Providing early hearing detection and intervention (EHDI) services over a distance challenges audiologists to exploit the potential offered by tele-audiology as a service delivery model, without violating legal constraints or compromising professional ethical responsibilities. The sensible application of current and emerging technology to deliver clinical services can assist in providing specialised expertise not otherwise available, enhance a clinician’s productivity and improve access to quality services in a cost-effective manner. This chapter discusses the main ethical challenges related to tele-audiology in EHDI by referring to six concepts: licensure; competence; privacy and confidentiality; informed consent; effectiveness of services and programme validation; as well as reimbursement for services.

Permanent hearing loss is a global health care burden, with congenital hearing loss being the most common neonatal sensory disorder (Chadha & Stevens, 2013). It is crucial to diagnose hearing loss as soon as possible after birth in order to facilitate early intervention, as a hearing loss that is not identified and treated appropriately will result in significant delays in language, cognitive and social development (Doković et al., 2014), with profound later effects on education and employment (Olusanya, Neumann, & Saunders, 2014). Universal standards of infant hearing health care dictate that infant hearing screening should be completed by one month of age and screening tests with results outside the norm should be addressed with definitive follow-up audiological testing by three months of age (Joint Committee on Infant Hearing [JCIH], 2007).

Timely adherence to infant diagnostic testing and hearing loss treatment is a complex process posing significant challenges to parents. This is because it is typically unknown terrain for parents. Risk of non-adherence to the process is even more pronounced in families with greater travel distances, low levels of parental education, low socio-economic status and lack of medical aid (Bust et al., 2015; Cavalcanti & Guerra, 2012; Lester, Dawson, Gantz, & Hansen, 2011). Conducting diagnostic testing can be complicated by limited access to service delivery in rural areas, breakdowns in communication, lack of parental support, financial constraints and poor
coordination of service delivery (Merugumala, Pothula, & Cooper, 2017). Access to services is further complicated by the fact that globally, the number of health care workers who have been educated, trained and employed is insufficient for the number of people who need health services. The lack of health care workers has become a widespread crisis requiring immediate action (Global Health Workforce Alliance, 2008). This is true for audiolologic services as well.

There are currently no existing evidence-based approaches to decrease non-adherence to infant hearing testing and treatment. The current state of communication and information technology, however, offers a unique opportunity to develop programmes that can bridge distance, improve access to services and facilitate the achievement of critical EHDI programme goals. Therefore, it is unsurprising that the recent advances in technology and the widespread access to the internet by the general public have created the possibility for health care related services to be offered remotely. Neither South Africa nor the audiology field has escaped this trend, leading to a new focus area aptly named tele-audiology.

Tele-audiology can be defined as ‘the application of telecommunications technology to deliver professional services at a distance’ (American Speech-Language-Hearing Association [ASHA], 2005, p. 1). As such, it is a blanket term for digital audiology solutions and auditory rehabilitation which has partly been driven by commercial developments in remote otoscopy, remote audimetry as well as hearing aids that can be adjusted by a remote professional. In 2009, the Tele-Audiology Network (TAN), an international non-profit organisation, was founded in South Africa to establish clinics that could provide remote diagnostic hearing care services both live and asynchronously. Unfortunately, TAN dissolved and is no longer in operation as a result of a lack of resources at the time. Tele-audiology seeks to change a situation by bringing an array of hearing care services to those who need them for various reasons, including long travel distances, limited access to or lack of available services and financial constraints. Addressing these barriers forms the basis of tele-audiology in South Africa, as established by the National Department of Health, which aims to deliver services at a distance to communities in underserved areas. The goal is to alleviate the human resource crisis noted earlier and improve the links and communication between developed audiology facilities (mostly found in larger metros) and the underdeveloped rural areas (Health Professions Council of South Africa [HPCSA], 2014).

Potential uses of tele-audiology in EHDI include hearing screening with otoacoustic emissions (OAEs) or automated auditory brainstem response (AABR), diagnostic testing (video-otoscopy, immittance testing, evoked potentials) and intervention (hearing aid fitting, verification, counselling as well as cochlear implant programming). Education, training and mentoring
of health care practitioners, paraprofessionals and parents can also be accomplished through tele-audiology systems and interactive online modules (Swanepoel, Olusanya, & Mars, 2010).

As technology continues to grow in scope and pace, the potential for remote service delivery will increase, realising the ideal of the JCIH (2007) that all children diagnosed with a hearing loss should have access to the necessary resources to allow them to reach their full potential. This ideal should, however, not only reflect resource availability following the identification of a hearing loss, but also appropriate and equitable assessment resources. All health care practitioners, including audiologists, should therefore be cognisant of holding a balanced approach towards tele-audiology – employing innovative interventions but without losing sight of the client (Fleming, Edison, & Pak, 2009).

This chapter provides an overview of the ethical aspects relating to early hearing detection through screening and intervention in the context of tele-audiology. We review some of the key professional challenges that could emerge, including the topics of competence, standard of care, privacy, informed consent and the use of support personnel, and offer several principles to guide audiologists. We believe that the audiology profession is only as strong as its commitment to ethical obligations and values.

Ethical considerations

The ethical considerations related to tele-audiology are familiar challenges, but situated in a new context. The American Academy of Audiology (AAA), the ASHA and the HPCSA have endorsed advances in tele-audiology for those with hearing loss and related disorders. This was done to expand the availability and accessibility of hearing and related care (AAA, 2008; ASHA, 2005; HPCSA, 2014). All tele-audiology services should involve a health care provider (servicing practitioner) where there is an actual on-site face-to-face consultation and physical examination of the client in a clinical setting. The consulting practitioner will communicate (via teleservices) the information to the servicing audiologist, who will then provide the necessary assistance (HPCSA, 2014). Tele-audiology is relatively new to the scope of audiology services and solid guidelines that monitor and control its implementation are not yet available. Therefore, providing services over a distance challenges audiologists to exploit the potential offered by tele-audiology, without violating legal constraints or compromising professional ethical responsibilities. The sensible application of current and emerging technology to deliver clinical services can assist in providing specialised expertise not otherwise available, enhance a clinician’s productivity, and improve access to quality services in a cost-effective manner (ASHA, 2001).
Registration as an audiologist with the HPCSA, under the Health Professions Act (No. 56 of 1974), implies certain responsibilities. For example, audiologists have the duty to meet the ethical standards and guidelines set by the HPCSA and the Board for Speech, Language and Hearing Professions (HPCSA, 2016a). Audiologists who engage in tele-audiology must observe the professional duties imposed in the HPCSA’s general ethical guidelines for good practice (HPCSA, 2016a). Tele-audiology is not the preferred approach when the technology does not allow audiologists to meet established clinical standards (Chaet, Clearfield, Sabin, & Skimming, 2017). Duties to clients include, but are not limited to, always acting in the best interest or well-being of the client, respecting clients’ privacy and dignity, providing clients with relevant and appropriate information in an accessible and easy to understand format, and maintaining confidentiality at all times as required by the National Health Act (No. 61 of 2003) and the National Patients’ Rights Charter.

These duties are in keeping with the principles of the Constitution of the Republic of South Africa (Act No. 108 of 1996) and the obligation imposed on health care practitioners by law. The Bill of Rights, contained in chapter 2 of the Constitution, embodies the basic principles fundamental to the ethics of health care. The Department of Health, in consultation with various other bodies, developed the National Patients’ Rights Charter to ensure the realisation of the right of access to health care services (HPCSA, 2016c).

The philosophy of primary health care and its call for ‘health for all’ was adopted by South Africa in 1994 (Naledi, Barron, & Schneider, 2011). The philosophy forms the basis of South Africa’s health policy and is based on the understanding that the solutions to major health problems lie not only in science, but also in the quest for social justice and the improvement of the life of the poor. It also asserts that health and access to health care are fundamental human rights, and supports the promotion of good health, interdisciplinary and intersectoral collaboration in health matters, along with equitable access to health care that is client-centred, acceptable, affordable and sustainable (O’Hare, 2018). It is important that health care services are available and accessible to all communities in South Africa so that they can receive these services when needed, without undue burden. In some cases, audiology services may be available within a community or geographical region, such as in large metros, but remain inaccessible to many people because of inadequate transportation. The internet and other technologies make it easier to provide audiological information and services over long distances, thereby minimising the obstacle of geography. Consequently, tele-audiology has the potential to reduce the burdens associated with the accessibility of services.

However, a lack of financial resources will be a challenge for many clients if they are required to purchase computers, telephones and other
Ethical Considerations and Tele-Audiology in Early Hearing Detection

devices on which most tele-audiology services depend. The unavailability or inaccessibility of information and communication technology is a serious health care justice concern. An ethical issue related to justice and inequality may arise if certain clients are deprived of tele-audiology due to a lack of knowledge or the required technology, such as the internet or smartphones, alongside limited internet coverage and bandwidth (Langarizadeh, Moghbeli, & Aliabadi, 2017). This is true for many areas of rural South Africa, posing a particular dilemma: the remote areas most in need of tele-audiology are often the areas without the necessary telecommunication coverage.

The main ethical challenges related to tele-audiology in EHDI have bearing on the National Patients’ Rights Charter, specifically informed consent, continuity of care, confidentiality and privacy as well as access to health care, including treatment and rehabilitation, provision of special needs to newborn infants, counselling and health information (ASHA, 2010; Denton & Gladstone, 2005; HPCSA, 2008). The core ethical values outlined in the HPCSA guidelines are important and clinically applicable in tele-audiology. Figure 13.1 shows the legal and ethical aspects generally related to tele-audiology. The top row lists the core ethical values and standards for good practice as outlined by the HPCSA (2016a). Specific aspects, marked with a star (✩), are discussed in more detail below: licensure, competence, privacy and confidentiality, informed consent, evaluating effectiveness of services in terms of programme validation, and reimbursement (fees) for services.

Licensure
The primary purpose of professional regulation is consumer protection, which is performed through licensure laws, and countries establish their own licensing statutes, rules and regulations. In South Africa, audiologists are governed by the HPCSA, a statutory body established by the Health Professions Act (Dhai & McQuoid-Mason, 2011). It is audiologists’ responsibility to be familiar with the specific laws, regulations and scope of practice documents under which they operate. The HPCSA guidelines are comprehensive and in line with the South African Constitution, placing the client at the centre of health care practice. In South Africa, only audiologists registered with the HPCSA are authorised to perform audiological services (including tele-audiology), irrespective of whether these are in the capacity of consulting or servicing (HPCSA, 2014). In the case of tele-audiology across country borders, audiologists serving South African clients should be registered with the regulating bodies in their original countries as well as with the HPCSA. The reverse is also true for South African audiologists who provide services in other countries.
### Section Three: Complexities of Early Hearing Detection and Intervention

#### ETHICS IN TELE-AUDIOLOGY (HPCSA BOOKLET 10)

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**Figure 13.1** General and specific ethical guidelines and rules for tele-audiology

Source: Adapted from HPCSA, 2016a
Competence

Competence is the ability to provide a level of care according to a set standard and according to the professional’s code of ethics (Aiken, 2002). The legal term *imperitia culpae adnumeratur*, referred to in South African law as the Imperitia Rule, is applicable (Dutton, 2015). It states that it is negligent to engage in any assessment or treatment unless one has the skill and knowledge specified by the profession’s professional body. Audiologists should continually endeavour to attain the highest level of knowledge and skills required in their area of practice, while acknowledging the limits of their professional knowledge and competence (HPCSA, 2008). The standards of competence are based on the ethical principles of beneficence (actively doing good) and non-maleficence (do no harm) (Knapp & VandeCreek, 2006). These principles imply that competence encompasses more than mere clinical skill. Additional aspects related to competence and tele-audiology include professional responsibility, clinical standards, technical competency and collaborating with colleagues in a professional manner.

Professional responsibility

Audiologists should not only be concerned with how to effectively and ethically deliver services but should also accept responsibility for deciding not to use a particular method or technique. Tele-audiology offers many advantages, including:

- effectively transmitting expertise over a distance to a client
- fostering protocol-defined assessment results that can be used by a range of related professionals, such as a teacher who may be working with the individual
- enhancing the effectiveness of outcomes through promoting the development of standards to meet the need for shared, common information between all the professionals involved in service delivery to the individual and the family.

If tele-audiology can increase the effectiveness of EHDI service delivery and audiologists actively choose not to utilise these services, they are causing harm to the client.

Another responsibility that audiologists bear when offering newborn hearing screening is to provide early intervention services (Olusanya, Luxon, & Wirz, 2006). Ethical issues arise when a diagnosis is made but treatment or management cannot be provided. Knowing that a newborn has a hearing loss without being able to provide treatment and management of the hearing loss is unethical. Therefore, in order to implement a screening programme, some form of intervention or collaboration with other initiatives needs to be available. An example is Worldwide Hearing Care for Developing Countries. This global initiative uses the framework of the World Health Organization’s
Section Three: Complexities of Early Hearing Detection and Intervention

(WHO) Guidelines for Hearing Aids and Services for Developing Countries, which was launched in 2001. One of its main purposes is to provide appropriate and affordable amplification and hearing services.

However, Olusanya et al. (2006, p. 590) ask an important question: ‘Should limited intervention services forestall early detection of hearing?’ They argue that failure to implement a screening protocol because of current shortages in service delivery may be counterproductive for requisite capacity-building as suggested by the WHO (2001), as a solution to deal with the current resource gap. In addition, they argue that not knowing what is ‘wrong’ with a child may lead parents to take incorrect actions, thereby causing additional stress to the family (Olusanya et al., 2006).

Rather than taking an all-or-nothing approach, one possible solution could be to share information and knowledge about available resources and support services, thereby providing the best available services at the time, while also explaining these limitations to the parents. Open communication and autonomy are key to providing ethical services.

Clinical standards
Policies and procedures for documentation, maintenance and transmission of records regarding tele-audiology consultations should be maintained at the same standards of care expected in traditional delivery methods. For example, it could be tempting to use online questionnaires to replace taking a documented clinical history, but this does not constitute an acceptable standard of care (HPCSA, 2014). Tele-audiology should focus on providing clients with new avenues to access services and not on capitalising on potential short cuts offered by technology.

Technical competence
The requirement that audiologists be competent regarding tele-audiology technology is embodied in ethical principles. Audiologists should hold the client’s welfare paramount, provide services only when reasonable benefit can be expected, ensure that all equipment used in the provision of services is calibrated and working accurately, and not provide services that exceed their level of education, training and experience (ASHA, 2003). The importance of technical competence cannot be overstated. An audiologist may be skilled in providing intervention for a particular disorder yet may not be competent to do so if the provision of those services requires the use of tele-audiology.

Audiologists should be able to judge whether tele-audiology is the best available option for service delivery. At a minimum, this requires the ability to assess whether the anticipated technology and equipment is of sufficiently high quality, meets the recognised technical standards and is operating satisfactorily. Back-up systems should be available. Quality assessment of the
technology employed must be an ongoing process, and routine controls and calibration should be available to monitor the accuracy and quality of data collected and transmitted. At all times, well-established procedures should be in place in the event of equipment failure or if a technical problem arises at the client’s remote location.

Finally, even if the audiologist is competent to provide services via tele-practice, the client may not be competent to receive services in this manner. Therefore, the audiologist needs to assess what technical competencies the client needs to have given the type of technology to be used. It is also the audiologist’s responsibility to ensure that the client is adequately trained in the procedures for tele-practice, is physically and cognitively capable of carrying out these procedures and fully accepts the process. With EHDI services, it is important that these considerations apply to all family members who are involved in assessment and intervention.

Working with colleagues
Other audiologists or assistants need to be considered. It is good clinical practice to document the roles and responsibilities of each party before starting the process. Both consulting and servicing audiologists are responsible for establishing the competency of the other party before agreeing to participate in tele-audiology activities. Both parties are responsible for detailed record taking and record keeping. If an audiologist makes use of support personnel, they should be cognisant of the fact that no matter where the assistant is located, the treating audiologist is solely responsible for the assistant’s conduct.

If an audiologist who provides tele-audiology services employs a colleague or a locum with minimal or no experience with the relevant procedures and technology, the practice owner remains fully responsible for all tele-audiology services offered. This will increase their supervisory responsibility towards the new employee. Similarly, when an audiologist takes leave and arranges a locum, it is the audiologist’s responsibility to ensure that the locum is competent in terms of tele-audiology technology.

Figure 13.2 provides a checklist to guide the audiologist in factors to consider when reviewing competence in providing tele-audiology services to the paediatric population.

Privacy and confidentiality
The terms ‘privacy’ and ‘confidentiality’ are often used interchangeably in everyday language. However, they have distinctly different meanings from a health professions and legal standpoint. The right to privacy is constitutionally and statutorily protected in the National Health Act. Common law also recognises a right to privacy related to medical malpractice, with specific reference to the unlawful publication of private facts about a person (Dutton, 2015).
Medical confidentiality relates to the public disclosure of private medical facts. The basis of medical confidentiality is twofold: while it protects the privacy of the patient, it also performs a public interest function.

Audiologists have an ethical as well as legal duty to protect clients’ privacy and confidentiality at all times. Tele-audiology poses new challenges in terms of ensuring the confidentiality of clients’ information and increasing data security while receiving, storing and transferring the data (Langarizadeh et al., 2017). Confidentiality and privacy are also closely related to veracity and truth telling (Pera & Van Tonder, 2011). A confidential and fiduciary relationship, which is central to trust between the audiologist and the client, arises whenever one person entrusts confidential information to another. Without confidentiality and trust, clients may be reluctant to provide audiologists with the necessary information for efficient assessment, differential diagnosis and effective management. It is the audiologist’s task to understand how the fundamental responsibilities of trust, respect and confidentiality play out differently in the context of tele-audiology when compared to the more traditional in-person client–audiologist interaction (Chaet et al., 2017).

Confidentiality comes into play with respect to the personal information shared by clients. The audiologist–client relationship establishes an implied contract of confidentiality, since audiologists need to collect and analyse private information to help clients. Clients have a right to expect that this type of information will be held in confidence. Audiologists are therefore also directly responsible for ensuring that all employees respect confidentiality in the performance of their duties. Anyone receiving personal information

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**Figure 13.2** Checklist for ethical decision-making in tele-audiology service delivery

*Source: Authors*
in order to provide care is bound by the legal duty of confidentiality, regardless of contractual or professional obligations to protect confidentiality. The additional duties on audiologists to obtain consent and to anonymise data are consistent with the provisions of the National Health Act, which states that all clients have a right to confidentiality, and that information should not be given to others unless the client consents or the audiologist can justify the disclosure. The HPCSA (2016c) guides audiologists in terms of situations that justify divulging information.

Privacy refers to the freedom from intrusion into one’s personal matters and information and is constitutionally and statutorily protected (Grace, 2009). As outlined in the Protection of Personal Information Act (No. 4 of 2013), it includes a right to protection against the unlawful collection, retention, dissemination and use of personal information. Although a client voluntarily relinquishes some of their privacy to an audiologist, this does not imply that the client gives up all right to privacy as described in Section 14 of the Constitution (Act No. 108 of 1996), the National Health Act and the Children’s Act (No. 38 of 2005).

The Protection of Personal Information Act addresses clients’ protected health information and requires that all services (including via tele-audiology) protect the privacy of clients by using secure systems for electronic information. It is audiologists’ responsibility to ensure the same level of confidentiality in delivering services, whether via tele-audiology or face-to-face on-site appointments. Three primary aspects of tele-audiology are susceptible to privacy threats.

The first relates to the observation of ‘live’ tele-audiology sessions. Just as an audiologist would need to obtain consent from clients, or parents in the case of EHDI, for students or other providers to observe a client–audiologist session, informed consent should also be obtained prior to observing a tele-audiology session. The tele-audiology provider should also be located in a private room to prevent unauthorised persons from viewing the session.

Secondly, technology used during tele-audiology makes it easy to record sessions with a client, thereby creating a potential privacy threat. Again, it is the responsibility of the audiologist implementing the tele-audiology session to ensure that the video recordings of sessions are secure from being viewed by unauthorised persons. Security is often raised as a concern with regard to possible hacking or gaining access to the two-way exchange. Hacking, computer viruses and worms are all threats to security (Houston & Behl, 2019). While some technologies may be less susceptible to security breaches, none are immune. The integrity and privacy protection of a client’s personal and health information is a high priority in all aspects of health care and no less so in tele-audiology applications. Most EHDI programmes and telehealth networks will already have policies and procedures in place to ensure client confidentiality. Most remote access software includes strong
encryption. Moreover, the host computer will typically not contain client data. Although the host site may track the number of tests performed for statistical and billing purposes, it should not record client information. However, caution should be exercised when an existing network or virtual private network is used to connect sites, as the remote laptop or personal computer that is linked directly to the test equipment (such as in the case of AABR and OAE assessment) will contain client data files. This equipment can be lost or stolen. In many jurisdictions, the consequences of such loss are expensive and problematic if the lost or stolen device contains client-identifying information. To prevent inappropriate access to personal information, it may be prudent to assign a unique identifier to each client file that relates to a separate identification/contact information file maintained at a central site (such as the infant’s regional EHDI agency). The actual file will contain the client’s demographic data while the code in the software will merely be a file identifier. Screen capture software may record the actual test for later training and evaluation purposes, but client information is not visible. The case manager must establish who is responsible for maintaining the client file and for reporting test results.

Thirdly, it is important to abide by privacy regulations when sharing recordings with other providers. Audiologists should obtain signed informed consent from the parents or legal guardians to record sessions to ensure that they are aware that recordings exist. They can also obtain copies of recordings if needed. In fact, one benefit of video recording is that parents can share their child’s progress and coaching strategies with others. It is as important to secure access to these recordings as it is to secure written records or verbal communications, for example by using a password protected, encrypted site (Houston, Behl, & Seroka, 2017). It is also important for audiologists to remember that no information about clients can be made available for research or review unless the client has specifically given informed consent (HPCSA, 2016b). Furthermore, appropriate security for storing recordings should be considered. If an audiologist is not familiar with network security, they should take appropriate authoritative professional advice on how to keep information secure before connecting to a network. The HPCSA recommends that such consultations and advice from other professionals be documented (HPCSA, 2016c).

Duty to inform and informed consent
The recognition of clients’ rights, specifically autonomy, became more widespread during the twentieth century. This resulted in increased emphasis on the client’s right to decide whether or not a particular assessment or intervention should occur. This shift has been described as a move away from the professional standards of disclosure approach to a client-based approach (Dutton, 2015).
Informed consent involves a social relationship between laypeople and health care practitioners built upon complex layers of mutual loyalty, fidelity, respect and support (Dutton, 2015). The sometimes close and overlapping relationships between ethics and the law necessitate that the legal requirements underlying consent be considered. Section 7(3) of the National Health Act defines informed consent as permission for the provision of a specified health service given by a client with the necessary capacity to do so, and who has been informed as detailed in Section 6 of that Act. Applying the information in that Act to audiology implies that the family should be informed of the following:

- the range of diagnostic procedures and treatment options available to the client
- the benefits, risks, costs and consequences associated with each option
- the differences between tele-audiology and services delivered face-to-face on-site
- the client’s right to refuse services.

As noted, a successful relationship between an audiologist and a client depends upon mutual trust. Establishing trust can only be achieved if the audiologist respects the client’s autonomy. Sufficient information should be provided in a clear and understandable way to enable clients to exercise their right to make informed decisions about their care. This is what informed consent means. The right to informed consent flows from the South African Constitution, the National Health Act, common law and the HPCSA (2016b) guidelines, which address this topic in detail. Here, we touch only on issues implicitly related to tele-audiology.

Booklet 10 of the Ethical Guidelines for Good Practice (HPCSA, 2014) specifies that informed consent for the use of telemedicine technologies should be obtained in writing from the client. Figure 13.3 shows an example of the information to be included in informed consent documentation.

Consent can be regarded as a cornerstone of health care, from a legal as well as ethical point of view (Kakar, Gambhir, Singh, Kaur, & Nanda, 2014). The concept goes to the heart of the audiologist-client relationship, as the audiologist does not hold the power to decide what is in the client’s best interest. Rather, the audiologist is in the position of serving the client and, in EHDI, the family. The essence of the relationship is respect for the client’s autonomy, and protection of individual rights to bodily integrity, privacy and dignity.

Programme validation
An important consideration in any method of providing audiology services, including tele-audiology, is the reliability and validity of the results. That is, will tele-audiology have the same results that on-site testing would provide?
Ensuring that the test and procedures are reliable and valid leads to a successful tele-audiology programme. The AAA (2008) states that all services should be validated by research before implementation in practice.

Validation of practice is a basic tenet of audiology and of EHDI programme protocol. However, the reality of validation is difficult in terms of proving real equivalence. Certain aspects relating to clinical practices are relatively easily validated, such as showing that remote interpretation of infant ABR
assessment data is equivalent to an on-site face-to-face assessment (HPCSA, 2014). However, not all facets of service delivery lend themselves readily and equally to validation, an example being the experience of the child’s parent during the actual test procedure and the communication of a diagnosis following an infant assessment. While tele-audiology may be ideal for hearing screening or diagnostic testing, some services, like hearing aid fitting and rehabilitation, are more challenging and require a different approach (Nemes, 2010).

Another important consideration when providing audiologic services is determining client satisfaction and the effectiveness of the services provided. The same applies for tele-audiology services. There is increasing support for the use of patient-reported outcome measures (PROMs) and patient-reported experience measures (PREMs) to measure the quality of care, clinical effectiveness, safety and client experience, as well as to guide service improvement (Kingsley & Patel, 2017). PROMs are standardised, validated questionnaires that are completed by the client to ascertain their perceived level of impairment, disability and health-related quality of life. It is a means of measuring clinical effectiveness from the client’s perspective. PREMs, on the other hand, gather information on clients’ views of their experience while receiving care. They provide an indicator of the quality of care from the client’s perspective and can be either relational or functional. Relational PREMs identify clients’ experience of their relationship with the health care practitioner, for example if they felt listened to. Consideration of the parental experience during tele-audiology service delivery can provide the audiologist with guidance on how to facilitate a client-centred approach. Functional PREMs focus more on practical issues such as the facilities available. Both PROMs and PREMs can easily be completed via online methods, increasing their value and applicability in tele-audiology.

Tele-audiology is a new area and although the research base is steadily growing, many questions remain unanswered. When establishing tele-audiology services as part of an EHDI programme, administrators and clinicians are advised to carefully review and examine practices to ensure effectiveness and efficiency (Krumm, 2010).

Reimbursement for services
Reimbursement is currently one of the most challenging aspects of implementing a sustainable tele-audiology programme in South Africa, as there are no standards for compensation in private practice. Specific procedural codes to claim from the client’s medical aid are not available. As a profession, audiologists need to raise awareness of the value and applicability of tele-audiology service options and advocate these services to medical aid boards. There is a need for evidence to prove that tele-audiology services are reasonable, reliable and cost-effective, especially when the client is unable to physically
visit an audiologist. Coding is more complex for the consulting audiologist than for the servicing audiologist, who can use standard available service delivery codes. In the long run, tele-audiology programmes require reliable, adequate revenue and reimbursement for clinical services. All fees should be discussed with the client in advance to ensure transparency and informed consent.

The public health sector does not face the same concerns related to procedural codes, but does face its own unique challenges. Firstly, the public health sector is under pressure to deliver services to over 80 percent of the population (Brand South Africa, 2012). These services have to be delivered despite a misalignment between resources and need (Global Health Workforce Alliance, 2008). The shortage of audiologists and equipment requires a reform plan to revitalise and restructure audiology departments to be able to offer tele-audiology. Secondly, provincial health departments provide and manage health services via a district-based, public health care model. This implies that clients who meet geographical criteria according to a catchment area may register for health care services. Tele-audiology, also focused on minimising the barrier of geography, would in the current structure only be available to clients within the catchment area. Implementation of tele-audiology requires a comprehensive planning assessment, including surveys of the population, workforce, transportation systems, expansion opportunities as well as consultation with key stakeholders in the target community to set priorities for a potential intervention (AlDossary, Martin-Khan, Bradford, Armfield, & Smith, 2017).

Risk management

Tele-audiology is an emerging technology and means of service delivery. The law regarding many of its aspects will only become known as disputes arise and when court judgments are delivered. For this reason, risk management forms an important part of the tele-audiology process. A number of steps can be followed as a strategy to minimise legal risk and create a safe environment for both the audiologist and the client:

- Consult with legal counsel. The South African Association of Audiology (SAAA) has partnered with the brokers Cover for Professionals (CFP) to provide audiologists with affordable malpractice insurance. Other insurance options are also available and more information can be obtained from SAAA or the South African Speech-Language-Hearing Association (SASLHA). Once registered, an attorney will be able to assist the audiologist in identifying and minimising risk. Audiologists should not assume that they are practising good risk management simply by providing the same standard of care when employing tele-audiology as they do.
when they render on-site services. Legal counsel can analyse all aspects of an audiologist’s tele-practice services related to duty of care, standard of care, jurisdiction, as well as the risks associated with the use of the technology.

- Notify insurance carriers if plans exist to initiate tele-practice.
- Ensure proficiency with technology: understand the minimum specifications for the technology and keep up with changes in capabilities and specifications (Dutton, 2015).
- Ensure the appropriacy of tele-audiology to the situation by documenting the benefits considered during decision-making.
- Educate clients on the benefits and limitations of tele-audiology. Recognise when the usefulness of a tele-audiology approach has been exhausted.
- Refer or schedule an on-site face-to-face consultation if tele-audiology does not provide an adequate assessment or if results are ambiguous.
- Set realistic expectations for all parties.
- Clarify contractual issues, including those with equipment vendors and manufacturers.
- Maintain an archive of equipment in use, which includes a system for performing and archiving backups.
- Personalise the tele-audiology encounter as much as possible.
- Document everything, including the equipment used, the resolution, as well as who participated and for what reason (Hall, 2020).

Conclusion

Audiologists have an obligation to provide services to those in need of audiological assessment or intervention. Tele-audiology is a valid and appropriate method of reaching those in need who would otherwise have difficulty in accessing audiologic services. With continuous and fast-paced changes and developments in technology, a variety of options and advances in tele-audiology enhance its appeal. However, tele-audiology is certainly not without its limitations and difficulties.

Despite some inherent challenges, the opportunities for beneficial utilisation of tele-audiology applications in EHDI programmes are numerous. Programmes may adopt EHDI in the context of tele-audiology to deliver many of the standard clinical service components, including screening, initial diagnostic assessments, behavioural assessment, hearing aid and cochlear implant programming, and communication development options. Tele-audiology in the context of EHDI can also make important contributions to many facets of programme infrastructure, including communication, training and quality management.
Section Three: Complexities of Early Hearing Detection and Intervention

Audiology as a profession should work towards a sound evidence base for EHDI via tele-audiology, where the client’s experience should be similar to services delivered face-to-face. Not only can tele-audiology serve to increase access to services but it can also facilitate a calibrated standard of practice across a programme so that all children and their families receive the best possible service.

References


Grace, P. J. (2009). *Nursing ethics and professional responsibility in advanced practice.* Boston, MA: Jones and Barlett.


Section Three: Complexities of Early Hearing Detection and Intervention


