Medical Mentoring Via the Evolving World Wide Web

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OBJECTIVES: Mentoring, for physicians and surgeons in training, is advocated as an essential adjunct in work-based learning, providing support in career and non-career related issues. The World Wide Web (WWW) has evolved, as a technology, to become more interactive and person centric, tailoring itself to the individual needs of the user. This changing technology may open new avenues to foster mentoring in medicine.

DESIGN, SYSTEMATIC REVIEW, MAIN OUTCOME MEASURES: A search of the MEDLINE database from 1950 to 2012 using the PubMed interface, combined with manual cross-referencing was performed using the following strategy: ("mentors"[MeSH Terms] OR "mentors"[All Fields] OR "mentor"[All Fields]) AND ("internet"[MeSH Terms] OR "internet"[All Fields]) AND ("medicine"[MeSH Terms] OR "medicine"[All Fields]) AND ("humans"[MeSH Terms] AND English[lang]). Abstracts were screened for relevance (UJ) to the topic; eligibility for inclusion was simply on screening for relevance to online mentoring and web-based technologies.

RESULTS: Forty-five papers were found, of which 16 were relevant. All studies were observational in nature. To date, all medical mentoring applications utilizing the World Wide Web have enjoyed some success limited by Web 1.0 and 2.0 technologies.

CONCLUSIONS: With the evolution of the WWW through 1.0, 2.0 and 3.0 generations, the potential for meaningful tele- and distance mentoring has greatly improved. Some engagement has been made with these technological advancements, however further work is required to fully realize the potential of these technologies. (J Surg 70:121-128. © 2012 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

INTRODUCTION

Much is expected of the current medical trainee. Training must facilitate them to be clinically able, up to date with their knowledge, conversant with research and teaching methodology and be effective communicators.[1,2] The latest digital technologies may be a key enabler to support these requirements. The Department of Health in the UK has recently published a "Framework for Technology Enhanced Learning" that advocates the use of e-learning and simulation to enhance learning where there is a clear benefit to patient care.[3]

What Is Mentoring?

The advent of the European Working Time directive has led to a subsequent reduction in junior doctors' working hours. This has resulted in a reduction of experience and an apparent skills gap emerging. This problem is particularly felt in the practical-based specialties, such as surgery.

The educational theory of constructivism[4] and the principles of andragogy (adult learning theory[5,6]) both emphasize learners' autonomy, initiative in problem solving and self direction. Andragogy principles also emphasize that the learning environment should feel safe, and that the learner should feel comfortable to express themselves openly.

Junior doctors often need guidance as to strategies that can be employed to overcome hurdles associated with modern day surgical training. Timely and good mentoring is a way in which surgical trainees may be helped through these difficulties in a manner compatible with the principles of adult learning. Mentoring may be best achieved in a "just in time" fashion where an appropriate mentor is available to facilitate problem solving in response to a real world need. In order for this mentoring to be achieved in a comfortable learning environment, a knowledgeable, yet not necessarily proximate mentor may be most suitable.

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The Standing Conference on Postgraduate Medical and Dental Education (SCOPME), in the UK, describes mentoring as "The process whereby an experienced, highly regarded, empathic person (the mentor), guides another individual (the mentee) in the development and re-examination of their own ideas, learning, and personal and professional development. The mentor who may or may not work in the same organisation or field as the mentee, achieves this by listening and talking in confidence to the mentee."[2]

The roles of the mentor are many and have previously been reviewed.[7] Briefly, these include Adviser; coach; counselor/guide and role model. A good mentor may have knowledge and awareness of the difficulties the mentee may experience. As someone who has successfully negotiated some of these difficulties, a mentor may offer motivation, hope and advice for the mentee. As technology increasingly becomes part of a managed learning process, expert mentoring of trainees, facilitated by technology, may become essential for ensuring patient safety.

Increasingly, mentoring has assumed an official rather than an ad hoc role in facilitating trainee doctors to becoming competent for independent practice. The benefits of mentoring have been well established in allied Medical specialities.[8-10] Existing practices suggest that medical trainees find having a mentor a useful adjunct to career development.[11,12] It has been previously reported that trainees often do not have mentors or are unaware of the role of the mentor and therefore do not have beneficial meetings with them.[7,12]

The Royal College of Surgeons of England strongly advocates mentoring in all stages of training.[13] A survey of American female medical students reports that being influenced by a mentor has a significant impact on final career choices.[14] The roles of the mentor are many and varied as are the needs of the mentee.[15]

Mentoring in UK Post Graduate Medical Training

In the UK the roles of Clinical and Educational supervisors have been introduced to assist in delivery and assessment of the trainee. Concomitantly, the educational supervisor may act in a mentoring role. The Educational supervisor may be from the same or a different department where the trainee works. The Clinical supervisor is the trainee's immediate supervisor.

Supervisors may or may not have received training in mentoring. The educational supervisor oversees the junior doctor's progress and acts as a contact between the doctor and training program director. The educational supervisor ensures the competencies set out by the junior doctor's training program are met and that the trainee is receiving regular education and is being supported within the surgical team. They act as a mentor for developing professional skills. Meetings with supervisors are flexible and ideally would implement recommendations for a successful mentoring relationship.[16]

A criticism for these currently ad hoc arrangements are that individuals who have accepted a mentoring role may not be

expert in issues in which the mentee requires mentoring or have access to necessary information.

With the evolving complexity of medical roles, subspecialties and careers, mentoring needs are also increasingly complex. Complex and varied mentoring needs may require multiple mentors addressing individual specialist interests. Also, appropriate mentors may be at a distance from mentees. Internet-based technology developments, including the WorldWide Web (WWW), allow for increasing interactivity and may be of use in fulfilling tele- and multiple mentoring needs.

The paradigm of on-line mentoring to meet the needs of trainees is one which has been implemented in nursing.[17] A mentoring model developed for academics in the University of Arkansas uses a multilevel Peer-Onsite-Distance (POD) approach. Here a network of mentors is used by a mentee to meet their varied needs.

There has been an evolution of the ways that interaction is facilitated and information processed and retrieved in the WWW. The newest incarnations of the WWW provide for an immersive, interactive, collaborative and information rich potential resource for medical mentoring. We review the literature regarding the evolving nature of the WWW and concomitant changes in paradigms of on-line medical mentoring.

METHODS

A search of the MEDLINE database from 1950 to 2012 using the PubMed interface, combined with manual cross-referencing was performed using the following strategy: ("mentors"[MeSH Terms] OR "mentors"[All Fields] OR "mentor"[All Fields]) AND ("internet"[MeSH Terms] OR "internet"[All Fields]) AND ("medicine"[MeSH Terms] OR "medicine"[All Fields]) AND ("humans"[MeSH Terms] AND English[lang]). Abstracts were reviewed by UJ for relevance to the topic. Inclusion criteria were any study pertaining to the topic. Search outcome: 45 papers were found of which 16 were relevant to the topic. All were observational or case control studies.

Three Phases of WWW Evolution

With Internet use soaring in the late 90s and early 2000s, the WWW evolved beyond its original form. Successive generations of the WWW are denoted by the terms Web 1.0, Web 2.0 and Web 3.0.[18] Technological advances in the successive generations allow for greater degrees of user interaction. The salient features of each will be briefly reviewed with applications relevant to medical mentoring.

Web 1.0

Web 1.0 was the first generation of the Web. During this phase the focus was primarily on building the Web, making it accessible, and commercializing it for the first time. Web 1.0 allowed for dividing the WWW into usable directories (taxonomies) and allowed everyone their own private corner in cyberspace.