SCREENING FOR THE IDENTIFICATION OF SHOULDERS AT RISK OF INJURY

Presenter: Shaw Bronner PT, MHS, EdM, OCS; Director of ADAM Center at Long Island University, Brooklyn, NY and Director of Therapy Services at Alvin Ailey, New York, NY.

Description: Performing artists experience high rates of musculoskeletal injuries. The annual incidence of musculoskeletal injury in dancers is 67 – 95% with the majority of injuries at the lower extremity (57-75%). [1-4] Less than 10% are upper extremity injuries. Not surprisingly, the majority of injuries in musicians are at the upper extremity, with shoulder problems ranging from 12 to 32%. [5-7]

Approximately 360,000 college athletes undergo preseason screening annually. In contrast, most performing artists do not. While performing artists are often referred to as “athletes”, it is apparent that they are not receiving the same considerations for wellness.

A screen of the shoulder region includes the following:
Performance or functional assessment. For the dancer, a technique-specific analysis includes the portebras and lifting. For the musician, interaction of player with instrument is key.

Beighton laxity test. [8]

Scoliosis screen.

Injury history.

Risk factors. [1-4, 9]

Objectives: At the conclusion of this presentation, participants will be able to:
1. Describe the objectives and elements of pre-participation screening of the shoulder girdle in dance populations.
2. Describe the objectives and elements of pre-participation screening of the shoulder girdle in musicians.
3. Understand risk factors for shoulder injury in dance and music populations.

Level: Multilevel.

Content: The major points in this presentation are:
1. Ergonomic and human factor analysis of the functional demands of the instrument-musician or dance-specific activity is key.
2. Previous injury of the area is an important risk factor.

References
EMERGENCY BACK STAGE CARE OF A SHOULDER INJURY
IN A PERFORMING ARTIST

Teresa L. Schuemann, PT, SCS, ATC, CSCS
Director, Skyline Hospital Physical Therapy and Sports Medicine

This lecture is about the initial evaluation and treatment of the performing artist who has suffered an injury to his/her shoulder. It will provide a systematic approach for evaluation and treatment to provide adequate initial medical care, minimize effect of injury and facilitate rapid recovery from the shoulder injury.

Objectives
At the end of the lecture, the participant will be able to:
1. Follow a systemic approach to initially evaluate a performing artist who has suffered an acute shoulder injury.
2. Initiate appropriate stabilization and initial treatment of a performing artist who has suffered an acute shoulder injury.
3. Understand and acknowledge classic “red flags” that lead to direct referral for further medical care and radiological studies
4. Properly “package” a performing artist who has suffered an acute shoulder injury to transport to another facility for further medical care.

Level – Intermediate 2

Content

Mechanism of Injury
What happened?
♦ Fall/Impact
  § Direct blow
  § Onto Outstretched arm
♦ Traction injury
♦ Overuse leading to failure

Primary survey
▪ ABC’s
▪ Head or cervical spine injury
▪ DOTS
  ♦ Deformity
  ♦ Open Injuries
  ♦ Tenderness
  ♦ Swelling

Transport Decision
▪ Mode of transport
  ♦ Independent with UE stabilization
- Assisted with people with UE stabilization
- Dependent
  - Carry
  - Stretcher
- UE Stabilization/Immobilization
  - Anatomical stabilization
  - Sling/Swathe

**Secondary Survey**

- Subjective evaluation
  - Mechanism of Injury
  - Audible sounds at time of injury
  - Feeling/Sensation immediate after injury
  - Pain description
- Palpation
  - Deformities
  - Sensation
    - Injury area
    - Distal to injured area
    - Dermatomes C2 – T1
    - Dermatomes – peripheral nerve distribution
      - Axillary
  - Pulse
    - Brachial
    - Radial
- Circulation
  - Capillary refill
- Warmth
- Swelling
- Pain upon palpation

- Active ROM
  - Cervical
  - Scapular
  - Shoulder
  - Elbow/Forearm/Wrist
- Manual Muscle Testing
  - Myotome (C2 – T1)
  - Major Muscle Groups
    - Upper trapezius/Levator scapulae
    - Deltoid
    - Supraspinatus
    - Infraspinatus
    - Supscapularis
    - Biceps
    - Triceps
Secondary Treatment

- Interventions re: Injury for correction and/or stabilization
- Anti-inflammatory treatments

Case Scenarios

- Shoulder dislocation
  - Anterior
    - Mechanism of Injury
    - Presentation
    - Initial treatment
    - Relocation attempt
  - Follow up treatment
  - Posterior
    - Mechanism of Injury
    - Presentation
    - Initial treatment
    - Follow up treatment
- AC Sprain/Separation
  - Mechanism of Injury
  - Presentation
  - Initial treatment
  - Follow up treatment
- Rotator Cuff Tear
  - Mechanism of Injury
  - Presentation
  - Initial treatment
  - Follow up treatment

Return to Performance Decisions

- Options
  - No return to performance with referral to further medical care
    - “Package” to transport
    - Initial anti-inflammatory treatment
  - No return to performance with further backstage evaluation
    - Stabilize for comfort, support and avoidance of further injury
    - Initial anti-inflammatory treatment
  - Return to limited performance with support
    - Restriction delineation
    - Support application
    - Re-evaluation/treatment plan
  - Return to full performance with support
    - Support application
    - Re-evaluation/treatment plan
  - Return to limited performance without support
    - Re-evaluation/treatment plan
  - Return to performance without restriction
    - Re-evaluation/treatment plan
- Functional testing to make these decisions
  - ROM
  - MMT
  - Shoulder clock in appropriate weight bearing position
  - Rhythmic Stabilization in appropriate positions
  - Push-up in appropriate position
  - Hanging in appropriate position

References
1. Emergency Response Textbook, American Red Cross 2000
2. Basic Life Support for Healthcare Providers American Heart Association 2000
11. Robinson CM, Kelly M, Wakefield AE. “Redislocation of the Shoulder during the First Six weeks after a Primary Anterior Dislocation: Risk Factors and Results of Treatment. JBJS 84:1552-1559, 2002
CASE STUDY OF A PERFORMING ARTIST LIMITED BY SHOULDER PAIN

Noel Goodstadt, MPT, OCS, CSCS. University of Delaware Sports & Orthopedic PT Clinic

Description: Shoulder pain is a common ailment in all upper extremity activities of repetitive nature, occurring in the work place, sports, and the performing arts. There are a large variety of pathologies and/or combination of pathologies responsible for shoulder pain. It’s important to rule out the common causes, but even more important to consider the uncommon causes. Shoulder pathology for a viola player can be significantly limiting, and can prevent an individual from participating in his/her season of concerts if not resolved quickly. Therefore, it is important to have a sound physical therapy diagnosis to guide the treatment intervention. There is limited evidence of the relationship between restricted thoracic spine movement and shoulder pain, however the evidence suggests an effect on scapular kinematics (Kebaetse, et al.1999). In this case presentation we hypothesized that her shoulder pain was due to poor thoracic mobility and weak scapular musculature.

Objectives: Upon completion of this case study the participant should be able to:

1. Identify profiles of patients who may benefit from the use of thoracic manipulation/mobilization in the treatment of shoulder pain.

2. Understand and apply the appropriate reasoning for keeping the artist practicing vs. resting during the initiation of PT.

Level: Multilevel

Content:

I. History of Present Illness
   a. Student involved in the University Concert Band with 3 week history of left shoulder pain.
   b. Decreased frequency of practice

II. Review of the Literature

III. Differential Diagnosis
   a. Hypothesis

IV. Intervention
   a. Segmental Mobilizations
   b. Thoracic Manipulation
V. Results/Conclusion

References:


Kaiser Permanente Los Angeles
Physical Therapy Clinic
Cervical Spine and Shoulder Disorders
Evaluation and Treatment

Describe your problem:___________________________________

How long has your problem existed?________________________

If you have pain, mark on the body diagram the location of these symptoms.

If you work or exercise, what type of physical activity or body posture (i.e. sitting, standing, bending, lifting, walking) does it entail?

What types of treatment have you had for this problem in the past?

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PHYSICAL THERAPIST'S NOTES: TREATMENT BASED CLASSIFICATION
MED/SURG:____________________________________________
INITIAL NDI/SPADI Date:_______________________________
FINAL NDI/SPADI Date:_______________________________

SIGNIFICANT IMPAIRMENTS/CATEGORIES (See form B for details)
Pain Limited Peripheral Nerve Mobility
Pain Limited Cervical/Thoracic/Rib Mobility
Pain Limited Shoulder Mobility
Resistance Limited Peripheral Nerve Mobility
Resistance Limited Cervical Mobility
Resistance Limited Shoulder Mobility
Shoulder Impingement
Shoulder Instability
Physical Medicine & Rehabilitation Consult
Refer For Immediate Physician Consultation
Neurosurgery/Spine or Orthopaedic Consult

PATIENT RECEIVED EDUCATION IN: Date
Sitting and Lying Ergonomics
Job Task Ergonomics
Recreational/Athletic Ergonomics
Self Care/Wellness and Prevention

PATIENT RECEIVED TRAINING IN: Date
Flexibility Exercises
Strengthening Exercises
Stabilization Exercises

Physical Therapist________________________________
(Signature)       Form A
Reported problem:____________________________________________________

History of problem/reason for onset/progression:__________________________

Body Chart (Include type of pain, aggravating and easing factors):          

Patient's occupational/recreational ergonomic stresses:___________________

Previous treatment:____________________________________________________

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PHYSICAL THERAPIST’S NOTES: TREATMENT BASED CLASSIFICATION

MED/SURG: ____________________________________ STAGE I (Pain Limited) Date

INITIAL NDI/SPADI Date:__________________________

PERIPHERAL NERVE ENTRAPMENT REDUCTION          _______

NECK STABILISATION PROCEDURES                  _______

NECK PHYSICAL AGENTS                            _______

FINAL   NDI/SPADI Date:__________________________

STAGE II (Resistance Limited)

CERVICAL MOBILISATION PROCEDURES          _______

THORACIC/RIB MOBILIZATION PROCEDURES          _______

NEURAL ELEMENTS MOBILIZATION PROCEDURES          _______

NECK/MUSCLE MOBILISATION PROCEDURES          _______

STAGE III (Exercise, Biomechanical, Multidisciplinary)

FLEXIBILITY EXERCISES                          _______

STABILIZING/STRENGTHENING EXERCISES            _______

BIOMECHANICAL EVAL & MGMT                      _______

MULTIDISCIPLINARY PAIN MGMT PROGRAM            _______

SIGNIFICANT IMPAIRMENTS/CATEGORIES (See form B for details)

PATIENT RECEIVED EDUCATION IN: Date PATIENT RECEIVED TRAINING IN: Date

SITTING AND LYING ERGONOMICS                   _______

JOB TASK ERGONOMICS                           _______

RECREATIONAL/ATHLETIC ERGONOMICS               _______

SELF CARE/WELLNESS AND PREVENTION               _______

Physical Therapist __________________________ (Signature)

Form A
C/S Ligament Stability Exam (Note “+” findings/impairments): +/ -

C/S Mobility Exam: Pain onset at end range (√), during movement (x), or negative (-):
- Left Rotation Ipsilateral/Contralateral Sx
- Right Rotation Ipsilateral/Contralateral Sx
- Left C/S quadrant ⇒ Radicular
- Right C/S quadrant ⇒ Radicular

VBI (Note “+” findings) +/ -

Neurological Status (Note “+” findings impairments):
- Manual Muscle Tests +/ -
- Sensation Tests +/ -
- Reflex Tests +/ -
- UMN/Cranial Nerve Tests +/ -

Nerve Mobility: Sx Reproduced with
- Median Bias
- Radial Bias
- Ulnar Bias

Spinal Mobility:
- Pain Limited
- Pain Limited
- Resistance Limited
- Resistance Limited

Shoulder AROM: Pain onset at end range (√), during movement (x), or pain free (-):
- Scaption
- 90/90ER
- IR (HBB)

Shoulder PROM: Pain onset at end range (√), during movement (x), or pain free with overpressure (-):
- Flexion/TOS
- Abduction
- 90/90ER
- IR (HBB)

Shoulder Accessory Mobility:
- G-H
- A-C
- S-C

Resisted Exam: (x) weak, (√) painful, or (-) 5/5 strength/pain free
- Left/Right/Both
- ER with sulcus
- IR
- Biceps Bracii

Active compression tests (- or +): Left/Right
- Labrum/Rotator Cuff
- AC Dysfunction

Tenderness (- or +): Subacromial Bursa
- Supraspinatus
- Infraspinatus
- Bicipital Groove

Strength Deficits (- or +): Left/Right/Both
- Lower Trap
- Middle Trap
- Serratus Anterior
- RC

Flexibility Deficits:
- Left/Right/Both
- Upper Trap
- Levator Scap.
- SCM
- Subscapuarius
- Pec Major
- Pec Minor
- Suboccipitals
- Latissimus Dorsi
- Teres Major

Postural Deficits:
- Excessive Capital Extension
- Protracted Scapula
- Excessive Thoracic Kyphosis

Date_______________ Physical Therapist________________________
Cervical and Shoulder Examination

Algorithm #1

Suspect 1) Fracture or Loss of Connective Tissue Integrity Due to Trauma or Disease, and/or 2) Abnormal/Hypermobile Cervical Segmental Mobility

Yes → Stabilization Procedures

No

Yes

Consultation with Appropriate Healthcare Provider

Medical Clearance and Negative Imaging

If Negative

Screen for Potentially Serious Non-Musculoskeletal Pathology

If Negative

Cervical Examination Algorithm #2

If Negative
Cervical Examination and Intervention

Algorithm #2

Cervical and Upper Thoracic Single Plane Active Mobility Examination

Pain During Movement or Pain Limits Motion in Available Ranges or Movement Produces Peripheral Symptoms

If Positive for Upper Motor Neuron Lesions

Consultation with Other Healthcare Providers

Neurological Status Examination

Mobility Examination of:
- Upper Quarter Neural Elements
- Peripheral Nerve Entrapment Sites

If Positive

Mobility Examination of:
- Upper Thoracic and Cervical Spine
- Upper Quarter Neural Elements

Pain Limited Nerve Mobility

Nerve Entrapment Reduction Procedures

If Symptoms Resolve to the Point Where Pain Does Not Limit Motion in Available Range, Return to Single Plane Active Mobility Examination

Pain Limited Cervical Mobility

Cervical Stabilization Procedures

If Negative

Resistance Limited Nerve Mobility

Mobilization of Upper Quarter Neural Elements

Resistance Limited Cervical Mobility

Mobilization of Cervical and Thoracic Spinal Segments

To Algorithm #3 Shoulder Examination and Intervention

Cervical Spine Side Bending, and/or Combined Side Bending/Rotation/Extension Over Pressures

Produces Vertebral Artery Signs

If Safe to Proceed

Produces Peripheral Symptoms

If Segmental Instability

Does Not Produce Peripheral Symptoms

If Negative

If Symptoms
Unresolved

If Positive

Vertebral Artery Disease Examination

If Safe to Proceed
Shoulder Examination and Intervention

Algorithm #3

Active ROM Tests:
1) Elevation
2) 90/90 or Neutral External Rotation
3) Hand Behind Back

Passive ROM Tests:
1) Elevation with Over Pressure
2) Isolated Glenohumeral External Rotation
3) Isolated Glenohumeral Internal Rotation

Passive Accessory Motion Tests:
1) Posterior Humeral Translation
2) Anterior Humeral Translation
3) Inferior Humeral Translation (sulcus sign)
4) Acromioclavicular Accessory Movements

Resisted Tests:
1) External Rotation
2) Abduction Active Compression
3) Flexion Test

Palpatory Examination of Suspected Enthesopathy

To Algorithm #3
Algorithm #3b

- First Time Traumatic Dislocation
- Age ≤25 Years Old
- Night Pain
- Weak External Rotators
- Over 65 Years of Age

Medical/Surgical Consultation in Addition to PT Intervention

Pain Limits Active and Passive Movements in Mid Ranges

- Normal or Excessive Active and Passive Range of Motion
- Painful and/or Excessive Humeral Accessory Motions
- Positive Active Compression Tests

Suspect Glenohumeral Capsuloligamentous Labral Tear

Instability

- Pain with Active Motions
- Pain with Passive Over Pressure
- Weak and/or Painful Resisted Tests

Shoulder Strengthening Therapeutic Exercises

Consultation with Other Healthcare Providers

Associated Upper Quarter Impairment Examination Algorithm #4

- Limited Active and Passive Range of Motion
- Limited Humeral Accessory Motions

Suspect Rotator Cuff Tear

Pain with Active Motions

- Painful and/or Excessive Humeral Accessory Motions
- Positive Active Compression Tests

- Pain with Passive Over Pressure
- Weak and/or Painful Resisted Tests

Shoulder Strengthening Therapeutic Exercises

Shoulder Mobilization Procedures

If Symptoms Resolve, and Pain No Longer Limits Active and Passive Movements in Mid Ranges, Return to Start of Algorithm #3

- Limited Active and Passive Range of Motion
- Limited Humeral Accessory Motions

Resistance Limited Shoulder Mobility
Associated Upper Quarter Impairment Examination

Algorithm #4

Physical Agents and Ergonomic Instructions

Shoulder Stabilization Procedures and Therapeutic Exercises

Shoulder Strengthening Therapeutic Exercises

Shoulder Mobilization Procedures

Nerve Entrapment Reduction Procedures

Mobilization of Upper Quarter Neural Elements

Cervical Stabilization Procedures

Mobilization of Cervical and Thoracic Spinal Segments

Strength/Motor Control/Endurance Deficits

Deep Neck Flexors

Lower Trapezius

Middle Trapezius

Serratus Anterior

Flexibility Deficits

Upper Trapezius

Pectoralis Major/Minor

Latissimus Dorsi

Levator Scapula

Suboccipital Group

Teres Major

Sternocleidomastoid

Subscapularis

Postural Deficits

Excessive Capital Extension

Protracted Scapulae

Excessive Thoracic Kyphosis
Selected References


