

**FIFA Medical  
Concussion Protocol**

**SUSPECT AND PROTECT**



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Head injuries can result in substantially different outcomes, ranging from no detectable effect to transient functional impairments or life-threatening structural lesions. In high-level international football tournaments, one head injury occurs every third match on average. This makes the immediate diagnosis of a head injury and determination of its severity, whether on or off the pitch, an essential skill for team physicians. Both elements can be challenging because clinical signs of a brain injury do not necessarily present immediately, but rather can develop over several minutes, hours or even days after the incident. Therefore, FIFA provides a standardised approach to support team physicians in their decision as to whether a player should be allowed to continue to play or should be removed from play after a head injury. If there is a SUSPICION of a concussive injury at any stage, you should remove the player from the match or training session and assess and treat them appropriately, as described in the following protocol.

### Definition and classification of concussion

Concussion is defined as a traumatic brain injury induced by biomechanical forces.

Several common features may be utilised in clinically defining the nature of a concussive head injury. These include the following:

- A sports-related concussion may be caused either by a direct blow to the head, face or neck or by a blow to another part of the body with an impulsive force transmitted to the head.
- A sports-related concussion typically results in the rapid onset of short-lived impairment of neurological function, which resolves spontaneously. However, in some cases, signs and symptoms evolve over a number of minutes to hours.
- A sports-related concussion may result in neuropathological changes, but the acute clinical signs and symptoms largely reflect a functional disturbance rather than a structural injury and, as such, no abnormality is seen in standard structural neuroimaging studies.
- A sports-related concussion results in a range of clinical signs and symptoms that may or may not involve loss of consciousness. The resolution of the clinical and cognitive features typically follows a sequential course. However, in some cases, symptoms may be prolonged.

For a diagnosis of concussion, the clinical signs and symptoms should not be explainable by drug, alcohol or medication use, other injuries (such as cervical injuries, peripheral vestibular dysfunction, etc.) or other comorbidities (e.g. psychological factors or coexisting medical conditions).

The evaluation after a head injury always includes an examination of associated structures, i.e. the neck and labyrinth, since symptoms alone cannot distinguish physiologic concussion from cervical/vestibular injury.

### Management of concussion

There are several actions that can be performed prior to a concussion that will improve the management of a concussed player, such as baseline examinations and the implementation of a structured plan for post-concussion management.

## Baseline examination

A baseline examination refers to a concussion assessment performed at a time when a player has not recently had a concussion incident (e.g. pre-season). The baseline examination provides valuable information for both the diagnosis and management of head injuries. Results from the baseline examination can be helpful to compare signs and symptoms following a potential concussion incident and assess the level of impairment in comparison to what is normal for the individual player. They can also be instrumental in the decision-making process with respect to the return to football. The baseline testing results are not useful for the removal-from-play decision.

FIFA recommends using the newest version of the Sport Concussion Assessment Tool (SCAT, currently version 5) for baseline examinations. The SCAT is the most widely used sideline assessment tool internationally and provides a battery of tests to assess several aspects of brain function that are typically impaired in concussion. It measures consciousness, orientation, neurocognitive function, self-reported symptoms and postural stability. It further includes a section for acute concussion evaluation, taking note of observable signs of concussion, including red flags, the Glasgow Coma Scale and cervical spine function, and a neurological screening examination. The SCAT should take a minimum of ten minutes to complete. It has a sensitivity of 0.83-0.96 and a specificity of 0.81-0.91.

## Diagnosis and management in first 72 hours after head injury

An eight-phase, systematic approach is recommended in the first 72 hours after a head injury in high-level football, starting with the initial examination and continuing with diagnosis and management:

- Phase 1: Observation and recognition
- Phase 2: Initial (on-pitch) examination
- Phases 3-4: Off-pitch/quiet-area examination
- Phases 5-7: Post-match examinations and observation
- Phase 8: Graduated Return-to-Football Programme

Notably, this procedure is the sole responsibility of the team physician.

The purpose of the on-pitch assessment is to identify clinical signs, symptoms or mechanisms that require removal from play for a more detailed examination. If there are signs or symptoms of damage to the brain, or a concussive injury is suspected despite the absence of signs or symptoms, the doctor/therapist should remove the player from the pitch for a more detailed examination (using a concussion substitute if available/required). Due to the potential severe neurological consequences of a head injury, any suspicion of abnormal findings should result in the initiation of an appropriate examination and removal from the match or training session (if any orange flags are identified as per Table 4 ). Remember that orange flag signs can always turn into red flags requiring emergency management. Only if players have no suspected signs or symptoms of concussion or any other significant injury (i.e. only if no orange flags are identified) should they be allowed to continue to play or train.

The post-match examinations serve to establish a diagnosis so as to accurately initiate therapeutic strategies and enable a safe return to football. The physician should be aware that an emergency situation can arise at any time in the hours and days immediately after the head injury; therefore,

repeated comprehensive examinations are required. Ideally, the team physician should know each individual player, including their characteristics, medical history and baseline test results (if such tests have been performed), and should be able to communicate with all players appropriately.

### Observation and recognition (Phase 1)

Team physicians should observe the match (or training) with a focus on potential head injuries, which often happen during aerial duels, and specifically the immediate red and orange flags, such as (suspected) loss of consciousness, convulsion or abnormal posturing, slowness or imbalance. The injury mechanism and player behaviour are best recognised using direct observation – supported, if possible, by immediate video review. There are specific signs following a head injury that should increase the suspicion of concussion (Table 1). If there is access to video review, there are relevant recommendations that can assist with the approach (Table 2).

Table 1. Observable signs of concussion (adapted from Davis GA, Makdissi M, Bloomfield P, et al. 2019)

<b>Lying motionless</b>	<p>Lying without purposeful movement on the playing surface for &gt;2 seconds.* The player does not appear to move or react purposefully, respond or reply appropriately to the game situation (including team-mates, opponents, match officials or medical staff). Concern may be shown by other players or match officials.</p> <p>(* &gt;2 seconds is the threshold for removal and assessment of the player. Significantly longer periods of lying motionless may necessitate immediate and permanent removal from play, depending on the circumstances.)</p>
<b>Motor incoordination</b>	<p>The player appears unsteady on their feet (including losing balance, staggering/stumbling, struggling to get up or falling) or in the upper limbs (including fumbling). May occur when the athlete is rising from the playing surface or in the motion of walking/running .</p>
<b>Impact seizure</b>	<p>Involuntary clonic movements that comprise periods of asymmetric and irregular rhythmic jerking of axial or limb muscles.</p>
<b>Tonic posturing</b>	<p>Involuntary, sustained contraction of one or more limbs (typically upper limbs), so that the limb is held stiff despite the influence of gravity or the position of the player. Other muscles, such as the cervical, axial and lower-limb muscles, may also be involved. Tonic posturing may be observed while the player is on the playing surface or in the motion of falling, where the player may also demonstrate no protective action.*</p> <p>(*This was previously known as “no protective action – stiff”.)</p>
<b>No protective action – floppy</b>	<p>The player falls to the playing surface in an unprotected manner (i.e. without stretching out their hands or arms to lessen or minimise the fall) after direct or indirect contact to the head. The player demonstrates loss of motor tone (which may be observed in the limbs and/or neck*) before landing on the playing surface.</p> <p>(*When the player’s arms are being held by a tackling opponent, this may only be observed in the neck, which was previously known as “cervical hypotonia”.)</p>
<b>Blank/vacant look</b>	<p>The player exhibits no facial expression or apparent emotion in response to the environment.*</p> <p>(*This may include a lack of focus/attention of vision. A blank/vacant look is best appreciated in reference to the athlete’s normal or expected facial expression.)</p>

Table 2. Six key video-review steps for the team clinician (adapted from Patricios JS, Ardern CL, Hislop MD, et al. 2018)

<b>1</b>	<b>Look for the suspected head impact event</b>	
<b>2</b>	<b>Look for the immediate response of the injured player (0-2 seconds)</b>	Does the player fall to the ground? If the player falls, is there loss of head and neck control? Does the player protect themselves when falling? If the player remains upright, are they steady on their feet?
<b>3</b>	<b>Look for the subsequent response (2-5seconds)</b>	If the player falls, do they move spontaneously? Is there evidence of purposeful voluntary movement (i.e. placing the ball or completing a tackle)? Is there evidence of a concussive convulsion or tonic posturing? How does the player respond to the attending medical staff (this phase may extend for substantially longer than 5 seconds, particularly if in-line cervical immobilisation is required)? If the player remains standing, the distinction between the subsequent and late responses may be unclear.
<b>4</b>	<b>Watch for the player's late response when returning to their feet (if the athlete has fallen)</b>	Is the player unsteady when attempting to get to their feet and return to sport? Does the player need help from others to stand up? Are the player's movements fluid and coordinated? Does the player fall to the ground?
<b>5</b>	<b>Watch the player's behaviour on returning to sport</b>	Are their actions appropriate or not? Do they move immediately to the correct position on the pitch?
<b>6</b>	<b>Observe the responses of other players and match officials</b>	

### Emergency management and red flags for referral to hospital

Prior to the initial examination, it is important to consider the differential diagnoses of a deteriorating or collapsed player. Potentially life-threatening emergency concerns after an acute head injury include signs or symptoms of cardiopulmonary arrest or of severe structural injuries to the brain, skull, face, cervical spine or spinal cord, which have been denoted as "red flags". The emergency assessment and management after any acute head injury should be performed according to clear principles and standardised practice, as per the FIFA Emergency Medicine Manual.

Any head injury should be regarded as having a concomitant cervical spine injury until this has been excluded by clinical examination, or by imaging if indicated (Table 3). Any suspicion of a cervical fracture or intraspinal lesion (e.g. as prompted by a Glasgow Coma Scale score <15 on initial assessment, neck pain or tenderness, focal neurological deficit, paraesthesia or weakness in the extremities, or any other clinical suspicion of cervical spine injury) should result in immobilisation and stabilisation of the cervical spine, appropriate removal from the pitch and emergency transport to a hospital.

Any suspicion of a skull fracture should result in immediate removal from play. In addition to local ocular tenderness to palpation, other significant signs and symptoms of an orbital floor fracture are periorbital haematoma, double vision (diplopia) and abnormalities in eye movements. Any deterioration of signs and symptoms can indicate intracranial bleeding and/or swelling, which

can only be diagnosed by tomographic imaging (e.g. computerised tomography) of the brain. Therefore, it is also important to continuously observe players even if they are initially symptom-free.

Table 3: Emergency management principles (from FIFA Emergency Medicine Manual)

Domain	Concern (C), Examination (E)	Actions	Consequence
Cardiopulmonary	C: Cardiopulmonary arrest E: Unresponsiveness, not breathing normally	<ul style="list-style-type: none"> <li>- Start cardiopulmonary resuscitation (CPR) chain: emphasis on chest compression and rapid defibrillation.</li> <li>- Place the automated external defibrillator (AED) but shock the player only if the AED device self-charges and verbally recommends pressing the shock button.</li> <li>- Place the player onto a spinal stabilisation device (e.g. spinal board) and strap appropriately.</li> </ul>	<p>Remove the player from the pitch and continue emergency management if indicated.</p> <p>Consider immediate emergency transport to hospital.</p> 
Brain	C: Intracranial lesion E: Glasgow Coma Scale score <13/15, loss of consciousness, severe headache, repetitive vomiting, seizure/convulsion, abnormal posturing, new difference in pupil size, nystagmus, fall due to imbalance	<ul style="list-style-type: none"> <li>- Neutralise and stabilise the cervical spine appropriately.</li> <li>- Maintain and protect the airway as safely as possible.</li> <li>- Ventilate the unconscious patient if necessary.</li> <li>- Place the player onto a spinal stabilisation device (e.g. spinal board) and strap appropriately.</li> </ul>	
Skull and face	C: Fracture E: Severe headache, blood or clear fluid exiting from the ear(s) or nose, deformity, periorbital or retroauricular haematoma	<ul style="list-style-type: none"> <li>- Neutralise and stabilise the cervical spine appropriately.</li> <li>- Control any external bleeding.</li> <li>- Place the player onto a spinal stabilisation device (e.g. spinal board) and strap appropriately.</li> </ul>	
Cervical spine and neck	C: Fracture or intraspinal lesion E: Deformity, severe pain, swelling over the neck, paresis, impaired sensation	<ul style="list-style-type: none"> <li>- Neutralise and stabilise the cervical spine appropriately.</li> <li>- Place the player onto a spinal stabilisation device (e.g. spinal board) and strap appropriately.</li> </ul>	

### Initial (on-pitch) examination of head injuries (Phase 2)

The outcome of the initial (on-pitch) examination is the basis for the team physician's decision on emergency management, referral to hospital, removal from play and/or off-pitch assessment in a quiet area. The physician's decision should be communicated to the referee and the coach.

The recommended elements of the initial inspection and examination are based on the latest version of the Sport Concussion Assessment Tool (currently SCAT5) and the National Institute of Health and Care Excellence (NICE) criteria (Table 4). During this initial examination, it is essential to focus on red and orange flags.

The inspection concentrates on visible signs (e.g. loss of consciousness, vomiting, mechanism of injury), while the examination assesses core signs and symptoms of neurological impairment of different brain areas (cortical, subcortical, cerebellar, brain stem) and of a cervical spine or intraspinal injury. Any period of loss of consciousness or a Glasgow Coma Score <15 indicates a brain injury. At any stage during this initial examination, the medical personnel attending to the injured player can utilise information/assistance from other available resources, such as video-replay technology or eyewitness accounts. The procedures for all of these, as well as the relevant lines of communication, should be agreed pre-match/training and documented in the FIFA Emergency Action Plan.

In non-emergency situations, the injured player should be removed to the off-pitch location for further assessment in either of the following scenarios:

The outcome in one or more aspects of the initial assessment is considered or suspected to be abnormal and additional time for examination is required.

All tests yield normal results, but the team physician suspects that the player is suffering from functional neurological impairment.

If there is no evidence of red or orange flags and the team physician's on-pitch assessment is not concerning, with the inspection and examination being normal, the team physician should continue to observe the player throughout the match and re-evaluate them serially to watch for the delayed onset of signs or symptoms (Phase 5). All players who have suffered a head injury should be observed for the first 24 hours thereafter (Phase 6).

Table 4: Initial (on-pitch) examination of a head injury

Inspection	1	<b>Acute signs</b>		
		Short-term loss of consciousness	No	Yes
		Deformity or swelling of the head or neck or holding of the head due to pain/for stabilisation	No	Yes
		Blood or clear fluid exiting from the ear(s) or nose	No	Yes
		Blank look	No	Yes
		Slowness in getting up	No	Yes
		Vomiting	No	Yes
		Uncharacteristic behaviour	No	Yes
Examination	2	<b>Glasgow Coma Scale: 15 points</b>		
		Eye opening: spontaneous (4 points)	Yes	No
		Verbal: oriented (name, place, date) (5 points)	Yes	No
		Motor: obeys commands (6 points)	Yes	No
	3	<b>Selected new acute symptoms</b>		
		Headache or pressure in the head	No	Yes
		Neck pain	No	Yes
		Nausea	No	Yes
		Vertigo, dizziness, drowsiness, unsteadiness	No	Yes
		Blurred or double vision, sensitivity to light	No	Yes
		Tinnitus, hypacusis, hyperacusis	No	Yes
		Impaired sensation in the upper or lower extremities	No	Yes
	4	<b>Orientation and memory (Maddocks questions)</b>		
		What venue are we at today?	Correct	Incorrect
		Which half of the match is it now?	Correct	Incorrect
		Who (which team) scored last in this match?	Correct	Incorrect
		Which team did your team play last week/match?	Correct	Incorrect
		Did your team win the last match?	Correct	Incorrect
	5	<b>Delayed, slow or inappropriate responses</b>	No	Yes
	6	<b>New difference in pupil size, crossed eyes, spontaneous nystagmus</b>	No	Yes
7	<b>Range of motion of the cervical spine, only if no acute neck pain</b>			
	Active rotation to the left and right from a neutral position	Normal and painless	Impaired or painful	
	Active flexion and extension from a neutral position	Normal and painless	Impaired or painful	
8	<b>Strength of the upper and lower extremities</b>	Normal	Impaired	
9	<b>Touch sensation of the upper and lower extremities</b>	Normal	Impaired	
10	<b>Balance, control and coordination of posture and the limbs</b>			
	Stand on both legs with heel and toe together (eyes closed, 10 seconds; if failed, maximum 1 repetition)	Stable/no sway	Failed	
	Finger-to-nose task (right and left) (eyes closed, 2 repetitions, both sides)	All trials correct	Failed	

 If no signs or symptoms -> player allowed to return to match play or training; further observation until leaving the sports facilities

 Orange flags can turn into red flags.

If any orange flag or if the physician is in doubt -> removal from football and further examination

If any red flag -> emergency management

### Off-pitch examination (Phase 3)

The off-pitch examination should focus on red and orange flags (Table 5). Testing of ocular motor function should be included, since many of the pathways in the brain potentially affected by head injuries are involved in ocular motor control. Obvious minor injuries, such as lacerations or bruises, might be treated.

Table 5: Selected signs and symptoms indicating red and orange flags after a head injury

Domain	Red flags	Orange flags
Alertness/attention	Glasgow Coma Scale score <13/15	Signs: Glasgow Coma Scale score 13/15 or 14/15, blank look, confusion, disorientation, delayed, slow or inappropriate response, difficulty concentrating or remembering Symptoms: Feeling slowed down, "don't feel right", drowsiness, fatigue, "low energy"
Neuromotor	Seizure/convulsion or postictal signs, abnormal posturing	Signs: Impaired control of trunk or limb movements
Headache	Severe headache, repetitive vomiting	Signs: Nausea or vomiting (once), holding of the head Symptoms: Pressure, headache
Dizziness/balance	Fall due to imbalance	Signs: Imbalance Symptoms: Vertigo, dizziness, fogginess, unsteadiness
Vision/ocular motor function	Crossed eyes, nystagmus, other acute disordered eye movements, new difference in pupil size	Symptoms: Blurred vision, "eyes cannot follow", sensitivity to light
Emotion/behaviour		Signs: Emotional instability, irritability or aggression with little or no provocation
Hearing	Acute hearing loss	Symptoms: Hyperacusis, hypacusis, tinnitus
Cervical spine/spinal cord	Pain, tenderness, swelling, deformity, paresis, impaired sensation in the upper or lower extremities	Signs: Impaired hearing, tinnitus, sensitivity to noise Symptoms: Neck pain
Skull/face	Blood or clear fluid exiting from the ear(s) or nose, deformity, periorbital or retroauricular haematoma	Signs: Contusion, laceration
Personal history	Anticoagulation, clotting disorder	Previous brain injury

Note: some signs and symptoms can be attributed to different domains. Orange flags can turn into red flags.

**RED FLAGS:** Potential life-threatening problems or hints of intra- or extracerebral lesion  
-> if any: emergency management and consider immediate transport to hospital

**ORANGE FLAGS:** Neurological or orthopaedic impairment  
-> if any or the physician is in doubt: removal from football and further examination, with a specialist to be consulted if required

#### Quiet-area examination and treatment (Phase 4)

If any (suspected) orange flags are identified during the initial on- or off-pitch examination, the player should be examined in the medical room using the latest version of the Sport Concussion Assessment Tool (SCAT5) and a detailed neurological examination.

The neurological examination should include an examination of cranial nerves, vestibular, balance and coordinative functions (spontaneous nystagmus, head impulse test, vertical eye deviation, dynamic visual acuity, balance (Romberg), positioning manoeuvres), the cervical spine (range of motion, stability, proprioception, strength, muscle tone), the motor function of the upper/lower extremities, and standardised neurocognitive tests. Based on the outcome of the neurological examination, the team physician may decide on further examinations, as recommended by NICE for head injuries and by the European Federation of Neurological Societies' guidelines for mild traumatic brain injuries, as well as other validated guidelines.

Players who continued playing or returned to the match in which they incurred the head injury, and who have no further signs or symptoms after Phase 2 (or 3), can be allowed to participate as usual in the next training session and match.

Players who are removed from a match or training session and have signs or symptoms of a traumatic brain injury or of another significant head injury at any time should complete the Graduated Return-to-Football Programme (Phase 8) once their symptoms have resolved.

#### Observation and serial re-examination until departure (Phase 5)

The team physician should observe the player until the end of the match for worsening or additional signs or symptoms, regardless of whether the player has returned to or been removed from match play. Medications that may mask or worsen symptoms should be avoided unless a more severe head injury has been ruled out. Any worsening or newly developed signs or symptoms should result in emergency management in the case of red flags or further examinations in the case of orange flags.

Prior to leaving the sports facilities, all injured players should be re-examined for worsening or new signs and symptoms using the latest version of the Sport Concussion Assessment Tool. Before travel without access to emergency care (e.g. flights), any worsening symptoms regarding any form of brain, skull or cervical spine injury should be checked, and any concerns allayed, using appropriate diagnostic imaging.

An initial computerised tomography scan is recommended on the day of the injury if any of the following are present:

- Glasgow Coma Scale score <13 (or <15 after 2 hours)
- Suspected skull fracture
- More than one episode of vomiting
- Post-injury seizure
- Loss of consciousness
- Persistent anterograde amnesia
- Focal neurological deficit

### Observation for 24 hours after head injury (Phase 6)

In general, all players who have suffered a head injury should be observed for 24 hours either by the team physician or by a responsible adult instructed to immediately contact the team physician or the emergency department of the closest hospital in the event of worsening or new symptoms (red or orange flags). Until re-evaluation (Phase 7), physical and cognitive rest is recommended, which includes avoiding the use of electronic devices.

If a player was allowed to return to play on the day of the injury and is free of symptoms, and the neurological examination does not show anything abnormal, the team physician may decide that the observation is not necessary. In any case, the injured player should be informed and instructed to report worsening or new symptoms, and the team physician should contact the player the following morning with respect to symptom development and further steps. Brain injury advice cards should be issued if appropriate – an example is shown below.

#### CONCUSSION INJURY ADVICE

(To be given to the person monitoring the concussed athlete)

This patient has received an injury to the head. A careful medical examination has been carried out and no sign of any serious complications has been found. The recovery time is variable across individuals and the patient will need monitoring for a further period by a responsible adult. The treating physician will provide guidance as to this time frame.

If you notice, or the patient notices, any change in the patient's behaviour, vomiting, worsening headache, double vision or excessive drowsiness, please telephone the patient's doctor or the nearest hospital emergency department immediately.

Other important points for the athlete to bear in mind:

Initial rest: limit physical activity to routine daily activities (avoid exercise, training, sport) and limit activities such as school, work and screen time to a level that does not worsen symptoms.

- 1) Avoid alcohol.
- 2) Avoid prescription or non-prescription medications without medical supervision. Specifically:
  - a) Avoid sleeping tablets.
  - b) Do not use aspirin, anti-inflammatory medications or stronger pain medications such as narcotics.
- 3) Do not drive until cleared by a healthcare professional.
- 4) Any return to play/sport requires clearance from a healthcare professional.

Clinic phone number: \_\_\_\_\_

Patient's name: \_\_\_\_\_

Date/time of injury: \_\_\_\_\_

Date/time of medical review: \_\_\_\_\_

Healthcare provider: \_\_\_\_\_

Adapted from Concussion in Sport Group 2017

Contact details or stamp

### Re-evaluation between 18 and 72 hours after head injury (Phase 7)

Players who were removed from football, or who continued to play and developed specific signs or symptoms at any time after the head injury, should be re-evaluated within 72 hours by a physician who is experienced in head injury assessment.

The time frame of up to 72 hours has been chosen because symptoms can develop with latency and a brief initial period of cognitive and physical rest after a brain injury is currently recommended. The team physician should assess the injured player daily during this period if the number or intensity of the signs and symptoms do not improve or even worsen.

In addition to the examination of cranial nerves, the cervical spine, the motor function of the upper/lower extremities, balance, vestibular and ocular motor functions, vision, coordination, emotions and neuropsychological tests, a detailed medical history (e.g. previous head injuries, pre-existing headache or sleep problems) – and, if indicated, neurocognitive tests – should be included. These examinations provide valuable hints, in conjunction with the baseline tests, that can assist with different head injury diagnoses.

The aim of the examinations in Phase 7 is to decide on the next step:

In the event of no, minimal or improving symptoms and a normal outcome in all examinations in Phase 7, the player can be medically cleared to start the Graduated Return-to-Football Programme (Phase 8).

In the event of persistent orange flags, the player should be referred to a medical specialist for further examination and treatment.

### Graduated Return-to-Football Programme (Phase 8)

The Graduated Return-to-Football Programme (Table 6) is based on the protocol drawn up by the Concussion in Sport Group and intended to ensure a controlled, stepwise return to sports activities for high-level adult football players after concussion/traumatic brain injuries. For players with structural damage (such as intracranial haemorrhage or a skull fracture), the return-to-football procedure should be determined on an individual basis by the physician in charge.

The player should be re-examined by the physician in charge before starting symptom-limited activity (Stage 1), ideally within 18-72 hours after the head injury (Phase 7), and before returning to “routine/contact training” (Stage 5). The medical re-evaluations should focus on:

Abnormal diagnostic findings on the day of the injury

Persistent or additional signs or symptoms or changes in their character, intensity or frequency

Symptom development under an increasing physical and cognitive training load

Current guidelines and position statements agree that a player with a (suspected) concussion should not return to sport on the same day. An initial phase of cognitive and physical rest (24 to 48 hours) is recommended before the graduated return to training and match play. After this initial period of rest, low-level exercise that does not heighten the pre-exercise intensity of symptoms or lead to new symptoms has been identified as beneficial. Allowing a player to participate in low-level exertion without an exacerbation of symptoms and without the risk of contact or a fall may also minimise the player’s likelihood of emotional dysregulation as a

psychological response to the injury. The period required until a return to match play varies and might be influenced by the player's age or history. A multidisciplinary-team approach is recommended, especially with respect to the return to routine/contact training.

The Graduated Return-to-Football Programme comprises six stages with a progressive increase in physical demands ("aerobic" to "anaerobic", "no resistance" to "resistance"), football-specific exercises ("simple" to "complex"), and the risk of contact ("individualised" to "team training", "non-contact" to "full contact") and head impact ("no heading" to "heading"). Each stage should include at least one training session and last a minimum of 24 hours. In the event of worsening or recurring symptoms during or after a training session at any stage, the player should rest until these symptoms have resolved (for a minimum of 24 hours) and then continue the programme at the previous symptom-free stage. The player should only be medically cleared to return to match play when each stage has been completed without symptoms. With younger players and players with certain risk factors, such as a history of repetitive concussive injuries, a more conservative approach must be followed.

The Accelerated Return-to-Football Programme should only be initiated if (a) any acute post-injury symptoms and signs were classified as not specific to concussion, (b) these unspecific symptoms and signs lasted for under 24 hours, and (c) the results of the re-evaluation were normal (or similar to the pre-injury baseline, if baseline tests were performed). A player is not eligible for an accelerated return to football in the event of persistent orange flags or one or more red flags at any time after the head injury. The accelerated approach focuses on stages 2 and 5 and requires close cooperation between the player, the coach, the team physician (who should be experienced in concussion management) and FIFA Medical.

Medical clearance for a return to football should always be given by the treating physician and be based on medical considerations only, regardless of a player's desire to play, the dissimulation of symptoms and/or pressure from others including the coaching staff, parents or the media.

Table 6: Graduated Return-to-Football Programme for high-level players

STAGE	FOCUS	ACTIVITY
1	Symptom-limited activity	Daily activities without exaggeration of symptom threshold (worsening of pre-activity symptoms or additional symptoms), e.g. 10 minutes of slow walking
2	Light aerobic exercises (unspecific)	a) Cardiovascular exercise on stationary bike; 25-40 minutes including warm-up and cool-down; controlled activities, low-to-moderate intensity b) Mobility/stretching, stabilisation and balance (double- and single-stance) exercises
3	Football-specific exercises	a) Cardiovascular training on the pitch - Warm-up for 10 minutes at moderate intensity with variable running tasks - Interval runs at higher intensities with sufficient breaks - Cool-down for 5-10 minutes at low intensity b) Technical training with the ball (1:1) - Basics: balance and passing; short/long passing; easy shooting at targets c) Body training (no resistance/add elastic resistance) - Mobility and stretching exercises - Trunk strength/stabilisation exercises (no resistance; no explosive movements) - Basic lower-/upper-extremity strength exercises (elastic resistance) - Balance exercises (double- and single-stance) on unstable surfaces No heavy-resistance training, no contact activities For goalkeepers: controlled diving movements (not explosive) on a foam surface in the gym (without catching the ball)
4.1	Non-contact football training drills	a) Cardiovascular training on the pitch - Warm-up for 10 minutes at moderate intensity with straight running, changes of direction, lateral shuffles, forward-backward running, zigzag running - Interval runs at high intensity up to 90% HR max - Cool-down for 5-10 minutes at low intensity b) Technical training (with a small group of players) - Small-sized game - Short/long passing - Shooting at goal/targets - Plant and cut, dribbling with the ball - Basics: easy heading with only a soft ball (increase in complexity: while balancing), controlled setting and limited quantity c) Body training (including elastic resistance) - Mobility and stretching exercises - Trunk strength/stabilisation exercises (including free weights) - Basic lower-/upper-extremity strength exercises (elastic resistance, free weights) - Balance exercises (double- and single-stance) on unstable surfaces d) Strength training - Keep resistance below about 80% 1-RM, no Olympic weightlifting or exercises with the head below the level of the hips - Progressively increase external resistance for multi-joint exercises No contact activities For goalkeepers: diving drills on a foam surface, some without catching the ball and others with catches (shots from short/medium range; 1:1 with the goalkeeping coach)
4.2	Football training drills with controlled contact	Controlled contact activities: simulate controlled contact situations (e.g. headers, checks, tackles) - Stepwise increase in intensity - From playing with 1 partner (e.g. rehabilitation coach) to training in small groups of players - Increase from a small playing area (1/3, 1/4) to the whole pitch - Heading with a regular ball in controlled settings (e.g. after throwing the ball; heading without opposition); gradual increase in the number of headers For goalkeepers: controlled diving drills on grass, some without catching the ball and others with catches (shots from short/medium/long range; 1:1 with the goalkeeping coach)
5	Full-contact practice (team training)	Following medical clearance, which should ideally be issued by a multidisciplinary team, participation in normal team training a) Cardiovascular training: continue to progress b) Body and strength training: resume usual routine training (unrestricted) c) Assess and ensure psychological readiness
6	Return to competitive football	Normal match play

Note: only move to the next stage when activities are tolerated without any worsening of pre-activity symptoms or the emergence of additional symptoms. Abbreviations: HR max = maximum heart rate; 1-RM = one-repetition maximum.

## Summary

Head injuries can result in different outcomes, and signs and symptoms can develop or change rapidly within the minutes, hours and days after a head injury. Concussion can manifest itself 72 hours after the initial injury. Therefore, a systematic procedure for the examination and management of football players after head injuries should be implemented to support team physicians in their decision as to whether a player should be allowed to continue to play or should be removed. Awareness of the potential severity of head injuries should be raised across sports and medical professionals.

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