COLLEGE OF PHYSICAL THERAPISTS OF BRITISH COLUMBIA

PRACTICE STANDARD

Number 2

Effective: April 1, 2013
Replaces: April 1, 2008
September 1, 2006
December, 1996
March 1, 1990

ELECTROPHYSICAL AGENTS

DEFINITION: Electrical, electromagnetic, thermal, light, or sound energies used in a therapeutic manner to reduce impairments or promote recovery of function. Electrophysical agents are sometimes referred to as "modalities", "thermal agents" or "electrotherapy".[1]

A. Purchase and Maintenance

1. In accordance with federal and provincial requirements, all electrophysical agents must:
   a. have a medical device license issued by Health Canada in accordance with requirements of Canadian *Medical Devices Regulation*. A medical device license can be confirmed by searching the Health Canada online registry at: http://webprod5.hc-sc.gc.ca/mdll-limh/index-eng.jsp, and
   b. with the exception of battery operated devices, bear a label of a certification agency accredited by the Standards Council of Canada or a label approved by the BC Safety Authority under section 10 of the *Safety Standards Act* (for example CSA or CUL). The BC Safety Authority is the body that determines what markings are acceptable for electrical products in BC. Approved marks and labels for electrical equipment can be found on the BC Safety Authority's website: http://www.safetyauthority.ca/permits-approvals/equipment-approvals/electrical

2. Where the manufacturer indicates that new equipment has not been calibrated, calibration must be performed according to manufacturers' specifications, and documented, prior to patient use.

3. Manufacturer requirements for ongoing calibration and electrical safety must be followed. In the absence of manufacturer recommendations, annual calibration and electrical safety testing must be completed by an electronics or biomedical technician and must be documented. Repairs must be made when indicated and a repair history must be kept for each piece of equipment.

4. Physical integrity of leads, cords, plugs and all accessories must be ensured. Conductivity of carbon-impregnated rubber electrodes must be tested (using a resistance [Ohm] meter) to ensure that they are replaced when their resistance is greater than ~ 500 ohms/cm between any two points on the electrode. See Appendix A for details on testing electrode conductivity. Self adhesive electrodes must be discarded if dried out.

5. Extension cords should be avoided. Where required, extension cords must be CSA approved, or bear a label approved by the BC Safety Authority.

B. Application of Electrophysical Agents

1. Prior to the application of any electrophysical agent the physical therapist must verify that there are no contraindications to the proposed application of the specific electrophysical agent, and must be aware of any precautions to the application.[1]

2. A patient's informed consent must be obtained prior to the application of electro-physical agents. (See the Practice Standard on Consent to Treatment http://cptbc.org/pdf/PracticeStandards/PracticeStandards4.pdf , and Houghton, Nussbaum & Hoens (2010)).

3. Appropriate sensation testing must be performed.

4. Self adhesive electrodes, or electrodes used on or around non-intact skin (e.g. peri-incisional, wound healing) must be used only for a single patient.

5. When electrodes are used, they must be secured in place.

6. Safe practice procedures must be followed (for example) as per Houghton, Nussbaum & Hoens (2010). Appropriate application technique specific to the selected electrophysical agent must be used e.g. angle and speed of movement of ultrasound transducer.

7. When light radiation is used, goggles must be used for both the patient and the operator. Laser devices must be used in a controlled area, with an appropriate warning sign. See: http://www.bccdc.ca/healthenv/Radiation/Optical+Radiation/Gnrl_Laser_Guide.htm for safeguard guidelines.

8. Patients must be instructed in how to obtain immediate assistance during treatment or instructed in safe practice procedures.

9. The patient's skin must be inspected after treatment. The patient must be instructed on how to perform a skin check if the physical therapist is unavailable.

10. Effects of treatment must be evaluated and subsequent treatment techniques and parameters must be modified appropriately.

11. An accurate description of the electrophysical agent application must be recorded including: modality, dosage, specific area of the body treated, and electrode placement, response to treatment, and change in treatment plan must be documented as per College Practice Standard No. 1 - Clinical Records (http://cptbc.org/pdf/PracticeStandards/PracticeStandards1.pdf).

12. World Health Organization standard infection control precautions must be followed (http://www.who.int/csr/resources/publications/StandardPrectHC.pdf). Any accessory that comes into contact with the patient must be cleaned according to current infection control procedures (http://www.bccdc.ca/prevention/default.htm). (See Practice Standard No. 7 – Infection Control)

C. Electrophysical Agents and the Physical Therapist Support Worker – General Principles

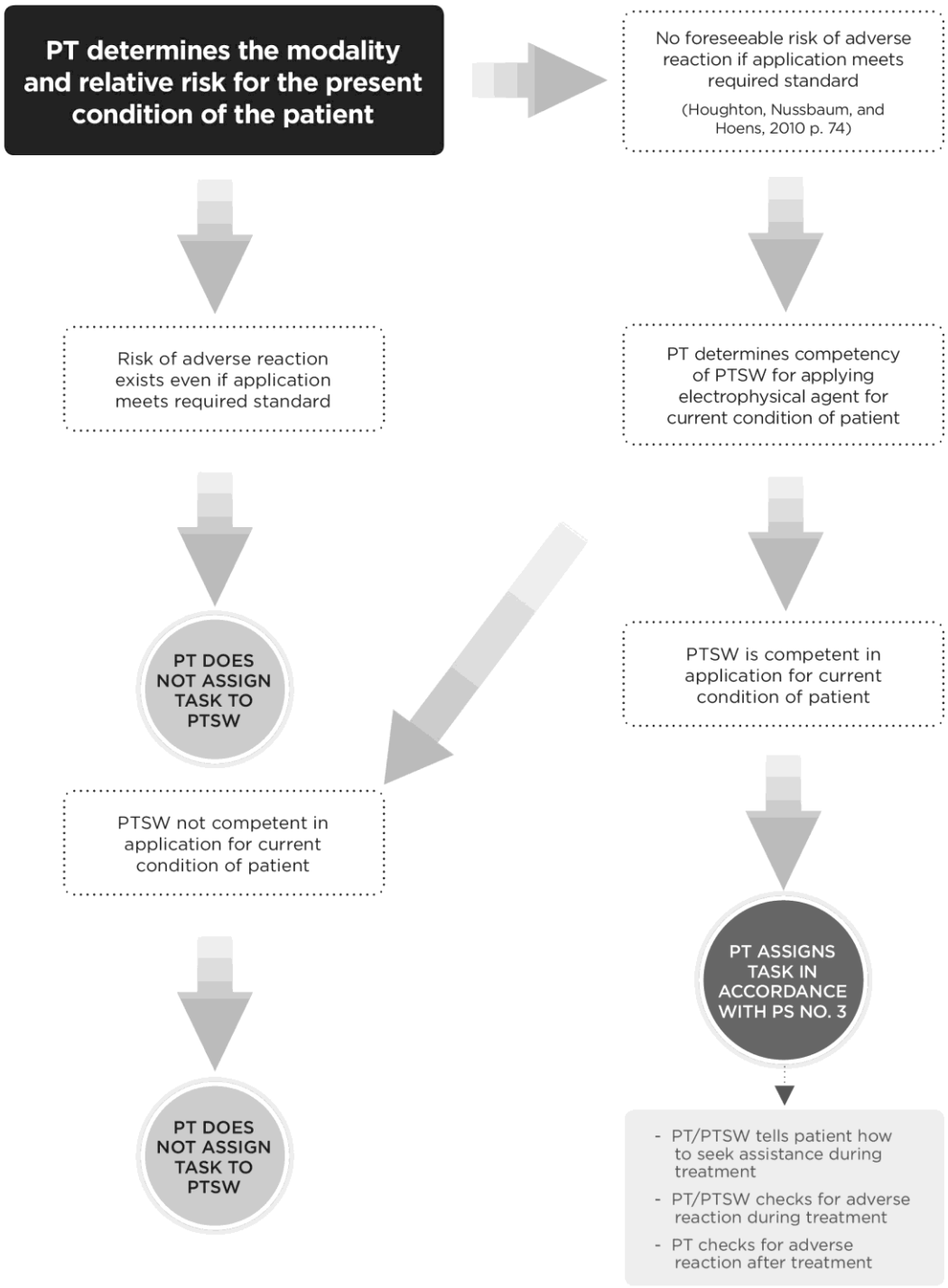
1. The physical therapist determines the relative risk for the use of the electrophysical agent for the current condition of the patient.
   a. The physical therapist determines if there are contraindications or precautions to the application of the electrophysical agent. (Refer to Houghton, Nussbaum, and Hoens, 2010)
   b. The physical therapist interprets any precautions in the context of the current condition of the patient.

2. The physical therapist determines the competency of the physical therapist support worker in the application of the electrophysical agent for the current condition of the patient.
   a. The physical therapist teaches specific application for a given electrophysical agent to the physical therapist support worker.
   b. The physical therapist teaches any required modifications to the specific application procedure to the physical therapist support worker for the current condition of a specific patient.
   c. The physical therapist ensures the physical therapist support worker is competent to replicate the correct application procedure, including any modifications to the electrophysical agent application.

3. The physical therapist ensures:
   a. The physical therapist support worker and the patient understand why the electrophysical agent has been selected from among appropriate alternatives (why it is chosen).
   b. The physical therapist support worker and the patient understand the mechanism of action and risks of the electrophysical agent (what it is).
   c. The physical therapist support worker and the patient know what the expected response to the electrophysical agent should be during treatment, and post treatment, and to contact the physical therapist if there is an unexpected reaction (how it should feel and what they should report).
   d. The physical therapist support worker and the patient understand the expectations of the patient during the treatment e.g. work with the NMES, don't look at the LASER, don't touch the electrodes (what they should do).
   e. The patient has the opportunity to ask questions and decline having the physical therapist support worker applying the electrophysical agent.

ELECTROPHYSICAL AGENTS and the PHYSICAL THERAPIST SUPPORT WORKER - ALGORITHM

The assignment to a physical therapist support worker (PTSW) of the application of an electrophysical agent (EPA) (e.g. ultrasound, low level laser therapy, transcutaneous electrical nerve stimulation etc.) must be undertaken on a case-by-case basis. Determination of whether a physical therapist (PT) should assign the PTSW to apply an EPA to a patient should be based on the following steps:



Reference:

[1] Houghton, PE, Nussbaum, EL, Hoens, AM. Electrophysical agents: contraindications and precautions. Physiotherapy Canada 2010 Special Issue;62(5):5-80.

Additional Resources:

For information on informed consent see the *Health Care (Consent) and Care Facility (Admission) Act* at http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_96181_01 and the *Infant's Act* at http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_96223_01

For information on Standard Infection Control Precautions see the World Health Organization website at http://www.who.int/csr/resources/publications/StandardPrectHC.pdf.

For information on infection control visit the BC Centre for Disease Control website at: http://www.bccdc.ca/prevention/default.htm .

For laser safeguard guidelines see: http://www.bccdc.ca/healthenv/Radiation/Optical+Radiation/Gnrl_Laser_Guide.htm .

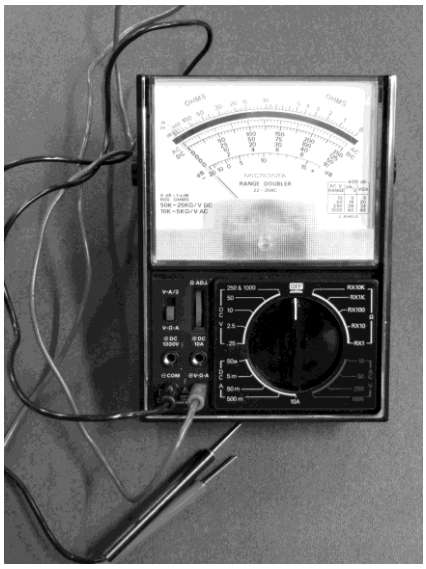
Medical Devices Regulation: http://laws-lois.justice.gc.ca/eng/regulations/SOR-98-282/index.html

To report a medical device incident to Health Canada call 1 800 267 9675 or visit: http://www.hc-sc.gc.ca/dhp-mps/compli-conform/prob-report-rapport/gui-0060_prob-rpt_doc-eng.php

APPENDIX A
How to Test Electrode Conductivity

Electrodes must be tested (yearly at a minimum, or whenever the carbon rubber electrode no longer appears shiny) to ensure that the conductivity is adequate to permit effective and safe application of electrical current with TENS, NMES, etc.

Equipment: An Ohm meter or a multimeter (analogue or digital; analogue shown)



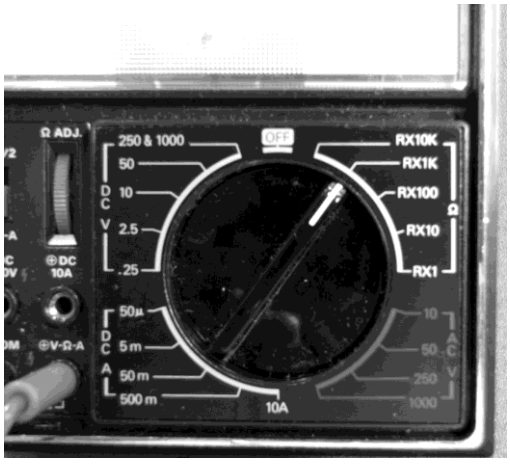
Procedure

1. Set Up (ohm meter probes plugged into correct place)

Ensure that the leads of the meter are correctly connected to the meter - one at the "+/red/Ω" and the other at the "-/com/black" terminal.

2. Integrity of the Meter Leads (ohm check)

Turn the meter dial to the setting marked with the ohm symbol (Ω). Note the different scales available. You'll have to multiply the meter reading by the factor on the scale you choose.



The meter will display "OL" for overload or open line. Touch the two meter probes together. The display should show close to zero. The number showing on the ohm meter is the resistance of the meter leads and the meter itself. Adjust the meter to “zero” by using the Ω-adjustment knob. If you use a digital multimeter the meter will be zeroed automatically.

3. Test the Electrode

Test the resistance of an electrode by placing the end of one probe at one point on the electrode and the end of the other probe on another point of the electrode approximately 1 cm away. You should test at least 3 different places on the electrode. If the resistance reads greater than 500 ohms between any two points, the electrode should be discarded.