

# EDUCATIONAL CAPNOGRAPHY CERTIFICATE

## Breathing Habit Analysis and Modification

GRADUATE SCHOOL OF BEHAVIORAL HEALTH SCIENCES

Offered by the School of Breathing Sciences

[www.bp.edu](http://www.bp.edu) Email: [education@breathingsciences.bp.edu](mailto:education@breathingsciences.bp.edu)

The **webinar-based Educational Capnography Certificate** program qualifies healthcare practitioners, human service professionals, performance consultants, health educators, and breath-workers to use capnography and related instrumentation for (1) assessing breathing habits and their effects on health and performance and (2) teaching clients to manage and/or overcome dysfunctional breathing habits that compromise respiration and related physiology.

The Certificate program is offered on a live interactive webinar basis. **For dates and registration go to: <http://breathingsciences.webex.com>, OR email us at [education@bp.edu](mailto:education@bp.edu).**

### EDUCATIONAL CAPNOGRAPHY

**Carbon dioxide** concentration in extracellular fluids plays a critical and immediate role in pH regulation, electrolyte balance, hemoglobin chemistry, circulatory physiology, muscle function, and kidney physiology. Deregulation of extracellular CO<sub>2</sub> precipitates major physical and psychological symptoms and deficits. Carbon dioxide concentration is precisely regulated by brainstem reflex mechanisms for maintaining proper homeostasis.

**Capnographs** (or capnometers) are instruments used for determining the concentration of CO<sub>2</sub> gas in blood plasma and other extracellular fluids (Interstitial, lymph, cerebrospinal). They do so by measuring End-tidal CO<sub>2</sub> (PetCO<sub>2</sub>), the CO<sub>2</sub> concentration at the end of the breath (tide) which represents the average alveolar CO<sub>2</sub> concentration. In healthy people, alveolar CO<sub>2</sub> concentration is highly correlated with arterial CO<sub>2</sub> concentration.

**Medical capnography** is about monitoring CO<sub>2</sub> in critical care, surgery, and medical emergency environments where life threatening shifts in blood gases must be continuously monitored and regulated.

**Educational capnography** is the implementation of the principles of behavior analysis and behavior modification for identifying and unlearning dysfunctional breathing habits that compromise respiration. Dysfunctional breathing habits, where reflex-regulated CO<sub>2</sub> has been compromised, may cause, trigger, exacerbate, and perpetuate a wide range of effects (symptoms and deficits) that are typically mistakenly attributed to other unrelated causes. In fact, the educational capnography is the only effective technological means to determining if, when, where, and how a learned habit is compromising respiration.

### CERTIFICATE OBJECTIVES

The Certificate program teaches colleague practitioners how to: (1) determine whether or not there is a dysfunctional breathing habit, (2) identify the learned behavioral components of dysfunctional habits, (3) identify the symptoms and deficits brought on by habits, (4) determine how existing health conditions may interact with the physiological effects of habits, (5) identify the triggers of breathing habits (e.g., pain), (6) identify the payoffs (reinforcements) and emotions that keep breathing habits in place, (7) uncover the origin of habits, and (8) assist patients in overcoming dysfunctional habits and learning new ones that are consistent with good physiology, especially respiration.

## **CURRICULUM OVERVIEW (125 HOURS)**

The 125-hour curriculum includes three 15-hour workshop courses (45 hours), one 30-hour Case Review Seminar, and one 50-hour Service Practicum (working with clients in your own setting). Participants completing the Certificate earn **six ACADEMIC (university) units and 75 CE (continuing education) hours** upon completing the Certificate. All units taken may be also applied toward earning the MS degree in Applied Breathing Sciences. The Certificate includes the following Graduate School offerings:

301 Respiratory Psychophysiology (1 academic unit, 15 hours CE), two 1-day sessions

404 Breathing Habit Assessment (1 academic unit, 15 hours CE), two 1-day sessions

405 Breathing Habit Modification (1 academic unit, 15 hours CE), two 1-day sessions

601 Case Analysis & Review (2 academic units, 30 hours CE), ten 3-hour sessions

701 Service Practicum (1 academic unit, 50 hours practical experience), in your own setting

### **Service Practicum (701) and Case Review Proseminar (601)**

The 50-hour Service Practicum consists of the following:

Assessment (10 hours): one 2-hour breathing assessment with five different clients;  $2 \times 5 = 10$  hours.

Training (40 hours): five 2-hour sessions with four different clients;  $5 \times 2 \times 4 = 40$  hours.

At least two of the Practicum sessions are formally presented during Case Review sessions. ten 3-hour Case Review sessions are scheduled during the 10 week practicum time.

## **COMPLETION TIME (15 WEEKS)**

The Certificate is designed to be completed in one trimester (15 weeks). Enrollees take the three courses during the first three weeks of a trimester. During the remaining 12 weeks they implement what they've learned during Practicum and Case Review.

## **TUITION FEES**

Fee: \$3,000.00.

## **CURRICULUM DETAILS**

### **301 Respiratory Psychophysiology (1 academic unit, 15 hours CE)**

Breathing is behavioral and respiration is reflexive. Breathing behavior is subject to the basic principles of learning that govern self-regulation, including motivation, attention, memory, emotion, and cognition. Applied breathing science is about the role of these principles in the acquisition of breathing habit patterns and their effects on health and performance, that is, the practical integration of respiratory physiology with breathing psychology. This course will provide an overview of the relevant sciences, as follows: Physiology – pulmonary anatomy, cellular respiration, internal respiration, external respiration, muscle physiology, neurophysiology, pulmonary diseases; Psychology – behavioral analysis, behavior modification, cognitive learning, interviewing, stress psychophysiology, behavioral disorders; Interventions – educational capnography, EMG biofeedback, HRV training, behavioral counseling, awareness training, habit assessment, habit modification, measurement instrumentation.

### **404 Breathing Habit Assessment (1 academic unit, 15 hours CE)**

Dysfunctional behaviors – identifying specific behaviors that compromise physiology; Learning history – pinpointing the evolution of vicious circle learning patterns; Behavioral Triggers – identifying specific places, times, tasks, people, & states that engage dysfunctional habits; Motivation & reinforcement –

emotions, self-esteem, sense of control, dissociation, secondary gain; Mediated effects – associated physiological & psychological symptoms/deficits; Cognition – belief systems, personal interpretation of symptoms; Information gathering – history taking, behavioral checklists, symptom checklists, breathing interview, phenomenological exploration, psychophysiological testing, breathing mechanics analysis; Guided exploration – intentional manipulation, memory & imagery challenges, en vivo testing, breathing mechanics challenges, negative practice, overbreathing, anaerobic testing; Types of evaluation – short form, long form, guidelines for referrals by colleagues.

#### **405 Breathing Habit Modification (1 academic unit, 15 hours CE)**

Habit modification is client-centered, not treatment oriented. Objective – learning new unconscious breathing habits vs. imposing conscious breathing exercises; Crisis interventions – breathing techniques, cognition, band aids devices; Cognitive learning – new thoughts, new interpretations of symptoms, new understandings; Desensitization – of conditioned emotional & motivational responses associated with breathing mechanics & breathing mediated symptoms; Extinction – removal of reinforcements for dysfunctional habits, reinforcement for adaptive competing responses, deactivating behavioral triggers; Negative practice – intentional engagement of dysfunctional habits, e.g., chest breathing; Reinforcements – establishing new reinforcements, changing behavioral preferences; New Habits – allowing for respiratory reflexes (trust), diaphragmatic breathing, quiet breathing; Biofeedback – EMG and CO<sub>2</sub> feedback; Generalization – learning in the field.

#### **601 Case Review (2 academic units, 30 hours CE)**

Each student is expected to present a minimum ONE breathing habit assessment (behavioral analysis) and ONE breathing learning session, or as specified by the Practicum Supervisor. Students will be expected to present data for habit assessment and habit modification sessions based on the data forms used during assessment and learning sessions described below (Service Practicum 701).

#### **701 Service Practicum (1 academic unit, 50 hours)**

Each 50-hour Service Practicum includes completion of at least FIVE habit assessment sessions, expected to involve two hours per case (10 hours total): 1-hour session time + 1-hour report writing time. At least one of these assessment sessions is presented during Case Review (601). Each report includes completion of the following forms: Interview Questionnaire, Interview Checklist, Interview Behavior Report, Interview Physiology Report, and Assessment Practicum Record.

The Service Practicum also includes completion of at least 20 habit modification sessions, expected to involve two hours per session (40 hours total): 1-hour session time + 1-hour report writing time. These hours should include a minimum of FIVE clients, each client for no less than four habit modification sessions (in addition to the initial assessment session). At least one of these sessions is presented during Case Review (601). Each report includes completion of the following forms: Learning Plan Form, Session Record Form, Homework Assignment Form, and Client Learning Form.

**Required instrumentation:** A capnograph that displays the live capnogram, breaths per minute, and End-tidal CO<sub>2</sub> (PetCO<sub>2</sub>). Data collection must be possible for later review.