



Optimizing Sleep and Performance in Performing Artists

Joanna Fong-Isariyawongse, MD, FAAN, FAES
Associate Professor of Neurology
University of Pittsburgh



TRANSPARENCY

Disclosure

The presenter has the following financial relationships

SPEAKER

PepsiCo

Gatorade Sports Science Institute

Speaker honoraria for educational presentations

**SPEAKER +
CONSULTANT**

Takeda Pharmaceuticals

Neurology & sleep medicine portfolio

Speaker and consultant on neurology / sleep topics

These relationships do not influence the content or recommendations of this presentation.

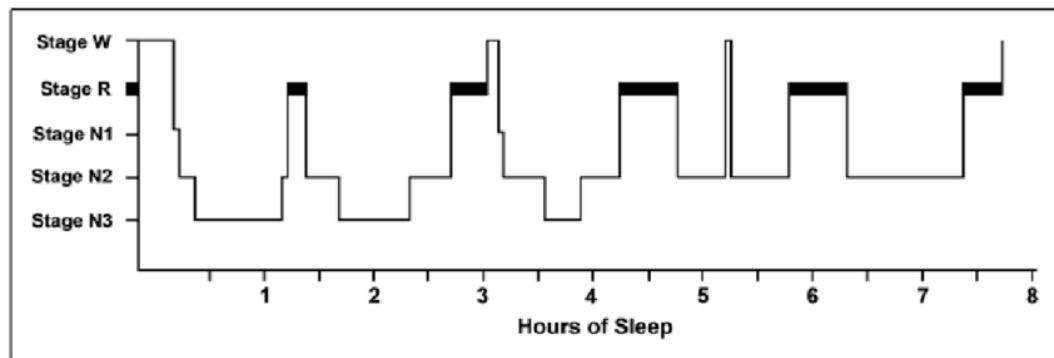
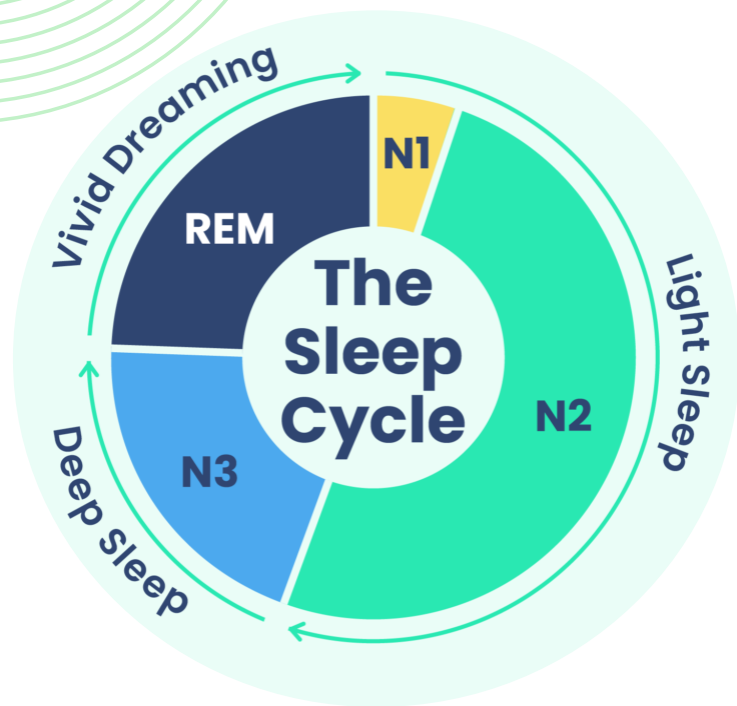


PART I • FOUNDATIONS

The Science of Sleep

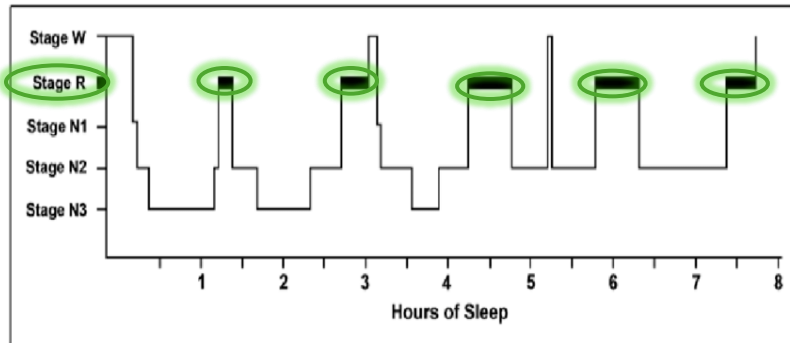
What sleep actually does inside the body —
architecture, circadian rhythm, mechanisms

STAGES • CIRCADIAN • HORMONES



REM SLEEP — THE DREAM STAGE

Where the brain rehearses performance and resets emotion



EMOTION REGULATION

Stay composed under pressure

REM peaks (green) cluster in the second half of the night — protect the back end of sleep

MEMORY CONSOLIDATION

Lock in choreography, repertoire & technique

WHY THIS MATTERS FOR PERFORMING ARTISTS



Cut sleep short and you lose REM first — meaning shakier focus on opening night, slower retention of new choreography and repertoire, and reduce ability to regulate emotion in high-pressure performances.

Sleep Deprivation & Mental Health

Poor sleep is one of the strongest predictors of depression and anxiety athletes.

No large
RCT on
performing
artists

YOUTH ATHLETES

2–4×

higher risk of depression
and anxiety^{1–3}

PROFESSIONAL ATHLETES

4.26×

more likely to report depressive
symptoms^{4–5}

WHAT THIS MEANS FOR PERFORMANCE

↓ Mood & motivation

Lower drive to train and compete.

↑ Anxiety & reactivity

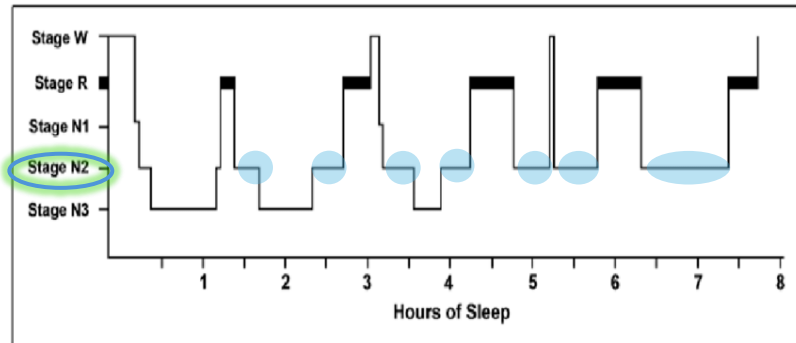
Pre-game nerves, lower stress tolerance.

↑ Burnout risk

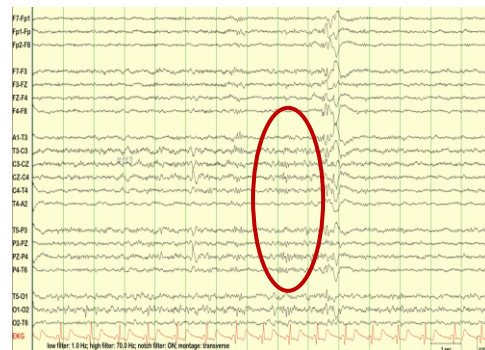
Higher dropout and early retirement.

Stage 2 Sleep — The Workhorse Stage

Roughly half of total sleep — where technique gets locked in



Blue ovals mark N2 phases — typically ~50% of total sleep



MUSCLE MEMORY

Lock in technique & repetition

SLEEP SPINDLES

Brain replays the day's rehearsal

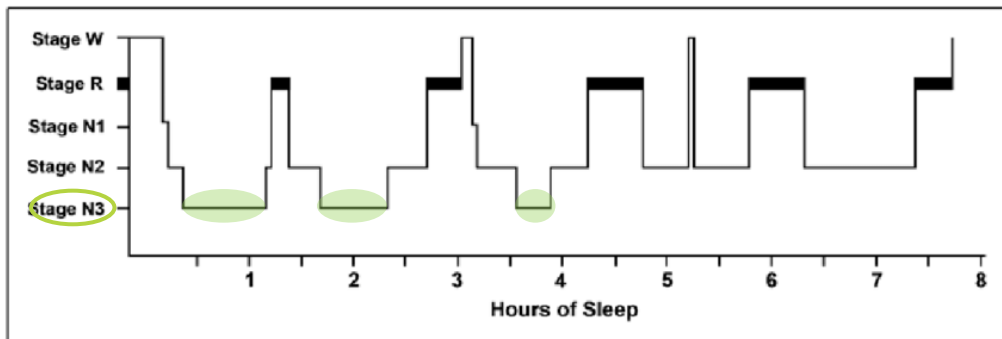
WHY THIS MATTERS FOR PERFORMING ARTISTS



N2 dominates your night — and it's when the brain runs "sleep spindles" that consolidate yesterday's rehearsal. Skip it and the choreography you drilled, the passage you finally nailed, the scene work you broke through – doesn't stick the same

SLOW WAVE SLEEP (DEEP SLEEP)

RESTORATIVE (RECOVERY)



**Human Growth
Hormone**



**Muscle Repair
Tissue Regeneration**



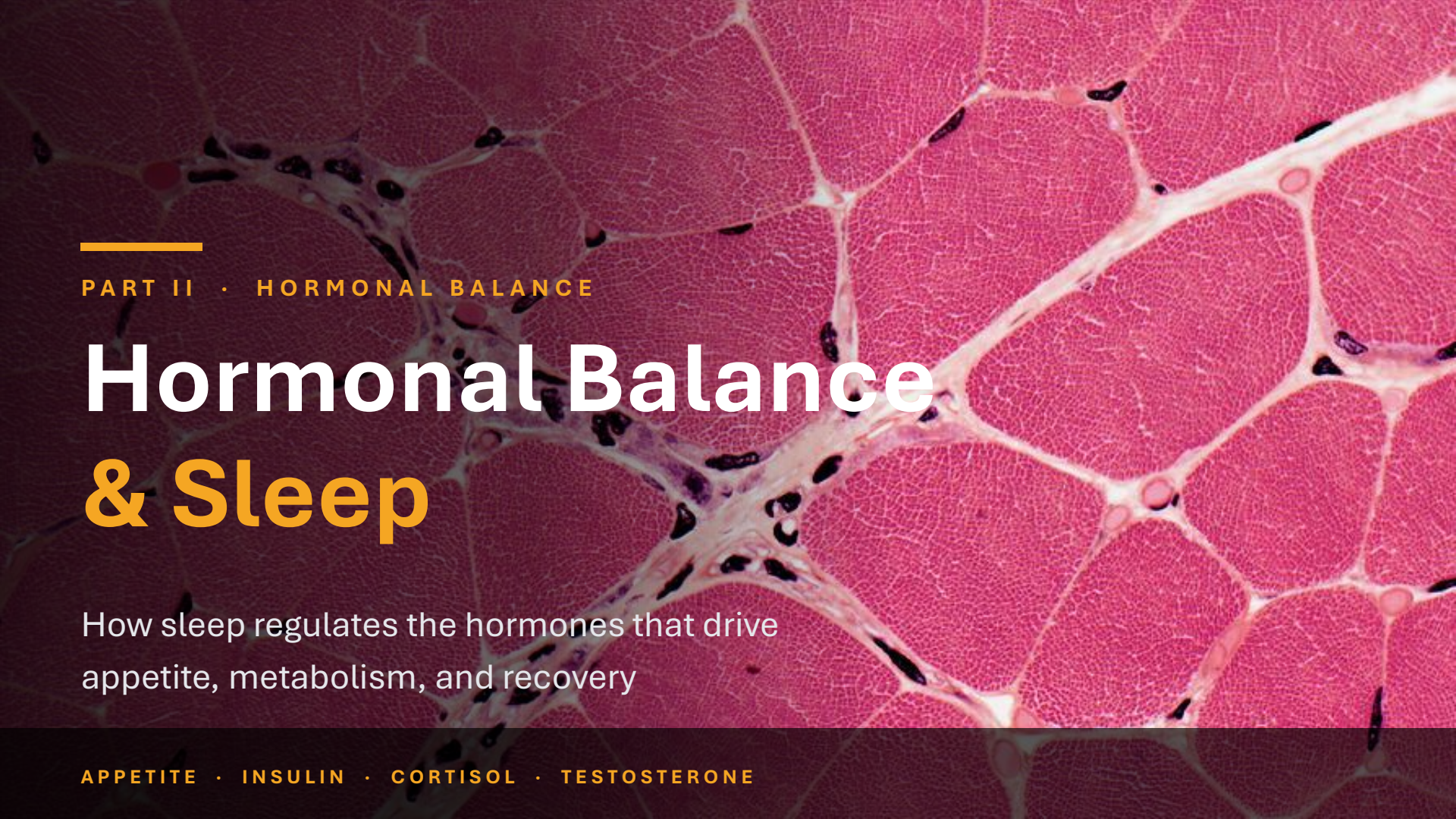
**Glycogen
Restoration**



**Immune Boost
Lower Inflammation**



Glymphatic System

A microscopic image of muscle tissue, showing large, pink, striated muscle fibers separated by thin layers of connective tissue and small, dark, elongated nuclei. The image is used as a background for the title slide.

PART II • HORMONAL BALANCE

Hormonal Balance & Sleep

How sleep regulates the hormones that drive
appetite, metabolism, and recovery

APPETITE • INSULIN • CORTISOL • TESTOSTERONE

SHORT SLEEP. WEAKER PERFORMANCE.

Four hormones turn against you — every rehearsal, every performance.

INSULIN



–10–30%

less fuel for the next act

CORTISOL



STAYS HIGH

*body never shifts to
recovery*

GROWTH HORMONE



**SHUTS
DOWN**

*overnight repair signal
gone*

TESTOSTERONE



–10–15%

*less strength and power
from the same physical
demand*

**LOWER REPEATABILITY
PERFORMANCE AFTER PERFORMANCE**



PART III-A

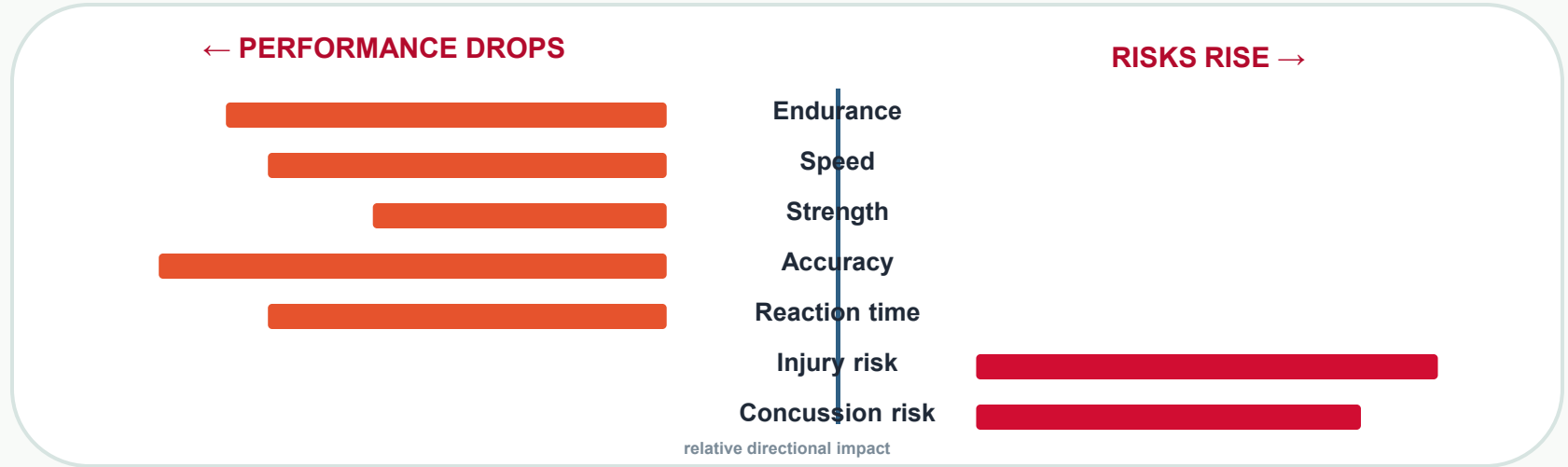
Sleep & Athletic Performance

How sleep shapes speed, strength, recovery,
and what shows up on the scoreboard

EVIDENCE · MECHANISMS · GAME OUTCOMES

Sleep deprivation degrades performance and raises safety risk

All seven measured outcomes move in the wrong direction when athletes lose sleep



Implication: sleep is a controllable performance variable—not just a recovery preference.

SLEEP EXTENSION WORKS

Extending sleep delivered measurable gains across sports



BASKETBALL (+2h x 5-7 wk)

- Free throw accuracy: **+9%**
- 3-point accuracy: **+9.2%**
- Sprint time: **4.3% faster**
- Faster reaction time (PVT)



TENNIS (+2h x 1 wk)

- Serving accuracy: **+5%**
- Daytime sleepiness improved



ICE HOCKEY (10h x 1 night!)

- Cognitive performance: **+8%**
- Fatigue reduced: **-23%**



PART III-B

Sleep & Performing Artist Performance

How sleep shapes voice, focus, stamina,
and what shows up on the stage

VOICE · PRECISION · STAGE OUTCOMES

SLEEP DEPRIVATION AND VOCAL PERFORMANCE

1.6×

HIGHER ODDS OF LONG-TERM DYSPHONIA AT <5 HRS / NIGHT
WHY · WHAT 24 HOURS WITHOUT SLEEP DOES TO THE VOICE

ROUGHER ↑

Vocal roughness rises

Tone loses smoothness

BRILLIANCE ↓

Less ring & clarity

Voice sounds dull, veiled

PITCH ↓

Fundamental frequency drops

Voice sits lower than baseline

1. Bagnall AD, Dorrian J, Fletcher A. Some Vocal Consequences of Sleep Deprivation and the Possibility of "Fatigue Proofing" the Voice With Voicecraft® Voice Training. *J Voice*. 2011.
2. Cho JH, Guilleminault C, Joo YH, et al. A Possible Association Between Dysphonia and Sleep Duration. *PLoS One*. 2017 (n=17,806).

AN EXTRA HOUR OF SLEEP LIFTS EVERY CORE MUSICAL SKILL

+38%

MUSICAL MEMORY GAIN AFTER 7 NIGHTS OF +60–90 MIN SLEEP

WHY · WHAT SLEEP EXTENSION DOES FOR MUSICIANS (n=50, RCT)

RHYTHM +4.5%

Tighter timing

p < 0.001 vs control

SIGHTREADING +7.1%

Read new music faster

p < 0.002 vs control

FLEXIBILITY ↑

Psychological resilience rises

p < 0.001 — control unchanged

PART IV · PUTTING IT INTO PRACTICE

Evidence-Based Sleep Strategies

From the lab to the rehearsal room —
protocols that actually move the needle

HYGIENE · TIMING · NAPS · TRAVEL

A group of mountaineers in colorful gear are ascending a steep, snow-covered mountain peak. The climbers are positioned along a narrow path, with their shadows cast long on the snow. The sky is a solid, deep blue. The overall scene conveys a sense of challenge and achievement.

THE PERFORMANCE WINDOW

Know your **biological peak.**

Peak Windows Across the Day

Sleep 1 AM–9 AM. Each domain peaks at a different number of hours post-wake — schedule the work to the window.



● COGNITIVE ● ATHLETIC ● PERFORMING ARTS

Windows anchored to wake time per Facer-Childs & Brandstaetter (2015); athletic peaks track core body temperature (Knaier et al., 2022).

The background of the image is a photograph of a grand, ornate theater stage. The stage is framed by a highly decorative archway with intricate carvings and gold leaf accents. The curtains are a deep red with gold fringe and are held back by gold rings. The stage floor is dark, and the overall lighting is warm and dramatic, highlighting the architectural details. The text is overlaid on the lower half of the image.

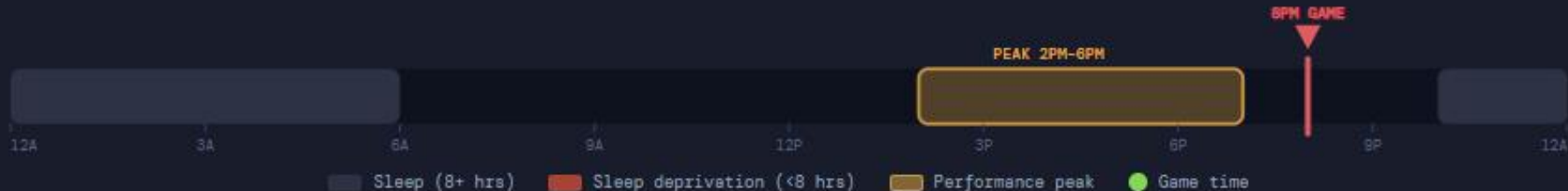
THE TRAVEL THESIS

It's not about *local* time.
It's about **peak time.**

Performance Window Explorer

Set the travel, sleep schedule, and game time. Watch the performance peak move — then generate a prescription for the team.

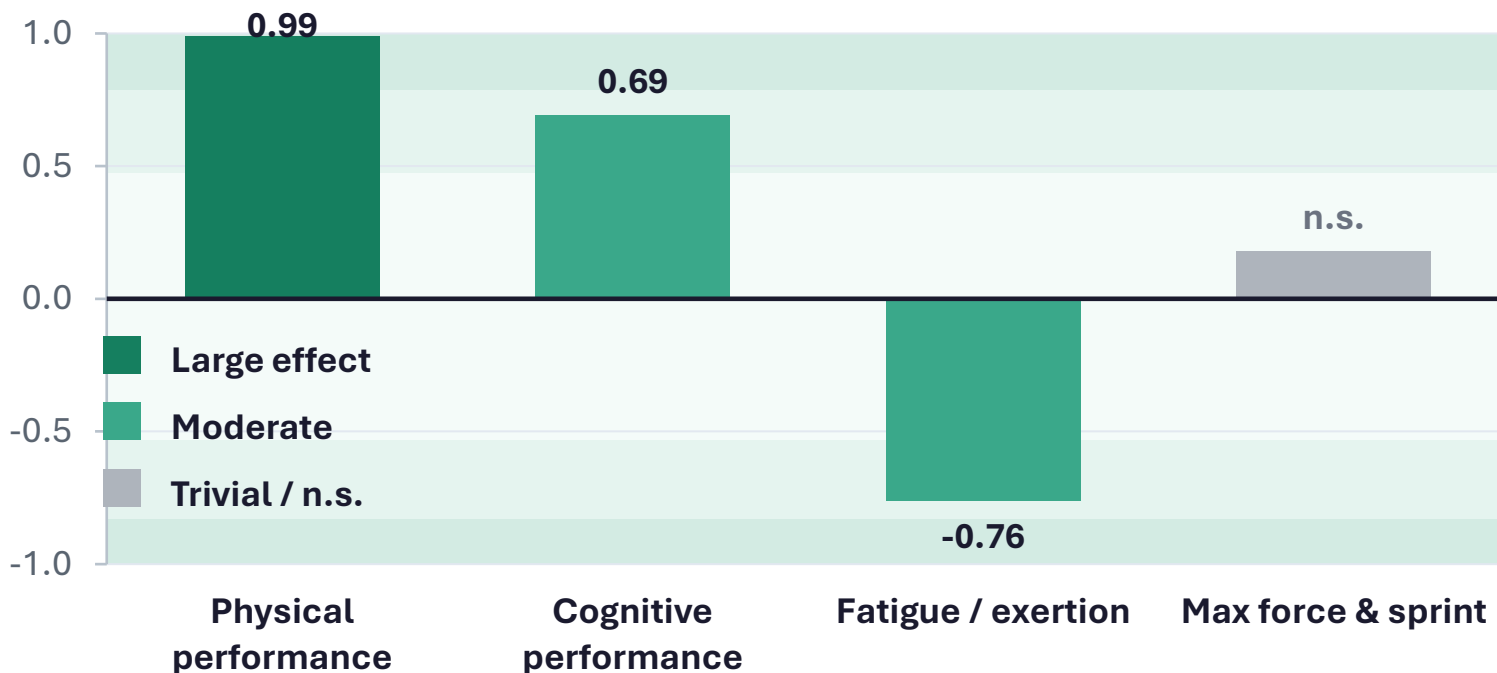
MANUAL EXPLORER

West -3**X MISALIGNED**

Peak window: 2PM–6PM local. The 8PM game falls outside the peak — performance below optimal. Try more pre-travel shifting, or add a strategic pregame nap.

Naps Move the Needle

Best results: 30–60 min, ≥ 1 h before performance — replacement naps offset travel sleep loss.



1. Mesas AE, Núñez de Arenas-Arroyo S, Martínez-Vizcaino V, et al. Is daytime napping an effective strategy to improve sport-related performance and reduce fatigue? A systematic review and meta-analysis (22 RCTs, n=291). *Br J Sports Med.* 2023;57(7):417-426.
2. Boukhris O, et al. Daytime napping — non-significant effects on maximal force, single sprint and Wingate performance (ES=0.18, p=0.27). 2024.

Power Nap vs. Deep Nap

Match the nap to the goal — short restores alertness; long consolidates motor memory but demands a longer pre-curtain buffer.

20–30 min

POWER NAP

well-rested · tight pre-show

WHAT IT BOOSTS

- Alertness, mood, vigilance
- Counteracts the post-lunch dip
- Sleep spindles → motor memory
- Minimal inertia — safe close to curtain

≥30 min before curtain · cognitive SMD 0.69

60–90 min

DEEP NAP

sleep-debt · complex repertoire

WHAT IT BOOSTS

- Procedural memory — choreography, repertoire
- Complex motor sequences (music, dance)
- Emotional regulation, mood reset
- Touring / chronic sleep-debt recovery

≥60 min — SWS inertia hurts fine motor

WHEN 13:00–15:00 post-lunch dip · pair with 100–200 mg caffeine pre-nap to blunt inertia · avoid after 16:00

Sleep is a performance intervention, not an afterthought

Behavioral. Schedulable. Tied to the calendar.

1

Anchor wake time

Same wake. Every day.

2

Bank before demand

+60–90 min/night before tech & Showcase.

3

Use an off-ramp

60–90 min wind-down post-show.

4

Nap, then caffeinate

20–30 min nap. Caffeine only if needed.

One behavior · one timing rule · one recovery window — schedulable.

Production weeks need different sleep tactics at each phase

Build capacity early. Protect the narrow window. Recover intentionally.

PHASE 1 Rehearsal SLEEP BANKING • +1–2 hrs/night • Same wake daily • Banking now = buffer later	PHASE 2 Tech Week PROTECT SLEEP • Draw on bank • 20-min nap • Guard window	PHASE 3 The Run OPTIMIZE • 60–90 min wind-down • 20-min afternoon nap • No alcohol, no review	PHASE 4 Dark Days RE-BANK • Extend sleep • Within 2 hrs of wake • Recovery = training	PHASE 5 Post-Run FULL RESET • Wk 1: 9–10 hrs • Wks 2–3: stabilize • Bank for next run
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FOR CLINICIANS

Ask where they are in the cycle. Prescribe one behavior + timing + recovery window.

**Cycle varies by discipline –apply the same principles to your productions or season structure*

Manage sleep debt deliberately

When 7–9 hrs isn't possible: know the debt, reduce losses, recover when the calendar opens.

Sleep debt

Hours under need compound.

One weekend ≠ reset.

Adapted ≠ performing.

Sleep banking

+60–90 min/night before tech, finals, auditions.

Bank before the hard week.

Recovery

Sundays, dark weeks, breaks.

Within 2 hrs of anchor wake.

Quick rules

Day off AM → recovery
5–6pm → 20-min nap
Light wk → bank
Later AM → extend

Clinician coaching sequence

1. Normalize

"Perfect sleep may not happen. Let's reduce damage."

2. Quantify

Compare actual sleep to need. Flag the worst nights.

3. Schedule

Pick one banking + one recovery window before they leave.

Clinical conversation: screen, coach, escalate

SCREEN

Ask about frequency + impact

3+ nights/wk for 3+ weeks → take action.

COACH

One specific behavior change

Anchor wake. Morning light. Wind-down ritual.

SUBSTANCES

Sedating ≠ restorative

Alcohol suppresses REM. Cannabis: tolerance + withdrawal.

ESCALATE

CBT-I is first-line

CBT-I or digital support if insomnia persists.

30-SECOND SCRIPT

"Sleep is where today's rehearsal becomes tomorrow's performance. Let's pick the smallest schedule change that protects that this week."

TIMING GUARDRAILS

Caffeine: <400 mg/day. Stop 6 hrs pre-bed.
Naps: 10–20 min · 90 min cycle. End 4–6 hrs pre-bed.

CLINICAL AIM One behavior · one timing rule · one recovery window — schedulable.



Thank you!

Email: fongjs@upmc.edu