Session Title:
Respiratory Sarcopenia – Fact or Fiction?

Speakers: Lawrence Cahalin, PT, MA, PhD, Matthew Butler PT, DPT, OCS, Abdullah O. Bajafar PT, MSc.

Session Description: Sarcopenia is a skeletal muscle disorder mostly found in older adults in whom there is a progressive loss of muscle strength and size. The loss of skeletal muscle strength impairs physical function and mobility and increases the likelihood of adverse outcomes including falls, fractures, physical disability, and mortality. Recently, there has been an increased interest in the possibility of respiratory sarcopenia (RS) which can exist alone or in combination with total body sarcopenia. A recent Japanese position paper by four professional organizations in Japan outlined specific criteria to identify RS, but with limited evidence to support the recommended measures. In fact, peak expiratory flow rate was included to identify respiratory weakness despite it being a measure of flow and not strength. Other key measurements outlined in the Japanese position paper included poor maximal inspiratory and expiratory pressure, low respiratory muscle mass, and low appendicular skeletal muscle mass. This session will provide a review of the available RS literature regarding its definition, measurement, and impact on quality of life (QOL). It will also include a laboratory session on how to detect the presence of RS using respiratory muscle performance, diaphragmatic ultrasound, and functional assessment testing. Attendees will take away the following skills which include the ability to: 1) identify, measure, and quantify the presence and severity of RS and 2) to define the impact of RS on QOL.

Objectives:

1) Review available literature to best define respiratory sarcopenia.
2) Identify the best measurements to determine if respiratory sarcopenia exists.
3) Understand the impact of respiratory sarcopenia on quality of life.
4) Identify what is still needed to better understand respiratory sarcopenia.

What will be the clinician/educator takeaways/skills that can be utilized immediately?
The takeaway skills for this session include: 1) the ability to identify, measure and quantify the presence and severity of respiratory sarcopenia, 2) understanding the impact of respiratory sarcopenia on a patient's QOL and mortality risk, and 3) identifying areas for future clinical practice and research regarding respiratory sarcopenia.

Speakers Bio:
Lawrence P. Cahalin PT, PhD, CCS, FAPTA, FAHA: Dr. Cahalin is a physical therapist who is a clinical professor in the Department of Physical Therapy at the Miller School of Medicine, University of Miami. He is a Board Certified Cardiopulmonary Clinical Specialist with a

varied research background and a PhD in Gerontology from the University of Massachusetts Boston. His research endeavors include studies of exercise testing, exercise training, and the assessment of functional capacity as well as testing and training of the respiratory muscles. His training in both physical therapy and gerontology has provided him with clinical and research skills to better appreciate and understand the effects of aging in older adults with and without various diseases.

Matthew Butler PT, DPT: Dr. Butler has been a practicing physical therapist for over 20 years. He received his Bachelor of Science degree in Psychology from Purdue University in 1997. He worked as a genetics laboratory manager at Rutgers University prior to getting his Doctorate in Physical Therapy from the University of Miami in 2005. Following his graduation, Dr. Butler worked in outpatient orthopedic rehabilitation, specializing in sports and spine conditions. He received his board certification as an orthopedic clinical specialist in 2008 through the APTA. In 2010, he completed a Fellowship in the American Academy of Orthopaedic Manual Physical Therapists at the University of Illinois at Chicago. Dr. Butler was born in Chicago, IL, but currently lives with his family in South Florida where he is working on his Ph.D. in physical therapy at the University of Miami. His research areas of interest are in sarcopenia and respiratory sarcopenia.

Abdullah Bajafar PT, MSc: Abdullah is a Ph.D. student in Physical Therapy at the University of Miami. He holds a master's degree in Physical Therapy from the University of Pittsburgh and is a certified physical therapist in Saudi Arabia. Abdullah's research focuses on the impact of sarcopenia on the quality of life in older adults. He is also interested in exploring the relationship between sarcopenia and the development of respiratory sarcopenia by identifying its underlying mechanisms and pathways. His goal is to generate new insights that can advance healthcare and make a meaningful difference in the lives of individuals affected by sarcopenia.

References:

1. Nagano, A., Wakabayashi, H., Maeda, K., Kokura, Y., Miyazaki, S., Mori, T., & Fujiwara, D. (2021). Respiratory sarcopenia and sarcopenic respiratory disability: Concepts, diagnosis, and treatment. The Journal of Nutrition Health & Aging, 25(4), 507–515. https://doi.org/10.1007/s12603-021-1587-5.
2. Ohara, D. G., Pegorari, Santos, N. O. D., De FÃ¡Tima Ribeiro Silva, C., Monteiro, R., Matos, A., & Jamami, M. (2018). Respiratory Muscle Strength as a Discriminator of Sarcopenia in Community-Dwelling Elderly: A Cross-Sectional Study. The Journal of Nutrition Health & Aging, 22(8), 952–958. https://doi.org/10.1007/s12603-018-1079-4.
3. Shin, H. I., Kim, D., Seo, K. M., Kang, S. H., Lee, S. Y., & Son, S. (2017). Relation between respiratory muscle strength and skeletal muscle mass and hand grip

strength in the healthy elderly. Annals of Rehabilitation Medicine, 41(4), 686. https://doi.org/10.5535/arm.2017.41.4.686.
4. Ro, H. J., Kim, D., Lee, S. Y., Seo, K. M., Kang, S. H., & Suh, H. C. (2015). Relationship between respiratory muscle strength and conventional sarcopenic indices in young adults: a preliminary study. Annals of Rehabilitation Medicine, 39(6), 880. https://doi.org/10.5535/arm.2015.39.6.880.
5. Izawa, K. P., Watanabe, S., Oka, K., Kasahara, Y., Morio, Y., Hiraki, K., Hirano, Y., Omori, Y., Suzuki, N., Kida, K., Suzuki, K., & Akashi, Y. J. (2016). Respiratory muscle strength in relation to sarcopenia in elderly cardiac patients. Aging Clinical and Experimental Research, 28(6), 1143–1148. https://doi.org/10.1007/s40520-016-0534-5.
6. Sawaya, Y., Shiba, T., Ishizaka, M., Hirose, T., Sato, R., Kubo, A., & Urano, T. (2022). Sarcopenia is not associated with inspiratory muscle strength but with expiratory muscle strength among older adults requiring long-term care/support. PeerJ, 10, e12958. https://doi.org/10.7717/peerj.12958.
7. Sawaya, Y., Ishizaka, M., Kubo, A., Shiba, T., Hirose, T., Onoda, K., Maruyama, H., & Urano, T. (2020). Association between skeletal muscle mass index and lung function/respiratory muscle strength in older adults requiring long-term care or support. Journal of Physical Therapy Science, 32(11), 754–759. https://doi.org/10.1589/jpts.32.754.
8. Sawaya, Y., Hirose, T., Ishizaka, M., Shiba, T., Sato, R., Kubo, A., & Urano, T. (2022). Patterns of Changes in Respiratory Muscle Strength over 1 Year in Non-Sarcopenia, Sarcopenia, and Severe Sarcopenia. International Journal of Environmental Research and Public Health, 19(24), 16571. https://doi.org/10.3390/ijerph192416571.
9. Pedreira, R. B. S., Fernandes, M. H., Brito, T. A., Pinheiro, P. A., Da Silva Coqueiro, R., & Carneiro, J. a. O. (2022). Are maximum respiratory pressures predictors of sarcopenia in the elderly? Jornal Brasileiro De Pneumologia, e20210335. https://doi.org/10.36416/1806-3756/e20210335.
10. Beaudart, C., Demonceau, C., Reginster, J., Locquet, M., Cesari, M., Jentoft, A. J. C., & Bruyère, O. (2023). Sarcopenia and health-related quality of life: A systematic review and meta-analysis. Journal of Cachexia Sarcopenia and Muscle, 14(3), 1228–1243. https://doi.org/10.1002/jcsm.13243.