PATHWAY TO BECOMING A

Neurofeedback practitioner

To become a Neurofeedback Practitioner, the following criteria should be met:

- **Registration with HPCSA/Allied Health Council of South Africa/Nursing Council/Social Workers Professional Board.**
  This enables one to have a scope of practice and an ethical, supervising/regulatory/governing body. It is important that the scope of practice allows the practitioner to practice as an independent practitioner as opposed to working under constant supervision (except during training).
- **Requirements to become Board Certified in Neurofeedback with BCIA, the only global accrediting association.**
  Each aspect is discussed below in the document. In brief, the requirements are:
  - Neuroanatomy/Neurophysiology;
  - Mentoring;
  - 36-hour Didactic Course;
  - Exam;
  - Continual Education and re-certification every 4 years;
  - Adherence to the ethical standards and clinical guidelines of BCIA.
- **BFSA encourages all of its members to become BCIA certified** to ensure adequate knowledge, training and competency.
- **To retain BCIA certification, the practitioner needs to accumulate continuing education points** to ensure adequate knowledge, training and competency. (Similar to the CPD system). Renewal of membership every four years is based on the accumulation of the correct number of points.

BCIA is the International Certification Body that guides and certifies us as practitioners in the field – **www.bcia.org**

The Pathway to BCIA Certification

The path starts with gaining the fundamental building blocks to establish your clinical reasoning in the field of Neurofeedback. This requires the enthusiasm to learn how to integrate various fields of knowledge with your current clinical qualification.

The first step is to visit and discuss with a current certified clinician how they use the different modalities with their client population.

There are two main areas that require investigation:

01 Choosing equipment and becoming familiar with the operation of the hardware and software of the equipment

02 Learning the fundamentals of the different modalities in the field and their clinical application.

01 We recommend that you start with reading some books and watching YouTube clips that are introductory to the concepts in the field:

BOOKS TO READ:
Neurofeedback the Non-Invasive Alternative, Helena Bester (Available from BFSA)
Introduction to Neurofeedback, John Demos (Available from Loot and Takealot)

YOUTUBE CLIPS:
Getting a Good EEG Impedance - Webinar Series — WATCH
10-20 EEG Measurement and Placement: — WATCH PART 1 — WATCH PART 2
10-20 International EEG Electrode Application Video — WATCH

02 Neuroanatomy and Neurophysiology course:

Neuroanatomy and Neurophysiology are the building blocks for clinical understanding and reasoning. If you do not have Neuroanatomy and Neurophysiology as part of your basic studies and have not completed it within the last 10 years, you need to take a course in the field. This should be a course that is recognized by BCIA and can be done online or in person. See BCIA website (**www.bcia.org**)

One of the recommended courses is Dr Fred Shaffer's online, self-learn course:

- **Dr Shaffer's Physiological Psychology course** is priced at $150, but he has it significantly discounted for South Africans as long as you use a .za email address.
- It is an online course and students receive PowerPoint slides.
- Students do an online exam after each chapter. There are 14 chapters and 20 multiple choice questions are set for each chapter. You need to pass with 70%. If you do not achieve 70% then you can retake the exam and see the correct answers at the end. It is a user-friendly way of studying.
- There is a text book (See the BioSource website for information). Whilst it is recommended that you buy the book, one can find the information on the internet. Dr Shaffer also has YouTube recordings.
- Dr Shaffer uses the latest research in his course.
- The course has a functional application where he deals with learning and memory, emotions, aggression and stress – all the presenting problems we see in our practices.
- You have a year to complete the course from the date of registration.

03 Neuro or Biofeedback Didactics Courses

- Neuro and Biofeedback each have a separate didactic component.
- The Neurofeedback Didactic is 4 or 5 days of intense lectures on the basics of Neurofeedback and is a 36 hour course. (See Appendix 1 – BCIA Neurofeedback Blueprint)
- Visit **www.biofeedbacksa.co.za** for contact details of presenters of the courses.

04 Mentoring requires a process that has to be followed:

- Mentors have to be recognized and approved by BCIA and they need to refresh their mentoring status annually with BCIA. For a list of approved mentors visit the BCIA website.
- The mentor approved by BCIA has to add each mentee to the list of persons they are mentoring. Each mentor needs to inform BCIA that he/she is mentoring a specific person so that BCIA has a clear record of the process.
- The mentee also has to apply to BCIA to begin the mentoring process. There is a specific form that must be submitted.
- You need a minimum of 25 hours over a minimum of 4 months with your mentor. The process is about accountability for learning and guiding the thinking process and clinical decision making process.
- There is a cost implication for being mentored. Discuss with the mentor.
- The requirement is 100-hour sessions, i.e. at least 10 clients for at least 10 sessions.
- The 10 clients have to be on file so that you have a record of how you interact with your client and the adjustments you have made in training as well as the reasons for the changes.
- Case studies are presented to your mentor, not to BCIA. You state the presenting problem of the client to the mentor and then discuss the NF placements. Process notes are also to be viewed by the mentor and all observations should be discussed with the mentor.
- The mentee needs to keep a record of all sessions completed and have them signed off.
- Mentees need to do 10 sessions of self-regulation and report back on these. The reason is that you need to be able to have a sense of what it feels like to self-regulate and report on it.
- Mentees may have more than one mentor. Each mentor signs off on the hours they have spent with the applicant.
- You may have a mentor outside the field of neurofeedback who is not BCIA accredited – e.g. a neurologist or psychiatrist, but they have to have some insight into neurofeedback. They will be required to complete a form for BCIA.
- International, BCIA qualified mentors can also provide this service.
- If you are far from your mentor, they may ask you to record a session showing sensor placement, etc.
- It is important in such an instance to ask the client's permission to record and discuss the session with your mentor.

05 Applying for Certification:

- Mentees need to be careful when submitting application forms because you have two years from application to when you write the exam.
- The didactic (boot camp) and the neuroanatomy courses can be done before you submit your application.
- It is best is to leave writing the exam to the last stage, after the mentoring sessions and other areas have been completed, so that you have accumulated as much information as possible before writing the final exam.
- The **essential skills** list is a great guideline to have with you at all times. If skills are lacking you can ask your mentor to help you with what you need to learn/understand/practice. (See Appendix 2 – Essential Skills list)

06 BCIA Exam

- **Booking an online exam** with BCIA and paying the exam fee is usually the final step but it can also happen any time in your 2-year Certification process.
- **Dr Schaffer's 'Neurofeedback 100' course** is the practice exam questions for the final BCIA exam and it is recommended that you learn these questions well.
- Once all the above and the exam have been successfully completed, one can lodge final documents for certification with BCIA.

All BCIA members have to be recertified every 4 years so it is important to keep abreast with ongoing learning, just as one does with HPCSA.

Points are awarded for various webinars advertised on the BCIA and ISNR websites, as well as many of the events organised by BFSA.

Appendices

Appendix 1

The Biofeedback Certification International Alliance

Blueprint of Knowledge Statements for Board Certification in Neurofeedback

The provider certified in Neurofeedback will have knowledge of:

I. Orientation to Neurofeedback – 4 hours

A. Definition of Neurofeedback (EEG Biofeedback)
Neurofeedback is employed to modify the electrical activity of the CNS including EEG, event related potentials, slow cortical potentials and other electrical activity either of subcortical or cortical origin. Neurofeedback is a specialized application of biofeedback of brainwave data in an operant conditioning paradigm. The method is used to treat clinical conditions as well as to enhance performance.

B. History and Development of Neurofeedback
1. Pioneers in EEG and Neurofeedback (e.g., Caton, Berger, Adrian, Kamiya, others)
2. Discuss highlights of the seminal studies in Neurofeedback (e.g., Sterman 1968, 2000, Lubar 1976, Birbaumer 1982, others)

C. Overview of principles of human learning as they apply to neurofeedback
1. Learning theory (e.g. habituation, classical and operant conditioning, discrimination, shaping, generalization and extinction.)
2. Application of learning principles to Neurofeedback (e.g., generalization to the life situation, discrimination training, length and number of sessions, etc.)

D. Assumptions underlying Neurofeedback:
1. Concepts of feedback and control in biological systems.
2. Basic psychophysiology of stress and attention

II. Basic Neurophysiology & Neuroanatomy - 4 hours

A. Neurophysiology
1. Bioelectric origin and functional correlates of EEG (pyramidal cell and dipole activity, resonance and synchrony, etc.)
2. Definition of ERPs and SCPs.
3. Relationship of post-synaptic potentials and action potentials to EEG
4. Neuroplasticity (e.g. LTD, LTP)

B. Functional Neuroanatomy
1. Basic neuroanatomy of ascending sensory pathways to cortex
2. Thalamic, cortical, and subcortical generators of EEG.
3. General cortical and subcortical anatomy.
4. Major functions of cortical lobes and major subcortical structures and Brodmann areas.
5. Overview of connectivity, phase, and coherence concepts related to EEG networks and tracts (e.g. default network, nodes & modules.)

III. Instrumentation & Electronics – 4 hours

A. Essential Terms & Concepts
Basic metrics and terminology in electronics and instrumentation such as, impedance, differential amplifier principles, analog and digital filters, basic electrical terms (e.g. AC, DC, sine waves, volume conduction, Nyquist principle, gain, Fourier transform, low/high bandpass and notch filters, etc.), and common mode rejection

B. Signal Acquisition
1. 10-20 International Standard measurement and nomenclature for 19 recording sites, both classical and modified
2. Comparison of QEEG to other neuroimaging techniques (e.g. PET, fMRI, CT, MEG, SPECT, etc.)
3. Use of limited number of electrodes (fewer than 19).
4. Montage options and their characteristics
5. Recognizing and correcting signals of noncerebral origin, such as but not limited to:
   a. Electromyographic
   b. Electro-ocular
   c. Cardiac (pulse)
   d. Sweat (skin impedance)
   e. Cable sway
   f. 60 Hz (grounding)
   g. Electrode “pop”
6. Recognizing normal EEG patterns
   a. posterior dominant rhythm

b. difference between eyes open and eyes closed resting conditions (e.g. posterior alpha attenuation)
c. developmental aspects of EEG
d. diurnal influences on EEG

7. Evaluation of subject variables during acquisition
   a. alertness-drowsiness
   b. medication/drug/alcohol effects
   c. physical relaxation
   d. eyes closed/eyes open/anxiety

C. Signal Processing
1. Analog, raw EEG
2. Basic signal measurement terms (e.g. amplitude, magnitude, power, Hz)
3. Filtering methods and subjective characteristics of frequency bands (delta, theta, alpha, beta, gamma)
4. Waveform morphology
5. Source localization (LORETA inverse solution, Laplacian analysis)
6. Clinically significant raw EEG waveforms (e.g. Mu, spike & wave, SMR, sleep spindles, etc.)

D. Aseptic Techniques
1. Client and trainer hygiene
2. Equipment sterilization
3. Cross contamination

E. Instrumentation Demonstration
Client preparation, basic set-up and operation of EEG equipment, proper electrode attachment and location of 10-20 sites, elimination of artifact from EEG recording, recognition of spike/wave activity in the raw EEG, etc.

IV. Research Evidence Base for Neurofeedback – 2 hours

A. Interpretation of the methodological and statistical criteria and procedures for determining levels of efficacy and effectiveness of neurofeedback, as outlined in the *Template for Developing Guidelines for the Evaluation of Clinical Efficacy of Psychophysiological Interventions and Evidence- Based Practice in Biofeedback & Neurofeedback.*

B. Key research studies establishing current efficacy levels of major applications of Neurofeedback (e.g., ADHD, Substance Abuse, Optimal Performance, etc.)

V. Psychopharmacological Considerations – 2 hours

A. Potential effects of prescribed and non-prescribed drugs on clinical presentation.

B. Potential effects of prescribed and non-prescribed drugs on EEG measures.

C. Potential effects of different drugs on neurofeedback assessment and training

VI. Patient/Client Assessment - 4 hours

A. Intake Assessment
1. The client's presenting symptoms and goals, medical and psychological conditions, medications, psychosocial and family history, and relevant biographical information, etc.
2. Pre and post-treatment assessments such as neuropsychological tests, continuous performance tests, EEG/QEEG, appropriate to your practice and licensure.

B. EEG Assessment
1. Standardized EEG Assessments (1 or 2-channel baselines)
2. Overview of QEEG – 19-channel QEEG or an abbreviated Q
   a. Reading topographical displays (brain maps) and connectivity/coherence displays
   b. Normative Databases
      - definition
      - common properties
      - how they are used
3. Recognizing common normal and abnormal patterns in the EEG (e.g., posterior alpha blocking with eyes open; excessive high frequency beta in alcoholism and anxiety; high frontocentral theta to beta ratio in ADHD, etc.)

C. Ongoing Assessment
1. Methods of periodic objective evaluation of patient/client progress
2. Adjusting and evaluating treatment procedures to improve outcome

D. Assessment Demonstration
Perform a basic EEG assessment, an abbreviated Q recording and/or attaching electrode cap and completing an abbreviated Q or 19-channel QEEG recording

VII. Developing Treatment Protocols – 6 hours

A. Evolution of neurofeedback protocols
Early protocols based on published studies (e.g.,Peniston Protocol and revised Peniston Protocols for alcoholism/PTSD, Theta/Beta protocol for ADHD, SMR protocol for epilepsy, etc.)
1. Protocols based on results of EEG analysis and psychometric assessments
2. Selecting a treatment model: standard (researched) protocols, QEEG-based amplitude and coherence/connectivity training, z-score training, LORETA z-score training, source localization training, SCP methods, etc.

B. Steps in protocol development and treatment planning using one or more of the treatment models

C. Demonstration and case example exercises for practice using steps/decision tree for applying client assessment data to neurofeedback protocol selection and treatment/training planning

VIII. Treatment Implementation – 6 hours

A. Client preparation for neurofeedback (e.g., orientation to neurofeedback and procedures; pre-training methods – respiration training, relaxation methods such as progressive relaxation, autogenic suggestions, HRV biofeedback, etc.)

B. Therapeutic relationship, coaching, and reinforcement strategies

C. Procedures and mechanics of conducting a neurofeedback session

1. Monitoring client reaction to treatment (e.g., use of pre-session questionnaires, etc.)
2. Obtaining clean EEG data (e.g., proper electrode attachment, impedance, artifact elimination, etc.)
3. Selecting appropriate electrode montages
4. Setting thresholds for amplitude training
5. Monitoring client progress (e.g., identifying drowsiness, revising protocols and moving to new sites, medication issues, identifying contraindications to treatment and adverse reactions, reading/interpreting session reports/graphs, etc.)

D. Introduction to Alpha-Theta Training
1. Applications (e.g., to over arousal conditions:
3. Issues related to alpha-theta crossovers, emotional abreactions, etc.
4. Psychotherapeutic skills and additional training beyond Introductory level course required for Alpha-Theta practitioners

E. Guidelines and Cautions for Remote Training – refer to the ISNR Guidelines

F. Full Neurofeedback Session Demonstrations.

IX. Current Trends in Neurofeedback – 2 hours

A. Identify current trends such as z-score training, LORETA z-Score training, etc.
B. Combining neurofeedback with other modalities (e.g., HRV, respiration, HEG, neuromodulation systems, etc.)

X. Ethical & Professional Conduct – 2 hours

A. Ethical and Legal Practice
Familiarity with the BCIA Certification Guidelines, Professional Standards and Ethical Principles of Biofeedback, ISNR Practice Guidelines for Neurofeedback and ISNR Code of Ethics, and the practice guidelines of one's primary profession

1. Experimental vs. commonly accepted neurofeedback treatment
2. Advertising, marketing of services, and public statements
3. Continuing education and training

B. Clinical Practice
When treating a medical or psychological disorder, one is required to carry a valid state-issued health care license from a BCIA-approved health care field or agree to work under supervision.

C. Scope of Practice
Neurofeedback services should be limited to the practice standards and guidelines of one's license or the license of their supervisor and also to those areas where one has:
1. Sufficient training (e.g., alpha/theta)
2. Familiarity with the client population and disorders (e.g., age, diagnosis, etc.)

D. Client rights
1. Privacy, confidentiality, and privileged communication
2. Informed consent to assessment and treatment, treatment contract apprising of

4. Equal access to health care
5. HIPAA compliance

E. Supervision
   1. Appropriate consultation and supervision in neurofeedback;
   2. Purposes and process of supervision and consultation
   3. Purposes and process of mentoring

F. Professional relationships
   1. Dual relationships
   2. Conflicts of interest and exploitation of clients
   3. Consultation, referral, and relationships with other professionals
   4. Medical and medication monitoring
   5. Procedures for dealing with unethical behavior and consumer complaints

Total: 36 hours

Appendix 2

Neurofeedback essential skills list

A beginning neurofeedback practitioner should be able to demonstrate mastery of the following basic skills, as attested by their BCIA-approved Mentor who will initial each item as completed.

Client/Patient Orientation

1. In layman's language, explain to a new client EEG biofeedback, self-regulation concepts, and operant conditioning of brainwave activity.
2. Explain the major stages in the neurofeedback treatment/training process, from initial intake and assessment to progress monitoring and reporting.
3. Explain client's role and responsibilities in the neurofeedback process. ___
4. At initial session, explain how the neurofeedback session process and equipment works, including:
   - purpose and steps involved in skin preparation;
   - steps in electrode attachment and selection of site placements; assure client about safety of "sensors"/ electrodes ;
   - meaning of primary features of the feedback screens and concepts of amplitude and frequency and/or z-scores;
   - relationship between client activity and on-screen feedback changes;
   - session recording and progress monitoring screens.
5. Obtain written client permission for treatment/training using a thorough Informed Consent form.

Intake, Assessment and Protocol Selection

1. Document a thorough client symptom and medication history and gather background information relevant to treatment/training goals.
2. Provide a thorough EEG baseline assessment, using the following skills:
   - perform correct measurements to name and locate on the scalp each of the International 10-20 System electrode placement sites
   - properly prepare scalp and ears and attach electrodes to selected assessment sites or attach an electrode cap if doing a full-cap quantitative EEG
   - correctly perform all steps to collect a qEEG recording or multi-channel EEG assessment: checking impedances, removing artifact, and collecting eyes-open and eyes-closed data
   - demonstrate basic understanding of a qEEG assessment report, as well as the most commonly reported components of qEEG databases (absolute power, relative power, phase, coherence, z-score comparisons, etc.)
   - identify recordings indicating spike and wave activity requiring consultation with a neurologist or qEEG expert
   - use all intake, psychometric, and baseline EEG assessment data to select target electrode placement sites and montages for neurofeedback treatment/training • Select an initial neurofeedback protocol and explain rationale to client.

Use and Maintenance of Neurofeedback Equipment

1. Demonstrate thorough knowledge of operation of neurofeedback equipment of choice:
   - Make correct hardware connections and start hardware.
   - Make correct electrode connections to the hardware.
   - Identify and remove (or control for) sources of common artifacts in the raw EEG signal. • Troubleshoot common equipment failures according to manufacturer's recommendations.
2. Demonstrate thorough knowledge of appropriate software for selected equipment:
   - Accurately select, install, and run neurofeedback treatment/training software.
   - Identify components, applications, and limitations of selected software package.

Neurofeedback Session Management and Reporting

1. Conduct neurofeedback treatment/training sessions involving the following procedures:
   - Provide initial orientation and instructions to client at first treatment/training session. • Prior to subsequent sessions, query client (and/or parent) verbally and/or via pre-session questionnaire on client's positive and negative reactions to previous session.
   - Maintain basic hygiene procedures in attaching (and cleaning) electrodes.

- Remind client of the training objectives for session and their role in attending to and responding to feedback.
- Start treatment/training software program, set up selected protocol parameters, and run basic feedback functions.
- As appropriate, set initial training thresholds and adjust as needed.
- Identify and remove sources of artifact appearing in session recordings.
- Monitor session recordings and provide coaching and supplemental verbal feedback to client during sessions, as appropriate.
- Save session data per equipment guidelines and review session results with client.
- Assign homework to client that supports and supplements session training goals.
- Consult with client's prescribing physician and/or providers of other concurrent treatments as necessary to avoid treatment complications and maximize treatment outcomes.
- Identify as soon as possible in the treatment/training process when neurofeedback is not working for a client; identify cause(s) for lack of progress; make necessary protocol or other training program adjustments; or, when necessary, recommend termination of neurofeedback.
  In collaboration with client, determine when neurofeedback treatment/training goals have been met and mutually plan for treatment termination and follow-up.
- Conduct all aspects of neurofeedback treatment and training in accordance with BCIA, AAPB and ISNR codes of ethical practice.

2. Maintain orderly and up-to-date client files, including
   - session-by-session training records, significant session events and client comments
   - changes in client medication, significant life changes, allergies, etc. that may impact treatment/training results
   - reports of consultations with other treatment providers, family members, teachers, etc.

Use of Supplemental Therapeutic and Training Modalities

In addition to the above, BCIA suggests the following items be addressed during the mentoring process: ___

1. Demonstrate ability to establish positive, constructive relationships with clients and their family members, using basic counseling and/or communication skills. ___
2. Document adequate training and demonstrate skills required to use appropriate counseling/therapy methods to supplement neurofeedback with clients having mental health diagnoses, if applicable. ___
3. Document adequate training in use of neurofeedback protocols. Demonstrate ability to select appropriate clients for specific neurofeedback protocols, as well as apply appropriate therapy methods when using these protocols. ___
4. Document adequate understanding of other neuromodulation modalities (such as HRV biofeedback, AVS, CES, etc.) for use in conjunction with neurofeedback, and demonstrate ability to select and use appropriate adjunctive modalities with individual clients, if applicable.

I attest that this work has been completed for: _____.

Name of Candidate for BCIA Certification

Signature of the Mentor: _____ Date: _____

Printed Name of Mentor: _____BCIA #:_____

If using more than 1 mentor, please make copies of this document for each mentor to complete.