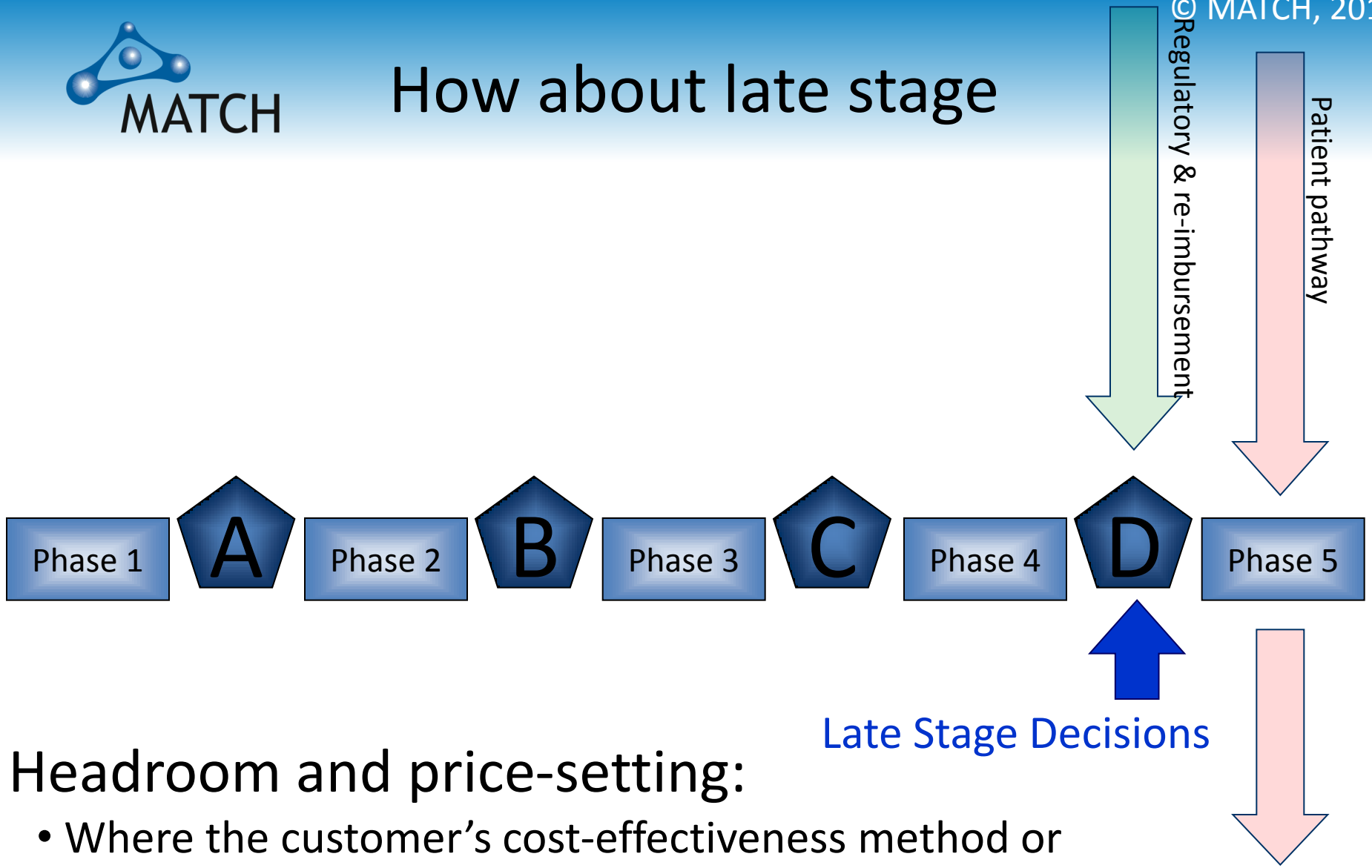
Market size	**Market size per year:**

Health Service Changes in resource use. Any changes in service delivery costs to the NHS that will result from the application of the new… *Describe any potential costs/savings that you haven't quantified. ***	

etc., etc.

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How about late stage

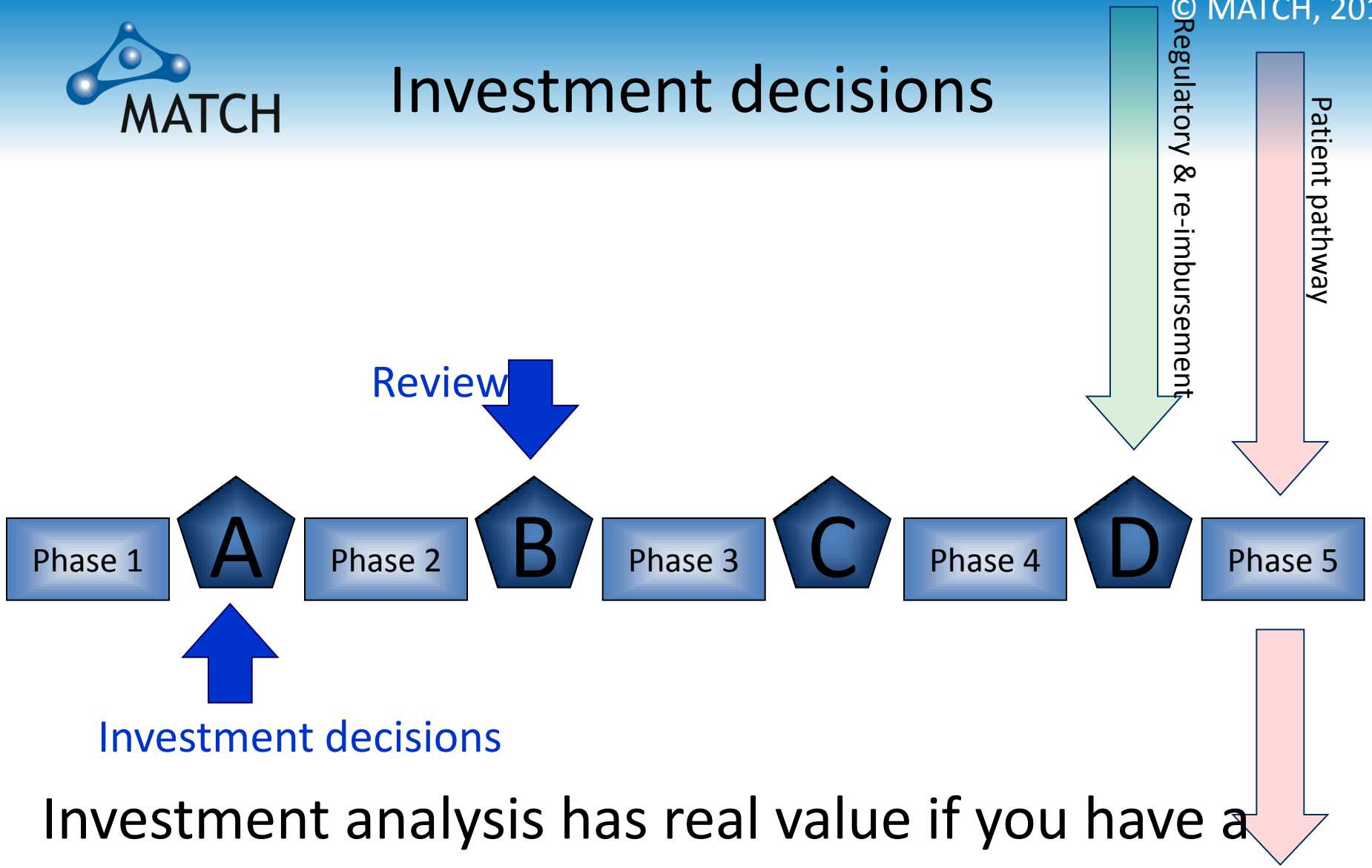


Headroom and price-setting:

- Where the customer's cost-effectiveness method or willingness-to-pay is known
- We have developed some theory
- And a rule-of-thumb

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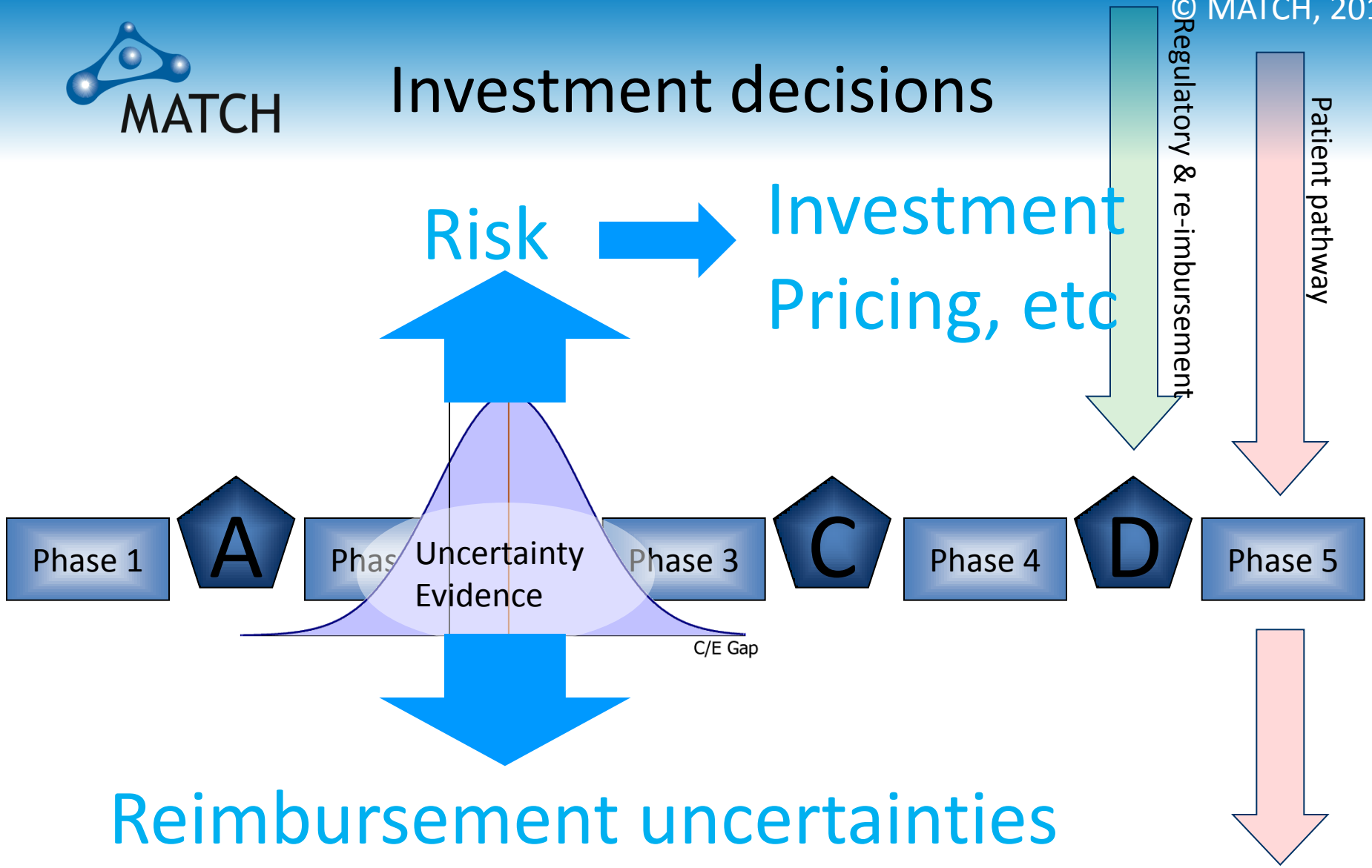
Investment decisions



Investment analysis has real value if you have a chance to change your mind later.

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Investment decisions



(2012) Girling, A.J., Lilford, R.J., and Young, T.P., Pricing of Medical Devices under Coverage Uncertainty - a Modelling Approach. Health Economics, 21(12): 1502-507. http://dx.doi.org/10.1002/hec.1807

(2010) Girling, A., Young, T., Brown, C., and Lilford, R., Early-Stage Valuation of Medical Devices: The Role of Developmental Uncertainty. *Value in Health*, 13(5): 585-591. http://dx.doi.org/10.1111/j.1524-4733.2010.00726.x

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Conclusions

- Risk management requires an ability to integrate decision-making, particularly at business reviews.
- Traditional reviews rely heavily on human judgement.
- MATCH is exploring ways to prove tools that can inform the decision-making process.
- Some of these are now being taken out as training courses.

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Engaging with MATCH

- **MATCH Affiliate Scheme**
  - Affiliate benefits
- **MATCH Courses**
  - Tools training
    - Health Economic Evaluation Software
  - Workshops
    - Understanding Device Users
    - Sold to the NHS
- **Consultancy**
- **Contact:**
  - Professor Terry Young, terry.young@brunel.ac.uk





