

Preface

The spectacular developments in surgery and procedure based treatments brought to the agenda concerns about the training and development of skills by young doctors and the acquisition of modern techniques by experienced surgeons. There is a widespread recognition that the traditional system of skill development in the operating room is no longer adequate. Many of the operations that were commonly performed and were used in whole or in part for basic training experiences are no longer in common usage. Forty years ago a third-year general surgical resident could expect, each week, under supervision to perform or significantly participate in several open abdominal “set piece” operations such as vagotomy and drainage, open cholecystectomy, and hernia repair. The cure of ulcers by medical treatment replaced vagotomy and the widespread adoption of minimally invasive surgery for cholecystectomy and hernia repair removed large and important educational opportunities fundamental to the basic training programs of most of the surgical specialties. In addition, the introduction of working time directives and the requirement to train more surgeons without commensurate expansion of services restricted the clinical experience of the individual trainee.

The introduction of minimally invasive surgery, particularly laparoscopic cholecystectomy, was accompanied by an increased frequency of complications, many life-threatening, particularly during the early experiences. That these problems could occur when experienced surgeons, well versed in open procedures and with knowledge of anatomy and pitfalls embraced new procedural practices heightened concerns about the training of novices who lacked such a background in open surgery. But the agenda was now set, surgery needed to develop new methods for training the novice in surgical approaches in general and for training experienced surgeons in the newer techniques. A series of high profile adverse medical events drew the attention of the general public to issues of clinical training. The societal response was best epitomized by The Bristol Inquiry – “there can be no more learning curve on patients.” Surgery was forced to confront realities and to consider new approaches to surgical training – particularly the development and use of simulation to train and develop new techniques and procedures “off site.” Surgeon Trainers were forced to engage with psychologists and computer engineers to develop new simulation technologies and to validate simulation based transfer of training to the clinic and operating room.

In *Fundamentals of Surgical Simulation* we attempt to provide a resource for program directors, surgical trainers, surgical trainees, psychologists, simulation engineers, and researchers. For trainers, this book gives explicit theoretical and applied information on how this new training paradigm works thus allowing them to tailor the application of simulation training to their program, no matter where in the world they work. For the trainee, it allows them to see and understand the rules of this new training paradigm thus allowing them to optimize their approach to training and reaching proficiency in as efficient a manner as possible. For the simulation researcher, engineer, and medical profession *Fundamentals of Surgical Simulation* poses some difficult questions that require urgent unambiguous and agreed answers.

This book is the product of a friendship and mutual respect between an experimental psychologist and a practicing surgeon/surgeon trainer. This friendship permits forthright exchanges of views and endures many agreements and disagreements particularly on the science and philosophy of surgical simulation, training, assessment, and validation. The outcome has been consensus, fellowship, friendship, and an abundance of (Irish) *craic*.

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Principles and Practice

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