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| |  |  |  | | --- | --- | --- | | |  | | --- | | **ASEPNewsletter** | | | | |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  | | --- | | **In This Issue** | | [**Editor's Corner**](https://gweb1.css.edu/gw/webacc/ba3dc617eeea5cb5a4a68e22fa1714b68157b4/GWAP/HREF/?action=Attachment.View&Item.Attachment.id=1&User.context=ba3dc617eeea5cb5a4a68e22fa1714b68157b4&Item.drn=230747z25z0&Item.displayExternalImages=0#LETTER.BLOCK7) | | [**Ask the EP**](https://gweb1.css.edu/gw/webacc/ba3dc617eeea5cb5a4a68e22fa1714b68157b4/GWAP/HREF/?action=Attachment.View&Item.Attachment.id=1&User.context=ba3dc617eeea5cb5a4a68e22fa1714b68157b4&Item.drn=230747z25z0&Item.displayExternalImages=0#LETTER.BLOCK8) | | [**Ads & Employment**](https://gweb1.css.edu/gw/webacc/ba3dc617eeea5cb5a4a68e22fa1714b68157b4/GWAP/HREF/?action=Attachment.View&Item.Attachment.id=1&User.context=ba3dc617eeea5cb5a4a68e22fa1714b68157b4&Item.drn=230747z25z0&Item.displayExternalImages=0#LETTER.BLOCK9) |  |  | | --- | | **Quick Links** | | [**Journal of Exercise Physiology-online**](http://rs6.net/tn.jsp?et=1102624377621&s=2&e=001EseY6qJ6retRZLbUvV_BiM0JzbDV64S8eSETEzILSbxVgiH1I1A5dTAWXoq7a7006l6Wjv1hKon9G9bcqyLtdDF8DY-7Obs67F2NTahFG4B9eywOaBfOxizZnYZSqn2x)    [**Professionalization of Exercise Physiology-online**](http://rs6.net/tn.jsp?et=1102624377621&s=2&e=001EseY6qJ6resTO9k_Jc5Jzsu_7DxGqDoOXvQE4iKicNLrDunFY7TYlxWqjusCuKDU4rOmPKYgbbrqGwwdzglpjMOx3FRyB338j7MHciqB_mLNLeu_AY-deAgPSJLj2FOv)    [**More On Us**](http://rs6.net/tn.jsp?et=1102624377621&s=2&e=001EseY6qJ6retXEKANIjAFADiz7xA9rOXbN5BYIhr6j5rd_AYo1q5m49yJTLGKpO4EyfiYfWxBAPUsdvCkO_5e1_fYn8oPg9NEWORmwcRxgeg=)    [**PhDs can now petition for Board Certification**](http://rs6.net/tn.jsp?et=1102624377621&s=2&e=001EseY6qJ6reuxivSqGMjrfRwjutDMJHDNY0bbfnCSELp8oEfILrGF_zcYCmmyioxJEzRL4ONh-5Jb7nZEGoiGKVEzXXfhI_THFbgYJk2bPpM2-YWRo4mZpZfyOJVMIrvEXwKR4KfuJjo6VWz3teqMlQ==) |  |  | | --- | | **Join Our List** | |  | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  |  | | --- | --- | --- | | **Issue: #7** | **July 2009** |  |  |  | | --- | | **Dear Exercise Physiologists,**  Thank you for being part of our community. **ASEP is the specific voice for (historically under-represented) Exercise Physiologists.** Please use this Newsletter as a link to ASEP resources from scientific journals to professional papers, to employment and related opportunities. And be sure to click on "More On Us" at the left for the ASEP-newsletter's parent web site.  Also, members please consider the [**ASEP Annual 2009 DUES Renewal Notice**](http://rs6.net/tn.jsp?et=1102624377621&s=2&e=001EseY6qJ6reurtcm03AXieE9A_fT3BcjwEUpFSiRxKmYZvvmIVnVxIs2rKACa2X6ocos8Ele8XRTc_rZA-C91t19kOiTwVvG58Zm8uZ7qgoWCLofwx-gaAQDviipNEhIOKCViGG-0ILkszMGgSxi3rl0t5dI4rI_6) on the ASEP web site.    -Lonnie Lowery and Jonathan Mike, ASEP-Newsletter Editors |      |  |  | | --- | --- | | **Editor's Corner** |  | | **ASEP Updates**  This month, as Editor of the ASEP-Newsletter, I would simply like to list some news from the [www.ASEP.org](http://rs6.net/tn.jsp?et=1102624377621&s=2&e=001EseY6qJ6retXEKANIjAFADiz7xA9rOXbN5BYIhr6j5rd_AYo1q5m49yJTLGKpO4EyfiYfWxBAPUsdvCkO_5e1_fYn8oPg9NEWORmwcRxgeg=) web site:   * First, the 2010 President of ASEP has accepted his Board of Directors nomination. More on this exciting development in future issues. * Second, Long Island University, Brooklyn, New York is the most recently ASEP accredited "Exercise Physiology" program in the United States. Congratulations! * Third, the International Federation of Exercise Physiologists (IFEP) was founded this year with the Memorandum of Affiliation agreement between the American Society of Exercise Physiologists and the Indonesian Society of Exercise Physiologists. For more information, contact the ASEP National Office. * Fourth, and finally, the ASEP-Newsletter now has approximately 1,500 high quality professional subscribers. The strong growth in the recent year has continued. Thanks for your support!   Warm Regards, Dr. Lonnie Lowery, ASEP-Newsletter Editor | |      |  |  | | --- | --- | | **Ask the EP** |  | | **Q.) In the context of stretching, could you explain the Neurophysiology of Muscle Spindles and the Golgi Tendon Organ(s) ?**  A.) Muscle **spindles** are receptor organelles that have both afferent and efferent innervation and are located **between muscle fibers**. The fibers called intrafusal and extrafusal fibers are within the spindles. The intrafusal fibers lie parallel to the extrafusal fibers and when stretched, the alpha 1 fibers fire from the nuclear bag, which are sensitive to rate of change- and decrease firing during stretch. During a held stretch, the alpha 1 fibers from the nuclear chain are sensitive to muscle length, and continue to fire during stretch. During this time, the afferent fibers provide nerve impulses from the periphery of the body to the brain and spinal cord. The efferent fibers carry those impulses from the central nervous system to an effector organ or body part.   The **Golgi tendon organs** are receptors that respond to tension, as opposed to length, change or speed. The GTO's are high threshold receptors that **exert inhibitory effects on the agonist muscles** and facilitatory effects on the antagonist muscles. For example, during muscle contraction, the GTO's shut off the agonist and stimulate the antagonist muscle if continued shortening of a muscle could cause damage due to hyperflexion or hyperextension. In essence, they manifest themselves as a defense mechanism, but this is not always the case as additional excitatory postsynaptic potentials can cause disinhibition, or minimizing the influence of the GTO's.    **Proprioceptive Neuromuscular Facilitation (PNF)** stretching techniques involve maximal or submaximal contractions (isometric or dynamic) of target (agonist) and opposite (antagonist) muscle groups followed by a passive stretch of the target muscle (1). PNF practices promote movement around a series of joints in more than one plane to achieve diagonal or spiral movements, which differs to single-joint motion in a single plane, often seen in static or ballistic stretching (2).    Stretching typically involves **afferent and efferent fibers**. The afferent fibers are nerves that conduct impulses from the periphery of the body to the brain and spinal cord. The efferent fibers are nerves that carry those impulses from the central nervous system to an effecter organ or body part. Upon the actual stretch the Ia neurons from the nuclear bag, which is to sensitive to rate of change, therefore decreasing the firing during stretch. Upon holding the stretch, the nuclear chain, which is sensitive to changes in muscle length, continue to fire during the stretch. **The five step process of PNF stretching is labeled below:**   1). Target muscle is stretched to endpoint 2). Put stretched muscle in a state of tension 3). Relax to a new endpoint 4). Put agonist muscle in state of contraction 5). Go to new endpoint   Neurophysiological explanations include inhibition of the spinal reflexes, such as stretch reflex and GTO's in the target muscles. These occur via decreases in muscle spindle activity discharge during slow static stretching and increased GTO activity during isometric contractions. In addition, voluntary contraction of opposing muscle groups during CRAC (contract relax agonist contraction) is best explained by reciprocal inhibition. Meaning, as the opposing muscle group is voluntarily contracted, the target muscle group is reflexively inhibited.  Some explanations for reciprocal inhibition include recurrent collateral pathways from motor neurons of the opposing muscle group that inhibit interneurons that reduce the excitability of the alpha motor neurons of the target muscle, therefore blocking inhibitory input to target muscle groups. Also, the interneurons activate sensory signals of the GTO's in a target muscle group also modifying the spinal reflex pathways (2).    Although the exact mechanisms are still unclear, **PNF seems to be the most effective stretching technique for increased range of motion (ROM).** This tends to have more favorable outcomes concerning activation of Golgi Tendon Organs (GTO) and muscle spindles in the target muscle group(s).   References   1). Hayward, V. Advanced Fitness Assessment and Exercise Prescription. 5th ed. Human Kinetics, 2006   2). Sharman MJ, Cresswell AG, Riek S. Proprioceptive neuromuscular facilitation stretching: mechanisms and clinical implications. Sports Med. 2006;36(11):929-39. Review     ~Jonathan Mike, CSCS, USAW, NSCA-CPT,  Doctoral Student, Assistant Editor | |      |  |  | | --- | --- | | **Advertisements** |  | | **Opportunities Related to Exercise Physiology**  **The Department of Kinesiology at the University of New Hampshire**... is currently seeking applicants for a tenure track appointment in Exercise Science at the Assistant or Associate Professor level. ...[**more information...**](http://rs6.net/tn.jsp?et=1102624377621&s=2&e=001EseY6qJ6reuUURNnquNlwVwbzyEb8-CRU1qKCfqx3dU-JeEqgsBBajrQDF2QHkU8p18yfzHwhhjJ46haEK-NXl4oUXa2TUmtZEEg44c_TRRnjv_nT2TUrw==)  **----------------------------------------------------**  **NOTE:** [**ASEP Board of Directors with approval of The Center for Exercise Physiology-online**](http://rs6.net/tn.jsp?et=1102624377621&s=2&e=001EseY6qJ6reuxivSqGMjrfRwjutDMJHDNY0bbfnCSELp8oEfILrGF_zcYCmmyioxJEzRL4ONh-5Jb7nZEGoiGKVEzXXfhI_THFbgYJk2bPpM2-YWRo4mZpZfyOJVMIrvEXwKR4KfuJjo6VWz3teqMlQ==) **developed the "EPC Petition Guidelines" for doctorate exercise physiologists to become Board Certified.** | | | | |  | | --- | |  |  |  | | --- | | Thank you for perusing our opinions, facts and opportunities in this edition of the ASEP-Newsletter.  **Sincerely,**  Lonnie Lowery American Society of Exercise Physiologists | | | |
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