

The Economics of Acute Care Surgery

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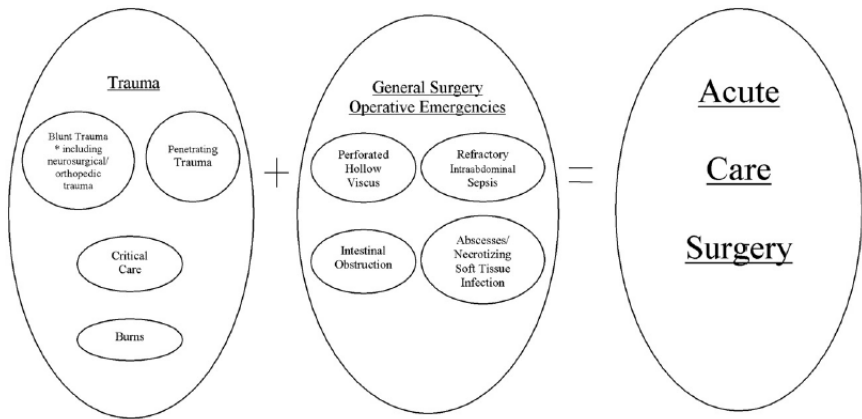
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What is Acute Care Surgery (ACS)?

- A reconfiguration of existing services labour and capital (non-labour factors of production, e.g. OTs)?
 - e.g., optimisation of OT availability and use, hand-overs/improved handovers?
 - economics: a *process innovation*?
- A new surgical specialty?
 - and hence, a new training program?
 - economics: a *product innovation*?

ACS as a Subspecialty (US)

[Britt(2007), p.305]



- proposed 2 year program [Britt(2007), p.305]
 - 12 months - Trauma/Emerg.Surg/Crit Care
 - 3 months each:
 - Thoracic
 - Transplant/Hepatobiliary
 - Vascular/Interventional Radiology
 - Elective (Orthopaedics, Neurosurgery, Plastics)

- proposed 3 year program [Britt(2007), p.305]
 - Year 1: 12 months—Trauma/Emerg Surg
 - Year 2:
 - 9 months—Crit Care (SICU/NICU/CCU/Burns/PICU)
 - 3 months—Vascular/Interventional Radiology
 - Year 3 (5;3;2)
 - Ortho and Neurosurg
 - Thoracic
 - Transplant/Hepatobiliary
 - Elective (Plastic/Ped Surg/Endosurgery)

Essentially, Acute Care Surgery is what general surgery used to be [Jurkovich and Rozycki(2010), p.863].

What do Surgeons Say About ACS?

- That depends who you ask (and whether the sub-specialisation meaning is applied):

The expansion of this specialty into orthopaedic trauma care is concerning...Attempting to patch the current model by adding “uncomplicated trauma procedures” from other specialties to make a career in trauma surgery more appealing will likely be divisive [and] detrimental to the patient

[Bosse et al.(2005) Bosse, Tornetta, Sanders, Swiontkowski, and Russ

What do Surgeons Say About ACS?

Whether a new training paradigm, “acute care surgery”, will benefit patients, the health services and the surgeons in New Zealand and elsewhere remains to be seen [Bhagvan and Civil (2009)].

What do Surgeons Say About ACS?

We strongly advocate...that such acute-care general surgery should not become a subspecialty of general surgery but remain a core competency of general surgery [Parasyn et al.(2009)Parasyn, Truskett, Bennett, Lum, Barry, Haghig p.16].

Acute Care Surgery As Process Innovation

- Edinburgh (separation of emergency and elective surgery) [Addison (2001)]
- Pennsylvania (appendectomy - ACS v on-call) Earley et al. (2006)]
- California county ACS model [Garland (2007)]
- Virginia [Britt et al. (2009)]
- Prince of Wales Hospital [Parasyn et al.(2009)Parasyn, Truskett, Bennett, Lum, Barry, Haghig
- Nepean [Cox et al.(2010)Cox, Cook, Dobson, Lambrakis, Ganesh, and Cregan

Nepean–Acute Surgical Unit (ASU)

- Consultant-driven, independent unit, with same composition and functions 7 days a week.
- Consultant does 24 period of on-call 7pm-7pm; in-hospital 7am-7pm (sole responsibility to ASU)
- ASU day team: 2 registrars, 2 residents, 1 nurse practitioner.
 - in any given week: 3 day registrars with staggered roster + night registrar
- Handovers aided by comprehensive ASU database.

- [Cox et al.(2010)Cox, Cook, Dobson, Lambrakis, Ganesh, and Cregan report
 - reduced proportion of after-hours operations
 - improved work conditions for consultants
 - high-frequency review of patients (+ “second opinion” advantage of handover)
- Disadvantages
 - weekday swaps difficult
 - inadequate remuneration to cover lost private work

What do Economists, Generally, Say?

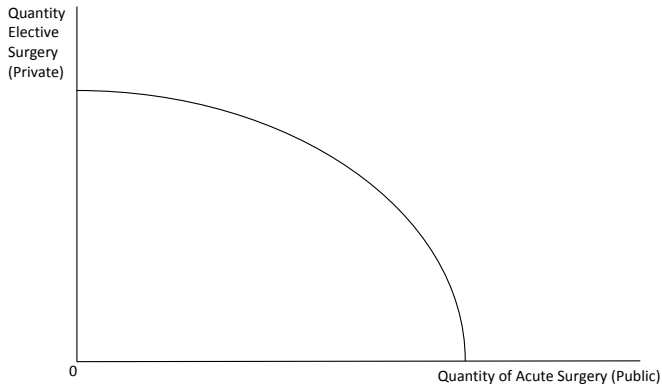
- Econlit—the premier source for economics references—search term: “Acute Care Surgery” “Acute Surg* Unit” (etc.)
 - search results: $n = 0$
- But there are several parts of the economic literature that are pertinent, including applications of linear programming, economic evaluation, labour economics etc.

An Economic Statement of the Problems

- Short-run
 - the surgical labour supply and medical technologies are fixed
 - the labour supply is inelastic
 - at least some surgeons exercise choice over private-public mix
- Long-run
 - factors of production are variable
 - technological change and workforce growth possible
 - effect of tech change on surgical labour demand?

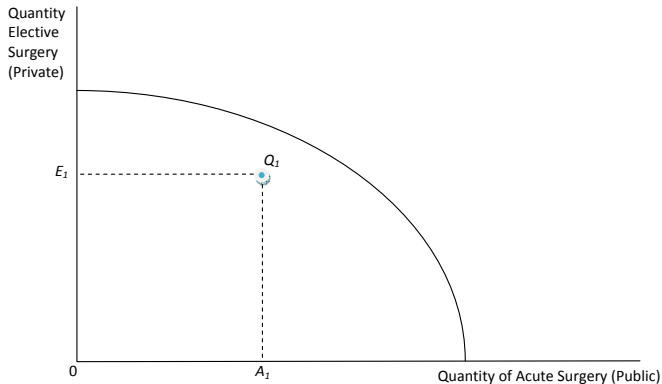
An Economic Model

Production possibilities frontier: surgical services



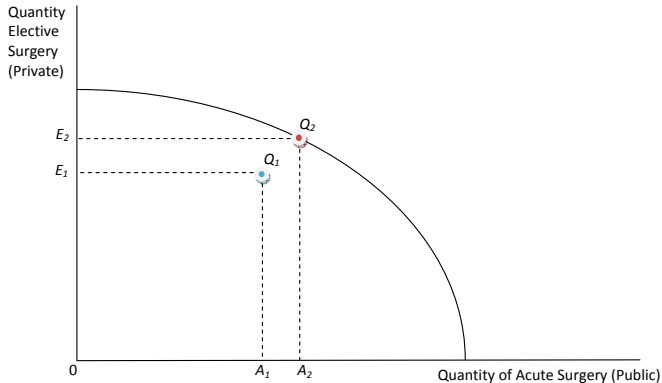
Characterising ASU-Type Innovation

Technical/productive efficiency (pre-innovation)



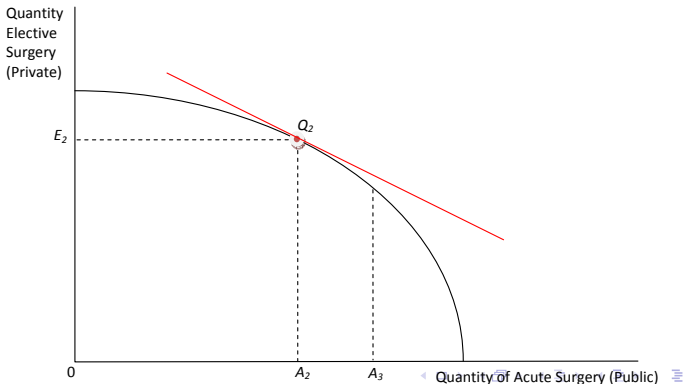
Characterising ASU-Type Innovation

Improved technical/productive efficiency (post-innovation)



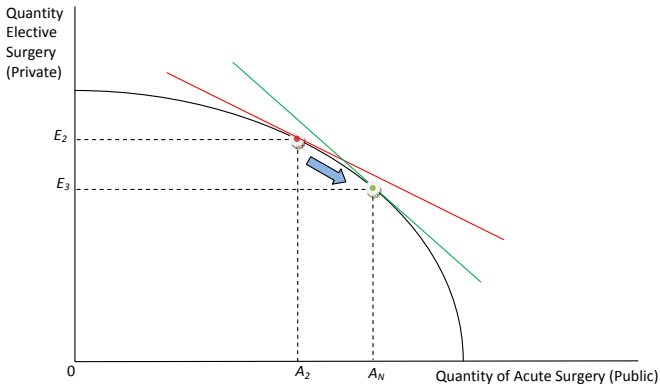
The Remaining Problem

The current service mix is chosen according to current relative prices: but more acute services are needed



Fixing the Problem

A short-run solution: change the relative prices



The Short-Run Solution (Recap)

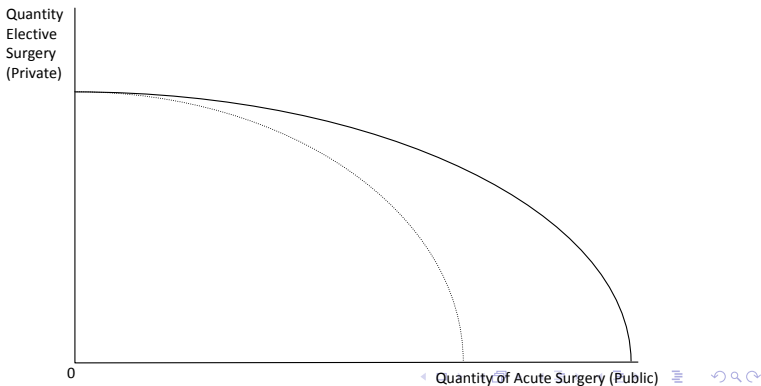
- Once (process) innovations that improve efficiency are exhausted (e.g., POWH and Nepean models?)
- Probably the only realistic short-run solution is to change relative prices
 - if supply were elastic, this could entail **lowering** the price of elective surgery
 - but supply is inelastic, so this entails **raising** the remuneration for surgeons in the public system
- Other options, such as providing more leisure time (etc.) would appear difficult, given the overall labour constraint.

- Workforce planning, boosting number of qualified practitioners, is important.
- In this context, the US ACS (Training) model and the UK/Australian alternatives (which do not involve the establishment of an ACS subspecialty *per se*) may be contrasted.

- A simplified/illustrative representation (some may say, caricature) of the ACS Training model
 - assume ACS subspecialists have license restrictions that prevent them from performing elective surgery
 - assume steady state for other surgical specialties that do perform elective surgery

Long-Run Changes

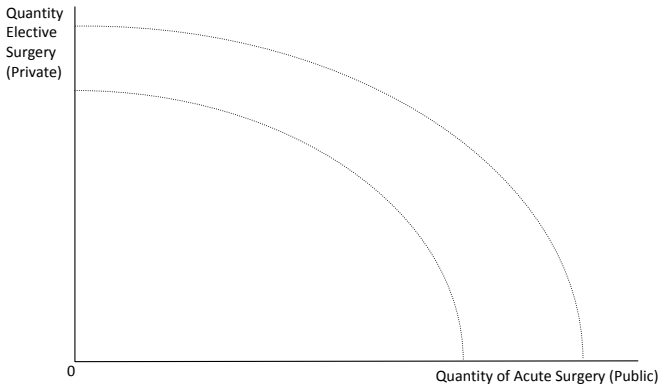
A Simplified Representation of the ACS Training Strategy's Effect on Long-Run Production Possibilities



- By contrast, the position that appears to have been adopted in Australia and the UK (for example) appears to involve
 - no “discontinuities”/seismic changes in training programs
 - recognition of need for workforce growth
 - consideration/adoption of process innovations (e.g., POWH-, Nepean-type approaches).

Long-Run Changes

A Simplified Representation of Workforce Growth (No Structural Changes to Training)



- The ACS “training model” does not, *prima facie*, seem to be a good solution to Australian problems in acute surgical care
- High levels of sub-specialisation in surgery have benefits for consumers
 - learning effects, economies of scale (etc.)
- Disparate levels of remuneration for public and private practice (along with short supply) is an important problem
 - note: some differences are tolerable, if compensated by professional challenge etc.

- POWH/Nepean ASU approach appear to improve some aspects of public practice without worsening indicators of quality (etc.)
 - measurement of the ultimate benefits and costs of this type of intervention is challenging
- Effects of demand on absolute price level and relative prices was not considered above
 - price/remuneration relativities are amenable to manipulation under the Medicare arrangements

Selected References



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