

Returning to usual activities after an concussion/mTBI can be challenging because of physical, cognitive and emotional impairments¹; however, current evidence indicates graded resumption of regular pre-injury activities as tolerated (i.e., in a manner that does not result in a significant or prolonged exacerbation of symptoms), within the first few days to weeks post-injury should be encouraged because, regardless of symptomatic status, activity is more likely to speed up rather than delay recovery.² A prospective, multicenter cohort study demonstrated for school-aged children physical activity within 7 days of acute injury compared with no physical activity was associated with reduced risk of persistent post-concussive symptoms.³ For workers, the literature demonstrates brain injury patients who are employed report better health status, improved sense of well-being, greater social integration within the community, less usage of health services and a better quality of life than do those who are not employed.⁴ In order to facilitate early and safe resumption of activities following concussion/mTBI, healthcare professionals should advise patients on appropriate restrictions and limitations when they exist and then focus on abilities to ensure the optimal timing and nature of return-to-work and school activities.

General Considerations Regarding Rest and Return-to-Activity

Determining the optimal timing and nature of return-to-activity for patients with concussion/mTBI must carefully consider the risks and benefits of activity resumption. While a short period of physical and cognitive rest may be beneficial, particularly to limit symptom aggravation, evidence suggests prolonged rest and/or avoidance of activities may worsen outcomes. Evidence indicates complete bed rest in excess of 3 days should be avoided^{2,5} and gradual resumption of pre-injury activities should begin as soon as tolerated.^{2,6-9} Activities with high concussion/mTBI exposure risk should be avoided in the first 7-10 days.

When advising patients on return-to-activity, it is important to consider both physical and cognitive activities because both have the potential to exacerbate symptoms^{10,11}. Cognitive load refers to mental activities requiring attention, concentration and problem solving. Patients should be educated on the concept of cognitive load and advised on how to go about minimizing cognitive load in circumstances where cognitively demanding activities are aggravating symptoms.

Activities associated with high cognitive load include:^{12,13}

- Work or school tasks requiring sustained concentration, attention or problem-solving
- Reading
- Computer or cell phone use, watching TV, video games
- Demanding social interactions

When planning return-to-activity, the patient's tolerance level for both cognitive and physical activity should be considered. Activity resumption recommendations should seek to achieve maximal participation in pre-injury activities while minimizing symptom exacerbations. Patients should be advised that subsymptom threshold levels of activity are recommended. When symptom exacerbations occur, patients should be advised to temporarily reduce their physical and cognitive demands and resume graduated return-to-activity at a slower pace.²

GENERAL CONSIDERATIONS REGARDING REST AND RETURN TO ACTIVITY

		GRADE
12.1	Immediately following any concussion/mTBI, patients should be provided with recommendations to avoid activities that would increase their risk for sustaining another concussion during the recovery period, particularly in the first 7-10 days. ^a	C
12.2	<p><i>There is currently insufficient evidence that prescribing complete rest may ease discomfort during the acute recovery period by mitigating post-concussion symptoms and/or that rest may promote recovery by minimizing brain energy demands following concussion.</i></p> <ul style="list-style-type: none"> • <i>An initial period of rest in the acute symptomatic period following injury (24-48 hours) may be of benefit.</i> • <i>After a brief period of rest, a sensible approach involves the gradual return to school and social activities (prior to contact sports) as tolerated, (i.e., in a manner that does not result in a significant or prolonged exacerbation of symptoms).^{b*}</i> 	C

a. Adapted from the VA/DoD Management of Concussion/Mild Traumatic Brain Injury Clinical Practice Guideline (VA/DoD, 2009).

12.3	Patients with concussion/mTBI should be encouraged to gradually resume normal activity (activities of daily living, work, physical, school, duty, leisure) based upon their tolerance as long as the activity is not at specific risk for concussion. Patients should be preemptively cautioned that transient symptom exacerbations with increased activity are common. If symptoms increase in severity then a monitored slower progressive return to normal activity as tolerated should be continued. ^a	A
12.4	If a person's normal activity involves significant physical activity and there are concerns about resuming daily activities, exertion testing can be conducted that includes stressing the body (e.g., graded treadmill exercise test). If exertion testing results in symptoms, the symptom threshold should be identified and a progressive return to activity based on sub-symptom threshold activities should be encouraged. ^a	C
12.5	<i>After a brief period of rest during the acute phase (24–48 hours) after injury, patients can be encouraged to become gradually and progressively more active as tolerated (i.e., in a manner that does not result in a significant or prolonged exacerbation of symptoms). **</i>	A

* NOT AN ORIGINAL RECOMMENDATION - REPEAT OF 3.4

**NOT AN ORIGINAL RECOMMENDATION - REPEAT OF 4.5

General Considerations Regarding Return-to-work (RTW)

The literature suggests the majority of workers with concussion/mTBI return to work within one to two weeks following injury; however, rates vary widely across studies.^{14,15} Predictors for return-to-work (RTW) in workers with concussion/mTBI extend beyond injury severity and medical comorbidities, with recovery expectations, the advice of healthcare providers, and socioeconomic factors all having a strong influence on disability duration.^{7,16-18}

Table 12.1. Factors Associated with Poor Functional Outcomes

- Dizziness¹³
- Number of symptoms reported at follow-up¹⁴
- Post-traumatic stress^{14,15}
- Cognitive impairments on tests of memory and executive functioning¹⁶
- Reduced social interaction (compared to pre-injury)¹⁷
- Financial compensation-seeking¹⁸
- Loss of consciousness¹⁹
- Pre-existing mental health difficulties (i.e., anxiety, depression, mania, psychotic symptoms)¹⁹
- Lower pre-morbid intelligence/cognitive ability¹⁹
- Pre-injury work history (i.e., prior work stability, earnings)²⁰
- Cognitive Difficulties

Medically unnecessary delays in RTW must be avoided because employment is an important determinant of health and unsuccessful RTW can have profound negative economic and psychosocial consequences for affected individuals.^{19,20} Systematic reviews and one experimental study have demonstrated the health benefits of staying at or returning to work in a variety of populations, times, and settings.^{19,21} Specific to concussion/mTBI, workers with brain injury who are employed report better health status, improved sense of well-being, greater social integration within the community, less usage of health services and a better quality of life compared to those who remain unemployed.⁴ Therefore, remaining at or promptly returning to some form of productive work, provided it does not pose risk of re-injury, should be encouraged, recognizing that individuals unable to RTW can experience greater physical ailments and poorer psychosocial adjustment including increased anxiety, depression and social isolation.^{20,22}

Barriers to return-to-work are varied and include both medical and non-medical factors. Cognitive difficulties (i.e., thinking, concentrating, and fatigue) are the most commonly reported medical factors that interfere with workability. Other factors include the invisibility of the injury, persistent symptoms affecting the ability to do the job, and lack of advice and guidance on returning to work. In addition to these barriers, RTW support systems were considered to be poorly coordinated and managed.²³ Workers reported common factors perceived in facilitating RTW were the support of family, friends, treatment providers and employers who provided accommodations.²³

To facilitate timely and effective return to work for patients with concussion/mTBI, healthcare providers should use a structured approach to assess fitness for duty being cognizant of predictors and factors influencing outcomes of RTW (see [Table 12.1](#)).²⁴⁻³¹ An accepted and effective approach to assess work readiness is for the healthcare provider to define “risk” (medical restrictions), “capacity” (limitations), and “tolerance”^{32,28} The healthcare provider should then

a. Adapted from the VA/DoD Management of Concussion/Mild Traumatic Brain Injury Clinical Practice Guideline (VA/DoD, 2009).

b. Adapted from McCrory P, Meeuwisse W, Dvořák J, et al. Consensus statement on concussion in sport. *Br J Sports Med* 2017;51:838-847

communicate the specific medical restrictions, limitations and abilities to the employer and other stakeholders, with appropriate consents, to facilitate temporary accommodations where necessary.³³ See [Table 12.2](#) for the stepwise approach to RTW planning for patients with concussion/mTBI.

Table 12.2 Stepwise Approach to Return-to-work (RTW) Planning for Patients with concussion/mTBI

Healthcare Professional	<ol style="list-style-type: none"> 1. Identify medical restrictions (risk) 2. Identify limitations (functional capacity: physical, cognitive, emotional) 3. Identify and document symptom triggers
Employer	<ol style="list-style-type: none"> 4. Review information on restrictions, limitations and symptom triggers 5. Review information on job demands 6. Identify opportunities for accommodations/work modification
Employer and Worker	<ol style="list-style-type: none"> 7. Formulate progressive RTW plan

Assessing risk involves defining impairments that could result in harm if the worker were to engage in the given work task.³² Risk of harm encompasses any situation where performance error in a physical or decision-critical task could result in injury to the worker, coworkers or the general public, and/or disruption of equipment, production or the environment.³⁴ For example, if a worker has impaired balance then a reasonable medical restriction would be “no working at heights”. Similarly, if a patient has impaired concentration or visual disturbance then a reasonable medical restriction would be “no operation of heavy equipment”.

Assessment of capacity refers to defining a patient’s functional impairments; activities that the patient physically, psychologically and/or cognitively is unable to perform. Limitations may not pose risk or harm to the patient or others *per se*, but they would reasonably interfere with a worker’s ability to perform a given task (e.g., photophobia, sonophobia, slowed cognitive processing) and they are therefore important to define to ensure the worker is not expected to perform tasks the worker is not currently capable of performing.

Tolerance refers to the ability of a patient/worker to tolerate symptoms and is not a medically-answerable question. The healthcare provider may comment on tolerance based on the patient’s reported symptoms, but should only do so if it is significant barrier to RTW and therefore requires accommodation in which case it would more appropriately be defined as a limitation.

It is imperative when assessing workers with concussion/mTBI for medical restrictions and limitations, to consider all three domains of physical, cognitive and psychosocial/emotional status. Defining levels of physical exertion that exacerbate symptoms can often be achieved based on a detailed history. Cognitive evaluations have been reported to be effective in identifying an individual’s capacity to return to work in complex cases. These should focus on executive functioning, attention, memory, information processing and verbal skills, as these were found to increase the likelihood of successful RTW.³⁵ The evaluation should also take into account the worker’s psychosocial status given studies show that concussion/mTBI can cause re-organization of a person’s psychosocial identities, affecting their ability to perform.³⁶ In turn, this is related to mood disorders, such as depression. Mood disorders post-injury create problems with interpreting and regulating emotions, displaying inappropriate responses to stimuli/events and cause the patient to be more/less susceptible to the need for approval in the workplace. As a result, other difficulties associated with concussion/mTBI may worsen due to poor job performance.³⁷ It is also important to note that concussion/mTBI impacts executive functions, affecting skills such as multi-tasking, prioritization, organization, prospective memory and time management. The contextual work-related factors listed above should be identified by the healthcare provider so this information can be communicated to the employer and other relevant stakeholders, with appropriate consents, to help facilitate successful RTW.

The goal of any RTW plan for concussion/mTBI is to enable the worker to fully participate in work tasks (maximizing work capacity) while remaining below symptom-exacerbation threshold levels. It is important to note that the existence of symptoms at baseline is not, in and of itself, a basis for no return to work. Symptoms are common in the general population and do not necessarily impair workability.³⁸ At issue is whether the work tasks exacerbate symptoms. Workers with symptoms that are present but do not change with an increase in the work activity can begin to transition back to work. Defining tasks that would cause the patient to exceed symptom-exacerbation threshold could reasonably be considered under medical restrictions because the medium- and long-term risks of exertion sufficient to exacerbate symptoms are

unknown. Therefore, reasonable advice is to encourage the worker to engage in activities (physical, cognitive, emotional/behavioral) as much as possible and, in response to symptom exacerbations, the worker should temporarily reduce the physical and cognitive demands and resume graduated return to work at a slower pace.²

While it is the responsibility of the healthcare practitioner to provide information on a patient's restrictions, limitations and abilities, it is the responsibly and role of the employer, based on the information provided by the healthcare practitioner, to determine the type of work available and whether the patient can be accommodated.^{33,39} Under provincial human rights laws, an employer may not discriminate on the basis of disability or other illness and has a duty to accommodate workers with medical impairments to the point of undue hardship.³⁹ See Rec. 12.7 for examples of work modifications that could be considered by employers to accommodate restrictions and limitations associated with concussion/mTBI.

There is no common RTW template that fits the needs of all individuals in all circumstances; in some instances workers may return to work regular duties, while in others accommodation with temporary workload restrictions or placement in a completely different job function may be necessary.^{40,41} Therefore, each program should be individually prescribed and should support the reintegration and rehabilitation of the person with the injury or disability back into the workplace.³³

In complex cases where the healthcare practitioner is having difficulty clearly defining a patient's restrictions and limitations, or where questions arise regarding the suitability of the accommodated work being offered by the employer (or lack thereof), an interdisciplinary vocational evaluation may be necessary. This is particularly true in instances where the worker's usual job tasks are safety-sensitive or decision-critical.

RETURN-TO-WORK CONSIDERATIONS: VOCATIONAL SCREENING AND EVALUATION		GRADE
12.6	If the work environment and/or duties pose potential risk to self or others, an in-depth fitness for duty evaluation and in-depth job analysis are advised. ^a	C
12.7	<p>Individualized work limitations should be identified if:</p> <ul style="list-style-type: none"> The worker is not able to perform specific work tasks as a result of symptoms. There is a work task that places the person at risk of repeat concussion. <p>Individualized work restrictions should be identified if:</p> <ul style="list-style-type: none"> The work/duty environment cannot be adapted to the patient's symptom-based limitation. Symptoms reoccur with return to work. The deficits cannot be accommodated. <p>If restrictions or limitations are identified, they should be communicated to the patient's employer (with the worker's consent) to facilitate appropriate accommodation and enable timely and safe return to work.</p> <p>Examples of vocational accommodations include:</p> <ul style="list-style-type: none"> Assistance with commuting to and from work. Flexible work hours (e.g., starting later or ending earlier). Gradual work re-entry (e.g., starting at 2 half days/week and expanding gradually). Additional time for task completion. Have a quiet space available for the individual to take breaks in throughout the day. Change of job Environmental modifications (e.g., quieter work environment; enhanced level of supervision, decreased computer work, ability to work from home; only day shift hours).^a 	C
12.8	<p>Patients who have not successfully resumed pre-injury work duties following injury should be referred for a interdisciplinary vocational evaluation that includes an assessment of (see Appendix 12.1):</p> <ul style="list-style-type: none"> Cognitive and psychosocial functioning Occupational and job demands Work environment Environmental supports Facilitators and barriers to successful work/return to work 	B

a. Adapted from the VA/DoD Management of Concussion/Mild Traumatic Brain Injury Clinical Practice Guideline (VA/DoD, 2009).

RETURN-TO-WORK CONSIDERATIONS: COMMUNITY RE-INTEGRATION AND FUTURE VOCATIONAL PLANNING		
		GRADE
12.9	When persistent post-concussive symptoms impede return to pre-injury employment, educational activities, community roles and activities that promote community integration (e.g. volunteer work) may be considered as an alternative focus for meaningful activities. ^a	B

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General Consideration Regarding Return-to-school (Post-Secondary)

There has been an increasing appreciation of the impact that concussion/mTBI symptoms have on the ability for students to manage their academic programs. More specifically there is a growing body of literature indicating that cognitive exertion can exacerbate concussion/mTBI symptoms and affect recovery time from these injuries.⁴² This has led to the development of specific academic management strategies for students who have sustained an concussion/mTBI to provide guidance on the steps that should be followed to resume cognitive activity. The essential premise of managing cognitive exertion is that cognitive activity must be paced in order to avoid exceeding the threshold at which concussion/mTBI symptoms are exacerbated.⁴³ See [Table 12.2](#) for an example of a gradual return-to-academics. Many individuals who sustain concussion/mTBI injuries are students who require integration into elementary, secondary or post-secondary institutions. Following an concussion/mTBI, resuming academic activity requires students to manage work in the classroom that includes listening, note-taking, presentations, homework, assignments and examinations, as well as managing additional volunteer activities and memberships in school-based clubs. The cognitive demands therefore span activities that would be conducted at school, and also at home and in the community. Considerable focus in the literature has been placed on developing strategies to manage these cognitive demands, such as duration for cognitive rest, concessions and accommodations, as well as education for academic staff on the symptoms and strategies for reintegration.⁴² It is recommended that the management strategies that are implemented should be highly individualized in the context of this guideline because the manifestation of concussion/mTBI symptoms and their impact upon the student are as variable as is their recovery.^{29,35,40,41,44,45} Contacting the school registrar immediately following concussion/mTBI is also important, even if symptoms are short-lived, to make sure that the student has as much support as possible. Other people who might be involved in the management plan, that includes cognitive rest and academics, may include academic support staff, team physician, course instructors and disabilities services.⁴²

However, many excellent guidelines focus primarily on cognitive management strategies that can be employed with the elementary and secondary school student in mind, and they have limited applicability for the post-secondary student. Not only does the nature of program requirements differ at the post-secondary level, but so does the nature of the accommodations and concessions that can be provided, which limit the applicability of the aforementioned guidelines.⁴² The following post-concussion cognitive management strategies were developed to take into consideration the unique issues faced by students who are either entering post-secondary institutions with an identified concussion/mTBI and/or have sustained an concussion/mTBI in the course of their post-secondary program. The applicability of the recommendations provided for managing the cognitive demands of post-secondary education are considered to be pivotal to maximizing successful academic integration or reintegration. See [Algorithm 12.2](#), which outlines key return-to-school timelines and considerations for students 18 years of age or older following concussion/mTBI.

Students, professors/instructors and appropriate administrators may also require education regarding concussion/mTBI and the associated symptoms, the functional impact in the classroom, and the fact that this is an unseen/hidden injury but can be functionally very debilitating. Regular communication between the student, the primary care provider and teachers/administrators regarding progress, challenges and changes in symptoms (i.e., improvements or recurrences) are beneficial. Symptoms of anxiety and/or depression should also be monitored in students with persistent symptoms.

a. Adapted from the VA/DoD Management of Concussion/Mild Traumatic Brain Injury Clinical Practice Guideline (VA/DoD, 2009).

RETURN-TO-SCHOOL (POST-SECONDARY) CONSIDERATIONS		GRADE
12.10	<p><u>Within 24-48 hours post-injury:</u> If asymptomatic: The student can attend school as tolerated but should not undergo evaluations (tests/exams) or should write with accommodations (such as separate space, paced breaks, rooms where lights can be altered, additional time) and should be monitored for potential symptoms. If symptomatic: The student should refrain from attending school and from participating in all academic and sports activities, including apprenticeship, practicum and shop-related activities, in order to decrease the risk for symptom exacerbation. In addition, the student should be offered psychoeducation and modified at-home study tasks as tolerated. Students should be able to tolerate school and life responsibilities prior to participating in sports or activities that put them at risk.</p> <p><u>After 24-48 hours post-injury: (see Appendix 12.4)</u> If asymptomatic: The student may return to academic/program related activities as tolerated as long as they remain asymptomatic. If symptomatic: the student should:</p> <ul style="list-style-type: none"> • Refrain from attending academic and/or program-related activities for one full week and up to two full weeks if symptoms remain functionally debilitating. • Connect with academic accessibility/disability services to request accommodations and receive additional support. • Be monitored for the emergence of potential symptoms and be provided with support and education. • The healthcare professional (with permission) should ensure that accessibility/disability services are notified that a concussion/mTBI has occurred (see Appendix 12.2) and that the student will require time off, and may require accommodations and support for reintegration. • Reintegration should occur progressively and specific accommodations should match the student's residual symptoms. <p><u>1-2 weeks post-injury: (see Appendix 12.5)</u> If symptoms are still functionally debilitating at 1 week post-injury the student should refrain from attending academic- and/or program-related activities. The healthcare professional should again notify accessibility/disability services that the student is still symptomatic and accommodations and support for reintegration will be required.</p> <p><u>After 2 weeks post-injury:</u> The student should start attending school (non-physical activities) very gradually as tolerated and with accommodations, even if the student is still experiencing symptoms. A healthcare professional with experience in concussion/mTBI rehabilitation should provide guidance to the student and educators. Accessibility/disability services should be notified again so teachers/professors can subsequently monitor progress with the student and adjust the return-to-school plan, as necessary.</p>	C

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RETURN-TO-SCHOOL (POST-SECONDARY) CONSIDERATIONS		GRADE
12.11	<p>If re-integration into school is ineffective or unproductive at 4 weeks (i.e., symptoms plateau/continue to get worse), consider the following:</p> <p>Further Clinical Assessment:</p> <ul style="list-style-type: none"> • Screen for ADHD, learning disabilities, anxiety and depression. If present seek assistance from specialized services • Conduct re-assessment by a rehabilitation provider with concussion/mTBI knowledge to evaluate possible determinants of return-to-school barriers. • Refer student for neuropsychological assessment. <p>Review Accommodations:</p> <ul style="list-style-type: none"> • Work with the professor/instructor or appropriate administrator and the student to look at the cognitive demands of various classes, with consideration of the student's current symptoms, to determine if appropriate accommodations can be made in the following areas as necessary: curriculum, environment, activities and timetable (see Appendix 12.3). • Move the student's courses to audit status, allowing them to participate in some academic activity without significant pressure from course requirements and examination. • Review whether the student should continue in the program for that term if there will be substantially negative consequences to their grades and program participation. 	C

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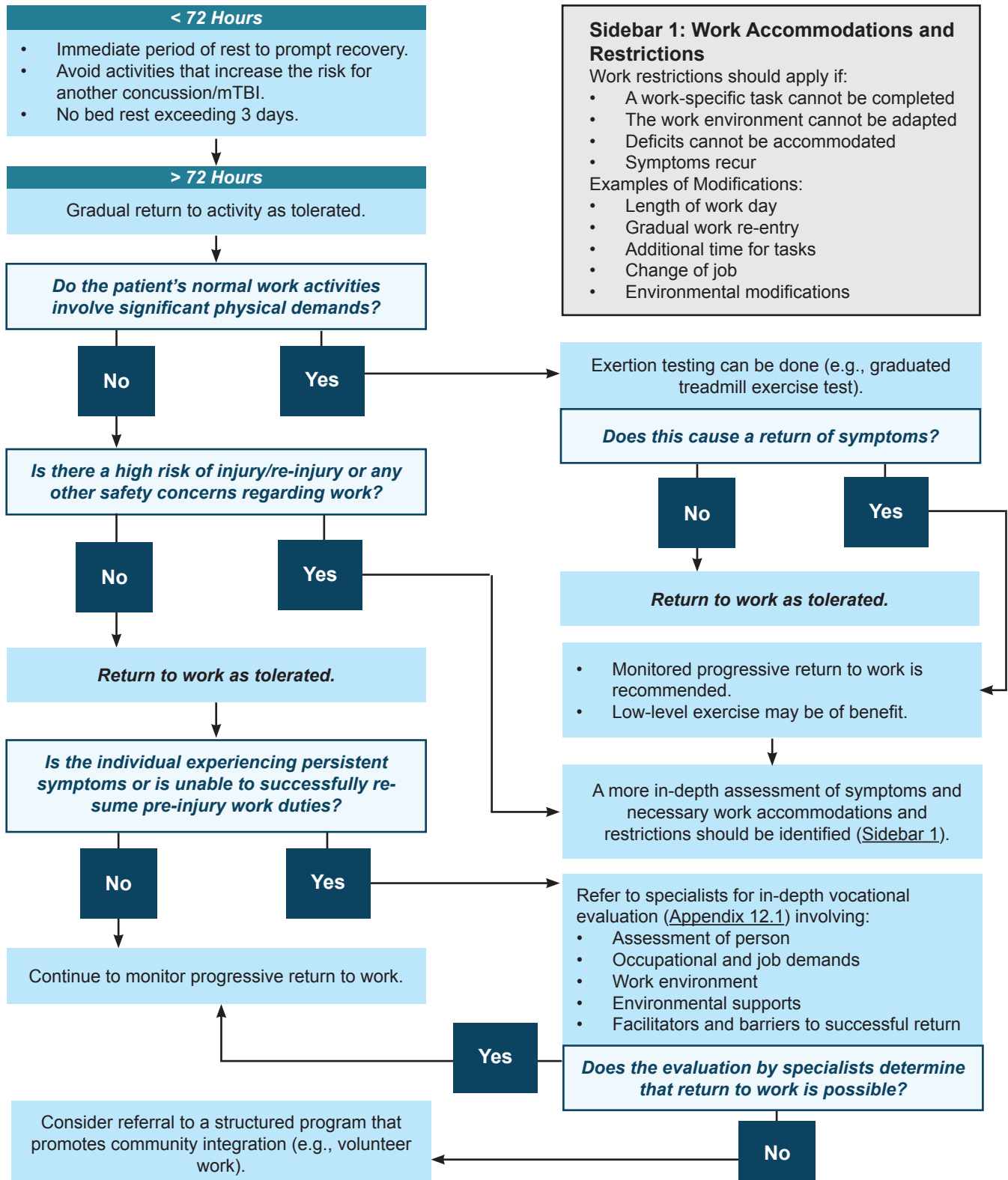
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Algorithm 12.1

Return-to-Work Considerations



Sidebar 1: Work Accommodations and Restrictions

Work restrictions should apply if:

- A work-specific task cannot be completed
- The work environment cannot be adapted
- Deficits cannot be accommodated
- Symptoms recur

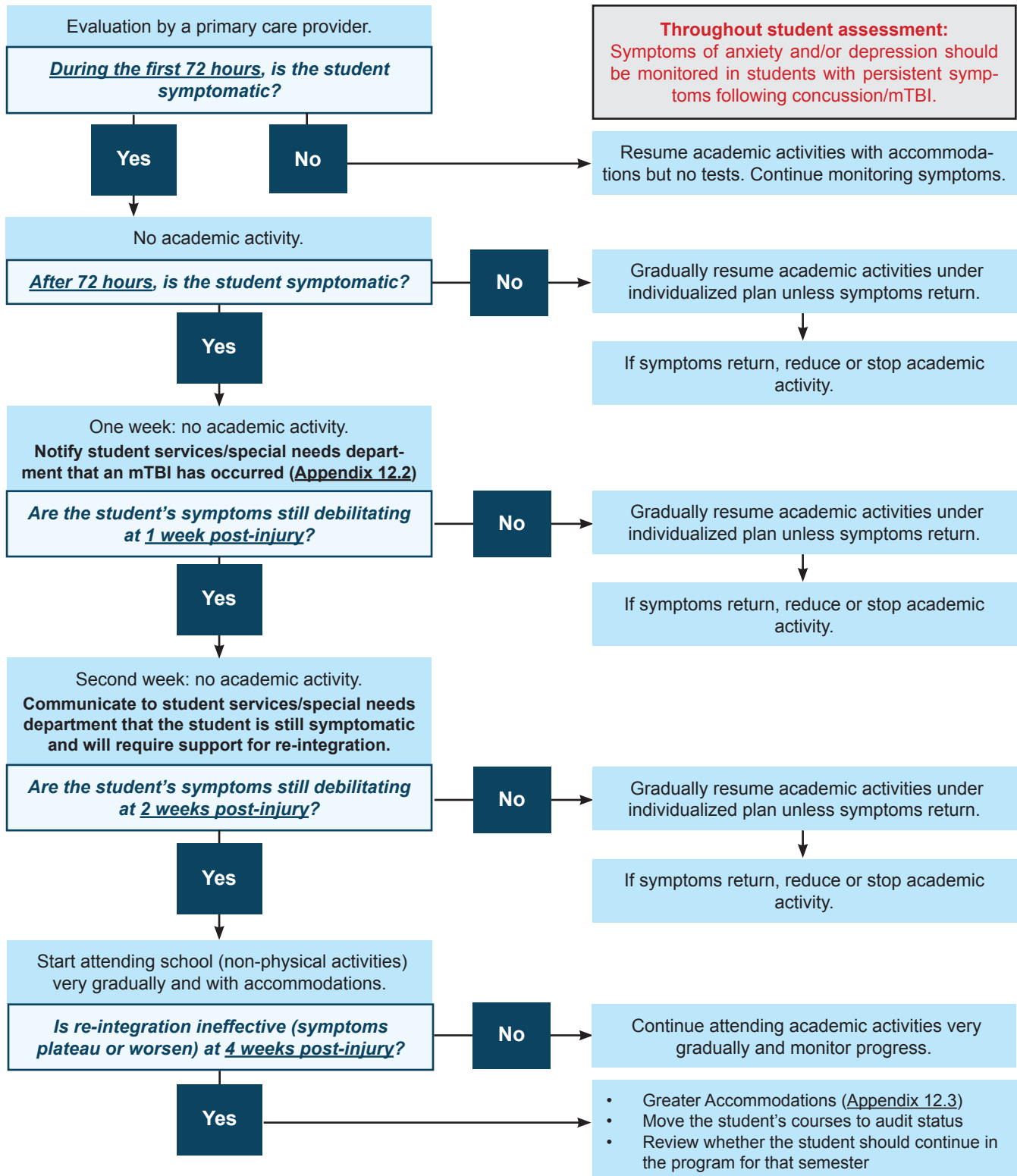
Examples of Modifications:

- Length of work day
- Gradual work re-entry
- Additional time for tasks
- Change of job
- Environmental modifications

For a narrative description and guideline recommendations related to this algorithm, please refer to **Section 12**.

Algorithm 12.2

Return-to-School (Post-Secondary) Considerations



For a narrative description and guideline recommendations related to this algorithm, please refer to **Section 12**.