Backstage Care of the Theatrical Performer and Padding/Taping
Modifications for the Dancer
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Harkness Center for Dance Injuries
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Types of Musical Theater

• New York: BROADWAY
• London: WEST END
• TOURS: National, International
• OFF-BROADWAY
• REGIONAL THEATRE (LORT)
• SUMMER STOCK (COST)
• DINNER THEATRE
• INDUSTRIALS (Business Theater)
On-Site Care

• On-site treatment:
  • 2 hour treatment allotment; 20 minute treatments
  • 2-3 treatment days/week
  • Supervising MD provides standing Rx

• Job Requirements:
  • Triage, treat, refer
  • Instruct HEP, show modification
  • Decide if need to pull performer from show
  • Communication with MD, Management
Treating Environment
Treating Environment

- HIPAA compliance
- Minimal modalities/equipment
On-site Kit

Equipment:
Treatment table
Kit – tape, ace wraps, etc
NO modalities
Emergency Management

• Who to contact?
• What to do?
• When is it appropriate to call 911?
• Where does the performer go for emergency care?
• How to activate EMS system?
Emergency Action Plan (EAP)

- Written document – comprehensive yet flexible
- Distributed to: on-site PT/ATC, supervising PT/ATC, MD, company management, administration and legal counsel of venue
- Review and rehearse EAP annually
- Specify equipment needed to carry out plan and location of equipment
- Clear communication mechanism, chain of command, and mode of transportation for victim
- Venue specific information
- Incorporate emergency care facilities to which victim will be transported
- Identifies personnel involved in carrying out EAP

Failure to have in place = negligence!!
Who’s Who

- Performers
- Management
- Crew
- Musicians
- Wardrobe
- Hair/Makeup
Performers

- What is a “track?”
- Principle
- Chorus
- Featured
- Swing
- Cover
- Understudy
- Dance Captain
Actor vs Dancer

• Actor
  • Dance usually not bulk of training
  • Dance training varies widely
  • “Actor who moves well”
  • Requirements to move/dance in show vary greatly per show

• Dancer
  • Strong dance training background
  • Many also gymnastics, other type of training as well – utilized in shows many times
  • May be asked to sing/act in show as well as dance

“TRIPLE THREAT”?
Treating the Performer On-site

- Determine your patient's background and training
- Determine what the role requires (see the show)
  - Tour the theater – see what environmental conditions present – stage, backstage, stairs, etc
  - Note: THEIR ROLE MAY NOT BE MATCHED TO THEIR TRAINING
- Adjust treatment plan accordingly
What are the Risks of Injury?

- Performer Intrinsic Factors
- Exposure
- Environmental Factors
Theater Conditions

• Many OLD theaters
• Stairs to dressing rooms
• Cross-over space
• Warm-up areas
• Poor lighting
Costumes

- Wigs/Headpieces
- Mic-packs
- Shoes
- Body Make-up
How many kinds of shoes do you see?
Environmental Conditions

Stage Conditions

TRAPS
ELEVATORS
TURNTABLES
STAIRS
RAKE (INCLINE)
TRACKS, SLOTS
FLOORS: NOT SPRUNG
Stairs

• Potential Problems:
  • Non-uniform step (tread) depth
  • Non-uniform riser height
What is a “Track”? 

• Allow automated scene changes
• Sets pulled by winches, computer controlled
• Enables fast-paced show
Stage Tracks

• Floor Construction
  • Wood planks over steel undercarriage

• INJURY RISK:
  • Width can vary
  • Uneven flooring
Raked Stage

• Stage on incline
  • “Upstage” (back) higher than “Downstage” (front)

• Design Purpose:
  • Forced perspective
  • Improves audience sight lines

Regulation Rake
½ inch rise/1 foot
~4% rake
Raked Stage

• Effects on performer:
  • **NO definitive research to show causal effect of rake to injury**
  • Strong performer belief
  • **Evans (1996)** – found rake stage as one predictor of injury in Broadway shows
  • **Hagins et al. (2007)** – biomechanical influence of stage incline to lower limb kinematics
  • **Pappas and Hagins (2008)** – significant hip and ankle joint angle differences standing on flat vs inclined surface
  • **Pappas et al. (2011)** – time to stability similar for flat and inclined floor surfaces
What do we know about injuries?

• NOT MUCH RESEARCH

• Washington (1978)
  • Self-report surveys over 4 years
  • “Theater dance” 1 of 4 categories

• Bronner, Bowenstein (1997)
  • Retrospective chart review of 1 Broadway show

• Evans et al – Broadway (1996) and West End (1998)
  • Retrospective surveys

• Wanke et al – more recent work (2011-2014)
  • Acute injury in musical theater and revue dancers
  • Retrospective accident report reviews

Who are the Performers?

<table>
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<tr>
<th></th>
<th>Male</th>
<th>Female</th>
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<tbody>
<tr>
<td>Number</td>
<td>77</td>
<td>89</td>
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<tr>
<td>Age</td>
<td>32.2 ± 8.4</td>
<td>28.0 ± 5.5</td>
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<tr>
<td>Height (cm)</td>
<td>177 ± 9</td>
<td>164 ± 8</td>
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<tr>
<td>(ft in)</td>
<td>(5' 10&quot;)</td>
<td>(5' 5&quot;)</td>
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<tr>
<td>Weight (kg)</td>
<td>74.5 ± 9.6</td>
<td>53.5 ± 6.4</td>
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<tr>
<td>(lb)</td>
<td>(164)</td>
<td>(117)</td>
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<tr>
<td>BMI</td>
<td>23.8 ± 1.9</td>
<td>20.0 ± 2.3</td>
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<tr>
<td>Age at First Class</td>
<td>15.9 ± 6</td>
<td>8.5 ± 5.4</td>
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<tr>
<td>Years Professional</td>
<td>11.0 ±</td>
<td>9.5 ± 6.0</td>
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Injury Incidence

• **Evans** (1996; 1998):
  • Broadway:
    • Total injuries: 55.5%
    • 5.6 injuries per 1000 performance hours
    • 33% resulted in at least 1 missed performance
    • 62% performers thought injuries were preventable
  • West End:
    • Total injuries: 46%
    • 2.1 injuries per 1000 performance hours
    • 31% resulted in at least 1 missed performance
    • 60.8% thought injuries were preventable

• **Wanke** (2014):
  • 440 acute injuries reported over 17 year period
  • 26 ± 6.3 injuries per season
  • .22 per 1000 dance hours
  • 39% injuries resulted in immediate work stoppage
Injury Site - HCDI

HCDI Broadway Injury Surveillance

- Wicked (2005-2006) (12mo)
- Chitty (2005) (9 mo)
- Spelling Bee (2006-2007) (24 mo)

% of Injury

- % back
- % foot/ankle
- % hip
- % thigh
- % knee
- % lower leg
- % neck/shoulder
- % wrist
- % other

Broadway vs West End Actors and Dancers

- % back
- % foot/ankle
- % hip
- % thigh
- % knee
- % lower leg
- % neck/shoulder
- % wrist/arm/hand
- % other/misc

 Actors vs Dancers
Injury Site – Wanke (2014)

Acute Injury Incidence

% Incidence

Body Area

Lumbar spine
Cervical spine/head
Thoracic spine/trunk
Upper extremity
Hip
Thigh
Knee
Lower leg
Ankle/foot

Male
Female
Risk Factors for Injury (Evans 1996;1998)

• Broadway: Sex (female), length of professional career, previously missed show due to injury, high physical demands of role, raked stage

• West End: Sex (female), age, height, body mass, duration as professional, previous injury, previously missed performance due to injury, current smoker, raked stage

• Wanke (2011): 63-66% reported injuries due to “extrinsic cause” i.e. partner, props, floor.
How to Effectively Manage Environmental Factors?

Change performer to fit environment

-OR-

Change environment to fit performer
Taping Modifications for the Dancer Patient
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Harkness Center for Dance Injuries
NYU Hospital for Joint Diseases
July 12, 2015
Guidelines

1. Compression by layers, not tightness
2. Inspect and protect skin
3. Position of joint
4. Know the mechanism of injury
5. Clinician positioning
6. Follow don’t steer
7. No wrinkles
8. Capillary refill
Dancer Needs

• KNOW YOUR DANCER!!
  • Shoe wear?
  • Costumes?
  • Style of dance?
  • Dance surface?
  • Length of class/rehearsal/performance?

• RULE #1: BE CREATIVE
• RULE #2: LET DANCER KNOW THEIR TAPING
• RULE #3: TEACH DANCER TO TAPE ON OWN
Goals

- **Hallux Valgus** = Neutralize 1st MTP alignment
- **Cuboid Subluxation** = Prevent midfoot abduction
- **Lisfranc Sprain** = Stabilize midfoot
- **Pronation** = Normalize subtalar (STJ) joint and support medial longitudinal arch
- **Talar Stabilization** = Prevent excessive anterior talar glide / promote posterior glide with movement
- **Fibular Glide** = Promote normal biomechanics with movement
Hallux Valgus
Hallux Valgus
Cuboid Subluxation

- Acute vs Chronic Subluxation
- Padding to support cuboid
Lisfranc Sprain
Midfoot Pronation

- Hypomobile STJ into eversion
- Excessive midfoot pronation
- Tape Goal: encourage calcaneal eversion; midfoot into supination (medial longitudinal arch support)
Midfoot Pronation
Talar Stabilization

- Excessive anterior glide of talus secondary to plantar flexion (PF) bias in dance
- Anterior talocrural joint (TCJ) impingement with functional dorsiflexion (DF)
- Tape Goal: Assist with posterior glide of talus with functional DF
Talar Stabilization

1

2

3

4
Fibular Glide

- Promote normal superior/posterior glide of fibula with ankle DF
- Allows posterior glide of talus to occur through proper widening of the mortise
Fibular Glide
Questions?
Broadway References


Taping References:


Handoll HHG, Rowe BH, Quinn KM, de Bie R. Interventions for preventing ankle ligament injuries. Cochrane Database of Systematic Reviews 2, 2009.


