The American Occupational Therapy Association
Advisory Opinion for the Ethics Commission

Ethical Considerations Relevant to Emerging Technology-Based Interventions

The use of new intervention techniques and emerging areas of practice create the potential for various ethical concerns. Decisions about selecting the most appropriate, safe, and effective interventions should be made on the basis of judicious clinical reasoning, sound judgment, insight, experience, and available research evidence (Christiansen & Lou, 2001). Evidence-based practice is described as practice based on the investigation and appraisal of currently available research regarding intervention efficacy (Case-Smith & Arbesman, 2008; Christiansen & Lou, 2001). According to Christiansen and Lou (2001), practitioners also should consider relevant ethical principles, such as patient benefit, truth, fairness, doing the right thing, avoiding harm, and respecting autonomy. Professional codes of ethics identify these principles to provide guidance for ethical practice and appropriate conduct. They also may be used to assist practitioners in making ethical decisions about less traditional aspects of clinical practice.

In recent years, new technology-based interventions have appeared for children who have sensory processing difficulties. This Advisory Opinion summarizes several emerging technologies in this area and relevant ethical considerations.

EMERGING TECHNOLOGY-BASED INTERVENTIONS

A variety of specialized technology (from low-tech to high-tech) has emerged over the past few years to address the needs of children with diagnoses such as autism, attention deficit hyperactivity disorder (ADHD), learning disabilities, and sensory modulation or sensory processing difficulties. One example of the application of specialized technology, the Sensory Learning Program, was developed in 1990 and is described as a multisensory approach that simultaneously stimulates the visual, auditory, and vestibular systems with light, sound, and motion to assist with developmental learning (Bolles, 2004). On the basis of a specific protocol, a trochoidal motion table uses computerized positioning equipment that “slowly rises and descends in a circular pattern that can be rotated 90 degrees, providing vestibular stimulation while the client, who is supine, listens to gated or modulated music through headphones, and is exposed to combinations of diffuse color” (Bolles, 2004). The objective of the program is to allow the
central nervous system to enhance sensory processing of information by facilitating the reorganization of the visual, vestibular, and auditory systems simultaneously. Bolles (2001) claimed that the program is an “innovative, noncognitive approach” that stimulates the senses and is based on the concept of neuroplasticity, enhancing “emergent faculties,” and “is a therapy that accelerates sensory integration and develops learning abilities for individuals with acquired brain injury, learning/behavioral problems, [attention deficit disorder/attention deficit hyperactivity disorder], developmental delays, autism, and birth trauma.” Unlike more traditional interventions, the cost of this modality can be several thousand dollars, which may not be covered by insurance and therefore is an out-of-pocket expense for the client and his or her family. However, no published articles found in the professional literature describe the Sensory Learning Program.

Another example of emerging technology-based intervention is sound-based therapy approaches that use the auditory system; these include auditory integration training (AIT) and other therapeutic listening programs (Baranek, 2002; Case-Smith & Arbesman, 2008; Sinha, Silove, Wheeler, & Williams, 2004; Tharpe, 1999). AIT (including the Tomatis and Berard methods) uses modulated music through headphones to remediate hypersensitivities and auditory processing abilities and therefore decrease aberrant behaviors (Baranek, 2002; Case-Smith & Arbesman, 2008). This intervention, too, has a specific protocol over several days (Dawson & Watling, 2000). Case-Smith and Arbesman (2008), however, indicated that evidence for the effectiveness of auditory or sound-based therapies was weak and inconclusive in promoting the integration and organization of the nervous system. Additional evidence-based reviews of this AIT intervention by Case-Smith and Arbesman (2008) and Sinha et al. (2004) came to the same conclusion related to efficacy for children with autism. In addition, the potential risks, adverse side effects, and lack of safeguards associated with hearing loss in some cases show that further studies are necessary (Baranek, 2002; Brown, 1999; Mudford et al., 2000; Sinha et al., 2004). Additional technology interventions based on syntonics, or colored-light therapy, and ZYTO remote technology based on galvanic skin response also have emerged for potential use with these populations (B. T. Barrett, 2009; S. Barrett, 2009; Liberman, 1986, 1991; ZYTO Corporation, n.d.). However, as in the first two examples, limited research and questionable validity of studies preclude scientific support for the current application of these technologies to occupational therapy (B. T. Barrett, 2009; S. Barrett, 2009; Evans & Drasdo, 1991; Liberman,
Given the scarcity of conclusive evidence to validate the effectiveness and safety of these technologies, occupational therapy professionals must consider ethical principles in deciding whether to implement them. Practitioners need to carefully examine their own motivations, driving forces, and rationale (e.g., financial gain, innovative interventions) if they choose to use emerging technology-based interventions that seem to have little evidence for treatment efficacy.

Occupational therapy practitioners have an ethical obligation to be totally transparent in disclosing their ability to provide certain interventions and to avoid practice in areas of limited competence (i.e., professional limitations). They also have an ethical obligation to ensure that equipment is safe and effective for use with clients. The principle of nonmaleficence mandates that practitioners not inflict or cause harm to a client by using an intervention that does not have a reasonable expectation of benefit or that they are not competent to administer. In addition, practitioners must consider that, by virtue of their trust in the therapeutic relationship, consumers may be biased to accept recommendations about innovative technology to address their condition (balancing the probability or possibility of harm vs. benefit). Relevant ethical questions include the following:

- Does the client fully understand the risks and benefits, effectiveness, and safety factors associated with a new, nontraditional intervention when evidence is not available or is limited? Some risks may be unknown.
- Has existing, relevant literature been shared with the client regarding the proposed utility of an emerging technology-based treatment?
- What considerations should direct the ethical decision-making process when evidence is limited or the research does not demonstrate effectiveness?

Ethical reasoning and transparency can assist in communication and autonomous decision making with the client when there is minimal or no evidence for a treatment. In particular, the following principles from the American Occupational Therapy Association’s (AOTA’s) Occupational Therapy Code of Ethics (2015) (referred to as the “Code”; AOTA, 2015) can assist
practitioners in evaluating and making decisions about whether to incorporate emerging or nontraditional technologies in their practice. The following principles are applicable:

- **Beneficence:** Principle 1. “Occupational therapy personnel shall demonstrate a concern for the well-being and safety of the recipients of their services” (p. 2).

- **1C.** “Occupational therapy personnel shall use, to the extent possible, evaluation, planning, intervention techniques, assessments, and therapeutic equipment that are evidence based, current, and within the recognized scope of occupational therapy practice” (p. 2).

- **1F.** “Occupational therapy personnel shall take steps (e.g., continuing education, research, supervision, training) to ensure proficiency, use careful judgment, and weigh potential for harm when generally recognized standards do not exist in emerging technology or areas of practice” (p. 3).

Principle 1 supports occupational therapy practitioners’ obligation to provide interventions that they can reasonably expect to benefit clients; improve their quality of life; and have a safe, effective outcome.

- **Nonmaleficence:** Principle 2. “Occupational therapy personnel shall refrain from actions that cause harm” (AOTA, 2015, p. 3).

- **2F.** “Occupational therapy personnel shall avoid dual relationships, conflicts of interest, and situations in which a practitioner, educator, student, researcher, or employer is unable to maintain clear professional boundaries or objectivity” (p. 4).

- **2I.** “Occupational therapy personnel shall avoid exploiting any relationship established as an occupational therapy clinician, educator, or researcher to further one’s own physical, emotional, financial, political, or business interests at the expense of recipients of services, students, research participants, employees, or colleagues” (p. 4).

Principle 2 involves preventing any foreseeable harm caused by using an intervention for which safety or the potential for harm has not been determined. Similarly, a potential undue
influence may pertain to financial incentives associated with providing these new technology-based interventions. For example, if a private practice owner has made a substantial investment in a particular piece of equipment, he or she may be inclined to promote or maximize its use for financial gain.

- 3D. “Occupational therapy personnel shall establish a collaborative relationship with recipients of service and relevant stakeholders to promote shared decision making” (p. 4).
- 3E. “Occupational therapy personnel shall respect the client’s right to refuse occupational therapy services temporarily or permanently, even when that refusal may result in poor outcomes” (p. 4).

This principle is about respecting clients’ values, interests, preferences, and privacy and their right to make their own decisions on the basis of those considerations, even if these decisions are not in agreement with practitioner recommendations.

It is important to distinguish between the concepts of informed consent and consent to treat. Informed consent is a client’s right to full disclosure of what is to be expected in terms of objectives or goals, plan of care, and the known or unknown risks or benefits associated with therapy services and to make decisions on the basis of that information. Consent to treat refers to a client’s autonomous decision to receive services by volitionally engaging in treatment. It is a professional and ethical mandate to obtain consent to treat from a client before initiating the evaluation and any subsequent services. If this is impossible, the practitioner must seek this consent from an individual with legal authority to make such decisions for the client (see Principle 3C of the Code). Respect for the patient rights of informed consent and consent to treat is the basis for the principle of autonomy and promotes free choice and trust in the therapist-client relationship. Because technology-based interventions may be at an experimental stage, they should be monitored until best practice, evidence-based, valid, and reliable outcome measures demonstrate definitive positive or negative results.

- Principle 1G. “Occupational therapy personnel shall maintain competency by ongoing participation in education relevant to one’s
practice area” (p. 3).

- **Justice: Principle 4.** “Occupational therapy personnel shall promote fairness and objectivity in the provision of occupational therapy services” (AOTA, 2015, p. 5).

- **4G.** “Occupational therapy personnel shall hold requisite credentials for the occupational therapy services they provide in academic, research, physical, or virtual work settings” (p. 5).

Ensuring competence is a professional responsibility, as is familiarity with applicable current research, to provide state-of-the-art intervention to the extent possible. However, if no evidence exists in the literature, additional professional resources should be sought and used (e.g., ethical reasoning, critical thinking skills, professional resources, e.g., the Occupational Therapy Practice Framework: Domain and Process; AOTA, 2014a). Professionals can maintain current competency through additional specialty training; certification, if available; or continuing education credits to competently and adequately deliver services.

Principle 4 also addresses occupational therapy practitioners’ professional and ethical obligation to be familiar with and comply with state licensure laws (or applicable state regulations) that govern appropriate practice and conduct by a practitioner. In states with licensure, licensure laws legally define a profession’s scope of practice or domain, and each state has jurisdiction, authority, and power to enforce the legally defined scope of occupational therapy practice in that state. However, language in state practice acts tends to be quite general, so practitioners may need to seek interpretation from the licensure board to assist in decisions about whether particular emerging technology interventions are within their scope of practice.

- **Veracity: Principle 5.** “Occupational therapy personnel shall provide comprehensive, accurate, and objective information when representing the profession” (AOTA, 2015, p. 6).

- **5A.** “Occupational therapy personnel shall represent credentials, qualifications, education, experience, training, roles, duties, competence, contributions, and findings accurately in all forms of communication” (p. 6).

- **5B.** “Occupational therapy personnel shall refrain from using or participating in the use of any form of communication that contains
false, fraudulent, deceptive, misleading, or unfair statements or claims” (p. 6).

Principle 5 addresses two additional concepts that are relevant to ethical decision making: transparency and vulnerability. Regarding transparency, occupational therapy practitioners are mandated to provide full disclosure of the risks and benefits of emerging technology-based interventions, including lack of research, if applicable, or the rationale for why they are proposing to use a particular device or modality.

The concept of vulnerability applies to clients with disabilities or their caregivers. For example, parents of children with sensory processing disorders, like most parents, may be vulnerable because they are willing to seek and try any available intervention that they believe may help their child improve his or her functional and occupational performance skills. In some circumstances, all customary therapeutic options have been exhausted, and when a new intervention becomes available, even if it is untried, parents may be in danger of being exploited as they seek positive outcomes. Consequently, parents may find themselves susceptible to costly interventions as they seek to leave no stone unturned to benefit the child, regardless of financial stress. Vulnerability involves issues of trust and the therapeutic relationship between practitioner and client— that is, the ethical Principle of Veracity and the Core Value of Truth. Clients in need of and receiving services are at a very vulnerable point in their lives and must trust in the honesty of a therapist–client relationship to protect their well-being.

In some cases, emergent technology-based interventions have not demonstrated sufficient or conclusive evidence of effectiveness, and adequate evidence may never be obtained. What should the decision-making process be when evidence is limited or altogether absent? The following questions may facilitate the ethical and scope-of-practice reasoning process when limited evidence and guidelines are available for nontraditional interventions:

- Was this body of knowledge contained in the practitioner’s core occupational therapy educational curriculum?
- Does the practitioner have adequate education and competence to provide this intervention on the basis of past education or current continuing education?
- “Is this intervention or practice usual and customary among occupational therapy practitioners, and would many of them agree?
If not, is it defensible and consistent with the occupational therapy scope of practice utilizing criteria previously outlined?” (Slater, 2004, p. 16).

- Has the practitioner sought clarification from the state licensure board in providing clarity to the less defined emerging areas of practice within the scope of practice?
- Has the practitioner used AOTA’s resources, such as position papers or Official Documents related to this practice area?
- “Is this occupational therapy?” (Slater, 2004, p. 16). Is occupation used to facilitate engagement in meaningful activities and life roles?

Practice must meet both ethical and legal criteria. The Scope of Practice (AOTA, 2014b) document is an excellent resource guide for reference when an emerging or nontraditional intervention is introduced to clinical practice. This document can provide practice domain guidance. However, AOTA Official Documents do not replace the legal language in state practice acts, which must be followed for compliance with state laws and regulatory board requirements.

CONCLUSION

Nontraditional technologies and interventions can have positive applications to occupational therapy clients but also can pose ethical challenges to occupational therapy practitioners seeking to integrate them into their practice. Clinicians must understand the level of education and training required to use these technologies and interventions competently from a legal and ethical perspective. Areas of emerging practice and specialization outside of traditional occupational therapy settings can raise similar issues. Practitioners have a professional responsibility to seek evidence and research related to these areas and interventions to help them make appropriate clinical decisions in collaboration with clients. Furthermore, practitioners must uphold the principles of beneficence, nonmaleficence, autonomy, justice, and veracity, which form the basis of the therapeutic relationship, to ensure that clients are protected in potentially ambiguous situations. Above all, occupational therapy practitioners have an obligation to promote benefit for the good of their clients.
REFERENCES


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This chapter was previously published in the 2010 edition of this guide. It has been revised to reflect updated AOTA Official Documents and websites, AOTA style, and additional resources. Please note that since this article was originally published in 2010, evidence and research regarding specific technologies mentioned may have changed.

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