



*Science*  
of  
**RUNNING**

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Prezentacja egzaminacyjna z przedmiotu:  
Język angielski specjalistyczny  
3 Rok Fizjoterapia JMS  
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# Vocabulary

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- enhance - wzmacniać
- convenient - wygodny
- propel - napędzać
- gait cycle – cykl chodu/biegu
- stance phase – faza podporu
- swing phase – faza przenoszenia
- float phase – faza lotu (obie stopy w powietrzu)
- initial contact – pierwszy kontakt stopy z podłożem
- loading response – faza obciążania
- shock absorption – amortyzacja wstrząsów
- cadence – kadencja (liczba kroków na minutę)
- training load – obciążenie treningowe
- progressive loading – stopniowe zwiększanie obciążenia
- tendon stiffness – sztywność ścięgien
- neuromuscular readiness – gotowość nerwowo-mięśniowa
- foam rolling – rolowanie na wałku piankowym

# *Running*

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- Running is one of the most accessible and popular forms of physical activity worldwide.
- It improves cardiovascular fitness, mental health, body composition, and overall well-being.
- Proper running technique reduces stress on joints and enhances movement efficiency.
- Recreational runners have lower cardiovascular and metabolic disease risk compared to non-runners

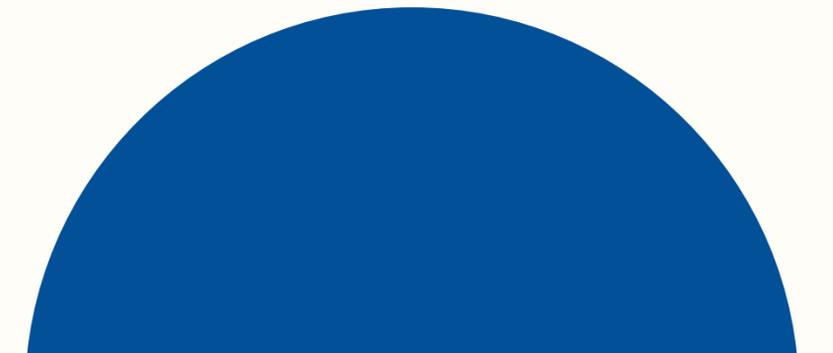




# *Why Running Is Worth Doing*

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- Strengthens heart, lungs, and major muscle groups.
- Boosts mood through endorphin release (“runner’s high”).
- Enhances bone density and joint lubrication progressively.
- Supports healthy body weight and metabolic rate.
- Regular running significantly improves VO<sub>2</sub> max and metabolic health.
- Convenient — no equipment required; easy to fit into daily routine.



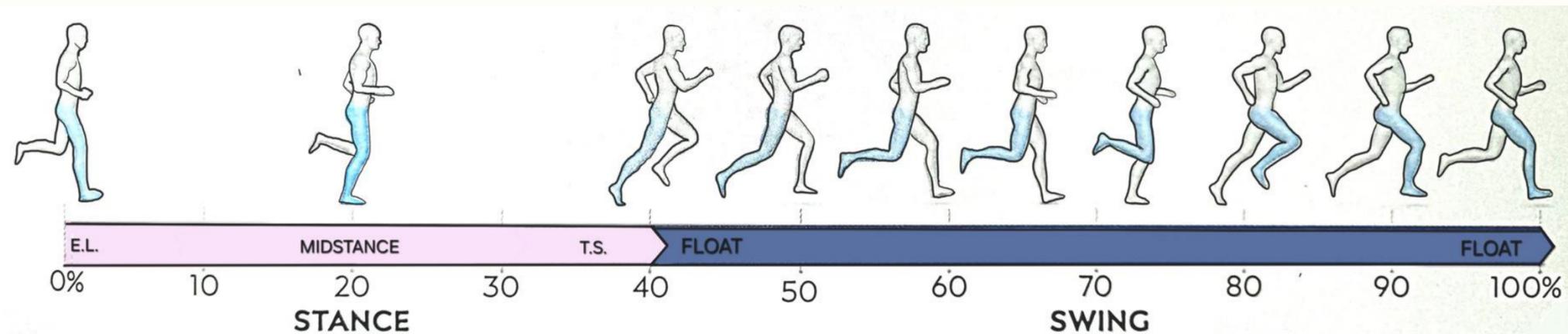
# *How We Run: Gait Cycle Phases*

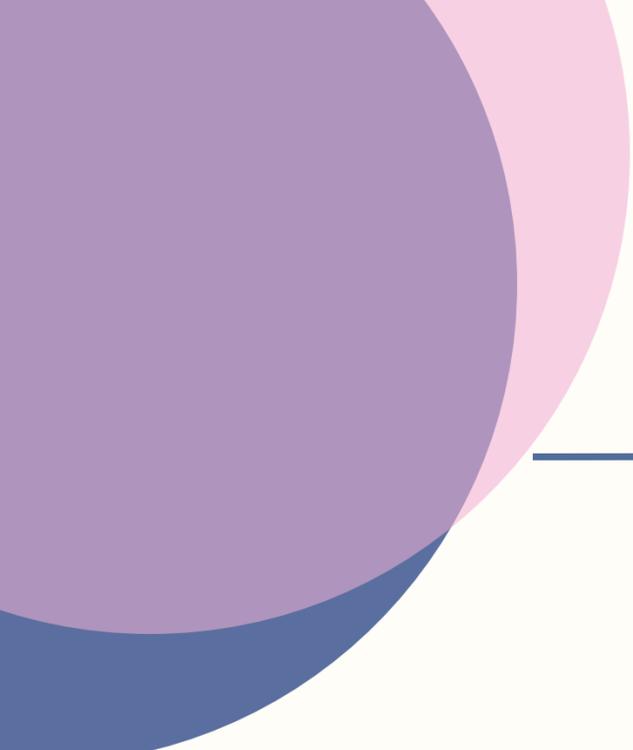
## ***I phase (stance)***

- **Early loading** - Initial Contact (rearfoot/midfoot/forefoot depending on style)
- **Midstance** — loading response, shock absorption
- **Terminal stance** — push-off phase, when the hip, knee and ankle are in maximal extension to propel the body forwards

## ***II phase***

- **Float** - One leg is in early swing, the other one is in late swing and both feet are off the ground
- **Swing Phase** — Hip flexes rapidly to swing the leg thorough until it returns to its starting position and prepare again for stance phase





# *Training Load & Footwear*

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## **Progressive Loading:**

- Increase weekly volume by maximum 10% per week
- Alternate hard and easy days
- Include rest days to allow tissue adaptation.
- Too fast progression = injury.

## **Footwear Rule:**

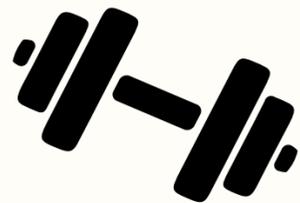
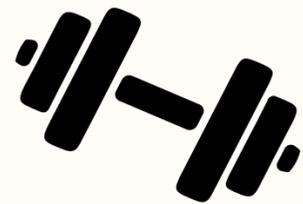
- Use two different shoe pairs and rotate them reduces injury risk by nearly 40%
- Choose footwear based on comfort

# *Strength Training*

- Improves force production
- Increases tendon stiffness for energy storage
- Reduces injury risk significantly
- Enhances performance by 2–8%

## **Example Exercises :**

- Squats
- Deadlifts
- Lunges
- Step-ups
- Romanian deadlifts
- Hip thrusts



# *Dynamic Warm-up Routine*

- Increase muscle temperature
- Improve range of motion
- Better neuromuscular readiness

## **Example Exercises :**

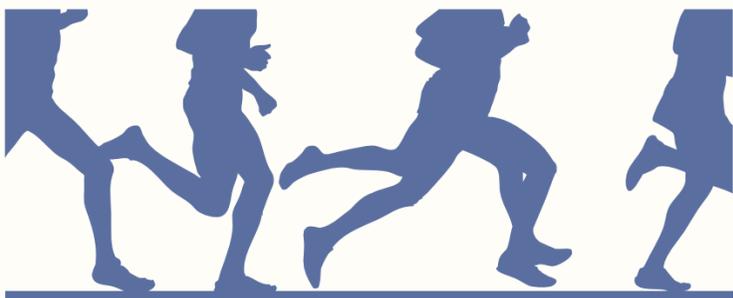
- Leg swings
- High knees
- Butt kicks
- Walking lunges with twist
- Ankle mobility drills
- Hip openers

5–10 minutes before each running session

# *Practical Training Tips*

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- Run with relaxed shoulders & upper body
- Keep cadence between 165–180 steps per minute
- Focus on shorter, quicker steps
- Add variety: intervals, tempo runs, long slow distance run
- Consistency is more important than intensity

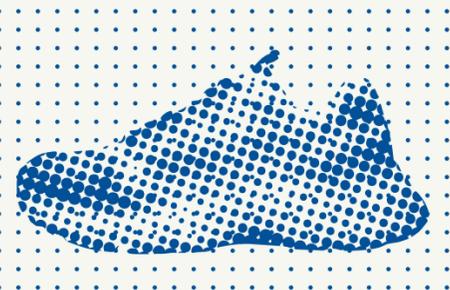


# *Motivation*

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- Set realistic goals
- Track progress
- Join running groups or find a partner
- Celebrate small achievements
- Remind yourself why you started

WELCOME  
TO THE CLUB



# *Recovery & Nutrition Fundamentals*

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## **Nutrition for Runners**

- Eat balanced meals: carbs + protein + healthy fats
- Carbohydrates = primary energy source
- Protein supports muscle repair
- Eat 1–3 hours before running

## **Recovery & Regeneration**

- Sleep 7–9 hours
- Light stretching after running
- Active recovery (walking, cycling)
- Massage or foam rolling
- Cold/heat therapy
- Rest days are essential for adaptation

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## **Hydration**

- Drink regularly throughout the day
- For long runs: add electrolytes
- Signs of dehydration: dizziness, cramps pain, dry mouth



# *Preventing Injuries: Key Strategies*

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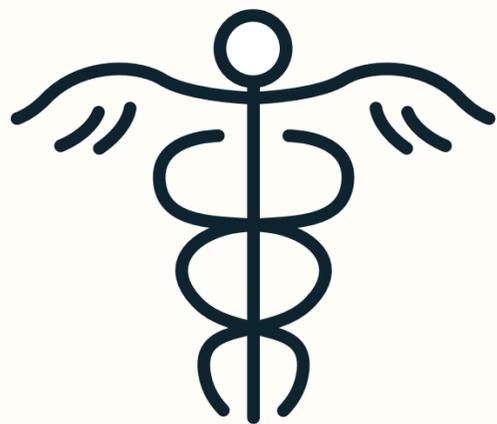
- Progressive load management is most critical
- Regular strength training and mobility work
- Technique adjustments and gait retraining
- Proper footwear selection based on comfort
- Early detection of faulty movement patterns



# *Physiotherapist's Role in Running*

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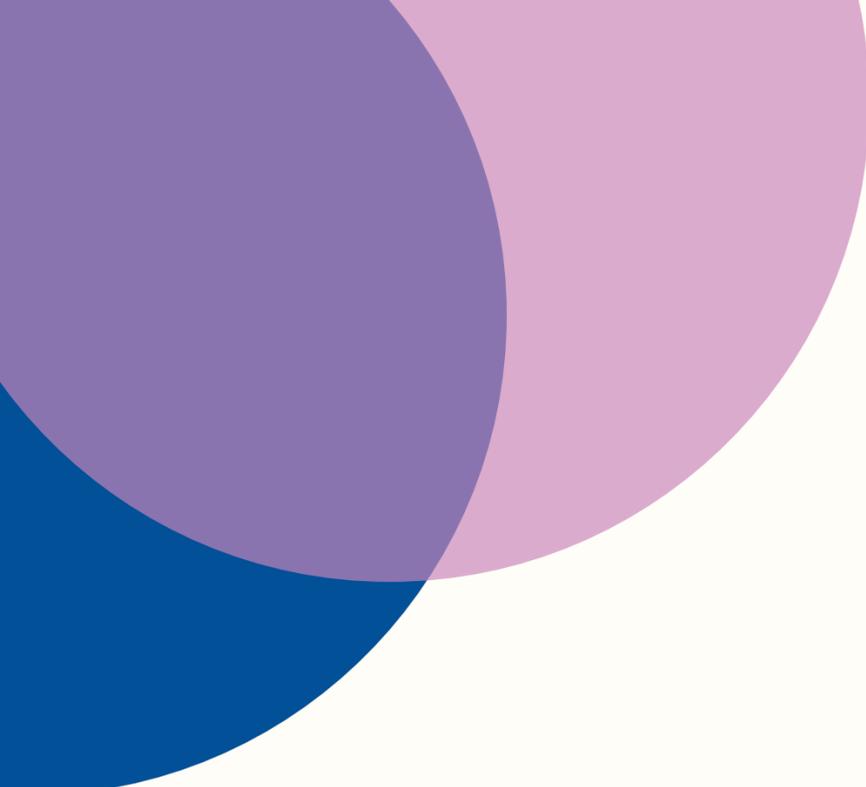
- Running technique assessment
- Footwear advice
- Gait retraining
- Strength programming
- Monitoring progress
- Injury prevention education



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Thank you for  
your attention!

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