

Striving for Perfection: *Special Considerations when Treating the Performing Athlete*



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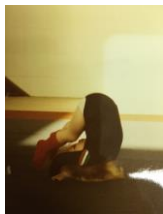
Objectives

- Understand the fundamentals of dance, gymnastics, and competitive cheer.
- Identify common impairments using specific assessment tools for the performance athlete.
- Design an effective rehabilitation program using sports specific interventions for the performance athlete



About Us

Jenny Borda



About Us

- Kathryn Iammarino



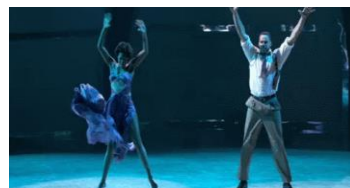
Special considerations

- Year Round participation/Increased hours
- Extreme Ranges of Motion
- Repetitive Movement/Perfection
- Early Specialization
- Aesthetic Aspect



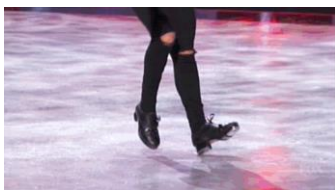
Considerations for types of dance

Jazz: Improvisational, bigger movements and isolations



Considerations for types of dance

Tap: minimal trunk movement, toe stands, and weight through outside or inside edge of feet



Considerations for types of dance

Ballet: turn out, pointe, extreme flexibility and strength



Considerations for types of dance

Modern: trunk swinging, change in levels/floor work



Shoe Wear

- Barefoot
- Soft Shoe
- Dance sneaker
- Pointe shoe



Common Dance Terms

- Parallel – Hips neutral
- Turn Out – Hips ER
- Relevé – Calf raise
- Plié – Squat
- Sauté – Jump



Terms: Sickling

- when pointing foot, inverting so it is not a straight line



Sickle Foot Regular Point Winged Foot



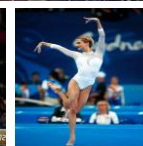
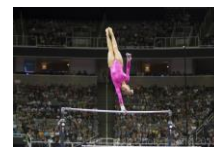
The Nature of the Sport

- Ideal body type
 - Flexible, low BMI
- Year round training
 - Season is usually fall-spring
 - Summer Intensives
- Time
 - Higher levels requires more hours
 - 6 days a week: 2-4 hours a day
 - Repetitions: perfect practice makes perfect



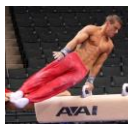
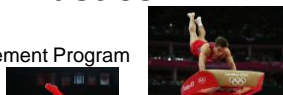
Women's Gymnastics

- Levels (changed in 2013)
 - 1-3: Developmental
 - 4-5: Compulsory
 - 6-10: Optional
 - Elite
- Xcel/high school



Men's Gymnastics

- Levels
 - 1-3: Basic Skills Achievement Program
 - 4-6: Compulsory
 - 7: Intermediate
 - 8-10: Optional
 - Elite



The Nature of the Sport

- Ideal body type
 - Small, muscular
- Age
 - Early specialization
 - Limits for each level
 - Most gymnasts peak at 15-18 years
- Year round training
 - Season is usually winter/spring
 - New skills are learned in summer/fall
- Time
 - Higher level requires more hours
 - Level 10s: 25-30 hours
 - Repetitions: perfect practice makes perfect

Level	Minimum age for competition (yrs)
2	5
3	6
4-7	7
8-9	8
10	9
Olympics	16*



Considerations for Cheer

- **School teams**- typically cheer for other sports teams associated with the school but can also compete
- **Recreation league**- under direction of recreational department or non-profit youth associations. Generally cheer for youth football/basketball teams but can also compete
- **All-star**- strictly competition teams, typically under direction of cheerleading or gymnastics gyms. Not associated with a school or other athletic teams. Level 1-5.



Cheer Terms

- **Flyer**- person who is elevated and/or tossed in the air by a base and may perform twists and/or flips before being caught
- **Base**- person with at least 1 foot on the floor who is in direct WB contact with the performing surface and provides primary support for another person
- **Spotter**- person who remains in contact with the performing surface, is responsible for watching for hazards, and must be prepared to catch the flyer if he/she falls.



The Nature of the Sport

- Year round training
- Season is usually fall-spring
- Time
 - Higher levels requires more hours
 - 5-7 days a week: 1-2 hours a day
 - Repetitions: perfect practice makes perfect



Dance Injuries

- A study looking at adolescent dancers (ballet) ages 9- 20 y.o. showed
- 53% foot/ankle; 21.6% hip, 16.1% knee and 9.4% back injuries over 5 years.



Dance Injuries

- A study looking at contemporary dancers in a university program
- Ankle/foot (30%), lower back (17%) and knee (15%) were the most common sites of injury.
- 1 year injury incident rate 81%



Gymnastics Injuries

- Sprains and strains are the most common injuries
- Greatest incidence of injury with landings
- Overuse injuries
 - 23.3%-44.2% Female Overuse Injury
 - 27%-39% Male Overuse Injury
- More likely to be injured in practice (more numbers, more time than competition)
- Males: shoulder > wrist > ankle
- Females: lower extremity, back



Cheerleading Injuries

- Cheerleading is a growing sport
 - 400K HS cheerleaders
 - >3.5 million cheerleaders (2003)
 - 4th most popular HS female sport (2015)
- Increase in injury rate and severity
 - 1980: 4,980 ED visits
 - 2007: 26,786 ED visits



Cheer Injuries

- Sprains and strains:
 - Ankle most common
 - Low back if basing
 - Shoulder: 8% of injuries
- Concussions: 4-31% of reported injuries
- Catastrophic Injuries: 50% of all women's sports

Table 4 Comparison of percentage distribution of annual injuries by injury site for high school and college cheerleaders

Injury site	High school ^a (n=425)	High school & college ^a (n=7)	College (n=184)
Ankle	22.7	22	44.9
Wrist/hand	17.8	21	19.3
Back	15.5	12	9.2
Shoe	10.4	5	*
Knee	8.4	15	11.9
Face	7.1	Not included	1.8
Head/neck	4.5	7	10.2
Thigh	3.7	2	2.7
Shoulder	3.5	8	*
Hip	2.0	2	*
Foot/Toe	1.4	2	*
Leg (dist)	-	Not included	*
Abdomen	*	2	*
Other	*	Not included	*

^aResponses <1%.

Jacobson
(2004)

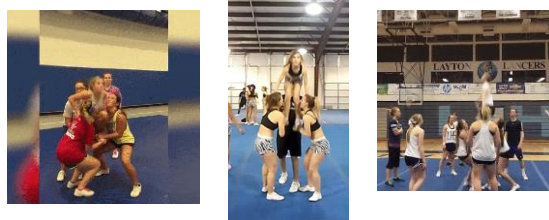


Risk Factors: All

- Base or spotter > flyer
 - 24% of injuries with basing
 - 15% from tumbling
 - 14% with falling
- Practice > Competition
- Previous injury
 - Mean of 3.5 injuries per athlete
- Higher BMI
- Tumbling/cheering on harder surfaces
- Coach with low level training



Injury Prevalence:



Dance Evaluation

- **Subjective**
- Types of Dance?
- Years of experience?
- Hours per day?
- Days per week?
- En Pointe?
- Cross Training?



Gymnastics Evaluation

Subjective:

- What level are you?
- How many hours/week do you practice?
- Dominant side? (Righty or Lefty?)
- Any planned breaks through the year?
- What things are you still doing in the gym?
- Any other sports or activities?



Cheer Evaluation

Subjective:

- Type of cheerleading and surface of performances?
- Practice schedule?
- Do they stunt? What position?
- What tumbling skills? Structured tumbling coaching?
- MOI: concussion screen



Female Athlete Triad

- Low energy availability, thought to be due to pressure to achieve or maintain unrealistically low body weight
- Defined by the ACSM as a combination of three conditions:
 - Disordered eating
 - Menstrual dysfunction
 - Altered bone mineral density
 - (Endothelial dysfunction)



The Female Athlete Triad: Screening

- Acute visits for fractures, weight change, disordered eating, amenorrhea, bradycardia, arrhythmia, depression, or gynec exams
- Women with one component of the Triad should be screened for the other components
 - Athletes with menstrual irregularity more likely to report disordered eating
 - Athletes with disordered eating more likely to report bone injuries
- Keep a high index of suspicion!!



Additional Questions

- When was your most recent menstrual period?
- Are you presently taking any female hormones (estrogen, progesterone, birth control pills or items?)
- Have you ever been told that you have low bone mineral density (osteopenia or osteoporosis)?
- h/o menstrual irregularities and amenorrhea
- h/o stress fractures
- h/o critical comments about eating or weight from parent, coach or teammate
- h/o depression
- h/o dieting
- personality factors (perfectionism, obsessiveness)



- pressure to lose weight and/or frequent weight cycling
- early start of sports specific training
- **overtraining**
- recurrent and non-healing injuries
- inappropriate coaching behavior



General Assessment

- ROM requirements- symmetrical
 - Increased spinal extension
 - Hamstring and hip flexor flexibility
 - Wrist extension and shoulder flexion
- Strength requirements
 - Overhead strength/stability, core strength
- Mechanics/alignment
 - Standing, Squating, lifting, jumping, landing
- Breathing



Assessment

ROM/Flexibility

- Range matches demands
- Flexibility symmetrical
- Hinging at specific point



Assessment

- Core testing
 - Plank
 - Double leg lower
 - Core stability with overhead movement



Dance Assessment

- Pencil Test



Dance Assessment

- Single Leg Balance with Eyes Closed
- Single leg Balance in Relevé



Dance Assessment

- Topple Test

Pass: Gesture leg full retire (turnout) , Support leg fully extended in turn, Support leg full relevé, Vertical trunk, Controlled landing



Dance Assessment

- Knee alignment with plie's parallel and turn out



Dance Assessment

- Airplane Test

- *Pass = 4 of 5 stands on 1 leg with trunk and other leg parallel to ground. Start with arms out to side and lower to ground as you plié.*



Dance Assessment

- Single Leg Sauté

- *Pass = 8 of 16 jumps with neutral pelvis, full knee extension. Full PF, good landing alignment and toe-heel landing.*



Cheer Assessment

- Heel Balance/other Flyer positions
- Overhead motion/posture especially if a base
- Jumps- take off and landing position



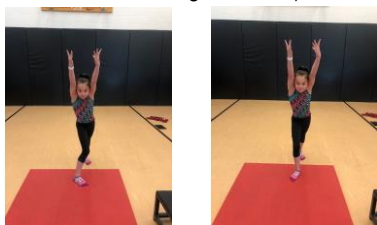
Gymnastics Assessment

- Hip flexibility without lumbar motion



Gymnastics Assessment

- Lunge position into & out of skills (and pay attention to what core is doing here also!)



Functional Outcome Measure

- Dance Functional Outcome Measure
- Patient Specific Functional Scale



Dance: Return to Sport

- Begin with barre work or technique.
- Begin with “marking”, doing movements in limited range and minimal impact.
- Progress to full turns and jumps.
- Progress to full out with no input from mirror
- Rest: around summer intensives



Return Letter

Return to: Stretching
 Core conditioning
 Barre Exercises
 Marking only
 Turns
 Jumps
 Pointe
 Full Rehearsal



Dance: Pointe Readiness

- Not before age 12
- Not anatomically sound (eg. Insufficient ankle and foot plantar flexion range of motion; poor lower extremity alignment)
- Not truly pre-professional
- Weak trunk and pelvic ("core") muscles or weak legs
- Hypermobility in the feet and ankles
- If ballet classes are only once a week

**If ballet classes are twice a week, and none of the above applies, begin in the fourth year of training.



Dance: Pointe Readiness

George Balanchine

"There is no reason to get a young dancer up on full pointe if she cannot do anything when she gets there!"



Gymnastics: Return to Sport

- Try to keep involved in the gym if possible
 - Conditioning only, no upper body, no lower body, no dynamic landings/kicking, etc.
- Progression is injury dependent- but typically tumbling on floor and vaulting happens last
- Add in 2-3 new skills/practice
- Talk about how to talk about pain with coaches



Cheerleading: Return to Sport

- Quality of tumbling skills:
 - Possible recommendation for structured gymnastics classes to work on form
- Progression through routine
 - Walk throughs
 - Dance/jumps
 - Level of stunting- half vs full
 - Tumbling- surface considerations
 - Standing before running



LAB



Treatment

- Short Foot



Treatment

- Calf Raise with toes off



Treatment

- Plantar flexion with toe flexion



Treatment

- Ankle circle band exercises



Treatment

- Knee Alignment/Foot Alignment with Squats



Treatment

- Pilates Side Leg Lift Series



Treatment

- Hip/Core strength
- -video of steamboats



Treatment

- Movement Sequencing



Treatment

- Single Leg Balance Relevé
- Single Leg Balance Heel



Treatment

- Lacrosse ball for glutes, QL, hip flexor, pecs, lats, calves, Achilles, feet!
- If it's tight/asymmetrical- stretch it!
 - Commonly lats, pecs, hip flexors, gastroc/soleus
- Don't do exercises in shoes!



Treatment Diaphragmatic Breathing

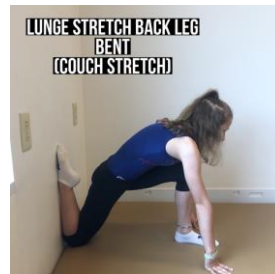


Treatment

Introduce Challenges with Breathing



Treatment



Treatment



Alternate with single leg bridging & Quad alt UE/LE



Treatment Hip Hinge



Treatment



Treatment

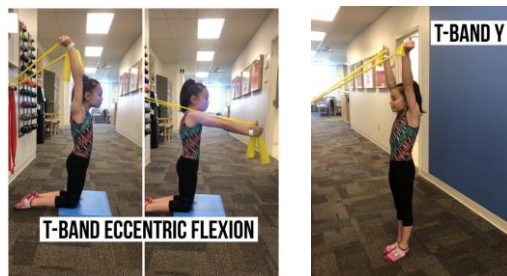
- Pay attention to stability with traditional exercises!



Treatment



Treatment



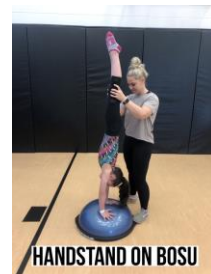
Treatment

- Getting back to UE weight bearing
 - Quadruped position
 - Add in hand taps in this position
 - Work toward single arm
 - Full push up
 - Ball walk outs
 - Working into handstand shapes
 - Shoulder taps in handstand



Treatment

- Work handstands on a compliant surface
- Have them do skills (at least handstands and cartwheels)
- UE plyometrics!!!
 - Falling onto hands, UE bouncing on tramp or BOSU



Treatment

- Don't forget about getting back to a hanging position!



Treatment

- Work on getting back to trunk extension!
- Press ups, trunk ext over t-ball, working into full bridging...



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Contact Us

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Questions?



Terms



Basket toss



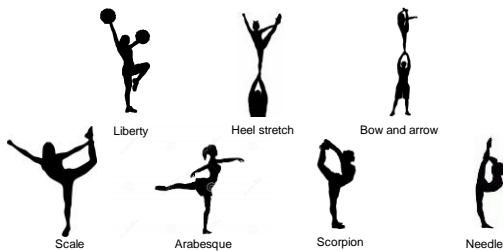
Pyramids



Stunt group vs. partner stunts



Terms



Terms



TICK JUMP



SPREAD EAGLE



VEE STRETCH



SIDE ROLLER



FRONT ROLLER



PIKE

