

Infographic. International Olympic Committee (IOC) consensus statement and clinical decision-making guide on acute respiratory illness in athletes

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These infographics seek to summarise the International Olympic Committee (IOC) consensus statements on acute respiratory illness in athletes.^{1,2} Figure 1 provides a brief overview from the IOC consensus statement Part 1: acute respiratory infections,¹ and Part 2: non-infective acute respiratory illness.² Figure 2 provides the Sport & Exercise Medicine (SEM) clinician with an algorithm to guide clinical decision-making for athletes with an acute respiratory infection. The algorithm follows a four-step process, which examines infection severity, athlete health risk, activity risk and risk tolerance.¹ Figure 3 provides both postexercise checklists for athlete/support staff and clinician to guide return to sport decision-making.


IOC CONSENSUS STATEMENT ON ACUTE RESPIRATORY ILLNESS IN ATHLETES


Part I ACUTE RESPIRATORY INFECTIONS

- 1 How Common is it?** 

50% of acute illnesses at major sporting events involve the respiratory system
- 2 What are the Risk Factors?** 


Endurance/winter sports, travel, altitude, and vitamin D deficiency **increase the risk** of acute respiratory infections.
- 3 Epidemiology** 


Most acute respiratory infections are **mild to moderate**, **viral**, affect the **upper respiratory tract**, and lack systemic features
- 4 Diagnosis** 


Screen for acute respiratory infection using validated questionnaires and checklists. Special investigations (CRP, CXR) and pathogen identification are **not typically required** for mild-moderate infection.
- 5 Management and Return to Sport** 


Follow algorithm based on **illness severity**, **athlete health risk**, **activity risk** and **risk tolerance**. Assess return-to-sport through **standardized checklists** and **exercise challenge tests**.


Part II NON-INFECTIVE ACUTE RESPIRATORY ILLNESS

- 1 Classification** 

Non-infective acute respiratory illnesses are categorized as **upper vs. lower airway** and **inflammatory vs. non-inflammatory** etiologies
- 2 Upper Airway Inflammatory** 

Allergic rhinitis and **environmental irritants** (e.g. air pollution, chlorine in pools) are most common. The mainstay in treatment is **trigger avoidance +/- antihistamines/corticosteroids**.
- 3 Upper Airway Non-Inflammatory** 

Typically due to **mechanical obstruction**, which can be **extrinsic (nasal obstruction secondary to trauma)** or **intrinsic (anatomic factors in exercise-induced laryngeal obstruction)**.
- 4 Lower Airway Inflammatory** 

Exercise induced asthma may occur due to sensitization of the airway after repeated tachypnea during strenuous exercise. **Elite endurance, aquatic and winter athletes** are at greater risk.
- 5 Lower Airway Non-Inflammatory** 

Assess athletes with **unexplained breathlessness** and **dysfunctional breathing** for **excessive dynamic airway collapse** (>50% collapse of the airway lumen during the expiratory phase).

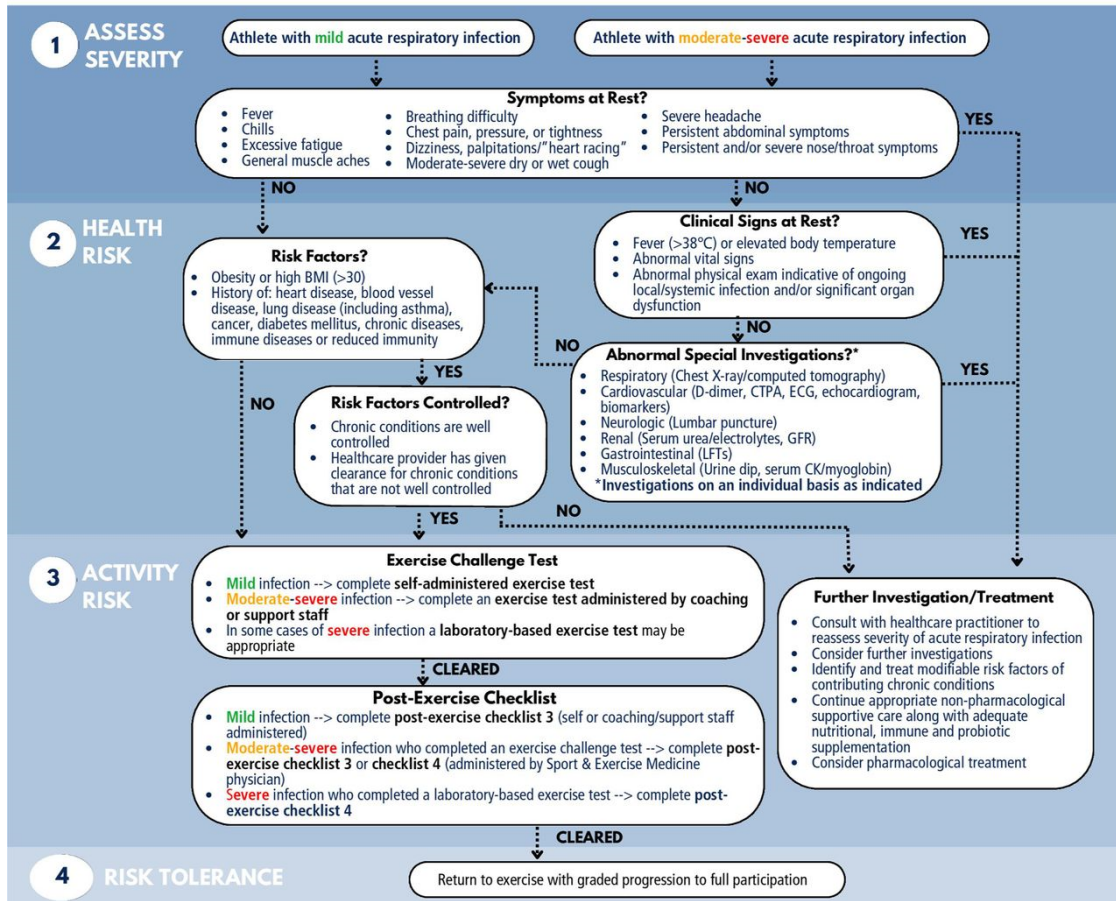
Abbreviations: CRP = C-reactive protein, CXR = chest Xray



Schwellnus et al 2022 (doi:10.1136/bjsports-2022-105759)
Schwellnus et al 2022 (doi:10.1136/bjsports-2022-105567)

ALGORITHM FOR RETURN TO SPORT FOLLOWING ACUTE RESPIRATORY INFECTION IN ATHLETES

FROM THE IOC CONSENSUS STATEMENT ON ACUTE RESPIRATORY ILLNESS IN ATHLETES



Abbreviations: BMI = body mass index, CTPA = computed tomography pulmonary angiogram, ECG = electrocardiogram, GFR = glomerular filtration rate, LFTs = liver function tests, CK = creatine kinase



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POST-EXERCISE CHECKLISTS #3 AND #4

FROM THE IOC CONSENSUS STATEMENT ON ACUTE RESPIRATORY ILLNESS IN ATHLETES

POST-EXERCISE CHECKLIST #3
Self-administered by Athlete or Administered by Coach/Support Staff

Question #1: Do you have any of the following symptoms during or immediately after an exercise session?

<ul style="list-style-type: none"> • Chest pain, discomfort or pressure • Excessive shortness of breath or breathlessness • Palpitations, racing heart, irregular heartbeat • Dizziness during exercise 	<ul style="list-style-type: none"> • Excessive fatigue or tiredness • Increased level of effort for similar past exercise load • Muscle/joint pain, very dark brown/red urine • Just 'not feeling well' during exercise
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Question #2: Do you have any of the symptoms (as outlined in Question #1) 24 hours after an exercise session?

POST-EXERCISE CHECKLIST #4
Completed by Sport and Exercise Medicine (SEM) Clinician

Question #1: Does the athlete have any of the following symptoms during or immediately after an exercise session?

<ul style="list-style-type: none"> • Chest pain, discomfort or pressure • Excessive shortness of breath or breathlessness • Palpitations, racing heart, irregular heartbeat • Dizziness during exercise 	<ul style="list-style-type: none"> • Excessive fatigue or tiredness • Increased level of effort for similar past exercise load • Muscle/joint pain, very dark brown/red urine • Just 'not feeling well' during exercise
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Question #2: Does the athlete have any of the following abnormal clinical signs or abnormal special investigations during or immediately after an exercise session?

<ul style="list-style-type: none"> • Abnormal heart rate, blood pressure, perceived exertion/breathlessness, heart rate recovery • Abnormal electrocardiogram 	<ul style="list-style-type: none"> • Excessive cough/wheeze/stridor/shortness of breath, abnormal pulmonary function tests (PFTs) • Abnormal additional clinical signs/special test(s)
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Question #3: Does the athlete have any symptoms (as outlined in Question #1) 24 hours after an exercise session?

Question #4: Does the athlete have any abnormal clinical signs or special investigations (as outlined in Question #2) 24 hours after an exercise session?

Athlete may increase the training load (intensity, duration and frequency) at next exercise session

Reassess severity of respiratory infection, SEM physician to determine further assessment and treatment

Abbreviations: SEM = sport and exercise medicine, PFT = pulmonary function tests



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The IOC consensus statements were developed as a response to the IOC Medical and Scientific Commission's call to action³ to establish best practices regarding the prevention, management and safe return to sport for athletes with acute respiratory illness. The consensus statement authors were comprised of a diverse group of SEM experts from various backgrounds including IOC research centre members, former National Olympic Committee medical staff, participants in the IOC World Conference on Prevention of Illness and Injury in Sport and involvement with IOC advanced team physician courses. These experts were divided into subgroups and tasked with reviewing the current literature while performing systematic and narrative reviews⁴⁻¹⁰ to fill in identified gaps. The finalised consensus statements were subdivided into two parts: acute respiratory infections¹ and non-infective respiratory illness.²

IOC consensus statement part 1 provides several novel recommendations for the management of acute respiratory infections in athletes. First, an exercise challenge test, self-administered by the athlete or administered by coaching staff, support staff or an SEM clinician should be completed prior to resuming moderate-high exercise training intensity. Second, athletes should undergo continual monitoring for signs and symptoms throughout the return to sport process, facilitated by the utilisation of pre-exercise and post-exercise checklists.¹ Meanwhile, IOC

consensus statement part 2 provides an in-depth overview of non-infectious respiratory aetiologies. A key finding in part 2 is the sparsity of literature on the impact of non-infective respiratory conditions like nasal obstruction, exercise-induced laryngeal obstruction and lower airway dysfunction on athlete health and performance.²

The recommendations included within these IOC consensus statements can be used by athletes, coaches, support staff, researchers and sport organisations as a practical approach to address infective and non-infective respiratory illness in athletes at all levels of sport.

Ethics statements

Patient consent for publication

Not applicable.

Ethics approval

Not applicable.

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Contributors

JST conceived of the idea. MRM created the original draft of the infographic and accompanying text. MS led the development of the IOC Consensus Statements. MRM, JST and MS reviewed and edited subsequent drafts and approved the final manuscript. JST is the guarantor.

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Competing interests

JST is an Editor of the BJSM.

References

1. Schwellnus M, Adami PE, Bougault V, et al. International olympic committee (IOC) consensus statement on acute respiratory illness in athletes part 1: acute respiratory infections. *Br J Sports Med* 2022;56:1066–88.
2. Schwellnus M, Adami PE, Bougault V, et al. International olympic committee (IOC) consensus statement on acute respiratory illness in athletes part 2: non- infective acute respiratory illness. *Br J Sports Med* 2022;56:1089–103.
3. Rogge J. An ounce of prevention? *Br J Sports Med* 2009;43:627.

4. Derman W, Badenhorst M, Eken MM, et al. Incidence of acute respiratory illnesses in athletes: a systematic review and meta-analysis by a subgroup of the IOC consensus on 'acute respiratory illness in the athlete.' *Br J Sports Med* 2022;56:630–8.
5. Snyders C, Pyne DB, Sewry N, et al. Acute respiratory illness and return to sport: a systematic review and meta-analysis by a subgroup of the IOC consensus on 'acute respiratory illness in the athlete.' *Br J Sports Med* 2022;56:223–31.
6. Derman W, Badenhorst M, Eken M, et al. Risk factors associated with acute respiratory illnesses in athletes: a systematic review by a subgroup of the IOC consensus on 'acute respiratory illness in the athlete.' *Br J Sports Med* 2022;56:639–50.
7. Kaulback K, Pyne DB, Hull JH, et al. The effects of acute respiratory illness on exercise and sports performance outcomes in athletes - A systematic review by a subgroup of the IOC consensus group on 'acute respiratory illness in the athlete.' *Eur J Sport Sci* 2023;23:1356–74.
8. McIntosh C, Clemm HH, Sewry N, et al. Diagnosis and management of nasal obstruction in the athlete. A narrative review by subgroup B of the IOC consensus group on 'acute respiratory illness in the athlete.' *J Sports Med Phys Fitness* 2021;61:1144–58.
9. Clemm HH, Olin JT, McIntosh C, et al. Exercise-induced laryngeal obstruction (EILO) in athletes: a narrative review by a subgroup of the IOC consensus on 'acute respiratory illness in the athlete.' *Br J Sports Med* 2022;56:622–9.
10. Price OJ, Sewry N, Schwellnus M, et al. Prevalence of lower airway dysfunction in athletes: a systematic review and meta-analysis by a subgroup of the IOC consensus group on 'acute respiratory illness in the athlete.' *Br J Sports Med* 2022;56:213–22