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TELEDERMATOLOGY:
A User's Guide

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TELEDERMATOLOGY

Teledermatology: A User's Guide was written to provide practical information for those individuals contemplating or planning a teledermatology program or expanding their current use of teledermatology. It focuses on the practical aspects of teledermatology implementation while providing a comprehensive treatment of the topic.

Discussions include business models and reimbursement issues, the current status of teledermatology research, the integration of teledermatology into dermatology residency training programs, ethical considerations, confidentiality issues, and the "art of teledermatology." It explores the technical aspects of teledermatology and describes the differences between live-interactive techniques and store-and-forward techniques. This book is intended to provide both novice and seasoned teledermatologists with comprehensive and practical information on teledermatology.

Many of the chapter authors are among the world experts in teledermatology and have developed successful and viable teledermatology programs. The knowledge presented here is based on the lessons they have learned in the course of teledermatology development.

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This book is dedicated to all the individuals who have developed, researched, and supported teledermatology in the past and to those individuals who will, in the future, further advance the field of teledermatology.

Contents

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1 Introduction

John D. Whited, Karen E. Edison, and Hon S. Pak

The goal of this book is to provide practical guidance for anyone who is interested in initiating a teledermatology program or expanding their current system. This book was written for a wide audience to include anyone in a private practice, academic center, large multispecialty clinic, state or federal sector.

To build a successful program several features require consideration and each is addressed in turn throughout this book. Specifically, relevant questions include the following:

1. What are your motivating factors? Do you want to increase access for the underserved? Increase your revenue stream? Maximize flexibility in your lifestyle? Or a combination of these factors?
2. What type of technology should you implement – store-and-forward, real-time interactive, or a hybrid model?
3. What are the equipment needs?
4. What communication systems are available for data transmission?
5. Who should be targeted as users (e.g., referring clinicians, patient population, and/or participating teledermatologists)?
6. Is teledermatology a sustainable enterprise and what are the business models that can be followed?
7. Is teledermatology reimbursable and, if so, how?
8. Is image quality good, and what are the training requirements?
9. Is teledermatology a diagnostically viable way of delivering dermatologic healthcare?
10. What legal, regulatory, and confidentiality issues arise?
11. What are the ethical considerations of using the technology?
12. Can teledermatology be integrated into dermatology training programs?

Although this may seem like a daunting list, it should not discourage you from pursuing a teledermatology implementation plan. With proper forethought and planning, the development of a teledermatology program can be tremendously successful. As well as being among the world experts in

teledermatology, many of the contributors to this book have developed successful and viable teledermatology programs. The knowledge delivered in this book is based on experience that includes successes, failures, and lessons learned in the course of teledermatology development.

What is teledermatology? Teledermatology, in its simplest terms, is the use of communication information technology to deliver dermatologic care. Typically, technology is used when a conventional "face-to-face" clinic visit cannot be performed – implying that distance or some other barrier prevents this conventional method of healthcare. In these situations the patient and clinician are separated by a geographic barrier, with technology providing the link. This is actually a restricted view of how teledermatology may be used in healthcare delivery but is, nonetheless, a useful way to describe the most common rationale for teledermatology implementation – a patient and a clinician separated from one another by distance. As is described in more detail later, there are two types of unique teledermatology modalities. The first type of modality is real-time interactive patient care, which employs videoconferencing events that use audio-visual communication technologies. The patient and clinician interact with one another in real time and are thereby separated only by space and not time. These are also known as synchronous visits or consults. The second method is called the store-and-forward type. Store-and-forward type interventions use "still" digital images bundled with text-based historical and demographic data. Store-and-forward consults are typically generated and reviewed at different times and are, thus, sometimes referred to as asynchronous consults. Store-and-forward consults separate the patient and clinician in both space and time. Aside from the technology, the major difference between these two types of care delivery is the ability of the patient and clinician to interact with each other when using real-time interactive technology. More recently, a hybrid model has emerged that combines both technologies to leverage the advantages of each teledermatology modality.

Dermatology was an early adopter of telemedicine technology, in large part because of the visual nature of the specialty. Some of the first telemedicine reports in modern medical literature resulted from a telemedicine link between Boston's Logan Airport and the Massachusetts General Hospital in the early 1970s [1]. A telemedicine link was established at a traveler's clinic located within the Logan Airport and was staffed by physicians at the Massachusetts General Hospital. Many of these interventions involved travelers with dermatologic complaints [2]. This particular telemedicine program used videoconferencing (real-time interactive) technology. Telemedicine was relatively quiescent for several years after these reports. A resurgence in interest in the late 1980s and early 1990s coincided with the development of cheaper and more efficient videoconferencing technologies, personal computers, and the Internet. With the digital transformation of healthcare, telemedicine had a natural medium for data transmission. Specifically, digital imaging technology allowed for easy capture, transmission,

and review of digitized versions of skin conditions (i.e., digital images) that could be bundled with other digital information. These digital consults could be integrated as part of an electronic medical record or could utilize other existing technology such as web-based interfaces.

Teledermatology is an evolving aspect of healthcare delivery, in part, due to the technology-oriented features inherent to telemedicine. Nonetheless, teledermatology is more rooted in experience and evidence than many other uses of telemedicine technology. In fact, teledermatology has been considered one of the best studied of the telemedicine disciplines [3].

As is described in the literature review chapter (Chapter 4), teledermatology is considered to be a reliable and accurate means of making diagnoses of skin conditions. Successful teledermatology systems have been implemented in the U.S. Department of Veterans Affairs, the U.S. Department of Defense, state-run healthcare programs, academic medical centers, and in private healthcare. Overall, telemedicine has been accepted by practitioners and patients alike in these settings. Reimbursement, specifically federal reimbursement, for teledermatology services (and telemedicine in general) represents the greatest barrier to wider adoption in the United States. Whereas real-time teledermatology interventions can usually bill for services, store-and-forward systems (with some exceptions) cannot. This is an active area of legislation and lobbying, and one that is likely to evolve in the coming years. Interestingly, despite the lack of wide federal reimbursement, utilization of teledermatology appears to be growing. This growth may be a result of an ongoing shortage/maldistribution of dermatologist in the United States. In the conclusion of this book, readers are directed to various web sites and other sources that can provide up-to-date information on this and a myriad other issues that confront teledermatology.

Throughout the book, the following themes and concepts are addressed and integrated into each chapter, as applicable:

1. There is a significant maldistribution of dermatologists. In fact, approximately 40 percent of our population does not have access to dermatological services.
2. Teledermatology utilization is growing in this country and around the world to meet the needs of our patients.
3. Teledermatology primarily improves access to and efficiency of dermatological care delivery. It solves the problem of maldistribution.
4. Teledermatology includes live-interactive, store-and-forward, and hybrid modalities. It may involve primary care provider to dermatologist or patient to dermatologist, depending on the setting.
5. Telecare (direct patient care), teletriage, teleconsultation, and telereferral services are all possible with teledermatology.
6. Teledermatology is safe, timely, equitable, efficient, effective, and patient centered.
7. Teledermatology technologies are increasingly reliable and affordable.

8. The technology must be adapted based on the particular setting to ensure that it adds value to the organization (education, etc.).
9. Human factors are of greater importance than technology. It is more about people than technology.
10. New models of care delivery, like teledermatology, impact the traditional doctor-patient and doctor-doctor relationship. It allows other care delivery models not previously possible without teledermatology such as remote physician extender supervision and virtual hospital consultation.
11. Teledermatology allows for virtual collaboration among experts for challenging patients nationwide or even worldwide.
12. Teledermatology serves as a new evaluation tool in residency training and enhances overall residency education by allowing objective measurements of the core competencies and access to diverse patient populations, otherwise not possible previously.
13. Teledermatology does not seek to replace dermatologists; it allows greater optimization of our scarce dermatology resources by mitigating distance and/or time barriers to care.
14. The key to successful implementation is in clearly identifying the needs and values of the organization, setting realistic expectations, marketing/education/buy-in, and customizing a solution that minimally disrupts the care delivery process.

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