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Should cost considerations be included in medical decisions? Yes

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The inexorable rise in healthcare costs as a proportion of national wealth is a trend that is increasingly recognized as being unsustainable [1]. Healthcare leaders have a critical role if this problem is to be addressed. At first glance, linking healthcare quality improvement to payment appears straightforward. Improve the care that one provides to one's patients and one is rewarded financially, but this strategy assumes that clinicians and administrators possess the necessary tools and knowledge, and that

the delivery system has the necessary levers. In fact, as stated by Cohen et al. [2], “although health-care workers and hospitals are publically committed to reducing inappropriate care, improving patient safety, achieving better health outcomes, and holding down costs, many are unsure how to do this effectively”. Moreover, this approach can underestimate healthcare system complexity and, in extreme circumstances, contribute to unintended and very harmful adverse outcomes through misaligned incentives, as occurred in the Mid Staffordshire Hospitals in the UK in the early 2000s [3].

Who might be interested in hospital spending reduction? Certainly governments and other healthcare payers, and hospital managers, but what about ICU physicians? The ICU director physicians might be motivated if cost reduction translates into rewards for the ICU: more nurses or research personnel, new equipment, funding for education, or other tangible benefits. Whether this can actually work depends crucially on the organizational model that exists within a hospital. In many institutions the effort required for cost containment does not translate into any reward for the unit and staff. The “pay for performance approach” and hospital incentives are either ineffective or do not benefit the ICU budget, or any gains are lost within the wider hospital finances. Moreover, hospital systems can be very cumbersome when it comes to displaying performance indicators. In this environment it is not surprising if ICU physicians are poorly motivated to consider cost in their decision-making. This is particularly true for young doctors who underestimate the true cost of expensive procedures or drugs [4].

One of us (RB) works in an alternative model where the multidisciplinary clinical leadership team of the ICU are directly responsible for the whole of the ICU budget, and where there is relatively sophisticated understanding of the difference between budget and cost, and transparency about income, activity, and expenditure. In such a system, where the clinical leadership is empowered to

take spending decisions, but is also directly accountable for both clinical and financial performance, there are powerful incentives for physicians to become much more involved in controlling costs by using clinical insight to improve quality and therefore reduce waste. Good financial performance then becomes an important performance and quality metric. This approach also encourages the development of clinically led management structures that are able to drive standardization through shared decision-making about (for instance) formulary content and drug policies, especially if aided by modern electronic record systems. This also encourages some clinicians to become more involved in clinical management, and to develop an understanding about the ICU's place within the broader hospital environment, and how it can contribute to overall financial success. Decisions about cost and value can then be taken across a whole patient pathway, rather than considering component budgets in an isolated and artificial fashion.

Medical resources are finite in all countries and inevitably generate tensions in our duty to respect autonomy, beneficence, and social justice, and rationing does occur [5]. From that perspective, reduction of spending by reducing unnecessary laboratory tests, imaging or by choosing cheaper drugs with equivalent efficacy must surely help. In most countries, public hospitals are funded through the diagnosis-related group (DRG) system [6], which does not consider individual procedures or specific drugs so there is often inadequate internal control. However, most ICU directors would like to have access to a detailed description of income and spending [7], suggesting that ICU leaders are willing to integrate cost constraints into daily practice when the system makes it practicable.

How does one reduce unnecessary or expensive prescriptions? For high-cost medications and specific antibiotics, in some countries a senior prescription is mandatory, with specific justification required before drug dispensing. For laboratory tests, electronic ordering systems can help in reducing redundant investigations and indicating true cost. A medico-economic approach with estimation of cost per year of saved life might also be educational [8]. The example of albumin is illustrative. The cost estimate for 100 mL of 20 % human albumin was 143 € while the true cost is 39 € in the study by Hernu et al. [4] so the cost-effectiveness assessment is largely overestimated [9]. This lack of knowledge of the true cost might explain the reluctance to use human albumin. An example of the opposite phenomenon was the estimation of the cost of recombinant activated factor VII at 1723 € while the true cost was 4574 €. This might explain prescription of that drug outside accepted guidelines. Moreover, to maximize return on effort, we should probably focus our attention on the 20 % of drugs accounting for 80 % of spending. Unfortunately, Hernu's paper does not provide information on the volume of prescription of the 46 selected prescriptions and so does not inform priorities for implementing corrective action.

Is it possible to reduce radiology examinations without impairing quality of care? There is no consensus for several situations [10]. Until 2011, US guidelines recommended routine daily chest radiographs (CXR) for mechanically ventilated patients in ICUs. However, on the basis of a multicenter cluster-randomized two-period two-strategies cross-over design, we have shown that *on-demand* strategies induced a reduction of 32 % of CXR. This CXR reduction did not translate into reduction of numbers of CXRs leading to therapeutic or diagnostic

Table 1 Recommendation of the American College of Radiology for CXRs in the ICU

| | | | | |
|-------------|--|--------|---|---------------------------|
| Before 2011 | Variant 2: Respiratory failure. Patient receiving mechanical ventilation. | | | |
| | Radiologic Procedure | Rating | Comments | RRL* |
| | X-ray chest portable daily | 9 | | Min |
| | X-ray chest portable clinical indications only | 9 | | Min |
| | Rating Scale: 1=Least appropriate, 9=Most appropriate | | | *Relative Radiation Level |
| Since 2011 | Variant 2: Respiratory failure. Patient receiving mechanical ventilation. | | | |
| | Radiologic Procedure | Rating | Comments | RRL* |
| | X-ray chest portable clinical indications only | 9 | | ☼ |
| | X-ray chest portable routine daily | 3 | Some subgroups may benefit from a daily chest radiograph. | ☼ |
| | Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate | | | *Relative Radiation Level |

Summary: "Routine daily CXR in the ICU is not indicated"

interventions. The two strategies were associated with similar mean durations of mechanical ventilation, ICU stay and ICU mortality rates [11]. Recommendations have changed (Table 1) and recent meta-analyses confirmed that unselective daily routine CXRs can likely be eliminated without increasing adverse outcomes in adult patients in ICU [12].

Uncontrolled and unnecessary spending jeopardizes our ability to apply recommendations with high levels of evidence. The concept of distributive justice applies in situations of cost constraint and physicians generally

understand this reasoning. Every effort should be made to spend the ICU budget wisely, and to make any limitations transparent, since this ensures the widest possible patient benefit and debate. A combination of bottom-up and top-down solutions is required, so that clinicians have the necessary information to aid decision-making when at the bedside, but are also engaged in designing organizational structures and driving standardization so that it becomes easy to do the “right” thing. Generally speaking, high-quality care, where everything is done correctly from the outset, is also more cost-effective care.

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