Masterclass: take-home messages

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Chest pain

- **Biomarkers: ?identify those at high risk who may benefit from early/aggressive intervention**

- **But:**
  - You can be too early
  - Troponin assays require intelligent application – individualised to the institution and the patient

Chest pain

- **Atypical chest pain – 'arrogance and ignorance of cardiologists'**

- **Do we need CPUs?:**
- **Probably not**
- **Do need shared protocols and policies with our ED colleagues**
- **Not all CP is cardiac**

Cardiac arrest

- **OHCA:**
  - Significant improvement in outcomes (short and long-term) over years
  - Commonest cause of death
    - MOF in first 3 days
    - Neurology thereafter
  - Coronary angiography is recommended for all – as many have CAD
- **Increasing potential for MCS**
  - eCPR (refractory cardiac arrest) – with ongoing trials
  - Post-arrest cardiogenic shock

Cardiac arrest

- **No treatment has been shown to improve outcome in MOF**

- **Brain:**
  - all drug trials thus far negative (cyclosporine, GNP1 etc)
  - ?Xenon in the future
  - TTM (how low, how long, how? TTM2 results awaited)

  - Neuroprognositcation
  - Wait – and use multimodality assessment

Cardiac arrest

- **ECMO: 'need to be able to say no, as well as yes'**

- **Ethical issues in the current era of MCS challenging – ECMO heralds a new era of defining death**

AHF

- **Registry data: state of HF management in 2017**

- **1-year overall mortality 35.9%**
- **Drop-off in evidence-based disease modifying agents from mid-50's - but prescribing rates increasing**
- **<50% admitted to cardiology ward (but ok if see cardiologist – in-patient mortality 6%)**
- **?why no improvement in mortality: ?older ?no new drugs**

AHF: common errors

- **GPs:** think respiratory disease is the commonest cause of dyspnoea in the elderly
- **ED:** diagnosis of HF alone is not enough – worry about the underlying cause
- **HF specialists:** think they can diagnose/exclude HF clinically - they cannot

- **Sepsis:** precipitant of AHF in around 30% cases


caution
Super Bug!

AHF: present and future

- >210 AHF trials in progress currently
- Most recent: serelaxin – negative
- Inotropes – ATOMIC HF – increased troponin levels
- CUPID2 – neutral for every endpoint
- Ultratide (TRUE HF) – no difference in outcome

Cardiogenic shock

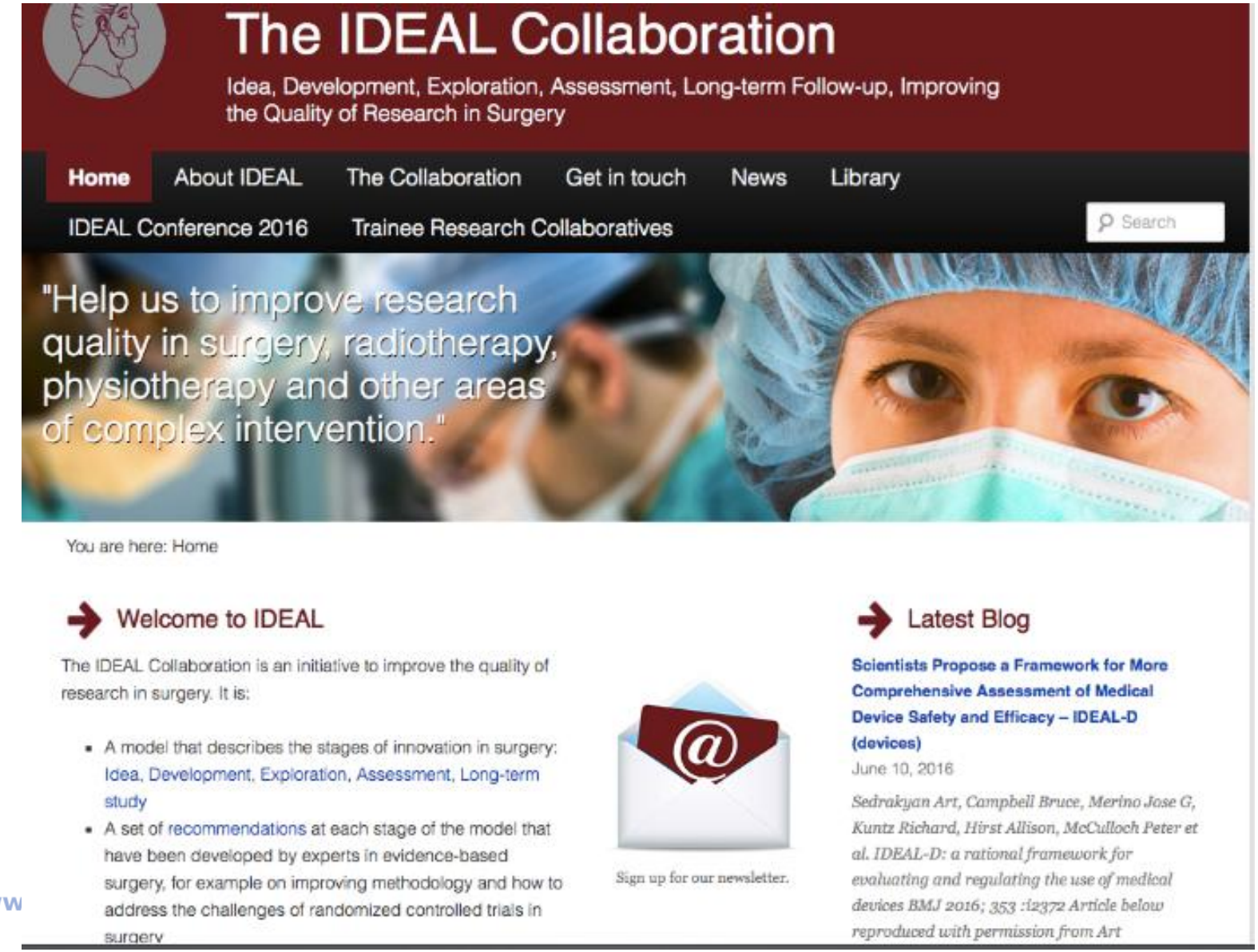
- **Endpoints and definitions not clear**
- **RCTs lacking**
  - Inotropes
  - Ventilation
  - The right heart
  - MCS
- **Awaiting Holger's next trial results for multi-vessel revascularisation**
- **Really need consensus regarding the whole spectrum of the disease process and interventions**

Cardiogenic shock: the future?

- **Uncertain outlook for future trials**
  - MCS
  - Inotropic agents
  - Any intervention whatsoever

- **Avoid if possible**

Lessons from surgery?



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Spread to devices?

- Concept that just being safe isn't enough – needs to be effective

Analysis

IDEAL-D: a rational framework for evaluating and regulating the use of medical devices

BMJ 2016 ; 353 doi: http://dx.doi.org/10.1136/bmj.i2372 (Published 09 June 2016)
Cite this as: *BMJ* 2016;353:i2372

Art Sedrakyan, professor1, Bruce Campbell, professor2, Jose G Merino, clinical research editor3, Richard Kuntz, chief scientific, clinical, and regulatory officer4, Allison Hirst, researcher5, Peter McCulloch, professor5

Adoption & diffusion: lessons from surgery?

	1 Idea	2a Development	2b Exploration	3 Assessment	4 Long-term study
Purpose	Proof of concept	Development	Learning	Assessment	Surveillance
Number and types of patients	Single digit; highly selected	Few; selected	Many; may expand to mixed; broadening indication	Many; expanded indications (well defined)	All eligible
Number and types of surgeons	Very few; innovators	Few; innovators and some early adopters	Many; innovators, early adopters, early majority	Many; early majority	All eligible
Output	Description	Description	Measurement; comparison	Comparison; complete information for non-RCT participants	Description; audit, regional variation; quality assurance; risk adjustment
Intervention	Evolving; procedure inception	Evolving; procedure development	Evolving; procedure refinement; community learning	Stable	Stable
Method	Structured case reports	Prospective development studies	Research database; explanatory or feasibility RCT (efficacy trial); diseased based (diagnostic)	RCT with or without additions/ modifications; alternative designs	Registry; routine database (eg, SCOAP, STS, NSQIP); rare-case reports
Outcomes	Proof of concept; technical achievement; disasters; dramatic successes	Mainly safety; technical and procedural success	Safety; clinical outcomes (specific and graded); short-term outcomes; patient-centred (reported) outcomes; feasibility outcomes	Clinical outcomes (specific and graded); middle-term and long-term outcomes; patient-centred (reported) outcomes; cost-effectiveness	Rare events; long-term outcomes; quality assurance
Ethical approval	Sometimes	Yes	Yes	Yes	No
Examples	NOTES video[6]	Tissue engineered vessels[7]	Italian D2 gastrectomy study[8]	Swedish obese patients study[9]	UK national adult cardiac surgical database[10]

RCT=randomised controlled trial. SCOAP=Surgical Clinical Outcomes Assessment Programme. STS=Society of Thoracic Surgeons. NSQIP=National Surgical Quality Improvement Program. NOTES=natural orifice translumenal endoscopic surgery.

Table: **Stages of surgical innovation**

Many interventions seem physiologically/intuitively sensible – but that doesn't mean they are right

Sir Iain Chalmers, co-founder Cochrane collaboration, BBC Radio 4, 2013