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Juan B. Ochoa Gautier

Critical Care Medicine
Ochsner Medical Center
USA

juan.ochoa@ochsner.org

[in linkedin.com/in/juan-ochoa-3a263627/](https://www.linkedin.com/in/juan-ochoa-3a263627/)

The business of research

What is the value of physicians and their contribution to the healthcare system and economic growth? This article talks about the need to understand the real value of physicians and to encourage them to be creative and innovative as this would improve their value beyond that of daily clinical labour.

Disruptive innovations are critical for the exponential economic growth that our society enjoys (Press 2013). While anyone can innovate, physicians are particularly well-trained to create disruptive innovations. And yet, our healthcare system overwhelmingly uses physicians only as *labour* ignoring the real *value* that they can bring. Physicians are versatile, with knowledge that spans the entire breadth of the evidence development process. This includes an intimate understanding of the *unmet needs* (of the patient and the healthcare system), the generation of breakthrough *mechanistic discoveries* and demonstration of *efficacy* of solutions created, to the final adoption of new standards of care. The real *value* of physicians comes from their capacity to *innovate*. Denying their creativity and participation in this process ultimately hurts all. Empowering physicians to contribute beyond their day to day labour is not only good business; it is an essential endeavour for these professionals.

Introduction

Training for physicians typically takes over 10 years and is even longer (up to 15 years or more) for those training in surgical specialties. The cost to the individual is very high in the United States and abroad and frequently obligates students to obtain large loans. The social investment in training physicians also involves large investments (rand.org/pubs/research_reports/RR324.html). It is expected that all this training “pays off” with a **return on investment (ROI)** that can and should be measured in societal and health economic benefits. Why is medical training so long? Is it necessary? Is society getting its ROI? What is the value of the physician and her/his contribution to the health care system and economic growth? This article proposes that physicians are particularly well-trained at generating new knowledge and new innovations that will improve their value beyond that of daily clinical labour.

Measuring Value

Value in healthcare is defined as clinical outcomes [O] divided by cost [C] modified as a function by the patient experience [PE] (Moriates et al. 2015).

$$V=(O/C) f x PE$$

This equation can be used to determine the value that a physician brings to the healthcare system as a product of her/his labour. For the most part, physician value is measured solely in her/his capacity to improve clinical outcomes, and each patient encounter is measured (at least in the United States) as *relative value units (RVUs)*. Physicians are also key to a satisfying patient experience and in managing health economic costs, even though these two factors are rarely incorporated in measuring physician value.

the real value of physicians comes from their capacity to innovate

Physician labour is essential for the sustained growth of the healthcare system, and the healthcare system itself is an essential aspect of maintaining economic growth. But physicians, as explained earlier are expensive to train and thus, it begs the question as to whether all this training (and expense) is necessary for the delivery of high-quality labour. In contrast to the training for physicians, training for other healthcare providers such as physician assistants (PA) or nurse practitioners (NP)

is much shorter, typically taking less than half the time it takes to train physicians. Despite this shorter training, the technical skills developed by PA and NP enable them in many instances, to competently perform responsibilities that would otherwise be reserved for physicians. PA and NP focus on providing clinical duties such as assessing patient conditions, making diagnoses and initiating and continuing medical treatments. PA and NP, with some additional training, can intubate patients, do invasive procedures and participate in surgery. In fact, in some instances, NP and PA can perform 90% or more of the roles that a physician normally plays (Johal and Dodd 2017). These observations place us in a conundrum; the investment in physician training must generate better value than just the performance of clinical activities. Thus, it is fitting for us to determine what *value*, in addition to that of the generation of clinical revenue through daily labour, can be brought by physicians for the benefit of patients and the healthcare system.

Value and economic growth – a macro-economic perspective

The world's economy has been growing exponentially, particularly since the end of the 2nd World War. The fruits of daily labour (including

From Discovery to application to adoption - Evidence Development Process (EDP)

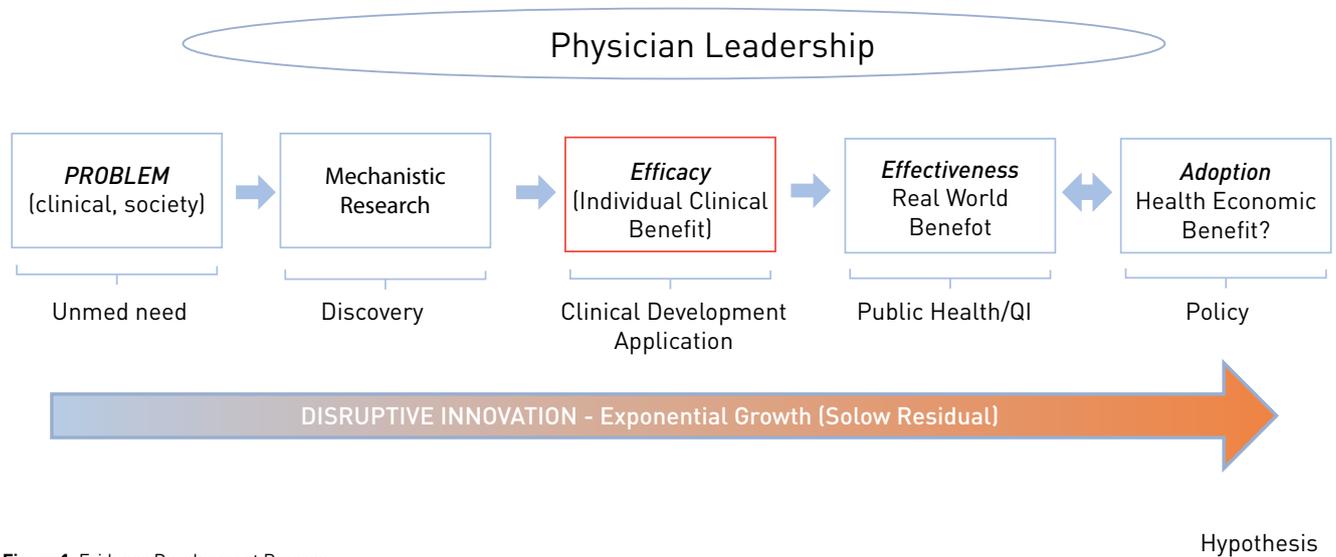


Figure 1. Evidence Development Process

physician labour) explain a sustained economic growth but fail to explain the exponential growth that we have become accustomed to. It took Robert Solow (Nobel Prize 1987) to explain that exponential growth came from the incorporation of the disruptive innovations that came from the creation of new technologies and the scientific knowledge necessary to create them (Press 2013). Disruptive innovations tend to simplify and/or improve daily living and, because of the benefits generated, are integrated into the social fabric.

Physician education involves an all-encompassing training that ranges from understanding the intricacies of the biological alterations caused by illness, the available treatments, the complexity of the healthcare system within which care of the patient is delivered, and the social environment where this takes place. It is the complexity of their training that physicians are particularly well poised to create disruptive innovations and ultimately to incorporate these into daily clinical practice.

Incorporating disruptive innovation into an evidence development process

To better understand the roles that physicians can and should play for the creation and

successful implementation of disruptive innovation, it is important to understand the process by which this takes place. This is called the evidence development process (EDP), and it involves a series of steps starting with the recognition of unmet needs for the patient and the healthcare system to the successful adoption of effective solutions into healthcare practices (Figure 1).

Understanding unmet needs; where an unmet need is defined as a poor health outcome that increases healthcare costs and for which an effective solution has not been successfully implemented.

Discovery phase involves the identification of the mechanisms that lead to illness and the development of hypothetical solutions that are first tested in a preclinical setting.

Clinical development phase tests solutions with the demonstration of efficacy on a measurable clinical outcome at an individual level (e.g. mortality).

Traditionally, the demonstration of efficacy was enough for advocating widespread use of a solution independent of cost or any barriers preventing its adoption into clinical practice. It has become apparent thus, that two other steps in the evidence development

process must be considered.

Demonstration of effectiveness comprises a phase where an evaluation of the societal value of the solution is evaluated. Health economic evaluation and analysis of cost-effectiveness are central to this phase.

Adoption; because the success of any solution created, including its demonstration of true value depends on its incorporation into daily clinical practice. Quality improvement initiatives, the generation of guidelines and the implementation of policies are all tools designed to generate widespread utilisation of technology.

Medical school uniquely prepares future physicians to engage in every aspect of the evidence development process with potential roles that reach far beyond their clinical training. Physicians, for example, intimately understand the patient unmet needs. Physicians are the main actors in their own practice and spontaneously engage in quality improvement projects to adopt new solutions to their clinical practice. Through their leadership, physicians have the capacity to engage in the creation of mechanistic discoveries, which are the foundation for the creation of disruptive innovations. Physicians happily engage in clinical develop-

ment with demonstrations of efficacy as well as participating in effectiveness trials.

Encouraging physicians to participate in disruptive innovation

It is in the desire of economic growth and the betterment of the healthcare system that an effort needs to be made to create an environment where physicians are encouraged to create disruptive innovations. Society needs highly trained and skilled workers to deliver on their full potential, far beyond labour. Who knows what new disruptive innovations are lurking in the minds of physicians, just waiting for the right opportunity?

Creating a working environment that facilitates disruptive innovation

Creativity is at the core of disruptive innovations (Pink 2009). Creativity is that moment when a new radical idea, exciting in its simplicity and the harmony of its cleanliness, erupts from the mind of an individual to provide a new solution, a new paradigm that radically improves and changes our world. A significant amount of knowledge as to the environment required to stimulate creativity comes from the knowledge generated through Behavioural Economics, a discipline that incorporates psychology and neurocognitive sciences, helping us understand how day to day decisions (including economic decisions) are made. Three key elements are necessary:

1. **Time away from daily labour.** Essential in the process of creativity is allowing a “time-space” that permits an individual (or a team) to think creatively. It is customary that creative thinking is done outside of the activities of daily labour, but this needs to change. **Creative time** is an integral part of physician daily activities and needs to be protected. After all, creative thinking will result in increased **value** beyond that of clinical activities (Huettel 2014).
2. **Lack of accountability.** Measuring labour is easy; measuring the benefit of creative time is difficult. Difficulties in measuring productivity that comes from creative

time is a frequent argument to state that companies can “just not afford” to invest in it. The counter argument is quite powerful, however. If disruptive innovation is what brings exponential growth, we simply need to give physicians time for creative thinking lest we miss on any disruptive innovations created. Interestingly, several companies have tested the concept of carving time for creativity. Google, for example, encourages creative time. 3M also does this. Evidence demonstrates that time for creativity has generated a large amount of growth for these companies.

the misuse of physicians as clinical labour robs our society of the benefits that they could bring to the patient, the health-care system and to social-economic growth

3. **Existential motivation.** Traditional economic theory (also called rational economic models) dismisses the importance of **altruistic existential motivations** that lead to a betterment of society with assumptions that these (existential motivations) bring no inherent **value**. Thus, the motivation of physicians to help and assist other human beings in achieving health is frequently ignored or even actively disincentivised within complex healthcare systems. Behavioural Economic Theory, however, demonstrates that, once basic needs are met, altruistic existential motivations are central to promoting creativity in human beings. Promoting, protecting and incorporating altruistic existential motivations is thus the essential “fire” that exists at the centre of the creative engine that leads to disruptive innovations.

Conclusion

Exponential economic growth comes from the incorporation of disruptive innovations into applications that generate value by simplifying and/or improving our daily living while generally reducing cost. Central to disruptive innovations is an environment that promotes creativity. Creativity demands time away from daily labour and a free environment where altruistic existential motivations provide an environment conducive to the generation of new (and often radical) paradigms. Physicians are a group of highly trained individuals, which have as their central motivation, the betterment of their patients. Based on this altruistic existential motivation along with long years of training, the physician is particularly adept at participating and providing the necessary leadership during the evidence development process that leads to the generation of disruptive innovations. The misuse of physicians exclusively as “clinical labour” robs our society of the benefits that they could bring to the patient, the healthcare system and to social-economic growth. ■

Key points

- Disruptive innovations are critical for the exponential economic growth that our society enjoys
- For the most part, physician value is measured solely in her/his capacity to improve clinical outcomes
- Physicians are particularly well poised to create disruptive innovations and ultimately to incorporate these into daily clinical practice
- Through their leadership physicians have the capacity to engage in the creation of mechanistic discoveries, which are the foundation for the creation of disruptive innovations.

Abbreviations

EDP	Evidence Development Process
NP	Nurse Practitioners
PA	Physician Assistants
ROI	Return on Investment
RUV	Relative Value Units

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