



Putting Technologies Used for Clinical Care and Education in Context

Donald M. Hilty¹ · Sandra DeJong²

Received: 5 March 2018 / Accepted: 10 October 2018 / Published online: 22 October 2018
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Academic Psychiatry continues to further the role of technology in clinical care and education in several ways. The articles on evidence-based approaches to tele- and e-behavioral health in this issue remind us of several core medical, psychiatric, pedagogic, and technical tenets. Academic health centers promote the current and next-generation's education through innovative approaches to research, clinical care, and faculty development. Innovations in medicine and technology (e.g., telepsychiatry) invite clinicians to practice and advocate for underserved populations without access to quality care due to geographical, cultural, and other barriers) [1]. Telepsychiatry also empowers patients, personalizes care, and increases administrative efficiency and communication. A new range of technologies challenges clinicians, trainees, and educators to ensure high-quality clinical care, professional standards, and sensitivity to differences in participants [2].

The articles in this issue are geared to help trainees, clinicians, faculty educators, and others improve care via clinical and technological competence. In order to do that, the profession has to consider new applications of technology as *instrumental*, rather than supplemental, to practice and teaching (e.g., “instructional technology”). The articles provide a broad perspective on what clinicians, trainees, patients, and the public are doing with technology and how they are using it in clinical care, education, and everyday life. A range of technologies is discussed, including social media [3] and smartphone apps [4]; these have been used across mobile health and other platforms [5].

Articles in this issue delve into telecompetencies, which are becoming an essential part of the clinical toolkit skills and practices. Indeed, telecompetencies help align targeted clinical outcomes with teaching/supervisory methods, evaluation, and

feedback. One paper provides an overview of why we need not just *telepsychiatric* competencies but also *telebehavioral health* competencies across mental health specialties [6]. Another paper spells out the domains: clinical evaluation and care; administration; cultural competence and diversity; legal and regulatory issues; evidence-based and ethical practice; and mobile health, smartphone, and apps [7]. Telepsychiatric competencies are updated [6], and specific competencies for social media are offered [3].

Several articles offer fresh ideas on how to use technology for teaching faculty, course and clerkship directors, program directors, and other leaders to advance medical and psychiatric residency education [8–10]. There are options for those interested in incorporating technology into the psychiatric residency curriculum [9] or developing a digitally informed curriculum in psychiatric education and practice [10]. Crawford et al. [11] offer three educational reports across the learning continuum to describe how to build ehealth and telepsychiatry capabilities, including those geared toward underserved, primary care, and integrated care populations. Ratzliff et al. [12] also look at tele-behavioral health in collaborative and integrated care. Finally, an article thinks through the professionalism implications for practice and education [13].

Competencies are a focus of undergraduate and graduate medical education but have yet to be fully described in the continuing medical education (CME) realm. The educational outcomes of the American Association of Medical Colleges (AAMC) are evidence-based, including the domains of medical knowledge, patient care skills and attitudes, interpersonal and communication skills and attitudes, ethical judgment, professionalism, lifelong learning and experience-based improvement, and community and systems-based practice [14]. The Accreditation Council for Graduate Medical Education (ACGME) specifies patient care/medical knowledge/practice-based learning and improvement, systems-based practice, professionalism, and interpersonal skills, and communication domains [15]. The AAMC framework on pre-entrustable and entrustable professional activities for entering residency [16] attempts to bridge gaps between knowledge and skills/

✉ Donald M. Hilty
donh032612@gmail.com

¹ Northern California Veterans Administration Health Care System, Sacramento, CA, USA

² Harvard University School of Medicine, Cambridge, MA, USA

behaviors. CME still lacks an integrated plan of competencies, despite consensus- and evidence-based guidelines and accreditation, legal, and regulatory agency policies.

The collection of articles in this issue is founded on other critical considerations. First, clinical care is only as good as the outcomes that are prioritized and evaluated. The Institute of Medicine and its Health Professions Education Summit [17, 18] linked health care professional training with quality of care, safety, and interdisciplinary skill objectives for patient-centered care, interdisciplinary teams, evidence-based practice, and information technology (IT). Another consideration is that lifelong learning is an ongoing necessary process for all psychiatrists—as supported by the American Board of Psychiatry and Neurology (ABPN) and the American Psychiatric Association, based on a lifelong learning platform [19].

Technology, now ubiquitous in everyday life, has had no “home” in mental or behavioral health or psychiatric journals. The collection of articles in this issue builds on a previous issue of *Academic Psychiatry* in 2006 on the use of technology for education and on the innovations and technology in education column. The *Telemedicine Journal and E-Health*, *Journal of the American Medical Informatics Association*, and *Journal of Medical Informatics Research—Mental Health* have some focus on these topics, but unlike *Academic Psychiatry*, education is not the focus. The new *Journal of Technology in Behavioral Science* focuses on telecompetencies across professions.

Trends in Clinical Care, Use of Technologies, and Competencies

This collection of articles takes a look at technologies applied to clinical and educational activities, as well as everyday life. It moves beyond telepsychiatry, a common service delivery option for over 20 years with a strong evidence base, to a mental or behavioral health-related continuum of technology-based options for patients, families, caregivers, and professionals. The field is exploring the interface between these technologies (e.g., a system) and the participants (e.g., individual/group, patients, virtual characters) [2]. This continuum includes Internet-based information; self-help/support groups; well-prepared materials for patient and clinician education; use of social media; self- and clinician-assisted assessment; asynchronous text, e-mail, and video; mobile health with apps; and synchronous video (Table 1) [2].

Being aware of how patients and populations at large are using technology is important [1, 20, 21]. Patients may at times prefer low intensity options for services (e.g., patient education modules, text/e-mail interventions) that, if researched and effective, may nicely complement traditional in-person and telepsychiatric care options. Indeed, technology

is a “practice extender” by performing some of the tasks that clinicians and staff have done to integrate care [22]. Perhaps more broadly, it can be considered an integral “team member” of a stepped care approach. It is hoped that these technologies will be better included in the electronic health record and/or part of a broader, mobile health platform.

The telepsychiatric competencies in 2015 [23]—the first telecompetencies published—were based on the ACGME [15] and CanMEDS [24] frameworks, in six domains: patient care, communications, system-based practice, professionalism, practice-based improvement, and knowledge. These competencies adapted the Dreyfus model for learners (5 levels: Novice, Advanced, Competent, Proficient, and Expert) [25] but combined them into Novice/Advanced Beginner, Competent/Proficient, and Expert levels. The Coalition for Technology in Behavioral Science developed an interprofessional, evidence-based framework for measurable telebehavioral health competencies [6, 7, 26, 27] in seven topic domains: (1) clinical evaluation and care, (2) virtual environment and telepresence, (3) technology, (4) legal and regulatory issues, (5) evidence-based and ethical practice, (6) mobile health and apps, and (7) telepractice development.

Social media and networking competencies in the graduate medical education domain framework were recently posited [7, 28] and are advanced in this issue [3]. Along with mobile health, smartphone/device, and app competencies, these technologies pose substantial challenges (e.g., asynchronous, not structured like traditional care visits, affect the therapeutic frame, create additional boundary issues). Advantages of these technologies include portability, accessibility across time and place, affordability, and the potential for additional features.

Clinical Issues and Challenges

Ethics, professionalism, and the law are domains with substantial overlap. Psychiatrists are typically held to a higher ethical standard than other physicians because of the nature of their work. Publicized breaches of professionalism online spurred the development of a field now called “digital ethics” or “e-professionalism” due to reports by deans and state medical boards [29, 30] and the media. Current use and misuse of technology by residents and medical students is difficult to assess.

Delivering mental health care through technology has many potential clinical, legal, professional, and communication ramifications [13]. Clinicians should screen patients about their use of technology, evaluate its impact, and be mindful of informed consent documentation and licensing and other legal requirements when using technology with patients [27]. The American Psychological Association Guideline for the Practice of Telepsychology [31] includes many components: clinical (e.g., informed consent,

Table 1 A tele-behavioral health spectrum of technology use in health and clinical care: issues for patients and clinicians

Level	Source/entry	Initiator goals/aims	Questions and perspectives	Liabilities	Suggestions for programs
1	Website information	Health information: gain perspective, obtain standard and updated info	Do I need more information? How should I approach the problem? What is out there? Better if referred by clinician who has checked it out	Quality of information and lack of regulation	Provide training on how to evaluate sites and to identify good ones; how to screen for patients' use
2	Online formal educational materials	Person/patient: education Caregiver: education, supports, and advice Clinician: continuing medical education (CME)	I learn easier this way? I need "sound" info to make decisions for loved ones CME implies good quality; peers' opinion helpful	Some prefer in-person interaction (e.g., Q&A) May not fit learning style	Provide advice on good options, how to evaluate the materials and help patients do likewise.
3	Support/chat groups or "communities"	Spontaneous, anonymity, gain answers/tips and greater perspective Socialization and networking	What should/can I do? What are others doing locally, regionally or globally? Can I connect easier with others?	Peer compatibility? Information quality? Who is talking on the other end?	Provide curricula in general and how to use at specific clinical sites (e.g., inpatient unit, outpatient care)
4	Self-directed assessment and decision-making options	Person/patient: tips to reflect, make changes and get help Caregiver: tips to reflect, tools to assess loved ones, and next steps Clinician: give patients assignments/resources; obtain tips on clinical care	What are my needs and resources? What is my next step in seeking help? Can my love ones/patients get help/support outside the office with help (i.e., with a nurse, mid-level or care coordinator)?	Not all problems can be self-assessed Some illnesses affect insight and reflection Quality is an issue; get a reference	Provide training on how to help patients consider options, take steps and share information with clinician; start self- and life-long learning options
5	Social media/networking	Person/patient/caregiver: easy, convenient, and spontaneous Clinician: rarely use; could screen if/what patients are doing, why and impact All: if purposeful and focused on one dimension, it could add to relationship	Can impact therapeutic alliance positively/negatively Public information may be visible; it cannot be collected for analysis, though Discuss, weigh pros/cons, address privacy, when to use/not use (e.g., SI) and tracking (if any) Not billable care	Not HIPAA compliant? Undisclosed and/or impulsive use may indicate problems and boundary issues? Personal/ professional role diffusion?	Provide skills, knowledge and approaches in curriculum and with case conferences Focus on developing professional role in transition from past personal experience(s)
6	Assisted self-care assessment and decision-making; de-identified	Person/patient/caregiver: feel ownership of care and better partnership with clinician Clinician: distributes my time with help from others and empowers patients	Empowering, in general? Increased self-efficacy/confidence? Feel part of a team? Do I have time to discuss issues with patient? Is there time to train team and share decision-making?	Occasional "bad" decision or poor outcome, partly due to lack of context? Doing more without time/quality is a risk?	Provide training on how to screen what patients are doing and when to seek help and when to make decisions together
7	Asynchronous video or one-time synchronous consultation	Person/patient/caregiver: obtain good quality tips for primary provider to use Clinician: distributes time well with help from others and empowers patients	Feels good about getting "better" care; glad primary provider gets an opinion Primary provider learns and develops relationship with psychiatrist?	Can primary provider use tips? They will work for which patients? Learning curve takes some time?	Build into the regular care continuum, like an option on a stepped continuum
8	Asynchronous, between-session patient-clinician contact (e.g., mobile app or e-mail/text)	Person/patient/caregiver has minor question, forgot a question, or needs a detail	Convenient to reach the clinician or team member? Easier for teen patients, who prefer texting over calling? Build into the EHR?	Some patients and/or clinicians do not use? Things taken out of context; errors?	Provide training across the curriculum; boost at core training sites; enhance with subspecialty (e.g., child)

Table 1 (continued)

Level	Source/entry	Initiator goals/aims	Questions and perspectives	Liabilities	Suggestions for programs
		Clinician: good for quick advice and simple details All: send/assign apps, questionnaires, reports (e.g., individualized educational plans); use screening/ follow-up surveys to track	Is the contact tracked, private, documented and billable?	HIPAA compliant? Some see as a nuisance (i.e., extra time)	Faculty development suggested for patient and trainee e-mail/text
9	Continuous mobile health/e-monitoring to database/electronic health record (EHR) (e.g. chroniform)	Person/patient/caregiver agrees Clinician: good for longitudinal monitoring All: set triggers to accelerate care prn; captured in EHR	Patient feels glad to be tracked and sense of bigger care plan? Integration with decision-making takes preparation and extra time?	Best in systematic care models with team-based approach?	Team training, coordination, communication and documentation is important
10	Synchronous or in-person ongoing care	Person/patient: it works and is much more convenient Clinician: if patients like it, it is a good option	Allows synchronous decision-making (patient-clinician); links providers (e.g., primary care psychiatry)	It always has to be scheduled (and paid for); not spontaneous	Provide curriculum and other experiences

documentation, confidentiality, adjusting assessments), ethical, educational, legal and regulatory, and security and management of data.

Other key themes across traditional video, Internet, mobile device, and other technologies include quality of information; how to communicate via texting, e-mail, and apps; therapeutic and boundary issues; and practitioner and patient privacy. While not wholly new, these issues raise unexpected and unintended consequences and challenges like verification of identity/authenticity, data “permanence” of information posted, public sharing of personal versus professional information, and searches conducted by the public, patients, and clinicians. Clinicians are expected to safeguard patients’ privacy and inform them of potential risks and benefits in the use of technology in the clinical setting.

Administrative, Business, and Reimbursement/Financing Issues

For administrators, attending to technology-related issues is another challenge. Telepsychiatry provides versatility to health care systems by enabling more patient points-of-entry, matching patient needs with provider skills, and helping providers work at the top of their licenses. Telepsychiatry and other technologies make collaborative, stepped, and integrated care less costly and more accessible. Effective health care delivery matches the intensity of the services to the needs of

a patient population or clinic, standardizes interventions, and evaluates both process and clinical outcomes.

Theoretically and practically, evaluation of clinical skills/ behaviors should dovetail with evaluation of clinical care. Perhaps a finite, but manageable, subset of faculty and trainees’ behaviors could be efficiently evaluated with regard to core concepts related to quality care and decision-making. If clinical supervisors and program directors work with administrators, the learning and clinical objectives can be aligned with the instructional method [32, 33] and policies and procedures for technology (e.g., electronic documentation). More than ever, teamwork is needed across professions and disciplines, teaching and clinical faculty, evaluators and students/clinicians, managers, and staff. Research findings must be translated into models of teaching, practice, and assessment.

Another challenge is in consolidating information in an effort to enhance decision-making, whether at the level of a clinician and/or a psychiatric leader. The amount of information is skyrocketing, and it is not integrated across public, private, and health system datasets and systems. Electronic health records are standard, but systems do not smoothly interface between systems and clinicians. This lack of ability to interface across systems restricts automated capture, processing, and utilization, which decrease the return on investment for technology. And perhaps worse, each new innovation is costly and often fails to provide a platform on which new data can be smoothly flow and be integrated.

In the growing flood of data, medicine is caught largely reacting instead of getting ahead of the problem. In business, shared domain knowledge and common understanding between the IT and the line managers has improved performance [34]—if it is done with a specific goal in mind and as part of a strategic approach. Competition in business made this a “life and death” proposition for survival rather than elective, but the result was a competitive advantage by abandoning manual processes in systems, even if there was disruption [34–37]. A strategic approach using this shared IT-business—or shared IT-psychiatric or IT-medical understanding—could (1) reduce supplemental, technological add-ons to the organization; (2) reduce expenditures; (3) increase reliance on integrative rather than manual (or siloed computer) systems for communication, evaluation, and queries; and (4) enhance long-term planning.

Technology could be central to health care transformation and improvement. Currently, Americans pick technology and obtain health care like a commodity—searching for the best service, price, and time—even though health care is viewed as a right and is best distributed by a central, equitable process [38, 39]. One might imagine a more systematic approach in which technology was harnessed to key goals of patient-centered care and value-based care as part of an overarching system coordinated by the Centers for Medicare and Medicaid Service. Such an approach might better tie reimbursements to clinical care, quality, patient experience, safety, efficiency, and mortality [40, 41] and potentially slow the growth of health care expenses [42], as has been demonstrated well in the Canadian and Japanese health care systems [43–45].

Academic psychiatrists and other mental health clinicians influence the future of the profession at the level of both the individual (e.g., trainees) and local and national systems. Technology is permeating future education and training, clinical practice, and research. This collection offers expert thinking about current practices and future needs across a wide variety of domains and settings with the goal of improving access to and quality of care across populations nationwide. There are many implications of telepractice for departments, schools, academic health centers, psychiatric workforce, and international organizations. There is much to learn about implementation and evaluation of competencies, change management, and prioritization of technology by leaders.

Acknowledgements I. The Coalition for Technology in Behavioral Science

American Psychiatric Association and the Board of Trustees Committee on Telepsychiatry.

American Telemedicine Association and the Telemental Health Interest Group.

Compliance with Ethical Standards

Conflict of interest On behalf of both authors, the corresponding author states that there is conflict of interest.

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