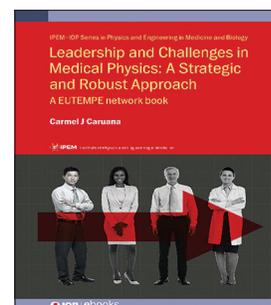


## Leadership and challenges in medical physics: A strategic and robust approach

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Medical physics is one of the most challenging and rewarding applications of physics to human health care program and is mainly concerned with the use of ionizing radiation in the diagnosis, therapy, and research in healthcare. Medical physicists working in the clinical environment are health professions as per the International Labor Organization and World Health Organization classification. The environment surrounding healthcare is rapidly evolving, and the technological innovation in the application of radiation in medicine is in fast progress. Medical physicists working in the clinical environment are expected to keep track with the exploding technological development and should have required competency, and therefore, undergo a structured education program and residency. Our exceptional education and training in physics, mathematics, medical devices, radiation, and other physical agents, and information technology has made us what we are today – a highly successful profession that has changed the face of healthcare. As a group, medical physicists are excellent scientists and health-care professionals. On the other hand, our education and training programs provide a little experience in how to deal with the real-world issues facing us when we move from the relative security of our academic physics departments to the realities of modern, large, complex health-care organizations. Therefore, in today's world, being a good medical physicists as health professional is simply not enough to survive and thrive in a multi-professional health-care system where in doctors, nurses, paramedics, administrators, and managers are part of the system; interprofessional teamwork has been reduced from a richly stimulating, intellectually satisfying multiprofessional environment to a battleground where a relatively hostile environment exists, and hence, the strategic and robust leaders are important for all professions, which is true for medical physics profession as well. Conventionally, as a profession we have, and rightly so, given major importance to science and science leadership. Leadership in medical physics is important because without good leadership, clinical or research teams fail to deliver, and

the profession as a group would not develop locally, nationally, regionally, or internationally. On account of the unique services provided by medical physicists, such failures would ultimately result in a degradation of the effectiveness, safety, and efficiency of the patient services. Being in this profession for more than three decades, I have realized how important professional leadership is.

In the past years, we have given greater attention to education and training issues, and one will find many books devoted to education and training of medical physics. The result of low importance given to the professional issues is that we did not have a single book which addresses the issues of leadership or the challenges we face in the profession due to lack of leadership grooming.

It gives me a great pleasure to review the first-ever book on leadership and challenges in medical physics, and I share the author's desire that "the book will stimulate much needed discussion regarding current professional issues and help develop strong strategic leaders for our profession." There is much wisdom in this book, and I am sure many of us who have been involved in the leadership of the profession will recognize many of it as forming part of our own thinking and experience. Being involved in professional activities at various positions in professional organizations, I confess that if such a book would have been available earlier, it would have helped me much more to deliver as a professional leader; nonetheless, it will help in future tasks.

This comprehensive book on leadership in medical physics is compiled by Prof. Carmel J. Caruana and published by the Institute of Physics (IOP) Publishing as a part of "Institute of Physics and Engineering in Medicine–Institute of Physics (IPEM-IOP) Series" in Physics and Engineering in Medicine and Biology. The book very empathetically stresses the difference in leadership and management. According to the authors, the leadership is the process of influencing and motivating others to agree on and work toward an exciting

shared future vision, there is a focus on inspiring others and creating shared organizational culture and values. Managers are employed to get things done by making sure administrative tasks such as planning, organizing, budgeting, quality controlling, staffing, and problem-solving are carried out effectively and without unnecessary waste of resources – the role of a manager is closer to that of an executive officer. The two roles of leadership and management are essential, but they are not the same. According to the author, it is very important to keep in mind that leadership is not administration, and certainly, leadership is not about being a boss. To do this, we need strategic and robust leaders who are well prepared to take on these tasks, which do not only aim to preserve the gains of the past but can push the profession to new heights. However, such leaders need to be educated and trained, and the resources for this simply do not exist. I am hoping that this book will be a first solid attempt at addressing this lacuna in our education and training as a health professional.

In the book, the author has classified four types of intelligence relevant to medical physics leadership, such as analytical, creative, practical, and emotional intelligences.

The book has been divided into ten chapters to deal with various aspects of leadership and strategic planning:

1. Chapter 1: What is strategic and robust leadership, and why is it critical for medical physics in the present environment?  
In this chapter, strategic and robust leadership is defined, and its importance for medical physics in a world dominated by austerity economics and interprofessional issues has been discussed. The chapter includes advice on how one can prepare oneself for leadership roles while highlighting that leadership is ultimately a personal journey.
2. Chapter 2: A strategic planning primer for medical physics leaders  
In this chapter, strategic planning is described in detail and applied to medical physics. The steps involved in developing, implementing, and evaluating a strategic plan are described. Furthermore, the various types of medical physics groups and teams that one could lead are described in detail and in a very effective manner.
3. Chapter 3: Internal STRENGTHS of medical physics  
In this chapter, one finds an inventory of the main strengths of medical physics and their importance for strategic planning. The chapter deals advantages to be a clinical medical physicist, the environment he/she works in, and how he/she can use the situation to strengthen and portray the contribution and importance of medical physics to health-care delivery system.
4. Chapter 4: Internal WEAKNESSES of medical physics  
This chapter presents a detailed discussion of the main weaknesses of medical physics and emphasizes on identifying, understanding, and rectifying. The author discusses the medical physics profession and compares the number of medical physicists with the number of

nurses and doctors in the hospital/institute. Medical physicist's number is very small as compared to others.

5. Chapter 5: External environmental OPPORTUNITIES for medical physics  
In this chapter, there is a detailed discussion of the main opportunities available for the further development of medical physics, and it explains that the key opportunities are those opportunities with a higher benefit value.
6. Chapter 6: External environmental THREATS for medical physics  
This chapter presents the main threats and challenges to the development of medical physics. The author emphasizes that such threats should be countered in the same manner that physicists counter all other problems: they should be acknowledged, researched, analyzed, addressed, and eliminated. In a hospital environment, there are attempts of dominance by other professionals and due to their number, powerful union, and influence the management, which can be detrimental to medical physics professionals.
7. Chapter 7: Healthy leadership and leadership styles  
This chapter presents the current view of what in the long run makes a leader successful. The various leadership styles are presented, and the application of their use in the different stages of the development of a project team is discussed in this chapter.
8. Chapter 8: Organizational psychology (also known as occupational psychology)  
This chapter discusses organizational psychology and its usefulness for the organization's success by improved performance, job satisfaction, motivation, and well-being and emphasizes that in the health-care system, the medical physics leader needs the knowledge of organizational psychology.
9. Chapter 9: Organizational politics – Learning to play the political game  
This chapter discusses organizational politics, and according to the author, organizational politics is inevitable and trying to avoid, it is bad for the group but learn how to survive, it is the best strategy.
10. Chapter 10: Negotiating skills for the medical physics leader  
This chapter distinguishes between distributive and integrative negotiation and reminds the reader that negotiation is the part of the problem-solving, part of controlling the egoistic tendencies of others, part of game, and part of luck.

The book narrates the importance of leadership in a multidisciplinary competitive health profession, its influence on growth and recognition of the profession. The book guides a professional medical physicist to prepare oneself for leadership with a quote "leadership is a personal journey." This book is not a textbook, but a useful and unique reference book designed to guide to develop leadership skills. However, the book lacks in illustrations, flowcharts for quick understanding, and the language is bit tricky to understand.

**Arun Chougule**

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I recommend this book a must read for postgraduate students, medical physicists, and educators in this profession.

About the author: Prof. Carmel Caruana.

The author is well known both in Europe and internationally and well placed to write about the topic. At present, Prof. Carmel J. Caruana is heading the Medical Physics Department at the Faculty of Health Sciences, University of Malta. In Malta, he has guided the development of the medical physics profession from a situation when it was totally unknown. As chair of the EFOMP Education and Training Committee, he has contributed to the development of European Guidelines on the Medical Physics Expert and policy documents. As EFOMP representative, he contributed to EU projects such as MEDRAPET, EUTEMPE, and ENETRAP. His experience has helped the development of International Medical Physics Certification Board guidelines. He has set up, under the auspices of EUTEMPE and EFOMP, the first-ever comprehensive module for leadership in medical physics, which has now been running for over 6 years, a module which has been described as a “Mini-MBA for Medical Physicists.” His vast experience and expertise in medical physics education and training has reflected in the text of the book.

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