Learning Objectives

1. Internalize and value the importance of proper body mechanics for injury prevention to support a lifetime of musical performance.
2. Understand what constitutes proper posture and how posture impacts musical execution.
3. Be able to perform warm-up techniques, such as progressive muscle relaxation and stretching exercises, to prepare your body for performance.
4. Be able to perform spinal stabilization techniques during rehearsal and performance.
Musicians: “Meticulous and artistic athletes”¹

- Biomechanically and neuromuscularly elite
- A violinist playing a Liszt etude plays up to 1800 notes per minute¹
- Professional musicians run marathons with their fingers every day
- Injury prevention is key
Prevention is Key

“The importance of prevention is critical when one notes the significant correlation between the length of a violin playing career, physical warm up, and the occurrence of musculoskeletal disorders.”²
Risk Factors

- Repetitive motions
- Lack of warm up
- Postural weakness
Overuse Injuries
Background: Overuse Injuries

- Playing a musical instrument is a very complex and intricate motor skill\(^2\).
- Musicians often experience pain due to the \textit{repetitive nature} of playing their instrument\(^2\).
- \textbf{Overuse injuries} = tissue damage that results from repetitive demand over time\(^3\).
  - Involve persisting pain and functional impairment in activities\(^4\).
Background: Overuse Injuries

- About 25% of music students experience a playing-related injury.\(^5\)
- Injuries related to playing possess a prevalence rate of up to 87%.\(^6\)
Background: Overuse Injuries \(^5,7\)

**Contributing Factors:**

- Excessive physical tension
- Extended hours of practice with inadequate rest breaks
- Lack of warm-up routine before playing
Background: Overuse Injuries

- Muscles that are unable to accommodate and adapt to the imposed demands of instrument playing can become injured and strained.

Symptoms of overuse injuries include:

- Muscular tightness
- Muscular weakness/fatigue
- Tenderness and aches
- Cramping
Background: Overuse Injuries

Common injury sites:

- Hands
- Arms
- Shoulders
- Back
- Neck

Common pathologies:

- Muscle sprain and strains
- Inflammation (Tendonitis)
- Nerve compression problems (Carpal Tunnel Syndrome)
Force
Tension
Repetition
Poor Posture
+ No Rest

= Overuse Injuries$^8$
3 Tools to help prevent overuse injuries:

- Posture
- Warm-up
- Spine Stabilization
Posture
Disclaimer

1. Please contact your physician or see a licensed Physical Therapist for further examination and professional advice prior to engaging in activity.

2. We are students and not physicians or practicing physical therapists.
How Heavy is Your Head?

12 lbs.  32 lbs.  42 lbs.

NORMAL POSTURE  2 INCHES FORWARD  3 INCHES FORWARD

42 Pound Head

“For every inch of Forward Head Posture, it can increase the weight of the head on the spine by an additional 10 pounds.”
Posture 2, 5

Correct posture allows the body to:

- Conserve energy
- Move freely
- Safely apply loading force to joints

Proper posture involves maintaining the natural curves of the body’s spine in sitting and in standing.
Posture

• **Improper postures** stress the musculoskeletal system which can lead to fatigue and muscular tension
  • Results in higher risk for overuse injuries
  • Fatigue and tension can negatively impact performance
Posture: See for yourself!

1. Slouch in your chair
2. And now try to raise your arms as high as you can...
3. Now sit up straight and raise your arms again as high as you can

Pretty different, huh?
Body Posture

Key points to remember:
1. Overall Posture
2. Axis of Gravity
3. Head and Shoulder Alignment
4. Pelvis Alignment

Good posture can help prevent debilitating injuries
Posture points to remember

1. **Overall posture**
   - Rigidity
   - Slumped
   - Instrument-specific (physiological)

2. **Axis of Gravity**
   - Weight shifted to the right, left, front or back
Posture points to remember

3. Head and Shoulder Alignment
   To the sides and forward and backwards

4. Pelvic Alignment
   Tilted forward and backwards
Warming Up for Performance
What is a warm-up?

A warm-up is a preparatory activity that helps to prime your body for physical exertion (Ex: playing an instrument, lifting something heavy, running)\textsuperscript{3,10}

Consists of a gradual increase in intensity of the performed exercises.
Purpose of a Warm-Up: Prepare and Prevent!

When you first start to engage in physical activity, your body needs an *adjustment period* to meet the required demand.

Warm-up activities act as a *bridge* between when your body is resting to when you are performing at an increased workload.
Changes In Your Body During Warm-Up

A warm-up will help to:³,10

1. Make muscles more flexible and reduce tension
2. Increase blood flow to muscles being used
3. Increase oxygen and nutrients to your muscles
4. Slowly raises your heart rate
5. Gradually increases breathing
What Does This Mean For You?

• A warm-up period most importantly helps to prevent or decrease the chances of injury.

• Reduces pain during and after performance.

• Allows you to perform better, faster and longer!
Quick and Easy Warm-Up Activities:

Progressive Relaxation$^{10}$

Tension

Full Body Movements$^{11}$

Body + muscle temperature, heart rate, blood flow

Stretching$^{10}$

Muscle length and tension
Progressive Muscle Relaxation

Works to decrease unwanted muscular tension by contracting and then consciously relaxing the muscles\textsuperscript{10}

Common areas of tension include the shoulders, neck, and jaw

Progressive relaxation options:

- Shoulders
- Face/jaw
- Arms
- Legs
Progressive Muscle Relaxation

Example - shoulders:

Pull your shoulders up to your ears

Hold the muscle contraction for 5 seconds

Then consciously relax your shoulders down
Progressive Muscle Relaxation

Apply to the rest of your body

- Arms
- Legs
- Back
Full Body Movements

Benefits:

• Helps to get blood flowing through the body
• Warms muscles up so they stretch easier
• Loosens up limbs and back for better posture and performance
• Can be done standing or in a chair. Do not require much space
• Takes about 1-2 minutes.
Full Body Movements

• Calf raises (tip-toes)
• Cat-Cow
• Sun salutations (snow angel)

These can be done both seated and standing.
Stretching help to increase the **flexibility** in your muscles and reduce **tension**.

You should feel a slight muscular stretch, but **no pain**. If you feel pain, back off of the stretch a little bit or stop.

When performing the stretch, **do not bounce**. Hold it in a non-moving position.

Want to hold each stretch for 15-30 seconds. Do that 2-3 times per muscle.

Remember to breathe normally while you hold the stretch. **Do not hold your breath** while holding the stretch.
Stretching Cont.¹⁰

**Neck:**
- Upper Trapezius Stretch

**Back:**
- Scapular Retractor Stretch

**Shoulder/Chest:**
- Pectoralis Stretch

**Wrist:**
- Flexor and Extensor Stretch
Cool-Down After Performance

• Just as important as a warm-up

• A cool-down period after exercise is used to help slowly return your body back to resting levels
  • Heart rate, body temperature, breathing

• Prevents any discomfort after activity

• Main activity with a cool-down is stretching
  • Want to stretching the muscles while they are still warm
  • Helps to prevent muscle tightness and soreness

• Can use the same stretches you did for your warm-up
Rest Breaks in Private Practice

• Take at least a five minute break every hour to rest your body. A ten minute break is better.

• Move your body around during this break. Give your hands and arms a rest.
Stabilizing the Spine
MOBILITY superimposed on STABILITY
Spine Stabilization

Transversus Abdominus

- Deepest muscle of abdominals
- Important for stabilizing spine to prevent back pain and injuries\(^1\)
Engaging TA

1. Put your hands on your hips and feel for the bone in front

2. Move your fingers just inside those two bones on the soft tissue

3. Gently draw your belly button towards your spine

4. Feel for TA pushing up under your fingers
Stabilizing before playing

• Prepare your spine for the forces about to be imposed on it

• Just before beginning to play, perform the drawing-in maneuver, *then* begin playing

• Think about tightening TA when moving into a fast or demanding section of music

• With practice, engaging TA will happen subconsciously!
Ready . . . . . . . Set . . . . . . . Play!

♩ Correct Posture
♩ Warm-up
♩ Full body movements
♩ Stretching

♩ Correct instrument posture
♩ Stabilize spine (TA)

♩ Make some music!
Conclusion & Take Home Summary

• The biggest injury risk a musician faces is an overuse injury. Repetitive motions, a lack of warm up, and postural weakness set you up for these injuries.

• Warm-up, correct posture, and spine stabilization are specific steps you can take to avoid overuse injuries.

• If you find yourself trying to play with pain, please take your instrument and consult a physical therapist. Specific therapy can help you prevent significant, career limiting problems.
Learning Assessment!


References cont.


