

PERFORMING ARTS

SPECIAL INTEREST GROUP

President's Letter

Annette Karim, PT, DPT, OCS, FAAOMPT

The CSM 2014 PASIG Business Meeting was a great time for gathering clinicians, academicians, and students who have a passion for the care of performing artists. During the meeting we transitioned two committee positions.

On behalf of the PASIG, I would like to thank Julie O'Connell, 2011-2014 PASIG President, and Amanda Blackmon, 2011-2014 Nominating Committee Chair, for their 3 years of service to our SIG. Thank you, Julie and Amanda!!

Our current PASIG Board and Committee Chairs are listed below.

The following section is a report from our Business Meeting:

Education

In the area of continuing education, we discussed updating our monograph/s on Performing Artists. Members expressed a need for an increased level of continuing education courses for experienced clinicians that included more specific manual techniques and exercises for treating each type of performing artist. A request for more courses on treating musicians and vocalists was made. A suggestion was made to offer an advanced level preconference course to address these requests. A suggestion for a movement class was made. If you have a suggestion for future programming, please contact Mark Sleeper at m-sleeper@northwestern.edu.

Student Scholarships

Congratulations to our CSM 2014 Student Scholarship recipients, Lindsey Seidelman, SPT, and Sarah Beckett, SPT, from the University of Central Florida. They presented a poster, *Incidence and Prevalence of Musculoskeletal injury Among Collegiate Marching Band and Color Guard Members*. Thank you, Lindsey and Sarah! If you are a student who is interested in submitting performing arts research content to CSM for poster or platform presentation, do so early. When your submission is

accepted for CSM 2015, you are eligible for a \$400 scholarship, but you must apply for the scholarship separately, through the PASIG, via Amy Humphrey at amymarieis@comcast.net.

Nominating Committee

We are looking for PASIG members to serve on our Board and committees. Positions we would like to fill are Treasurer, Secretary, Bylaws Chair, Practice Chair, and Public Relations Chair. These are appointed positions decided upon by the current governing Board and Nominating Committee. The chair of each committee can appoint their committee members, and volunteers are welcome to initiate contact. Physical therapy students are welcome to participate and receive mentorship from committee members. This is a great way to grow into leadership positions. We will need candidates for one Nominating Committee position in 2015, an elected position voted in by all Orthopaedic Section members. We need committee members for the Student Scholarship Committee and the Education Committee. If you are interested in serving in any way, please contact Rosie Canizares, Nominating Chair, at rcc4@duke.edu. She will be able to provide chair and committee position descriptions upon request.

Research Call to Action

We need writers for the 2014 Citation blasts. These are put together on a monthly basis. Please contact Brooke Winder for more information at BrookeRwinder@gmail.com. Go to the web site to look at topics that have been covered, add new content, or update old citation topics at http://www.orthopt.org/content/special_interest_groups/performing_arts/citations_endnotes

We need case reports and original research papers that focus on clinical applications to the care of performing artists to publish in the PASIG newsletter pages of our quarterly *Orthopaedic Practice* magazine. *Orthopaedic Practice* is a great way to get your case reports, original research, and clinical application pearls into the hands of our members. Please contact Annette if you are interested in submitting your writing at neoluvsonlyme@aol.com.

SIG Governing Board & Committees	Terms	Email
Annette Karim, President	2014-2017.....	neoluvsonlyme@aol.com
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Amanda Blackmon, Membership Chair	2014-2016.....	Mandy@onetherapy.com
Sarah Wenger, Dancer Screening Chair	2014-2016.....	Sbw28@drexel.edu

Information for potential authors can be found at: https://www.orthopt.org/uploads/content_files/Downloads/OPTP/OP_Instructions_to_Author.pdf.

If you are seeking research participants, or are seeking a researcher to work with your potential participants, contact both Brooke Winder, Research Chair at BrookeRwinder@gmail.com.

Membership

Membership is FREE to all Orthopaedic Section members! FREE!

Please take two seconds to join: http://www.orthopt.org/sig_pa_join.php

Current members please update your profile: https://www.orthopt.org/login.php?forward_url=/surveys/membership_directory.php.

**You must be an APTA Orthopaedic Section member to join the PASIG.*

ALL Members: please send a quick e-mail to Amanda Blackmon, Membership Chair, at mandy@onetherapy.com.

Amanda is organizing our membership by region, to facilitate improved communication between members. At CSM, our members have expressed an interest in geographically networking and having access to other members of PASIG, and increasing collaboration with other health care providers in a direct access environment. Amanda will also update our web site for internships, residencies, and fellowships, so please send her your information.

Dance Screening

At CSM, we discussed standardization and consensus in screening the pre-professional dancer. If you have suggestions or questions, please contact Sarah Wenger at Sbw28@drexel.edu.

The following impromptu collaboration hopes to serve as a thought-provoking and informative demonstration of the clinical reasoning process behind screening and treating the young dancer. Enjoy!

Annette

CLINICAL APPLICATIONS SCREENING AND TREATING THE YOUNG DANCER: A CLINICAL REASONING PROCESS

Annette Karim, PT, DPT, OCS, FAAOMPT

Clare Frank, DPT, MS, OCS, FAAOMPT

Shirley Sahrman, PT, PhD, FAPTA

The dancer is an 8-year old, hypermobile female who studied Vagonova ballet technique for two years, 3 classes per week. She would like to become a professional ballerina. In her Vagonova technique classes, she was praised for her flexibility and lines, but in her new classes, she struggled with jump height and speed of movement. She was a direct-access, cash pay wellness client, referred by a former dancer patient to Dr. Karim. The dancer currently had no injury, pain, musculoskeletal impairment, or functional disability. There were no red flags for outside referral. The following case description demonstrated clinical reasoning in screening and treating this dancer through movement system impairment exam by Dr. Sahrman, applied dynamic neuromuscular stabilization (DNS) principles by Dr. Frank, and spe-

cific dance medicine concepts by Dr. Karim. Participant photo consent was given.

Dr. Sahrman:

Standing Posture: The dancer stood in spinal extension, with the left leg and pelvis laterally rotated with the left knee more hyperextended than the right (Figure 1). At this point we asked if is this habit, or a structural issue. The pelvis tended to move to the left, so we needed to check the greater trochanters for symmetry. Since she hyperextended the left knee more than the right, she might prefer standing on her right leg since she could do this without excessive hyperextension. She used her back extensors excessively because her hip flexors pulled her forward so that the line of gravity would be over her base of support as she bends backward. In ballet, the dancer will hold her shoulders down when she raises her arms, so the latissimus pulled her into more extension. Her infrasternal angle was wide, so she needed to use her external obliques to pull the ribcage in.

Standing Movement: In forward bending, she had a high right hip at end range and felt a big pull of the hamstrings (Figure 2). The hamstrings “pulled” to provide stability until hip flexion was past 120°, at which point she could bend all the way down. Sidebending was unremarkable. She can rotate to the right more than the left so the left abdominal muscles were less taut than the right side. At this point, we thought the left external oblique may not be as active. With excessive knee hyperextension she doesn’t need to oscillate between quadriceps femoris and hamstrings, so she needed to balance hip flexors and hamstrings. In single limb stance on the left with right hip flexion (Figure 3), she demonstrated increased adduction of left femur and a trunk shift, indicating insufficient performance of the left abductors. She moved into lateral rotation and walked turned out to increase her base of support for stability. At this point, we earmarked the left hip abductor and left external oblique for further testing. With young children, it is difficult to see where the structural limit is, so we tested in different positions.

Supine: In her two-joint hip flexor test, her right side did not show much anterior tilt, but more so, abduction; therefore, her pelvic anterior tilt was a dynamic, not a tissue problem. On her left side, she abducted and laterally rotated, and when corrected into midline, her tibia laterally rotated, indicating a stiff tensor fascia latae pulling on the tibia into lateral rotation by virtue of its insertion into Gerdy’s tubercle on the lateral knee (Figure 4). In the leg log test, she had good internal and external rotation bilaterally. She toe flexed (pointing her toes), another problem in young dancers who overuse the toe flexors vs. the gastrocnemius, so we taught “lift your heels,” instead of pointing the toes. With passive hip flexion, the left hip was better than the right. There was increased right anterior glide, also seen in prior single limb stance left—the right hip posteriorly pelvic tilted, and in standing forward flexion, where the right hip is higher than the left. In bilateral leg lowering abdominal testing, she used the rectus abdominis instead of the external obliques. She performed sitting up very well, using the internal obliques, which widened the infrasternal angle. In ballet, dancers use the lower extremity co-contraction to stabilize the pelvis instead of the abdominals. Why would we give double leg instead of unilateral leg lowering as an exercise prescription? The tendency in ballet is to use the opposite hip extensors for stability and not the external obliques. We needed to recruit the



Figure 1. Left > right hip lateral rotation, left > right knee hyperextension, spinal extension.



Figure 3. Left femoral adduction and medial rotation, lateral trunk shift and pelvic rotation, tensor fascia latae/iliotibial band driven, sartorius substitution for right hip flexor insufficiency.



Figure 2. High right hip, taut right hamstring, left tibial lateral rotation.



Figure 4. Tensor fascia latae/iliotibial band on tension, tibia leads.

external obliques. Another exercise to use bent knee fall-out, to learn to use the lower extremity while learning to stabilize pelvis with external obliques. **Sidelying:** While lying on her left side, with right hip abduction and lateral rotation, her right hip did lateral rotation first, then abduction after doing it for a while. She did a good job using right lateral abdominals. At this point I asked, “What movement do I see? Is there a deficiency in the muscle test to back it up?” Her tendency while lying on her right side with left hip abduction and lateral rotation was to flex and roll back with a left lateral pelvic tilt. The left pelvis rotated back and the left tensor fascia latae compensated for the absence or insufficiency of gluteus medius activation. **Prone:** Gluteal folds were not level. In the prone two joint hip flexor extensibility test, the right was okay, but the left is positive. Is it the tensor fascia latae/iliotibial band? If I abduct her, she is still positive, so I needed to see the difference between the right and left iliopsoas. The left iliopsoas is more active than the right and the right is weaker. The left hip was more medially rotated than right (Figure 5), which is interesting because she liked to stand in left lateral rotation. Gluteus maximus testing was okay.

Quadruped: In quadruped rocking, she veered off to the left; when corrected, the right hip did not flex as much and the hip is high. With alternate arm raises, she tried to use her hamstrings to control her hips. **Seated:** With knee extension she showed lumbopelvic rotation. With unilateral hip flexion, her left iliopsoas was more active than her right, so there was more anterior pelvic tilt. Her left iliopsoas and her right hamstrings were stronger, or more active.

Summary: Functionally, she was trying to balance by using her hip flexors to pull herself forward or her back extensors to pull herself back. She needed to strengthen her right iliopsoas and left gluteus medius, left external oblique. She had an acquired lateral rotation, not structural. Her lateral rotation came from her tibia instead of her femur. She was not using her musculature. In sit to stand, she should not hyperextend the knees. She should learn arch exercises, walking heel strike to heels up with knees bent. She needed to work through her ballet movement to use her left external oblique, right iliopsoas, and left gluteus medius. Evaluation tools can be found in Dr. Sahrman’s first book.¹

Dr. Frank:

My examination would be very similar to Dr Sahrman’s structured movement exam with additional DNS tests.

The intraabdominal pressure (IAP) regulation test² in the triple flexion position demonstrated a slight lumbar extension with pelvic rotation on the left, with insufficient left lower abdominal wall activity in the area just above the groin. (Figure 6). Providing a gentle caudal shift of rib cage to facilitate better abdominal activation (placing diaphragm in a better mechanical advantage for postural function) was an effective manual technique when teaching the exercise. To evoke/facilitate the support function of gluteus medius from the DK and Dynamic Neuromuscular perspective, I placed the dancer in an oblique sit position. Note the left hyperextended elbow with poor scapular stability and the bowing of her left lateral trunk (Figure 7). For movement re-education, I assisted by tacking the rib cage down slightly while avoiding elbow hyperextension while the dancer performed a rotational reach movement. My right hand applied pressure on the dancer’s left lateral knee to facilitate the support function of the left gluteus medius by virtue of its reverse action (Figure 8). Scapular stability had a strong connection with lateral abdominals. A good Integrated Spinal Stabilizing System was necessary to provide a stable base for the hip musculature to function.³ The dancer’s impairments were listed as follows: There was inadequate ISSS and IAP regulation, especially on the left lower portion of abdominal wall; left tensor fascia latae stiffness; right 1-joint hip flexor weakness, excessive co-contraction of hamstrings, adductors, and extensors; poor left gluteal support function (ipsilateral rolling pattern turning to the left was impaired); excessive left tibia lateral rotation; dominance of toe extensors over gastrocnemius and soleus; decreased dynamic scapular stability; and habitual hyperextension of elbows and knees, which may perpetuate the hypermobility. Treatment focus should include narrowing the rib cage angle to improve external oblique function while maintaining good IAP regulation in triple flexion position, (Figure 6) and translating this awareness to various positions and movements. Make sure that neck and pectoralis muscles are relaxed as this may be a com-



Figure 5. Medial rotation range of motion of the hips.



Figure 6. A positive IAP test in 90/90 position with manual correction.



Figure 7. High oblique sit position with poor stabilization.

compensatory mechanism for insufficient ISSS. The high-oblique sit position with reach (ipsilateral pattern, Figure 8) can be used to improve left support function of gluteals, while making sure the other joints are centrated, ie, elbows, shoulders, foot. Muscles (gluteals, scapulae, etc.) must be trained in both the phasic (open kinetic chain) and support function (closed kinetic chain). Heel-toe gait (plantarflexion knee flexion) and sit-to-stand should be practiced avoiding hyperextension of the knees. Future visits should address checking proprioception, practicing quality single heel raises, and strengthening foot intrinsics to counter the pronatory stresses on foot/knee and up the chain.

Dr. Karim:

At the barre, the dancer stood in anterior pelvic tilt, with excessive lumbar extension and forward head, a wide infrasternal angle, and winged scapulae (Figure 9). In tendu en avant she sat into her left hip, curling her right toes vs. pointing her foot,



Figure 8. Corrected high oblique sit.

with forced turnout, “rolling in” her feet, with a temporary left first metatarsal pronation and proximal phalanx lateral deviation (Figure 10). To achieve this position, she activated her rectus femoris first. She stood on a left hyperextended knee with right arabesque, with loss of her lateral hip and core stabilizers, as well as scapular elevation as she struggled for stability. Standing right, she demonstrated left cervical and lumbar sidebend, excessive use of bilateral sternocleidomastoid, left pelvic lateral rotation as a compensatory movement for left<right hip external rotation. In single limb parallel pli e, she moved into extension rotation of the lumbar spine with adduction medial rotation of the femur on the left side. She was unable to balance in relev e pass e on either side. I expected poor activation of the relevant phasic, or postural muscles: intrinsic cervical spine flexors, serratus anterior, lower trapezius, transverse abdominis, external obliques, posterior gluteus medius, intrinsic external rotators, gluteus maximus, gastrocnemius, peroneals, and intrinsic foot muscles. This suspicion was confirmed with 3-/5 MMT on the left and 3/5 on the right for these muscles. Additional findings are a positive 9/9 Beighton’s Hypermobility Test,⁴ an inability to single limb balance with eyes closed, a one second hold on the craniocervical flexion test,⁵ and excessive passive accessory joint mobility throughout. There was no need to test other ballet movement, such as degag e, ronde de jambe, or jumping, as the foundational ballet position and movement intent was not correct. The dancer was given manual correction of posture in various positions, side oblique sitting, and corrected dance movement (Figures 11 and 12). Home exercise consisted of weight shifting to single limb stance while facing the mirror, bent knee fallout, and modified plank with hip abduction and external rotation. The plan of care for this dancer should involve therapeutic exercises, DNS, and ballet-specific dance movement with and without ballet class music and with and without a mirror, to simulate class and performance. Imagery,⁶ intent, and breathing should be included in open and closed kinetic chain exercises. Cues should be given manually and visually, then verbally, less so with each visit. Eccentric and concentric chains of support should be addressed.



Figure 9. Preintervention ballet first position.



Figure 10. Preintervention tendu en avant.



Figure 11. Postintervention ballet first position.



Figure 12. Postintervention tendu en avant.

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