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Saudi Commission for Health Specialties

The Saudi Higher Diploma in Clinical Audiology

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بسم الله الرحمن الرحيم

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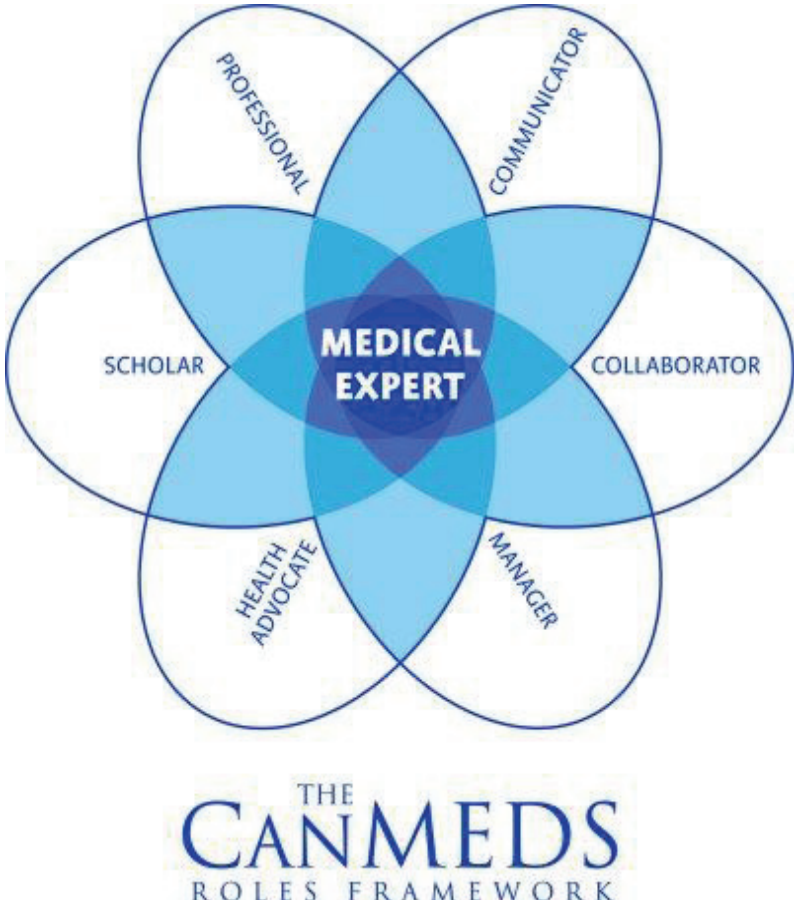

The CanMEDS Roles Framework. Copyright.
Frank JR (ed.) 2005. The CanMEDS 2005 Physician Competency Frameworks. Better Standards. Better Physicians. Better Care. Ottawa: Royal College of Physicians and Surgeons. Canada.

FOREWORD

The CanMEDS Framework of essential competencies was adopted as an innovative framework for medical education in the development of the Saudi Higher Diploma in Clinical Audiology (SHDCA). The CanMEDS focuses on articulating a comprehensive definition of competencies that are necessary for medical education and practice. The CanMEDS model for physician competence is adopted globally in various professions. The CanMEDS Framework is organized around seven roles, namely, medical expert (central role), communicator, collaborator, health advocate, manager, scholar, and professional.

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Glossary

ABR	Auditory brainstem response
ALDs	Assistive listening devices
ASSR	Auditory Steady State Response
BAHA	Bone-anchored hearing aid
BOA	Behavior observation audiometry
CEX	Clinical evaluation exercise
CLABSI	Central line-associated bloodstream infection
CI	Cochlear implant
DOPS	Direct observation of procedural skills
ECAP	Electrically evoked compound action potential
EEG	Electroencephalography
ENG/VNG	Electro-nystagmography/video nystagmography
ENT	Ear, nose, and throat
EP	Evoked potential
ESRT	Electrical stapedius reflex threshold
FDA	Food drug administration
FM	Frequency modulation
HAI	Hospital acquired infections
HCW	Healthcare workers
IT	Information technology
KAESC	King Abdullah Ear Specialist Center
KSU	King Saud University
MRSA	Methicillin-resistant Staphylococcus aureus
OAE	Otoacoustic emissions
OSCE	Objective structured clinical examination
PBL	Practice-based learning
PNU	Princess Noura University
SCFHS	Saudi Commission for Health Specialties
SHDCA	Saudi Higher Diploma in Clinical Audiology
SLP/T	Speech language pathology/therapy
VEMP	Vestibular evoked myogenic potential
VOR	Vestibulo-ocular reflex
VR	Vestibular rehabilitation
VHIT	Video head impulse test
VRA	Visual reinforcement audiometry
VRE	Vancomycin-resistant enterococcus
WBL	Work-based learning

Chapter 1

Introduction

The Saudi Higher Diploma in Clinical Audiology (SHDCA), which is offered by the Saudi Commission for Health Specialties (SCFHS), qualifies SCFHS-certified audiology specialists to become senior specialists in the field of audiology upon successful completion of the program. The qualification certificate is granted by the Scientific Council for Community Health (SCFCH) and the Scientific Board for Health Rehabilitation at the SCFHS under the supervision and accreditation of the SCFHS.

The SHDCA program aims to graduate highly qualified senior audiologists, who not only possess superior knowledge and clinical skills but are also highly competent professionals prepared to assume leadership roles in the field of audiology. The SHDCA aims to meet international standards of high-quality health care by elevating practice at the national level. To this end, it ensures that its trainees receive advanced training in various relevant areas of audiology.

The SHDCA program will help trainees attain excellence in audiology through evidence-based practice based on a foundation of sound research as well as active learning and clinical training.

1.1 Clinical Audiology Education in Saudi Arabia: History

1.1.1 Bachelor's Degree in Hearing and Communication

The first BSc program in hearing and communication officially opened as a four-year (inclusive of internship year) speech and hearing rehabilitation program at King Saud University (KSU) in 1984, making it the first program in the field of audiology in Saudi Arabia. It started accepting female applicants in 1985.

The program was temporarily closed after graduating the last class of 11 students in 1991. The program reopened 7 years later as a five and a half-year program (inclusive of internship year), with the first class of students graduating in 1998. The program continues to produce both female and male graduates upon completion of a five-year program (inclusive of internship year). The program was designed to educate professionals specializing in either audiology or speech language pathology/therapy (SLP/T); the internship year is split between both specialties (6 months in audiology and 6 months in SLP/T).

KSU remained the only university to train hearing professionals until 2016. In 2016, the first class of audiologists (31 students) graduated from Princess Noura University (PNU).

Unlike KSU, PNU's program trains audiologists in a program separate from that of SLP/Ts. PNU audiology graduates spend their entire internship year training in one specialty. The PNU audiology bachelor's program enables graduates to evaluate and manage hearing and balance functions and disorders.

The internship year is spent training at recognized hospitals and healthcare facilities in accordance to a prepared training program approved by the university, with mutual supervision by the college and the training institution. Only after the completion of the internship year do graduates receive a certificate of competence from the university that enables them to become licensed practitioners.

As of 2018, a total of 529 male and female students have graduated from KSU's Speech and Hearing program.

1.1.2 Scope of Practice

A typical job description for a BSc audiology graduate working as a clinical audiology specialist includes the following:

- The performance of audiological services such as behavioral and conventional audiometry (adult and pediatric)
- Speech audiometry
- Immittance battery (tympanometry, acoustic reflex testing, acoustic reflex decay, multi-frequency tympanometry, and Eustachian tube function testing)
- Hearing aid fitting and verification of digital instruments
- Screening and diagnostic otoacoustic emissions (OAEs)
- Pre-cochlear implant evaluation
- Post-cochlear implant follow-ups including aural rehabilitation, evaluation of progress, and programming of CI speech processors
- Evoked potentials including frequency-specific auditory brainstem response (tone burst ABR), auditory steady state response (ASSR), and electric ABR
- Training of students and interns from the Rehabilitation of Speech and Hearing (Speech Therapy and Audiology) Department, the College of Applied Medical Sciences, KSU and of audiology students and interns from PNU
- Performance of administrative work, upon assignment
- Participation in research related to clinical audiology practice
- Respecting patients' rights and following the healthcare code of ethics and policies

1.1.3 Career Opportunities

Job opportunities (including academic, clinical, and/or research positions) for graduates of this program are available in different institutions in the health sector (e.g., government and private hospitals, primary healthcare centers, medical professional entities, and regional health organizations), academic institutions, and charitable associations.

1.2 Status of the Saudi Higher Diploma in Clinical Audiology (SHDCA)

There is a significant demand for highly trained audiologists across the Kingdom. The recent introduction of a neonatal hearing screening program in Saudi Arabia is expected to result in an increase in the number of individuals with hearing loss who would otherwise have remained undetected. Additionally, this will necessitate the presence of highly trained audiologists in different regions of the country. With the development of new health care facilities, there will be employment opportunities for audiology professionals to serve the local population without the need to travel to large cities such as Riyadh.

Proper early diagnosis and intervention for hearing impairment has been reported to significantly impact the individual's environmental awareness, auditory skill development, language development, speech perception and production, literacy and academic performance, as well as the speed of such developments. This in return will have a financial return as well as improve the general social wellbeing of hearing-impaired individuals, which is in accordance with Saudi Arabia's 2030 vision.

The SHDCA aims to contribute effectively to the development of Saudi Arabia's healthcare system by training highly skilled healthcare professionals based on a well-structured clinical audiology diploma program.

1.2.1 Overview

The Clinical Audiology Diploma Program enables clinical audiology specialists to attain a high level of practical experience in the subspecialties of clinical audiology.

During the diploma program, students' clinical skills are further developed to endorse evidence-based practice while developing the necessary skill subsets needed to carry out clinical research and critical analysis of present clinical evidence. The diploma educational experience will be continuously reviewed in alignment with updated training and medical education concepts. In concordance with the SCFHS regulations, trainees will be provided with suitable assistance from preceptors/advisors. The rotations are structured to ensure that the trainees observe and participate in hands-on practices in different areas of advanced audiology patient care.

The rotations are six months each, and they include: 1) clinical audiology science and disorders, 2) advanced audiological and vestibular assessment, 3) audiological rehabilitation and management, and 4) advanced audiological management.

Each rotation includes lectures by experts in the field as well as trainees and local lecturers, in addition to practical training that occurs within local hospitals.

The diploma program requires the trainees to study full time, as the program delivery format involves daily practice and theory sessions. They must pass all the different rotations of this program, complete a research project, and fulfill the criteria set by the SCFHS to obtain their diploma and the SCFHS licensure.

There are limited spaces in the program each year. Rotations are directed toward the application and practice of advanced audiology. By the end of the fourth rotation, each trainee must select a final project related to the rotation or a subspecialty program in which he/she is interested. Before the end of the program, in the fourth rotation, each trainee must submit and defend his/her final project.

1.2.2 Goal

The overall goal of the program is to enroll diploma students in a well-structured comprehensive training program in clinical audiology, which is certified by the SCFHS. After successfully completing the required practical rotations and passing the theoretical exam, graduates can work in the following areas:

- **Clinical practice:** Graduating trainees will be able to provide highly competent specialized audiological management to various patient populations with different audiological and/or vestibular disorders. They will also learn how to incorporate their clinical knowledge into their daily professional practice, and work both independently and as a member of a healthcare team. Continuous medical education will be promoted during the diploma program to help students develop life-long habits of reading, keeping up to date with the literature, consulting with colleagues, attending scientific meetings, and presenting scientific research as part of continuing medical education contributing to development of the individual and the quality of audiology care. The following aspects of practice are covered during the diploma program:
  1. **Detection**
     - Constructing and supervising hearing screening programs to detect hearing loss across the life span
  2. **Evaluation and Diagnosis**
     - Conducting hearing evaluations that cover comprehension and supervision of behavioral, psychoacoustic, and electrophysiological measures of the peripheral and central auditory systems
     - Evaluating the vestibular system, including supervision and interpretation of electrophysiological and behavioral tests of equilibrium
     - Diagnosing hearing and/or vestibular abnormality based on the evaluation performed using calibrated instruments and standardized testing procedures
  3. **Management**
     - Evaluating, fitting, and verifying the amplification devices, including assistive listening devices (ALDs)
     - Administering audiological identification, assessment, diagnosis, and treatment programs to children with hearing impairment from birth and preschool through school age
     - Determining the appropriateness of amplification systems for persons with hearing impairment, evaluating their benefits, and providing counseling and training on their use
     - Conducting otoscopic examinations
     - Taking ear canal impressions
     - Fitting, evaluating, and dispensing hearing aids and other amplification systems
     - Assessing and providing audiological management for persons with tinnitus using techniques that include, but are not limited to, masking, biofeedback, hearing aids, education, and counseling
     - Providing pre- and post-surgical assessment and counseling as part of a multi-disciplinary team for implantable auditory devices (e.g., cochlear implants [CIs], middle ear implantable auditory devices, fully implantable hearing aids, bone-anchored hearing aids [BAHAs], and all other amplification/signal processing devices). Counseling includes ongoing counseling and specific pre-implantation counseling.
     - Providing manufacturer appropriate intra-operative electrically evoked compound action potential (ECAP) measures and objective testing
     - Providing post-surgical management, programming, troubleshooting, evaluation and counseling for recipients of implantable hearing devices (e.g., CIs, middle ear implantable hearing aids, fully implantable hearing aids, BAHAs, and all other amplification/signal processing devices)

- Providing counseling regarding hearing loss, the use of amplification/ implantable auditory devices, and strategies for improving speech understanding within the audiologists' expertise and scope of practice, and providing counseling regarding the effects of hearing loss on communication and psycho-social status in social, personal, and vocational areas.
- Evaluating and managing vestibular disorders

4. **Hearing Conservation**
   - Implementing and coordinating industrial and community hearing conservation programs
   - Aiding patients in identifying and eradicating noise-hazardous conditions, identifying hearing loss, providing recommendations and counseling on hearing protection, implementing employee education, and training and supervising non-audiologists to perform hearing screening in the industrial setting
   - Conducting intraoperative neurophysiological assessment and monitoring, conducting, and interpreting electrophysiological measurements of neural functions while considering sensory and motor evoked potentials and test nerve conduction velocity

- **Teaching:** Graduating trainees will be involved in teaching other trainees; audiology specialists; audiology students; audiology interns; nursing staff members of audiological clinics, medical students; ear, nose, and throat (ENT) trainees; and other interested physicians.
- **Research:** Trainees will learn how to design, implement, and defend a clinical research project. Graduates will be able to critically assess and appraise published works together and design and perform research activities, which will allow the trainee to contribute as an individual and team member to the development of audiology care in Saudi Arabia.
- **Data Management:** Graduates will learn how to evaluate population-derived information and information from the administered audiology procedures. These skills should include familiarity with information technology (IT) and the use of databases, spreadsheets, and statistical packages. Graduates will also be able to apply it for the management of audiology information both in hospital setting and within the community.

Chapter 2

Outcomes and Competencies

2.1 Educational Outcomes of the Program

Successful graduates will acquire a broad understanding of the fundamentals, and core knowledge, skills, and attitudes of essential audiology principles and skills necessary for early identification, assessment, evidence-based management, and prevention of hearing impairment and vestibular dysfunction in adults and children. In addition, they will possess essential research skills comprising a general understanding of research methodology, design, and statistics.

Upon completion of the SHDCA, the graduate will be able to effectively and efficiently conduct the following activities according to the latest evidence-based practice guidelines:

- Patient interview/audiological case history
- Otoscopy
- Immittance testing
- Tympanometry
- Acoustic reflex thresholds
- Acoustic reflex decay
- Speech reception threshold testing with and without masking
- Pure-tone testing by air conduction with and without masking
- Pure-tone testing by bone conduction with and without masking
- Word-recognition testing (including roll over)
- Interpretation of results and counseling
- Ear impressions (impression taking and ear mold selection)
- OAE testing
- Transient evoked OAE
- Distortion product OAE
- Neuro-diagnostic auditory brainstem response (ABR)
- Tone burst threshold search ABR
- Auditory steady state response (ASSR)
- Middle and late latency auditory evoked potentials
- Vestibular assessment
- Electro-nystagmography/video nystagmography (ENG/VNG)
- Electro-cochleography
- Hearing aid evaluation
- Hearing aid selection
- Hearing aid fitting
- Hearing aid programming
- Hearing aid verification and outcome measures
- Hearing aid troubleshooting/repair
- Appropriate prescription, fitting, and counseling for FM systems and ALDs
- Specialty testing
- Electroacoustic analysis in determining device function
- Conditioned play audiometry
- Visual reinforcement audiometry

- Behavioral observation audiometry
- Tuning fork tests
- Vestibular evoked myogenic potential (VEMP) skills
- Tinnitus
- Evaluate hearing-impaired individuals for CIs and other auditory implantable devices
- Provide appropriate management to hearing-impaired individuals for CIs and other auditory implantable devices
- Construct hearing conservation and hearing monitoring programs
- Record keeping
- Recommendations
- Appropriate referral(s)

2.2 Program Competencies

Upon completion of the diploma program, students will be able to serve in the following roles:

Role #1 Clinical Expert

Audiology

- Review the historical and current attitudes toward hearing and balance disorders
- Define audiology care, and outline its basic principles, standards, and models of care
- Provide effective audiology care services in a variety of settings, including: outpatients, inpatients, and field patients (e.g., military) in community and home settings
- Adjust approach to care according to the setting and consider organizational arrangements for the smooth delivery of audiology care in specific settings (e.g., schools)
- Describe the elements of a comprehensive and practical audiology care consultation, including approaches to dealing with hearing loss and balance disorders
- Display competency in taking an audiological history and performing a complete and appropriate audiological evaluation
- Describe the etiology, pathophysiology, classification, and characteristics of hearing loss and balance disorders, and incorporate this knowledge into taking a history, assessing, and managing patients
- Realize the impact of hearing loss and balance disorders across the human lifespan
- Plan appropriate interventional and rehabilitative management when hearing loss or vestibular disorders are confirmed
- Explain the principles of good management
- Show the skills required to perceive, analyze, integrate, and produce information using relevant models, frameworks, and theories of hearing and balance to apply relevant and current scientific knowledge
- Explain the use of alternative solutions in the management of hearing loss and balance disorders
- Consider various approaches and modify management to specific related problems
- Utilize appropriate interventions for prevention and management of handicapped patients
- Apply underlying theories and principles beyond the perspective in which they were first studied, and implement them in a work situation
- Critically appraise the suitability of scientific knowledge and various approaches in problem solving

- Display relevant critical thinking skills and demonstrate knowledge of and summarize the critical points in theoretical and practical problems
- Represent an argument and illustrate it with relevant evidence from the literature and theory, and analyze and develop research, theories, and ideas from relevant sources
- Understand the limitations of their knowledge, and how such limitations affect analysis and interpretation within the context of audiology care

Hearing Disorders

- Review principles of evaluation and management of different types of hearing loss
- Assess candidates for various hearing loss management solutions, and provide fitting, programming, validation, and verification measures, such as the use of hearing aids, cross hearing aids, bone conduction hearing aids, audio-link, FM system, BAHAs, hearing assistive technology systems, CIs, and other implantable devices, including the expected outcome and limitations
- Perform advanced evaluation and non-medical management of tinnitus
- Counsel patients in a scientific but compassionate manner to discuss various modes of hearing loss management
- Describe the important role of rehabilitation using up-to-date resources, along with methods of implementation

Vestibular Disorders

- Exhibit broad understanding of anatomy, physiology, and biomechanics of the peripheral and central vestibular systems
- Demonstrate knowledge and comprehension of the critical role of patient case history and interview techniques
- Implement and interpret behavioral and electrophysiological tests of the peripheral and central vestibular systems
- Comprehend and apply vestibular rehabilitation (VR) theory, as well as therapy and non-medical treatment protocols
- Assess treatment outcomes to demonstrate the success of the implemented management measures, which may be objective and/or subjective and pre- or post-intervention

Pediatrics

- Demonstrate understanding of the impact of hearing on development and communication
- Demonstrate competency in relation to general child and auditory development to audiological practices
- Determine the presence and extent of hearing loss and balance disorders early on with early effective management decisions for infants and children
- Perform clinical diagnostic audiological evaluations, including visual reinforcement audiometry (VRA), behavior observation audiometry (BOA), play audiometry, electrophysiological tests, OAE, and balance evaluation
- Evaluate, fit, program, and validate the amplification of hearing aids and CIs in children
- Provide proper intervention, prohibit further hearing loss, and manage any hearing or vestibular damage
- Produce formal, evidenced-based reports on findings

Cochlear Implants (CIs) and Auditory Implantable Devices

- Establish a high level of understanding of the current state of CI technology and its key role in the management of severe profound deafness
- Demonstrate knowledge and comprehension of key issues affecting CI performance, both in terms of the nature of the intervention and individual characteristics
- Select and manage young children and adults receiving CIs or other implantable auditory devices
- Demonstrate knowledge and comprehension of the main characteristics of CI hardware and signal processing
- Recognize the main characteristics of other implantable auditory devices
- Become familiar with the main methods of monitoring the function of CI devices, including both subjective and objective methods
- Become familiar with the concept of CI tuning and its scientific and clinical basis
- Describe and apply ethical considerations and professional issues and their impact on the assessment and treatment of individuals with hearing deficits

Role #2 Communicator

- Recognize the impact of diversity upon relationships
- Modify communication to minimize barriers due to diversity
- Provide educational and supportive counseling for patients and their families
- Demonstrate effective communication skills in dealing with deaf patients and their families, including in specific scenarios such as breaking bad news or running a family meeting
- Recognize the barriers to effective communication and modify the approach to minimize these barriers
- Appreciate that empathy and caring can be expressed through both verbal and non-verbal communication
- Listen actively
- Be sensitive to non-verbal cues
- Demonstrate effective verbal and written communication among members of the interdisciplinary audiology team, and other health care professionals
- Maintain clear, accurate, timely, and complete client records
- Deliver formal presentations for different categories of educational activities

Role #3 Collaborator

- Realize the importance of collaboration and assess the stages of team formation and development
- Recognize the unique roles of members of the interdisciplinary audiology team
- Demonstrate effective conflict resolution skills, including the ability to identify the nature and causes of conflict, and utilize techniques to resolve or mediate it
- Respect personal and professional differences among coworkers
- Support positive team dynamics
- Manage misunderstandings, limitations, and conflicts to enhance collaboration

Role #4 Health Advocate

- Assess the current state of audiology in high standards international academies, including barriers to the provision of better care for patients (e.g., geographical, cultural, and financial barriers)
- Engage in promotion and prevention activities
- Reflect on the psychosocial issues of patients with hearing and balance disorders and their families; in particular, consider the impact on quality of life, and the nature of handicaps
- Appraise ethical implications of different cultural perspectives, and demonstrate cultural competency in the delivery of care
- Reflect on the importance of support for caregivers
- Modify the approach of care to reflect differing perspectives of patients and families
- Interpret the legal elements of consent
- Provide information and tools to assist clients to obtain funding and services for themselves
- Provide information and support to promote self-advocacy and societal inclusion
- Facilitate opportunities for clients to connect with others experiencing similar challenges
- Consider other ethical dilemmas in audiology care

Role #5 Manager

- Describe the roles, regulatory frameworks, responsibilities, and professional capabilities of members of other professions involved in audiology care
- Recognize how the different models of care (e.g., audiologist vs. audiology technician) impact audiology care delivery
- Consider career options and become aware of the practical skills required for different career paths
- Speak with mentors during the program to aid in exploring career opportunities
- Engage in human resource management activities consistent with organizational needs
- Engage in financial management and resource planning activities consistent with organizational needs
- Engage in business management consistent with organizational needs
- Participate in quality improvement activities

Role #6 Scholar

- Incorporate evidence-based decision-making in caring for hearing-impaired patients and their families
- Refer to relevant literature to help solve clinical problems
- Participate actively in all academic division activities, such as Academic Half Day and Journal Club
- Apply critical appraisal skills to audiology literature
- Describe the unique challenges of audiology care research and strategies to overcome barriers
- Explain the principles and techniques of qualitative and quantitative research methodologies and outcome evaluation, including the statistical bases and limitations of current methods to assess the validity of audiology services research
- Identify current themes and trends in audiology research
- Demonstrate knowledge of basic grant and proposal-writing techniques to obtain provincial and national funding sources

- Satisfactorily complete the Foundations of Audiology Services on-line research course, including its assignments
- Provide clinical teaching and mentoring for junior trainees who are on training rotation

Role #7 Professional

- Recognize the importance of reflective practice by exploring personal experiences of hearing and balance disorders and in caring for audiology patients
- Comply with relevant federal and provincial requirements
- Comply with regulatory requirements
- Comply with professional code(s) of ethics
- Recognize and respond to ethical issues encountered in practice
- Recognize and respond to situations involving conflict of interest
- Recognize and respond to unprofessional behaviors of others in practice
- Maintain a professional demeanor
- Become a role model by demonstrating skillful patient care with hearing and balance disorders
- Demonstrate integrity, honesty, and compassion in patient care
- Consider the different approaches in caring for capable and incapable patients, including the ethical and legal roles of substitute decision-makers
- Interpret the legal elements of consent
- Respect the limits of professional privileges and authority
- Maintain boundaries in relationships with clients, colleagues, and other professionals
- Recognize and respond to opportunities to contribute to clinical education

2.3 Program Duration and Rotations

The program will be provided over 2 years. It will be distributed over four rotations (each rotation occurs over a duration of 6 months).

2.3.1 First Rotation: Clinical Audiology Science and Disorders

This rotation covers all required background knowledge and basic skills required to proceed to advanced clinical skills.

Core Topic	Modality	Objectives
• **Principles of auditory science**	Lectures	• Provide a basic understanding of the physical principles underlying the generation and propagation of sound, and the behavior of vibrating systems • Describe basic acoustic processes such as resonance, isolation, absorption, reflection, and refraction • Link knowledge of acoustics to the subject of audiology • Provide the basic background information necessary to read, understand, and benefit from the scientific literature on hearing • Demonstrate understanding of the basics of sound production, transmission, and perception

• **Normal development of speech and language**	Lectures	• Be familiar with the normal milestones for speech and language development • Be familiar with the processes underlying speech and language development
• **Anatomy of the vestibular system**	Lectures	• Describe the anatomy of the vestibular system
• **Physiology of the vestibular system**	Lectures	• Describe the physiological processes involved in balance • Describe the physiological processes involved in vestibular pathology
• **Impact of hearing loss on language development**	Lectures	• Provide an overview of information about the effects of hearing loss on the development of auditory skills • Provide an overview of information about the consequences of hearing loss on language development and the interaction with brain plasticity
• **Etiology of hearing loss**	Lectures	• Provide information about the different underlying causes of hearing loss • Provide information about the identification and differentiation between the different causes of hearing loss
• **Ototoxicity**	Lectures	• Provide guidelines for designing hearing monitoring programs • Provide guidelines for procedures for hearing conservation and ototoxicity monitoring
• **Diseases and syndromes associated with hearing loss**	Lectures	• Be familiar with the different diseases and syndromes associated with hearing loss • Be familiar with the symptoms of those diseases and syndromes and how to identify them
• **Genetics and hearing loss**	Lectures	• Provide an overview of information about the genetics of hearing loss • Provide an overview of information about syndromes associated with hearing loss • Provide an overview of information about genetics and management of hearing loss
• **Instrumentation and calibration in audiology**	Lectures and clinical practice	• Be familiar with equipment used in hearing and balance testing • Perform calibration of audiology unit's equipment • Demonstrate understanding of principles of auditory science • Effectively use the sound level meter

• **Research methods**	Lectures	• Provide information about objectives and types of research • Defining a research problem • Provide information about research design • Provide information about sampling design • Data collection • Data processing and analysis • Hypothesis testing • Interpretation and report writing
• **Evidence-based practice in audiology**	Lectures and clinical practice	• Provide overview and explanation of what evidence-based practice is • Provide overview and explanation of how to clinically apply evidence-based practice in audiology

2.3.2 Second Rotation: Advanced Audiological and Vestibular Assessment

This rotation covers advanced audiological evaluations of hearing and balance, including vestibular evaluation, pediatric audiology, electrophysiological tests, tinnitus, and establishing neonatal hearing screening programs.

Core Topic	Modality	Objectives
• **Immittance measurements**	Lectures and clinical practice	• Discuss preparation of an immittance testing and principles of ensuring its validity • Explain the procedures involved in performing acoustic immittance • Describe basic knowledge and theoretical underpinnings involved in acoustic immittance
• **Conventional behavioral audiometry**	Lectures and clinical practice	• Discuss the preparation of an audiometry and principles of ensuring its validity • Describe and explain the procedures and theoretical underpinnings involved in performing pure-tone air- and bone-conduction testing • Assess and diagnose the degree and type of hearing loss using audiometry in addition to other audiology procedures • Describe and define parameters of audiogram interpretation • Communicate results and recommendations orally and in writing
• **The masking procedure**	Lectures and clinical practice	• Describe and explain the procedures and theoretical underpinnings involved in performing pure-tone air- and bone-conduction masking

• **OAEs (evoked, spontaneous, contralateral suppression)**	Lectures and clinical practice	• Describe basic OAE types and sources • Describe and explain the procedures and theoretical underpinnings involved in performing OAEs
• **Pediatric audiology**	Lectures and clinical practice	• Describe the development of the auditory system and auditory behavior in fetuses and infants • Identify the procedures for pediatric audiologic behavioral evaluation
• **Play audiometry, behavioral observation audiometry, and visual reinforcement audiometry**	Lectures and clinical practice	• Perform hearing evaluation of pediatric patients using behavioral procedures (behavioral audiometry, behavioral observation audiometry, play audiometry, and visual reinforcement audiometry)
• **Speech audiometry**	Lectures and clinical practice	• Demonstrate knowledge and comprehension of the purpose of speech audiometry testing • Perform speech audiometry testing
• **Tinnitus assessment**	Lectures and clinical practice	• Provide overview of procedures for tinnitus assessment
• **Balance and vestibular assessment**	Lectures and clinical practice	• Provide information about the causal factors, differential diagnosis, treatment, and prognosis of major vestibular pathologies • Provide information about and explain the physical, biological, and psychosocial aspects of specific vestibular disorder • Identify and undertake a relevant subjective history
• **Neonatal hearing screening**	Lectures and clinical practice	• Provide an overview of and information about the electro-physiological methods of screening infants for hearing impairments • Provide an overview of and information about the structure of a neonatal hearing screening program and benchmarks
• **Intra-operative measurements**	Lectures and clinical practice	• Perform intra-operative measurements (ECAP, EABR, and/or electrical stapedius reflex threshold [ESRT])
• **ABR and frequency-specific ABR**	Lectures and clinical practice	• Provide information about how to administer and interpret electrophysiological measures to estimate frequency-specific hearing threshold (auditory brainstem response [ABR], air conduction and bone conduction, frequency-specific [tone burst] ABR air conduction and bone conduction • Administer and interpret electrophysiological measures to estimate hearing threshold

• **Electrophysiological evaluation (1-week workshop)**	1-week workshop at training center	• Provide information about how to administer and interpret additional electrophysiological measures to estimate hearing threshold such as auditory steady state response (ASSR) • Administer and interpret electrocochleaography • Administer and interpret electrophysiological measures to perform differential diagnosis • Identify the difference between infant and adult responses • Describe applications of middle latency responses and late latency responses in assessment of auditory processing • Describe applications of electroencephalography (EEG) measurements for evaluation of CIs, hearing aids, and brain injuries

2.3.3 Third Rotation: Audiological Rehabilitation and Management

This rotation covers audiological management, including hearing aid selection, fitting and verification, ALDs, implantable auditory devices, noise-induced hearing loss, hearing conservation programs, ototoxicity monitoring, and research methods.

Core Topic	Modality	Objectives
• **Hearing aid selection and fitting**	Lectures and clinical practice	• Determine patient candidacy for hearing aids • Apply relevant technology to appropriate patients and patient situations • Describe the acoustic effects of ear mold characteristics and modifications
• **Hearing aid verification and follow-up**	Lectures and clinical practice	• Perform electroacoustic measures for verification • Perform real ear measurements, test box measurements, and functional gain (aided) testing
• **Early intervention**	Lectures and clinical practice	• Demonstrate understanding of the importance of early intervention • Determine the best management option for infants diagnosed with hearing loss through neonatal hearing screening • Administer hearing monitoring programs for infants and young children with high-risk factors for developing hearing loss
• **Auditory implants (cochlear, middle ear, BAHA, etc.)**	Lectures and clinical practice	• Provide a history of implantable auditory devices • Provide an overview of and information about the current state of implantable auditory technology and its key role in management of severe to profound deafness • Provide an overview of implantable auditory devices and how they work

• **Tinnitus management/ treatment**	Lectures and clinical practice	• Provide an overview of and information about tinnitus treatment/management • Provide an overview of and information about the use of counseling and sound therapy • Provide an overview of and information about the use of hearing aids/CIs in tinnitus management
• **Noise-induced hearing loss**	Lectures and clinical practice	• Provide an overview of inner ear physiology • Provide information about noise-induced hearing loss, causes, types, physiological changes, theories, and evidence
• **Hearing conservation programs**	Lectures and clinical practice	• Provide an overview of and information about the rationale behind hearing conservation programs • Discuss risk factors and the basis of hearing conservation programs with examples and guidelines
• **Ototoxicity monitoring program**	Lectures and clinical practice	• Provide overview and information about rationale behind hearing ototoxicity monitoring programs • Discuss risk factors and basis of ototoxicity monitoring programs with examples and guidelines
• **ALDs**	Lectures and clinical practice	• Provide overview and information about available ALDs • Provide overview and information about the use of available assistive devices in different settings • Provide overview and information about programming the available assistive devices

2.3.4 Fourth Rotation Talks: Advanced Audiological Management

This rotation covers in-depth audiological management, such as VR including candidacy evaluation, counseling, fitting, and management of auditory implantable devices, and management of complex cases and psychological aspects of hearing loss to enable better counseling and management.

Core Topic	Modality	Objectives
• **VR**	Lectures and clinical practice	• Provide overview of and information about the theoretical background for VR • Provide overview of and information about the goals of VR, VR techniques, and exercises
• **Middle ear implants evaluation, selection, and counseling**	Lectures and clinical practice	• Address key issues affecting performance of middle ear implants, both in terms of the nature of the intervention and individual characteristics • Provide overview and information regarding key issues in selection and management of young children and adults receiving middle ear implants

• **CI evaluation, selection, and counseling**	Lectures and clinical practice	• Address key issues affecting CI performance, both in terms of the nature of the intervention and individual characteristics • Provide overview and information regarding key issues in selection and management of young children and adults receiving CIs or brainstem implants
• **CI programming (mapping) and troubleshooting specialized workshop**	2-week workshop at King Abdullah Ear Specialist Center (KAESC)	• Address the main characteristics of CI hardware and signal processing • Provide an overview of and information about the main methods of monitoring the function of CI devices, including both subjective and objective methods • Become familiar with the concept of CI tuning and its scientific and clinical basis • Complete hands-on training for CI fitting, trouble-shooting, and objective measures for all CI manufacturers within the Saudi FDA
• **Counseling in audiology**	Lectures and clinical practice	• Review issues facing audiologists • Appreciate the effect and consequences of hearing loss on individuals and families • Analyze non-professional counseling strategies • Provide overview of and information about the difference between professional and non-professional counseling • Promote idea generation on how to apply principles of non-professional counseling in clinical settings
• **Management of difficult cases**	Lectures and clinical practice	• Provide evidence-based practice guidelines for dealing with complex cases • Provide examples to demonstrate how to manage complex cases
• **Introduction to auditory processing disorders**	Lectures and clinical practice	• Provide an overview of auditory processing disorders • Provide an overview of working theories in the diagnosis and management of auditory processing disorders • Provide an overview of general guidelines in the diagnosis and management of auditory processing disorders
• **Introduction to psychology**	Lectures	• Understand what is psychology • Learn about: (a) Cognitive psychology such as memory, language, and thought; (b) social psychology; and (c) stress and health

• **Psychological aspects of hearing loss**	Lectures	• Examine potential psychological effects of hearing loss on children including its psychosocial consequences • Examine potential psychological effects of hearing loss on adults including its psychosocial consequences • Discuss how personality affects adaptation to hearing loss and CI • Discuss psychosomatic hearing loss

2.4 Continuum of Learning

This is a brief section showing the expected learning that should take place in each key stage of progression within the degree program, and expected changes between Year 1 and Year 2.

Year 1	**Year 2**
Obtains fundamental knowledge related to core clinical problems of audiology	Applies knowledge to provide appropriate audiological care related to core clinical problems of audiology
Acquires audiological examination and assessment skills and applies these in clinical practice	Analyzes and interprets audiological findings to drive appropriate differential diagnosis and management plans for the patient
Acquires all basic technical and basic life support skills	Develops proficiency in all basic technical procedures and basic life support skills
Acquires advanced and up-to-date knowledge related to the core clinical problems of audiology	Compares and evaluates challenging or contradictory findings and develops expanded differential diagnoses and management plans
Performs allocated tasks and begins to plan tasks	Plans and prioritizes tasks appropriately
Becomes aware of management issues	Develops management skills and is able to take responsibility for a defined project
Performs allocated audit projects and understands the audit cycle	Designs audit projects and understands risk management; is able to write appropriate clinical guidelines
Understands the principles of critical appraisal and research methodology	Able to appraise the literature critically and apply it in clinical practice
Works efficiently on a multi-disciplinary team	Able to take a leadership role among members of a multi-disciplinary team

Chapter 3

Teaching and Learning

3.1 Introduction

To enhance the diploma program, teaching and learning will include different modalities of delivery. It will include three formal teaching and learning activities:

1- Core specialty topics covered over four rotations
2- Practice-based learning (PBL)
3- Universal topics

A formal teaching time is an activity that is planned in advanced with an assigned tutor, time slot, and venue. Formal teaching time excludes bedside teaching, clinical postings, etc. Formal teaching and learning are delivered via a mixture of formal lectures, which are given by trainees and guest lecturers under the supervision of the program faculty in addition to specialty workshops. The trainee will also be required to design, implement, and write a research project to be completed at the clinical sites.

Every two weeks, at least 1 hour should be spent meeting with mentors to review the student's training portfolio, receive counseling, and reflect on the trainee's performance.

3.2 Core Specialty Topics

Core topics will be provided during the clinical rotations.

3.2.1 Learning Outcomes of Core Topics

1- *Principles of Auditory Science (Basic Acoustics):* At the end of the learning unit, students should:
   a) Possess a basic understanding of the physical principles underlying the generation and propagation of sound, and the behavior of vibrating systems
   b) Describe acoustic signals using basic acoustic terminology
   c) Describe the basic principles and methods of sound quantification
   d) Describe basic acoustic processes such as resonance, isolation, absorption, reflection, and refraction
   e) Link knowledge of acoustics to the subject of audiology
   f) Possess the basic background knowledge necessary to read, understand, and benefit from the scientific literature on hearing
2- *Principles of Auditory Science (Instrumentation and Calibration in Audiology):* At the end of the learning unit, students should:
   Demonstrate an understanding of the basics of sound production, transmission, and perception
   Be familiar with equipment used in hearing and balance testing
   Be able to calibrate an audiology unit's equipment
   Effectively use a sound level meter

3- *Conventional Behavioral Audiometry:* At the end of the learning unit, students should be able to:
   a) Discuss the preparation of an audiometry and principles to ensure its validity
   b) Describe and explain the procedures and theoretical underpinnings involved in performing pure tone air- and bone-conduction testing and masking
   c) Assess and diagnose the degree and type of hearing loss using audiometry in addition to other audiology procedures
   d) Perform pure tone audiometry, including air conduction and bone conduction
   e) Perform procedures for tinnitus and hyperacusis assessment
   f) Perform procedures for hearing conservation and ototoxicity monitoring
   g) Generate and explain the rationale for recommendations and referrals
   h) Provide counseling to facilitate patients' understanding of hearing problems
   i) Describe and define parameters of audiogram interpretation
   j) Communicate results and recommendations orally and in writing
4- *Speech Audiometry:* At the end of the learning unit, students should be able to:
   a) Understand the purpose of speech audiometry testing
   b) Perform speech audiometry
   c) Perform procedures to acquire speech recognition threshold
   d) Perform procedures to acquire word recognition score (speech discrimination score)
   e) Perform procedures to acquire speech awareness threshold
   f) Effectively apply masking procedures used in audiology
   g) Interpret and explain the results of the measurements
   h) Generate and explain the rationale for recommendations and referrals
   i) Communicate results and recommendations orally and in writing
5- *Immittance Measurements:* At the end of the learning unit, students should be able to:
   a) Effectively use immittance to assess middle ear function for both pediatric and adult populations
   b) Discuss the preparations for immittance testing and principles of ensuring its validity
   c) Describe and explain the procedures involved in performing acoustic immittance
   d) Demonstrate the basic knowledge and theoretical underpinnings of acoustic immittance
   e) Carry out all immittance tests (tympanometry, multi-frequency tympanometry, ipsilateral and contralateral acoustic reflex thresholds, and reflex decay)
   f) Perform the Eustachian tube function
   g) Interpret and explain the results of specific pathologies
6- *OAE:* At the end of the learning unit, students should be able to:
   a) Describe basic OAE types and sources
   b) Describe and explain the procedures and theoretical underpinnings of performing OAEs
   c) Describe the rational for specific stimulus and recording parameters
   d) Administer and interpret OAE measures (transient evoked OAEs and distortion products OAEs)
   e) Generate and explain the rationale for recommendations and referrals
   f) Communicate results and recommendations orally and in writing
7- *Pediatric Audiology:* At the end of the learning unit, students should be able to:
   a) Demonstrate an understanding of the development of the auditory system and auditory behavior in fetuses and infants
   b) Evaluate hearing in pediatric patients using behavioral procedures (behavioral audiometry, behavioral observation audiometry, play audiometry and visual reinforcement audiometry)
   c) Identify the procedures for pediatric audiologic behavioral evaluation

d) Demonstrate understanding of the need for early identification (neonatal hearing screening, well-baby infant hearing screening, and high-risk infant hearing screening)
e) Demonstrate understanding of the need for early management of hearing-impaired children
f) Demonstrate knowledge of speech perception theories supporting auditory (re)habilitation methods
g) Demonstrate understanding of the effect of hearing impairment on speech perception, production, and language
h) Demonstrate knowledge of communication strategies and educational options, handle pediatric patients, and evaluate their hearing using behavioral procedures

8- *Auditory Electrophysiology Measurements:* The trainee will be able to assess the hearing of pediatric and adult populations though electrophysiological procedures. At the end of the learning unit, students should be able to:
a) Demonstrate an understanding of the anatomy and physiology of the auditory system
b) Describe the normal aspects of electrophysiology measures for individuals over the lifespan
c) Describe the instrumentation related to electrophysiologic assessment
d) Describe the physical characteristics and measurement of stimuli related to electrophysiologic assessment
e) Describe electrophysiologic methods of screening infants for hearing impairment
f) Administer and interpret electrophysiological measures to estimate hearing threshold (auditory brainstem response [ABR]- air conduction and bone conduction, frequency-specific [tone burst] ABR- air conduction and bone conduction, and auditory steady state response [ASSR]);
g) Administer and interpret electrocochleaography
h) Administer and interpret electrophysiological measures to perform differential diagnosis including middle and late latency auditory potentials
i) Identify the difference between infant and adult responses
j) Describe applications of middle latency responses and late latency responses in assessment of auditory processing
k) Describe applications of EEG measurements for evaluation of CIs, hearing aids, and brain injuries

9- *Hearing Aids and ALDs:* The trainee will be able to manage pediatric and adult patients using hearing aids and or other ALDs. At the end of the learning unit, students should be able to:
a) Demonstrate a basic knowledge of hearing aid components, signal processing, and technological features work
b) Determine patient candidacy for hearing aids
c) Apply the technology to appropriate patients and patient situations
d) Describe the acoustic effects of ear mold characteristics and modifications
e) Describe and explain the technical function of different ALDs
f) Determine patient candidacy for ALDs
g) Demonstrate knowledge of hearing aid fitting and programming procedures
h) Perform hearing aid evaluation, hearing aid selection, and hearing aid fitting
i) Perform electroacoustic measures for verification, real ear measurements, test box measurements, and functional gain (aided) testing

10- *Vestibular Assessment and Rehabilitation:* The trainee will be able to perform and analyze vestibular system test results to assist an otolaryngologist (ENT) in diagnosing balance disorders. At the end of the learning unit, students should be able to:
   a) Demonstrate an understanding of the anatomy and physiology of the vestibular system
   b) Demonstrate an understanding of the causal factors, differential diagnosis, treatment, and prognosis of major vestibular pathologies
   c) Understand and explain the physical, biological, and psychosocial aspects of specific vestibular disorder
   d) Identify and undertake a relevant subjective history
   e) Administer and carry out a full vestibular assessment, management and rehabilitation, including but not limited to: spontaneous nystagmus testing, saccade testing, smooth pursuit testing, optokinetic testing, vestibulo-ocular reflex (VOR), caloric testing, positional and positioning testing, rotational testing and vestibular evoked myogenic potentials (VEMP), and posturography and head impulse test/video head impulse test (VHIT)
   f) Interpret and explain the results of such measurements
   g) Generate and explain the rationale for recommendations and referrals
   h) Provide counseling to facilitate patients' understanding of the vestibular problem
11- *Implantable Auditory Devices and CIs:* The trainee will be able to evaluate pediatric and adult populations for their candidacy for CIs. Additionally, the trainee will be able to perform intra-operative measurements, and program, map, and troubleshoot CI devices. At the end of the learning unit, students should be able to:
   a) Demonstrate knowledge of relevant history, anatomy, and candidacy for implantable auditory devices (including osseointegrated, cochlear, and auditory brainstem implants)
   b) Demonstrate understanding of audiologic candidacy and evaluation criteria for implantable devices, including performance of CI candidate evaluation and selection
   c) Demonstrate a basic understanding of risk factors and surgical procedures for the implantable auditory devices
   d) Perform intra-operative measurements (ECAP, EABR, and ESRT)
   e) Demonstrate knowledge of basic fitting and programming concepts and considerations for each of the implantable devices
   f) Demonstrate understanding of outcome measures and post-operative audiological follow-up for implantable auditory devices, including objective measures as measured through the devices as well as more subjective measures
   g) Perform troubleshooting for the different implantable devices
   h) Perform counseling: 1) pre-implant (e.g., expectations, commitment, rehabilitation, etc.), 2) pre-operative (e.g., device, surgery, meningitis vaccine, careful monitoring of ear infection, etc.), and 3) post-implant (e.g., care and use of device, expected initial auditory responses, rehabilitation, etc.)
   i) Obtain and appreciate the multidisciplinary aspect of working with patients with implantable devices from a clinical perspective
12- *Research Methods and Study:* Trainees will be assigned a research project that can be carried out at the clinical practicum sites and must be completed in order to graduate from the program. This is a partial fulfillment of the criteria of the final certification exam. At the end of the learning unit, students should be able to:
   a) Conduct critical reviews of peer-reviewed journal articles and run a thorough literature search to assess available evidence to be incorporated into practice
   b) Develop his/her understanding of the basic principles of scientific research
   c) Distinguish the different types of research methodologies
   d) Demonstrate an understanding of commonly used statistical techniques

e) Interpret statistical data to draw conclusions
f) Demonstrate an understanding of ethical considerations in research and ensure that ethics are maintained during the completion of the project
g) Conduct all the necessary steps to developing and successfully completing a research study
h) Apply an evidence-based approach to selecting psychometrically sound and clinically viable outcome measures
i) Describe and apply steps involved in disseminating research results and findings in conference presentations and peer-reviewed papers for submission

3.3 Teaching Activities

3.3.1 Teaching Methods

The teaching will include:
1- Hands-on training and practice
2- Theoretical lectures and presentations
3- Specialty workshops
4- Discussions and brainstorming
5- Multidisciplinary meetings
6- Interactive sessions
7- An up-to-date literature review
8- Case studies
9- Journal club meeting (four in each rotation)
10- Attendance of educational meetings, such as conferences and workshops
11- Completion of a research project

3.3.2 Workshops

Workshop-1: CI programming (mapping) and troubleshooting workshop (Specialty workshop at a specialized center)

Duration: 2 weeks

Venue: KAESC, King Saud University Medical City, KSU (the largest CI center in the Middle East)

Format: Talks, hands-on clinical practice with patients implanted with different devices from different manufacturers, simulation training with different devices from the different manufacturers

Lecturers: consultant audiologists

Lectures:
History of CI
CI anatomy and function, CI equipment
CI signal processing
CI candidacy, factors affecting post-CI outcome
Telemetry and electrophysiology

Programming and follow-up in CI
Major CI companies/manufacturers
Speech perception, speech and language outcomes, binaural hearing, and CIs
Wireless technology and connectivity for different devices from different manufacturers
Case studies, complex cases, research, and future directions

Hands-on clinical practice:
CI parts, CI connections for different devices from three different CI manufacturers approved by the FDA (Advanced Bionics, Medel, and Cochlear)

Troubleshooting, general principles, and manufacturer-specific practice (Advanced Bionics, Medel, and Cochlear)

ECAP objective measures for different manufacturers (Advanced Bionics, Medel, and Cochlear), and how to apply these measures in programming

Programming different devices from different manufacturers (Advanced Bionics, Medel, and Cochlear)

Simulation training:
ECAP measures
Programming of different devices (Advanced Bionics, Medel, and Cochlear)

Workshop-2: Electrophysiological Evaluation:

Duration: 1 week

Venue: Training facility or at KAESC/King Abdulaziz University Hospital KAUH if training facility is not available

Format: Talks, hands-on practice with patients, including implanted individuals

Lecturers: consultant audiologists

Lectures:
Overview of evoked potentials (EPs) measurements
Electrophysiology basics and principles
Middle latency response
Auditory steady state response
Auditory cortical responses
Cognitive event-related potentials
How to prepare and measure ABR
How to prepare and measure EABR
Case studies, complex cases, research, and future directions

Hands-on practice:
Measure electrocochleography, ABR, and middle and late latency potentials, including:
- Preparing the EP machine
- Preparing the subject and electrode montage
- Measuring the potentials
- Changing parameters

Measure EABR, including:
- Preparing the EP machine
- Connecting the CI system
- Preparing the CI software
- Preparing the subject and electrode montage
- Measuring the potentials
- Changing parameters

3.3.3 Practice-Based Learning (PBL)

PBL requires the trainee to investigate and evaluate their clinical practice and patient care, appraise and assimilate scientific evidence, and continuously improve patient care and clinical skills based on constant self-evaluation and life-long learning. PBL activities include:
1. Morning report case presentations (optional)
2. Morbidity review
3. Journal club
4. Systematic reviews
5. Case presentation
6. Hospital rounds with other health team members
7. Guest speakers on core specialty topics

8. Clinic-based learning
9. Workshops and courses (trainee selected topics)

3.4 Universal topics

Universal topics are high value, interdisciplinary topics of the outmost importance to the trainee. These topics are delivered centrally to ensure that trainees receive high-quality teaching and develop their essential core knowledge. These topics are common to all specialties, and meet one or more of the following criteria:

1. They are developed at the level of the Saudi Commission for all specialties.
2. Priority is given to topics that are high value, interdisciplinary, and integrated, as well as expertise that may be beyond the scope of the local clinical training sites.
3. Universal topics are developed centrally by the Saudi Commission and are available as e-learning modules.
4. Learning outcomes of the core topics will be determined centrally.
5. Each universal topic will have a self-assessment at the end of each rotation.

The duration of each topic is one-and-half hours.

Assessment: The topics will be delivered in a modular fashion. At the end of each learning unit, there will be an online formative assessment. Upon completion of all topics, there will be a combined summative assessment in the form of context-rich multiple-choice questions (MCQs). All trainees must attain a minimum score on the summative assessment. Alternatively, these topics can be assessed in a summative manner along with a specialty examination. The following table outlines the universal topics applicable to the audiology program:

TRAINING YEAR	UNIVERSAL TOPIC
First year	1. Hospital-acquired infections 2. Assessment of frail elderly 3. Mini-mental state examination 4. Care of the elderly
Second year	5. Occupational hazards of HCW 6. Patient advocacy 7. Ethical issues: treatment refusal; patient autonomy

3.4.1 Description of Universal Topics Learning Units

1- *Hospital-Acquired Infections (HAIs):* At the end of the learning unit, students should be able to:
   a) Discuss the epidemiology of HAIs with special reference to HAIs in Saudi Arabia
   b) Demonstrate knowledge and comprehension of HAIs as one of the major emerging threats in healthcare
   c) Identify the common sources and causes of HAIs
   d) Describe the risk factors of common HAIs, such as ventilator-associated pneumonia, MRSA, CLABSI, and vancomycin-resistant enterococcus (VRE)
   e) Identify the role of HCWs in the prevention of HAIs

f) Determine appropriate pharmacological (e.g., selected antibiotic) and non-pharmacological (e.g., removal of indwelling catheter) measures in the treatment of HAIs
g) Propose a plan to prevent HAIs in the workplace

2- *Assessment of Frail Elderly:* At the of the learning unit, students should be able to:
a) List the similarities and differences between comprehensive assessment of elderly patients and assessment of other patients
b) Perform comprehensive assessment, in conjunction with other members of a health care team, of frailty with special emphasis on social factors, functional status, quality of life, diet and nutrition, and medication history
c) Develop a problem list based on the frailty assessment

3- *Mini-Mental State Examination (MMSE):* At the end of the learning unit, students should be able to:
a) Review the appropriate usages, advantages, and potential pitfalls of MMSE
b) Identify patients suitable for MMSE
c) Screen patients for cognitive impairment through MMSE

4- *Care of the Elderly:* At the end of the learning unit, students should be able to:
a) Describe the factors that must be considered in planning elderly patient care
b) Recognize the needs and well-being of caregivers
c) Identify the local and community resources available for elderly patient care
d) Develop, with input from other health care professionals, individualized care plans for elderly patients

5- *Occupation Hazards of Health Care Workers (HCW):* At the end of the learning unit, students should be able to:
a) Recognize common sources and risk factors of occupational hazards among HCWs
b) Describe common occupational hazards in the workplace
c) Develop familiarity with legal and regulatory frameworks governing occupational hazards among HCWs
d) Develop a proactive attitude toward promoting workplace safety
e) Protect one's self and one's colleagues against potential occupational hazards in the workplace

6- *Patient Advocacy:* At the end of the learning unit, students should be able to:
a) Define patient advocacy
b) Recognize patient advocacy as a core value governing medical practice
c) Describe the role of patient advocates in healthcare
d) Develop a positive attitude toward patient advocacy
e) Be a patient advocate in conflicting situations
f) Be familiar with local and national patient advocacy groups

7- *Ethical Issues: Treatment Refusal and Patient Autonomy:* At the end of the learning unit, students should be able to:
a) Predict situations where a patient or family is likely to decline prescribed treatment
b) Describe the concept of "rational adult" in the context of patient autonomy and treatment refusal
c) Analyze key ethical, moral, and regulatory dilemmas in treatment refusal
d) Recognize the importance of patient autonomy in the decision-making process
e) Counsel patients and families declining medical treatment concerning the patients' best interests

3.5 The Research project

The trainee will learn how to design and implement a research project that can be carried out at the clinics of any of the practicum sites.

3.6 Educational Resources

1- Articles and updated learning material
2- Dhar, S. and Hall, J.W. 2012. Otoacoustic Emissions: Principles, Procedures and Protocols. San Diego, CA: Plural Publishing.
3- Dillon, H. 2012. Hearing Aids (2nd ed.). Sydney: Boomerang Press.
4- Eisenberg, L.S. (ed.). 2016. Clinical Management of Children with Cochlear Implants. San Diego, CA: Plural Publishing.
5- Hall, J.W. 2014. Introduction to Audiology Today. Boston, MA: Pearson.
6- Hall, J.W. 2015. eHandbook of Auditory Evoked Responses: Principles, Procedures & Protocols.
7- Hay-McCutcheon, M. 2013. Cochlear Implant Patient Assessment: Evaluation of Candidacy, Performance, and Outcomes. San Diego, CA: Plural Publishing.
8- https://www.asha.org/
9- https://www.audiology.org/
10- http://www.baaudiology.org/
11- http://www.thebsa.org.uk/
12- Irwin, D., Pannbacker, M., and Lass, N. 2008. Clinical Research Methods in Speech-Language Pathology and Audiology. San Diego, CA: Plural Publishing.
13- Katz, J. (ed.). 2014. Handbook of Clinical Audiology (7th ed.). Philadelphia, MD: Lippincott, Williams & Wilkins.
14- Niparko, J.K. (ed.). 2009. Cochlear Implants: Principles & Practices. Philadelphia, MD: Lippincott, Williams & Wilkins.
15- Tharpe, A.M. and Seewald, R. (eds.). 2016. Comprehensive Handbook of Pediatric Audiology. San Diego, CA: Plural Publishing.
16- World Health Organization's (WHO's) Guidelines and Recommendations

Chapter 4

Assessment

4.1 Purposes of Assessment

- To enhance learning by providing formative assessment, which will enable trainees to receive immediate feedback, measure their own performance, and identify areas for development
- Drive the learning process and enhance training by clarifying expectations for trainees and motivating them to ensure that they receive suitable training and experience
- Ensure that trainees are acquiring competencies within the domains of good medical practice
- Assess trainees' actual performance in the workplace
- Ensure that trainees have acquired the essential underlying knowledge required for their specialty
- Provide robust, summative evidence that trainees are meeting the curriculum standards during the training program

4.2 General Principles of Assessment

- Assessment should be continuous.
- Assessment must be strongly linked to the curriculum and course content.
- All the course contents that are to be assessed must be assessed.
- There is no single approach to competency-based assessment; it must be responsive to the needs of the situation.
- Assessment must not discriminate against individuals or groups.
- Assessment will be reviewed periodically by the diploma training committee to identify aspects that may require further emphasis or counseling.
- The SHDCA program evaluation consists of formative and summative assessments. Formative assessments include the portfolio, mini-CEX, CBD, and attendance. The summative assessment is the end of program (written and clinical) exam, which is held after the final rotation.
- The trainee and faculty must meet to review portfolios and logbooks once every two months. The trainee should be provided with feedback in formal sessions throughout the rotation to explore his/her strengths and weaknesses and improvement plans will be revealed in the ongoing learning contract.
- Guidance and training for trainer/evaluator should be conducted for better use of workplace-based assessment (WPBA): Mini-clinical evaluation exercise (Mini-CEX), case-based discussion (CBD), and direct observation of procedural skill (DOPS) tools for each trainee according to his/her level.
- The portfolio is a pre-requisite for the summative assessment and will not be included in the final score. Candidates must score 70% or higher on their portfolio to be eligible for the summative assessment.

4.3 Formative Assessment

Trainees, as adult learners, should be receptive to feedback throughout their journey of competency from "novice" to "mastery" levels. Formative assessment (also referred to as continuous assessment) is the component of assessment that is distributed throughout the academic year aiming primarily to provide trainees with effective feedback. Input from the overall formative assessment tools will be utilized at the end of the year to make the decision of promoting each individual trainee to the subsequent training level. Formative assessment will be defined based on the scientific committee of audiology program recommendations. According to the executive policy on continuous assessment (available online at www.scfhs.org), formative assessment consists of the following features:

a. Multisource: minimum four tools
b. Comprehensive: covering all learning domains (knowledge, skills, and attitude)
c. Relevant: focusing on workplace-based observations
d. Competency milestone-oriented: reflecting trainee's expected competencies that match trainee's developmental level

Trainees should play an active role in seeking feedback during their training. On the other hand, trainers are expected to provide timely and formative assessment. SCFHS will provide an e-portfolio system to enhance communication and analysis of data arising from formative assessment.

Workplace-Based Assessments (WPBAs)

WPBAs will be composed of the following:

1. Mini-Clinical Evaluation Exercise (mini-CEX): 3 every 6 months
2. Case-Based Discussion (CBD): 4 every 6 months
3. Direct Observation of Procedural Skills (DOPS) per rotation: 1 every 6 months

4.3.1 Mini-CEX (6 per year)

This tool is used to assess a clinical encounter with a patient to provide an indication of competence in skills essential for good clinical care, such as history taking, examination, and clinical reasoning. Further, the trainee receives immediate constructive feedback about his/her performance. The mini-CEX can be used at any time and in any setting (see Appendix 1).

Basic Topics of the Mini-CEX:

1. Communication with patients and families
2. Clinical evaluation and examination
3. Clinical evaluation of related clinical problems
4. Counseling the patient and family in relation to case management
5. Assessing the outcome of selected management
6. Clinical evaluation and ongoing care of deaf and hearing-impaired patients
7. Evaluating the need for psychological assessment or intervention
8. Evaluating the need for social services support

4.3.2 CBD (8 per year)

The CBD assesses the performance of a trainee in his/her management of a patient to provide an indication of competence in areas such as clinical reasoning, decision-making, and application of medical knowledge in relation to patient care. It also serves as a method to document conversations about, and presentations of, cases by trainees. The CBD should include discussion about a written record (such as written case notes, out-patient letters, and discharge summaries) (see Appendix 2).

Basic Topics of CBD

1. Inter-professional relationships
2. Doctor/patient relationships
3. Record keeping
4. Appropriate referrals
5. Recognition, assessment, and management of critical change in patient pathway
6. Shared care in different settings
7. Management of concurrent clinical problems
8. Other interventions in hearing loss and vestibular disorders management
9. Follow-up and future planning
10. Psychosocial care
11. Discipline and reliability
12. Self-awareness and insight
13. Ethical standards
14. Teamwork and leadership

4.3.3 DOPS (2 per year)

A DOPS is an assessment tool designed to assess the performance of a trainee in undertaking a practical procedure against a structured checklist. The trainee receives immediate feedback to identify strengths and areas for development (see Appendix 3).

List of required DOPS until independence in these procedures is demonstrated:

1. Tuning fork testing
2. Otoscopic examination
3. Immittance testing
4. Speech testing
5. Pure-tone testing
6. OAE testing
7. Electrophysiologic testing including click ABR, threshold estimation with frequency-specific ABR and ASSR
8. Pediatric behavioral hearing assessment
9. Vestibular assessment testing including VNG/ENG and rotational testing
10. Hearing aid selection, fitting, verification, and troubleshooting
11. Evaluating candidates for CIs and other implantable auditory devices
12. Programming and troubleshooting of CIs and other implantable auditory devices

The reflective record contains a series of questions to guide completion and to encourage the breadth and depth of reflection. Feedback will be provided by at least two different supervisors.

4.4 Logbook

Academic and clinical assignments should be documented on an electronic tracking system (e-Logbook when applicable) on an annual basis. Evaluations are based on accomplishment of the minimum requirements for the procedures and clinical skills, as determined by the program (see Appendices 4 and 5).

4.5 Portfolio

The portfolio is a collection of the trainee's work, which provides evidence of his/her achievement of knowledge, skills, and professional growth through a process self-reflection. The portfolio should be assessed every 3 months by the supervisor or mentor (see Appendix 6).

4.6 In-Training Evaluation Form (ITER) and Final In-Training Evaluation Form (FITER)

At the end of each rotation, an evaluation form (ITER) should be completed, and the trainee should receive rotation feedback (see Appendix 7). In addition to the local supervising committee's approval of the completion of the clinical requirements (via the trainee's logbook), the program directors prepare a FITER for each trainee at the end of the final year (Appendix 8). This could also involve clinical or oral examinations or completion of other academic assignments.

4.7 Research project

4.7.1 Research project Proposal

- The final study proposal describes the trainee's research plan. It is designed to convince the advisor that the trainee has a clear research plan and has started the process of conducting research (see Appendix 9).
- All trainees are required to conduct a research project during training.
- In each academic year, two research days are held, mid-year research day and end-year research day where the research project for each trainee is evaluated.

4.7.2 Research project Evaluation

The defense panel members will evaluate both the final written report and oral presentation. The grades will be distributed in the fourth rotation, as follows:

- Final research proposal form (10% of the total grade) by the end of Week 5
- Final research report (60% of the total grade) by the end of Week 18
- Final research oral presentation and discussion (30% of the grade) by Week 20

4.7.3 Requirements for Each Year

1. By the end of the first year, the Trainees should have gained experience in the initial assessment and management of patients presenting common auditory or vestibular function impairments.
    - By the end of Year 1, competence must be demonstrated via:
        - MiniCEX
        - CBD

2. By the end of Year 2, the Trainees should be autonomously competent in the assessment and management of patients presenting all auditory or vestibular function impairments.
   - By the end of Year 2, competence must be demonstrated via:
     – MiniCEX
     – CBD

Assessment	Year 1	Year 2
DOPS	Demonstrated competence in 2 DOPS	Demonstrated competence in 2 DOPS
Mini-CEX	Six mini-CEX satisfactorily completed	Six mini-CEX satisfactorily completed
CBD	Eight CBDs satisfactorily completed	Eight CBDs satisfactorily completed
Research	Select the research topic/problem, write the proposal, apply for IRB, and start initial data collection	Complete data collection, data analysis, and prepare the manuscript for submission
Final Examination		Passed final written and OSCE exam

Certification of Completion of Training

The certification of training completion will only be issued upon the trainee's successful completion of all program requirements in the different rotations. This certificate will make the trainee eligible to sit the final examinations.

4.8 Summative Assessment

The summative assessment is the component of assessment that aims primarily to make informed decisions regarding the trainees' competency. In comparison to the formative assessment, the summative assessment does not aim to provide constructive feedback. For further details on this section, please refer to the general bylaws and executive policy of assessment (available online: www.scfhs.org). To be eligible to sit the final exams, a trainee should be granted the "Certification of Training-Completion."

4.8.1 End-of-Program Final Examination

- The end-of-program final exam will be held at the end of/after the final rotation.
- The exam is held once a year.
- The trainee must complete all procedures and training requirements before sitting the final exam.
- The trainee will be awarded his or her diploma certificate once he/she has successfully completed the final examinations.
- The final SHDCA examination comprises two parts:
  1- Written Examination: This examination assesses the candidates' theoretical knowledge base, including knowledge of recent advances and problem-solving capabilities in the specialty of audiology. It is delivered in an MCQ format (see Appendix 10).

The examination blueprint and format (including the number of questions, eligibility, and score required to pass) is based on the Saudi Commission Examination Rules and Regulations, available from the Saudi Commission website, www.scfhs.org.sa (Appendix 11 provides an example of the blueprint).

2- Practical Examination: This examination assesses a broad range of high-level clinical and diagnostic skills, including data gathering, patient management, communication, and counseling. The examination is held preferably in an objective structured clinical examination (OSCE).

The examination blueprint and format (including the number of questions, eligibility, and scores required to pass) will be based on the Saudi Commission Examination Rules and Regulations, available from the Saudi Commission website, www.scfhs.org.sa (Appendix 12 provides an example of the blueprint).

- Exam eligibility: As per SCFHS general exam rules and regulations (scfhs.org.sa).
- Exam rules: As per SCFHS general exam rules and regulations (scfhs.org.sa).
- Exam format: As per SCFHS general exam rules and regulations (scfhs.org.sa).
- The questions cover all aspects of audiology as shown in the blueprint.
- Passing score: In accordance with the commission's training and examinations rules and regulations. There will be no negative marking, as per the rules of SCFHS.

4.9 Certification

- Trainees will be granted the SHDCA after successfully passing both the final written and clinical examinations.
- An unsuccessful trainee will be subject to the law of the Saudi Commission for Health Specialties.

Chapter 5

Policies and Procedures

5.1 Program Admission Requirements

For acceptance into the SHDCA training program, the candidate must fulfill the following requirements:

- Hold a bachelor degree in audiology and or audiology/speech pathology from a recognized institution.
- Complete the internship year from an accredited and recognized university after acquiring a BSc in audiology or audiology/speech pathology before the beginning of the diploma program.
- Sponsorship by a governmental or private sector sponsor to support the financial fees required for the enrollment in this program is preferred. Self-sponsorship is also acceptable.
- Submit three confidential letters of recommendation from professional tutors, lecturers, supervisors, instructors, or senior/consultant audiologists.
- Provide a sponsorship letter from the candidate institution (employer), indicating through a "**no objection letter"** the eligibility of the candidate to join the 2-year SHDCA program on a full-time basis.
- Pass the admission exam and/or committee interview, and comply with the specific regulations of the SHDCA.
- Fill out and submit the application form in a timely manner during the application period.
- Provide complete original copies of all required certificates and letters, including the experience letter, upon application.
- Pass the entry interview conducted by a faculty member.

5.2 General Rules

The program is subject to the general regulations, approved by the SCFHS. These regulations must be applied to all trainees for:

1- Rules of Training
2- Rules of Examinations
3- Rules of Accredited Training Centers

5.3 Program Length, Terms, and Duty Hours

The duration of the residency-training program is two years (96 weeks, excluding annual vacations). Trainees are required to attend from 7:30 a.m. to 4:30 p.m. Moreover, they are also required to attend program educational activities, which include scientific lectures, conferences, and subspecialty seminars. In addition, they are required to provide didactic presentations of, among others, cases, selected topics, and journal clubs during the program.

5.4 Vacation and Holidays

- The trainee is granted an annual leave of four weeks in addition to one of the two Eid holidays.
- The trainee may be granted a scientific leave (to attend a conference or scientific seminars in the same specialty of no more than seven working days for a given training year.

- Military doctors may enroll in military courses determined by their sponsor during the period of their enrollment in the programs of the Commission.
- Pausing regulations are applied to maternity, sick, and other leaves and shall be compensated during or at the end of training.

5.5 Preceptor Responsibilities

- Serve as a role model for the provision of audiological services.
- Enhance the trainees' current understanding of commonly encountered disease states related to the concerned rotation and their audiological management.
- Assist the trainees in completing an in-depth and thorough patient evaluation, which includes all the various sources of information needed to complete the assessment.
- Help the trainee establish an evidence-based approach to the provision of audiological management to patients on the assigned rotation.
- Provide prompt and effective feedback to ensure a valuable learning experience.

5.6 Mentoring

A mentor is an assigned faculty supervisor who is responsible for the professional development of trainees under his/her supervision. Mentoring is the process through which the mentor provides support to the trainee. A mentee is the trainee under the supervision of the mentor.

A postgraduate residency training is a formal academic program for trainees to develop their full potential as future consultants. This is potentially the last substantial training program before they become an independent specialist. However, unlike the undergraduate program, which has a well-defined structure, the residency training is inherently less organized. Trainees are expected to be in the clinical settings delivering patient care. They are rotated through multiple sites and subspecialties.

Although this residency program structure is necessary for good clinical exposure, it also lacks opportunities for building long-term professional relationships with faculty members, and a trainee may feel lost without proper guidance. Moreover, without long-term longitudinal relationships between faculty and students, it is extremely difficult to identify a struggling trainee. Trainees may also struggle to develop their professional identities in the home program, especially when they are rotating with other disciplines for a long period.

Finally, the new curriculum incorporates more work-based continuous assessment of clinical skills and professional attributes. Trainees are expected to maintain a logbook, complete a mini-CEX and DOPS, and meticulously chart their clinical experience. The new curriculum has a robust and structured monitoring system in place, with clearer accountability and defined responsibility for both the trainees and their assessors.

The nature of the relationship between a mentor and mentee is *formal yet friendly*. This is a *partnership* between a mentor and a trainee. Trainees are expected to take the mentoring opportunity seriously, and help the mentor to achieve the outcomes. The mentor must receive a copy of any adversarial report by other faculty members about the trainee.

5.6.1 Mentorship Goals

- Guide the trainees toward personal and professional development through continuous monitoring of their progress
- Identify early both struggling and high-achieving trainees
- Detect early trainees who are at risk of emotional and psychological disturbances
- Provide career guidance

5.6.2 Roles of the Mentor

The primary role of the mentor is to nurture a long-term professional relationship with the assigned trainees. The mentor is expected to provide an "academic home" for the trainees so that they feel comfortable sharing their experiences, expressing their concerns, and clarifying questions in a non-threatening environment. The mentor is expected to keep sensitive information about the trainees confidential.

The mentor is also expected to make an appropriate and early referral to the program director or head of the department if s/he determines a problem that would require expertise or resources that are beyond his/her capacity. Examples of such referrals include:

- Serious academic problems
- Progressive decline in academic performance
- Potential mental or psychological issues
- Personal problems interfering with academic duties
- Professional misconduct

However, the following are NOT the responsibilities of a mentor:

- Providing extra tutorials, lectures, or clinical sessions
- Providing counseling for serious mental or psychological problems
- Becoming involved in the trainees' personal matters
- Providing financial or other material support

5.6.3 Roles of the Trainee

- Submit resume at the start of the relationship
- Share medium- (1–3 years) and long-term (3-7 years) goals with the mentor
- Take primary responsibility for maintaining the relationship
- Schedule monthly meetings with the mentor in a timely manner, and does not request an ad hoc meeting, except in emergency cases
- Recognize self-learning as an essential element of residency training
- Report any major events to the mentor in a timely manner

5.6.4 Who Can Be a Mentor?

Any faculty member who is classified as a senior specialist or consultant within the diploma program can be a mentor. There is no special training required.

Number of Trainees per Mentor

As a guideline, each mentor may handle four to six trainees at once. As much as possible, the trainees must come from all years of training. This will create an opportunity for the senior trainee to work as a guide for the junior trainees.

Frequency and Duration of Engagement

The recommended minimum meeting frequency is once every four weeks. Each meeting should take from 30 minutes to an hour. It is also expected that once assigned, the mentor must continue to work with the same trainee, preferably, for the entire duration of the training program or for at least two years.

Meeting Tasks

The following suggested tasks must be completed during meetings:

- Discuss the overall clinical experience of the trainees with particular attention to any concerns raised
- Review the logbook or portfolio with the trainees, to determine whether the trainee is on schedule to meeting his/her training goals
- Revisit earlier concerns or unresolved issues, if there are any
- Explore any non-academic factors that could seriously interfere with the training
- Document excerpts of the interactions in the logbook

The following incidences must be reported to the program director or departmental head:

- Consecutive absences in three scheduled meetings without any valid reasons
- Unprofessional behavior
- Consistent underperformance despite the mentor's counseling
- Serious psychological, emotional, or health problems that may potentially cause unsafe patient care
- Any other serious concerns of the mentor

REFERENCES

1. http://www.royalcollege.ca/portal/page/portal/rc/resources/aboutcanmeds (Royal College of Physicians and Surgeons of Canada)
2. SCFHS Regulation Manual. http://www.scfhs.org.sa/en/Reglations/Pages/default.aspx

Appendix 1

Mini-Clinical Evaluation Exercise (Mini-CEX)

Definition

The mini-CEX is a 10-20 minute direct observation assessment or "snapshot" of a trainee-patient interaction. To be most useful, the evaluator should provide timely and specific feedback to the trainee after each assessment of a trainee-patient encounter.

Purpose

A mini-CEX is designed to:

- Guide the trainee's learning through structured feedback
- Help improve communication, history taking, physical examination, and professional practice
- Provide the trainee with an opportunity to be observed during interactions with patients and identify strategies to improve their practice
- Be a teaching opportunity enabling the evaluator to share their professional knowledge and experience with the trainee

Trainee responsibilities

- Arrange a mini-CEX encounter with an evaluator
- Provide the evaluator with a copy of the mini-CEX rating form

Evaluator responsibilities

- Choose an appropriate consultation for the encounter
- Use the mini-CEX rating form to rate the trainee
- Provide constructive feedback and discuss improvement strategies. If a trainee received a rating which is unsatisfactory, the assessor must complete the "Suggestions for improvement" section.

Mini-Clinical Evaluation Exercise (Mini-CEX) Rating Form

Trainee name: SCFHS Registration no: Traineeship level:

Date:

Mini-CEX time: min

Observing: min

Providing feedback: min

Brief summary of case:

☐ New example ☐ Follow-up case

☐ Inpatient ☐ Ambulatory ☐ Emergency ☐ Department ☐ Other

Complexity:

☐ Low ☐ Moderate ☐ High

Focus

☐ Data ☐ Gathering ☐ Diagnosis ☐ Therapy ☐ Counseling ☐ Other

Assessment

SCORE FOR STAGE OF TRAINING									
Questions	Unsatisfactory			Satisfactory			Superior		
	1	2	3	4	5	6	7	8	9
History taking									
Physical examination skills									
Communication skills									
Critical judgment									
Humanistic quality/professionalism									
Organization and efficiency									
Overall clinical care									

Suggestions for improvement:

1-

2-

3-

Evaluator name: Evaluator signature:

Question	Description
History taking	Facilitates patient's narrative; uses appropriate questions to obtain accurate, adequate information effectively; responds to verbal and nonverbal cues appropriately
Physical examination skills	Follows an efficient, logical sequence; examinations are appropriate for clinical problems; provides patients with explanations; is sensitive to patients' comfort and modesty
Communication skills	Explores patients' perspectives; jargon free speech; open and honest; empathetic; agrees to management plans and therapies with patients
Critical judgment	Forms appropriate diagnoses and suitable management plans; orders selectively and performs appropriate diagnostic studies; considers risks and benefits
Humanistic quality/professionalism	Shows respect, compassion, and empathy; establishes trust; attends to patient's comfort needs; respects confidentiality; behaves in an ethical manner; is aware of legal frameworks and his or her own limitations
Organization and efficiency	Prioritizes, is timely and succinct, summarizes
Overall clinical care	Demonstrates global judgment based on the above topics

Appendix 2

Case-Based Discussion (CBD)

The purpose:

The purpose of this encounter is to evaluate the level of professional judgment exercised in clinical cases by the trainee.

The CBD is designed to:

- Guide the trainee's learning through structured feedback
- Help improve clinical decision making, clinical knowledge, and patient management
- Provide the trainee with an opportunity to discuss their approach to the case and identify strategies to improve their practice
- Be a teaching opportunity enabling the evaluator to share their professional knowledge and experience

Overview:

A CBD encounter involves a comprehensive review of clinical cases between a trainee and an evaluator. The trainee is given feedback from an evaluator across a range of areas relating to clinical knowledge, clinical decision-making, and patient management. A CBD encounter takes approximately 20-30 minutes.

Trainee responsibilities:

- Arrange a CBD encounter with an evaluator
- Provide the evaluator with a copy of the CBD rating form

Evaluator responsibilities

- Choose the case(s) for discussion
- Use the CBD form to rate the trainee
- Provide constructive feedback and discuss improvement strategies
- Provide an overall judgment of the trainee's clinical decision-making skills

Case-Based Discussion (CBD) Rating Form

Trainee name: .....

Registration no: ....

Level: ..... Date: .....

Brief summary of case:

□ New example □ Follow-up case

□ Inpatient	□ Ambulatory	□ Emergency	□ Department	□ Other	
Complexity					
□ Low	□ Moderate	□ High			
Focus					
□ Data	□ Gathering	□ Diagnosis	□ Therapy	□ Counseling	□ Other

Assessment

SCORE FOR STAGE OF TRAINING

Questions	Unsatisfactory			Satisfactory			Superior		
	1	2	3	4	5	6	7	8	9
Clinical assessment									
Investigation and referrals									
Treatment									
Follow-up and future planning									
Professionalism									
Clinical judgment									
Leadership/managerial skills									
Overall performance									
Suggestions for improvement									

1) .....
2) .....
3) .....

Evaluator name:

Signature:

Appendix 3

Direct Observation of Procedural Skills (DOPS)

Direct Observation of Procedural Skills (DOPS) Assessment Form			
Trainee's name:			
Registration no:			
Observation		Registration #	
Observed by		Date	
Signature of supervising doctor			

Description	Satisfactory	Unsatisfactory	Comment
Understands the indications for the procedure and clinical alternatives			
Clearly explains plans and potential risks in a manner that the patient understands			
Possesses a good understanding of the theoretical background of the procedure including anatomy, physiology, and imaging			
Demonstrates good advance preparation for the procedure			
Communicates plan for procedure to relevant staff			
Demonstrates awareness of risks of cross-infection and effective aseptic technique during procedure			
Understands procedure success or failure in the current setting			
Copes well with unexpected problems			
Handles patients gently and skillfully			
Maintains accurate and legible records including descriptions of problems or difficulties			
Issues clear post-procedure instructions to patient and/or staff			
Seeks at all times to work at the highest professional standards			

ASSESSMENT	
Practice was satisfactory	
Practice was unsatisfactory	

Examples of good practice:

_____

_____

Areas of practice requiring improvement:

_____

_____

Focus areas for further learning and experience:

_____

_____

Appendix 4

Log Book

Objectives

1) Record and document all academic activities (e.g., procedures, lectures, journal clubs, meetings, training courses, workshops, symposia, and case presentations) undertaken during the training program
2) Assist the trainee in identifying his/her deficiencies in specific areas
3) Assist the program director/evaluator in documenting the contribution and evaluation of trainees
4) Provide the evaluator with guidance about appropriate and fair assessment of trainees
5) Provide the program director with guidance regarding deficiencies in training

Guidelines for trainee

6) Trainees are required to maintain log books during the entire training period
7) Log book entries concerning recorded activities should be completed on the day on which activities are conducted
8) All entries must be signed by a mentor within one week
9) Trainees should discuss their training progress, as indicated in the log book, with the mentor and/or program director every month
10) Trainees should submit their completed log books to the program director at the end of rotations and training, for subsequent submission to the Scientific Committee
11) If a log book is not signed by the program director, the trainee will be ineligible for end-of-training certification and final examinations

Procedures Logbook

Date	MRN	Age/Gender	Procedure Name	Supervising Consultant	Comments

Trainee Name: _____ Signature: _____

Appendix 5

Minimum Number of Required Procedures

Procedure	Minimum required number	Suggested number to be completed in Y1
Case history taking	100	70
Otoscopic examination	150	100
Tympanometry	150	100
Acoustic reflex threshold	100	50
Reflex decay	80	40
Eustachian tube function	80	40
Pure tone audiometry	200	100
Speech audiometry	100	50
Behavioral observation audiometry	80	40
Visual reinforcement audiometry	100	50
Conditioned play audiometry	100	50
Aided threshold audiometry	100	70
Otoacoustic emission	100	70
Click auditory brainstem response	100	40
Frequency-specific auditory brainstem response	50	25
Auditory steady state response	40	20
Electrocochleography	15	0
Ear mold impression	30	15
Hearing aid selection and evaluation	60	40
Hearing aid fitting	60	0
Hearing aid verification	60	0
Vestibular assessment	50	0
Electro-nystagmography/video nystagmography (ENG/VNG)	50	0
Rotational vestibular assessment	10	0
Cochlear implant evaluation	50	25
Intra-operative cochlear implant testing	15	0
Cochlear implant programming	100	40
Bone-anchored hearing devices/middle ear implant evaluation	70	35
Bone-anchored hearing devices/middle ear implant programming	30	15
Counseling	100	50

Appendix 6

Portfolio Assessment

(This form is to be completed at least every 3 months during the mentoring/supervision meetings with the trainee)

Trainee Name: …… Level: ……

Mentor Name: ……

Date: ……Time: ……

Clinical Rotation: …… Rotation: …… Duration: ……

Domain		Achievement Required	Scoring 0 = Poor ↔ 4 = outstanding										Remarks
Mini- CEX (1/3 month)	Minimum number achieved	Did the trainee do a minimum of 2 Mini-CEX last month?	0		1				2				
	Competency assessment score	What were the average results of the assessment?	0		1		2		3		4		
DOPs	Minimum number achieved	Did the trainee do a minimum of 2 DOPs last month?	0		1				2				

(2/3 months	Competency assessment score	What were the average results of the assessment?	0		1		2		3		4		
		Did the trainee complete at least one sheet for the learning objectives, for an											
Learning contract/objectives		average of 2–3 objectives every week with feedback signed by trainer?	0		1		2		3		4		
(2–3 objectives/week)													
Evidence of self-directed learning													
		Did the trainee show any documentation of self-directed learning (CME, topic review, course, workshop, etc.)?	0		1		2		3		4		
Overall assessment of portfolio												/18	/50

Comments:

……

……

……

Original for program secretary/trainee file

Copy for the trainee

Appendix 7

The In-Training Evaluation (ITER) Form

Initial General Competency Assessment	**Unit-Specific Competency Assessment**			**Annual Competency Assessment**	
Competency title	1st attempt Date:	2nd attempt Date:	3rd attempt Date:	Competent? Yes/No	Comments:
Patient interview/ audiologic case history					
Otoscopy					
Immittance testing					
Tympanometry					
Acoustic reflex thresholds					
Acoustic reflex decay					
Speech reception threshold testing					
With masking					
Without masking					
Pure-tone testing by air conduction with masking					
without masking					
Pure-tone testing by bone conduction					
with masking					
without masking					
Word-recognition testing (including roll over)					

Interpretation of results and counseling					
Ear impressions (impression taking and ear mold selection)					
Otoacoustic emissions (OAE) testing					
Transient evoked OAE					
Distortion product OAE					
Neuro-diagnostic auditory brainstem response (ABR)					
Tone burst threshold search ABR					
Auditory steady state response (ASSR)					
Electrocochleography					
Vestibular assessment					
Electro-nystagmography/video nystagmography (ENG/VNG)					
Rotational vestibular testing					
Posturographic vestibular testing					
Hearing aid evaluation:					
Hearing aid selection					
Hearing aid fitting					
Hearing aid programming					
Hearing aid verification and outcome measures					

Hearing aid troubleshooting/repairs					
Appropriate prescription, fitting, and counseling for FM systems and ALDS					
Specialty testing					
Performs electroacoustic analysis in determining device function					
Performs conditioned play audiometry					
Performs visual reinforcement audiometry					
Performs behavioral observation audiometry					
Performs tuning fork tests					
VEMP skills					
Tinnitus					
Cochlear implants					
Other auditory implantable devices					
Professionalism					
Record keeping					
Recommendations					
Appropriate referral(s)					

Trainee name: Preceptor name:

Signature Preceptor signature

Appendix 8

Final In-Training Evaluation Report (FITER)/ Comprehensive Competency Report (CCR)

Trainee Name:

Trainee SCFHS number:

Evaluation covering the last year as a trainee:

In the view of the Trainee Program Committee, the trainee mentioned above has acquired the competencies of the Higher Diploma in Clinical Audiology as prescribed in the Objectives of Training and is competent to practice as a specialist.	**Yes**	**No**
	☐	☐

The following sources of information were used for this evaluation:

	Yes	**No**
• Written exams		
• Oral exams		
• Clinical observations by Faculty		
• OSCEs		
• Feedback from healthcare professionals		
• Completed research project		
• Other evaluations		

COMMENTS:

Name of Program Director:
Date:
Signature:

This is to attest that I have read this document.

Name of Trainee
SCFHS number:
Date:
Signature:
TRAINEE'S COMMENTS:

Note: If, during the period from the date of signature of this document to the completion of training, the Residency Program Committee judges that the candidate's demonstration of

competence is inconsistent with the present evaluation, this document may be declared null and void and be replaced with an updated FITER. Eligibility to sit the final examination is dependent on the updated FITER.

FITER: (Medical Expert Competency)
Trainee Name:
Trainee SCFHS number:

	EXPECTATIONS					
	*Rarely meets	*Inconsistently meets*	*Generally meets*	*Sometimes exceeds*	*Consistently exceeds*	Not Applicable
Medical Expert						
a. Possesses basic scientific and clinical knowledge relevant to specialty						
b. Performs histories and physical examinations that are complete, accurate, and well-organized						
c. Uses all pertinent information to arrive at complete and accurate clinical decisions						
d. Recognizes and manages emergency conditions resulting in prompt and appropriate treatment. Remains calm, acts in a timely manner, and prioritizes correctly						
e. Recognizes and appropriately manages patients with complex problems and multi-system diseases						
f. Demonstrates proficiency in pre-operative and post-operative patient management, including indications for surgical intervention						
Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the objectives and give specific examples wherever possible.						

***Rarely meets ≤30%**
***Inconsistently meets >30-60%**
***Generally meets >60-80%**
***Sometimes exceeds >80-90%**
***Consistently exceeds >90%**

FITER: (Procedures and Clinical Skills Competencies)
Trainee Name:
Trainee SCFHS number:

	EXPECTATIONS					
	*Rarely meets	*Inconsistently meets	*Generally meets	*Sometimes exceeds	*Consistently exceeds	Not Applicable
PROCEDURES AND CLINICAL SKILLS						
Demonstrates the ability to perform diagnostic and therapeutic procedures/skills described in the Higher Diploma in Clinical Audiology Traineeship Training Curriculum						
a. Behavioral and speech audiometry						
b. Immittance measurements						
c. Otoacoustic emission measurements						
d. Electrophysiology measurements						
e. Hearing aids and implantable auditory devices						
f. Vestibular measurements and rehabilitation						
Clinical Skills: **Minimizes risks and discomforts to the patient** **Overall is proficient in clinical and procedural skills relevant to audiology**						
Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the specific objectives and give specific examples wherever possible.						

***Rarely meets**
***Inconsistently meets >30-60%**
***Generally meets >60-80%**
***Sometimes exceeds >80-90%**
***Consistently exceeds >90%**

FITER: (Communicator Competency)
Trainee Name:
Trainee SCFHS number:

	EXPECTATIONS					
	*Rarely meets	*Inconsistently meets	*Generally meets	*Sometimes exceeds	*Consistently exceeds	Not Applicable
COMMUNICATOR						
a. Establishes a therapeutic relationship with patients and communicates well with the family. Provides clear and thorough explanations of diagnosis, investigation, and management in a professional manner. Demonstrates empathy and sensitivity to racial, gender, and cultural issues						
b. Prepares documentation in an accurate and timely manner						
c. Develops diagnostic and therapeutic plans that are clear, concise, and understandable to patients and other healthcare personnel, including other consultants						
d. Presents clinical summaries and scientific information in a clear and concise manner to a healthcare audience						
Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the objectives and give specific examples wherever possible.						

***Rarely meets ≤30%**
***Inconsistently meets >30-60%**
***Generally meets >60-80%**
***Sometimes exceeds >80-90%**
***Consistently exceeds >90%**

FITER: (Collaborator Competency)
Trainee Name:
Trainee SCFHS number:

	EXPECTATIONS					
	*Rarely meets	*Inconsistently meets	*Generally meets	*Sometimes exceeds	*Consistently exceeds	Not Applicable
COLLABORATOR						
a. Interacts effectively with health professionals by recognizing and acknowledging their roles and expertise						
b. Consults and delegates effectively						
c. Establishes good relationships with peers and other health professionals						
d. Effectively provides and receives information from other health professionals						
e. Manages conflict situations well						
Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the objectives and give specific examples wherever possible.						

***Rarely meets ≤30%**
***Inconsistently meets >30-60%**
***Generally meets >60-80%**
***Sometimes exceeds >80-90%**
***Consistently exceeds >90%**

FITER: (Manager Competency)
Trainee Name:
Trainee SCFHS number:

	EXPECTATIONS					
	*Rarely meets	*Inconsistently meets	*Generally meets	*Sometimes exceeds	*Consistently exceeds	Not Applicable
MANAGER						
a. Understands and makes effective use of information technology, such as methods for searching medical databases						
b. Makes cost-effective use of healthcare resources based on sound judgment						
c. Prioritizes and uses personal and professional time effectively to achieve a balanced personal and professional life						
d. Demonstrates an understanding of the principles of practice management						
e. Demonstrates the ability to effectively utilize healthcare resources to maximize benefits to all patients, including managing waiting lists						
Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the objectives and give specific examples wherever possible.						

***Rarely meets ≤30%**
***Inconsistently meets >30-60%**
***Generally meets >60-80%**
***Sometimes exceeds >80-90%**
***Consistently exceeds >90%**

FITER: (Health Advocate Competency)
Trainee Name:
Trainee SCFHS number:

	EXPECTATIONS					
	*Rarely meets	*Inconsistently meets	*Generally meets	*Sometimes exceeds	*Consistently exceeds	Not Applicable
HEALTH ADVOCATE						
a. Understands the specialist's responsibility to intervene on behalf of patients with respect to social, economic, and biological factors that may impact their health						
b. Understands the specialist's responsibility to intervene on behalf of the community with respect to social, economic, and biological factors that may impact community health						
c. Recognizes and responds appropriately in advocacy situations						
Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the objectives and give specific examples wherever possible.						

***Rarely meets ≤30%**
***Inconsistently meets >30-60%**
***Generally meets >60-80%**
***Sometimes exceeds >80-90%**
***Consistently exceeds >90%**

FITER: (Scholar Competency)
Trainee Name:
Trainee SCFHS number:

	EXPECTATIONS					
	*Rarely meets	*Inconsistently meets	*Generally meets	*Sometimes exceeds	*Consistently exceeds	Not Applicable
SCHOLAR						
a. Demonstrates an understanding of, and commitment to continuous learning. Develops and implements an ongoing and effective personal learning strategy						
b. Critically appraises medical information by asking relevant questions and determining which information is reliable. Successfully integrates information from a variety of sources						
c. Understands the principles of adult learning and helps others learn by providing guidance, teaching, and constructive feedback						
d. Facilitates the learning of patients, other house staff/students, and other health professionals						
e. Completes the electronic logbook in a timely fashion						
Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the specific objectives and give specific examples wherever possible.						

***Rarely meets ≤30%**
***Inconsistently meets >30-60%**
***Generally meets >60-80%**
***Sometimes exceeds >80-90%**
***Consistently exceeds >90%**

FITER: (Professional Competency)
Trainee Name:
Trainee SCFHS number:

	EXPECTATIONS					
	*Rarely meets	*Inconsistently meets	*Generally meets	*Sometimes exceeds	*Consistently exceeds	Not Applicable
PROFESSIONAL						
a. Demonstrates integrity, honesty, compassion, and respect for diversity						
b. Fulfills the medical, legal, and professional obligations of a specialist						
c. Meets deadlines and demonstrates punctuality						
d. Monitors patients and provides follow-up						
e. Understands ethical principles and applies them in clinical situations						
f. Demonstrates an awareness of limitations, and seeks advice when necessary. Accepts advice graciously						
g. Demonstrates respect toward other physicians and healthcare workers						
h. Participates in professional organizations—local, provincial, and national						
Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the objectives and give specific examples wherever possible.						

***Rarely meets ≤30%**
***Inconsistently meets >30-60%**
***Generally meets >60-80%**
***Sometimes exceeds >80-90%**
***Consistently exceeds >90%**

Appendix 9

Research project Proposal Form

FINAL PROJECT PROPOSAL FORM
Trainee Name:
Project Advisor:
Project Title:
Written Component (research question):
Project Goal (expectations and benefits of this project):
Project Design and Methods:
Trainee Signature: **Date:**
Project Advisor Signature: **Date:**
☐ **PROJECT APPROVED**
Faculty Member Signature: **Date:**
Project Advisor Signature: **Date:**

☐ PROJECT REJECTED
Faculty Member Signature: **Date:**
Project Advisor Signature: **Date:**
REASONS FOR REJECTION
_____Topic too broad _____Inappropriate topic ___Others (Please specify.) **_____**

PROGRESS REPORT FORM
Trainee Name:
Project Advisor:
Project Title:
Project Achievements:

Trainee Signature: **Date:**
Project Advisor Signature: **Date:**

Appendix 10

Example of MCQs

Answer: D

Section	Auditory Evoked Potentials
Subsection	
Section Domain	Assessment/Procedure
Item Level	K1
Reference	Ross J. Roeser, Michael Valente and Holly Hosford-Dunn. 2007. Audiology Diagnosis. Chapter 20 (429).
Paired	

Insert Image

Insert Stem

Which stimulus type is used for frequency-specific auditory brainstem response?
A. Clicks
B. Speech
C. Pink noise
D. Tone bursts

Appendix 11

Written Exam Blueprint

No	Section	Number of MCQs for each section
1	Basic acoustic	4
2	Instrumentation and calibration	2
3	Otoscopy	2
4	Etiology of hearing loss	6
5	Conventional behavioral audiometry	8
6	Speech audiometry	5
7	Immittance measurements	6
8	Otoacoustic emission (OAE)	5
9	Pediatric audiology	8
10	Hearing assessment for special populations	4
11	Auditory evoked potentials	10
12	Hearing aids and assistive listening devices	6
13	Vestibular assessment and rehabilitation	10
14	Implantable auditory devices and cochlear implants	10
15	Auditory Processing Disorder	2
16	Auditory neuropathy spectrum disorder	2
17	Ototoxicity	2
18	Hearing conservation	2
19	Research methods and project	2
20	Quality/safety	2
21	Ethics	2
Total		**100**

Appendix 12

Final Clinical Exam Blueprint

		DIMENSIONS OF CARE				
		Health Promotion & Illness Prevention 2±1 Station(s)	**Acute** 3±1 Station(s)	**Chronic** 2±1 Station(s)	**Psychological Aspects** 1±1 Station(s)	**# Station(s)**
DOMAINS FOR INTEGRATED CLINICAL ENCOUNTER	**Patient Care** 4±1 Station(s)	**1**	**1**	**2**		**4**
	Patient Safety & Procedural Skills 1±1 Station(s)		**1**			**1**
	Communication & Interpersonal Skills 2±1 Station(s)		**1**		**1**	**2**
	Professional Behaviors 1±1 Station(s)	**1**				**1**
	Total Stations	**2**	**3**	**2**	**1**	**8**

*Main blueprint framework adapted from Medical Council of Canada Blueprint Project
(Adapted from SCFHS policy and procedure for examination)