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March 20, 2025

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On behalf of the entire *New England Journal of Medicine* staff, please accept my wishes for a rewarding career.

Sincerely,

Eric J. Rubin, MD, PhD

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Preparing Physician CVs and Resumes for Consumption in the Digital Age

Customization and confidentiality are key considerations in the current recruiting marketplace

By Bonnie Darves, *a freelance health care writer*

A physician's curriculum vitae (CV) has long functioned as a passport of sorts into the realm of potential practice opportunities, which is why physicians must make sure that the all-important document does well what it's intended to do: provide a comprehensive but succinct and completely accurate overview of your medical training, work, and accomplishments, in a format that's easy to read and digest. Today, however, when everything moves at, well, cyberspeed, physicians should be prepared to respond in near real time when a desirable opportunity comes up — by not only submitting a polished document but by also ensuring that the CV is tailored to the position, according to Peter Angood, MD, chief executive officer of the American Association for Physician Leadership.

"It's important for physicians to customize their CV each time they submit it, to ensure they're including the appropriate keywords," Dr. Angood said, to match qualifications the organization is seeking in a candidate. "Remember that you're trying to get through the initial screening, so the CV keywords should ideally match those in the job position."

That screening, these days, often includes computer technology that ingests, "scrapes," and dissects the document via machine learning, artificial intelligence, and other mechanisms to identify specific experience or specialization. Because this process typically occurs before the document is routed for human review, the CV should include keywords included in the job description, Dr. Angood said. The idea is to make sure that the physician's qualifications "pop out" readily during both electronic and human screening. "Even in that human screening, keep in mind that the HR professional or a recruiter might only spend 30 seconds to a minute initially reviewing the CV — that's why it should be customized," he added.

Getting the CV through the first electronic screening hurdle is, to some extent, a numbers game, according to John Lastinger, manager of candidate experience for the national recruiting firm Merritt Hawkins. Because computer programs that match candidates with practice opportunities are primarily keyword-based, Mr. Lastinger said, the facility seeking a physician prioritizes the skill set and experience it desires and then the system scans inbound CVs for matches to those keywords. "The more matches within the text of the CV, the higher the match rate and score, and the higher the probability the physician will be interviewed," he said.

That's where the specificity comes in. "Physicians should highlight all key skills and experience that fit the opportunity. For example, radiologists who are certified to read mammography should include that on their CV, as should a cardiologist who performs peripheral interventions," Mr. Lastinger said. At the same time, he added, physicians should choose keywords judiciously and place them strategically, to avoid disseminating a document that's obviously (and intentionally) overfilled with keywords. "We advise physicians to keep focused and be purposeful about their keyword usage," he said. Physicians who are very particular about where they want to practice — whether that's a specific metro area or state, or a particular region — should also ensure they communicate that information in their CV, or in an accompanying cover note.

Brenda Reed, a senior recruitment and retention consultant at Atrius Health in Boston, said that even though computer CV screening is ubiquitous these days, physicians shouldn't be unduly concerned that their CV will be overlooked if it doesn't pass the computer screen. "Do organizations get so many CVs that they sort them only by bot, and not by people? I'd be truly surprised if there's an institution that only uses bots," Ms. Reed said. "There's a recognition in the industry, I think, that CV parsing isn't that advanced yet, and I'm not aware of any applicant tracking systems that do it very well." Applicant tracking systems are software programs that organizations use to help them facilitate recruitment and hiring, by helping HR personnel and recruiters organize and navigate potentially large numbers of applicants.

Assemble a CV "package," including a resume, in advance

Creating a polished, effective CV is the most important task for physicians seeking a practice opportunity, but that's only the first step. All sources interviewed for this article agreed that physicians should have a complete, customizable package prepared before they start actively identifying and applying for open positions. That package, ideally, includes a CV, resume, and draft cover letter or note that can be readily adjusted to fit the opportunity, according to Dr. Angood. "I think it's critically important to create a set of documents, and then tailor them," he said. "There's an ongoing need, in my experience, for physicians to appreciate the intent and purpose of these materials," he said.

The physician resume is a short version of the CV that quickly highlights skills and qualifications for a particular position, and more importantly, provides an opportunity to briefly explain why the candidate is a good fit for the prospective position. For example, if a physician is seeking an opportunity that includes a mix of clinical and administration or leadership roles, a resume might focus the physician's direct experience in the latter two areas. A well-structured resume that includes any business experience or credentials is a must for physicians who want to transition from clinical practice to nonclinical roles, Dr. Angood noted, and the document should also include both specific achievements — even specifics such as increasing patient volumes over time through efficiency — and a forward-looking focus or statement.

"Organizations today are looking for physicians who can demonstrate not just their experience but also how their work made an impact and how their accomplishments have prepared them to contribute to the organization they join," Dr. Angood said, given the changing priorities of and increasing demands on hospitals and health systems today. For example, physicians who have either experience or interest in such areas as patient-centered care models, shared decisions-making, or value-based care should includes those details in a resume. "Hiring organizations are very interested in knowing the opportunities and results physicians accomplished in their position," said Dr. Angood.

Young or early-career physicians likely won't need a resume, Ms. Reed said, unless they have obtained specific skills or experience in business, technology, or organization-wide initiatives. "Sometimes a physician applying for a patient-care opportunity might be a good candidate for an innovation position that include some nonclinical work, so that extra experience in worth noting," she said, in either the CV or a resume.

Be selective — and careful — when using job boards to upload your CV

While physicians can likely expect a personal review of their CV when they send it directly to a hiring organization, that's not necessarily the case when it comes to job boards. Scott Edwards, chief executive officer of Metropolis, a marketplace for health care jobs, advises physicians to be very selective when using job boards and to exercise due diligence before creating an account and uploading their information and documents into a database.

"It's important to check out the job board's reputation and to ensure that you have some control over how your documents are handled. In some cases, you might upload your documents thinking that you're applying for a particular position, when in fact you've simply placed your CV and personal information into a repository that all can see and that's searchable," said Mr. Edwards. When that happens, physicians may quickly be overwhelmed with inquiries regarding positions they're not interested in or opportunities in unsuitable geographic areas — or possibly run the risk that their current colleagues might come across their information.

"Physicians should understand that many job boards aren't private," said Mr. Edwards, whose company uses a private and confidential "match" model that only connects applicants with prospective employers that have subscribed to the service and agreed to be connected if a match is found. He recommends that physicians avoid job boards that don't allow for confidentiality or aren't nimble enough to enable narrowing the search parameters — in terms of practice type, subspecialty, and geographic location — to only those desired.

"Physicians really should understand, before submitting their CV to a job board or repository, exactly how their materials are ingested, dissected, and disseminated once they upload it to a database," said Ms. Reed. In short, in the persisting highly competitive, high-demand market for physician services, CVs are such hot commodities that there are technologies and software programs waiting in the wings to "snatch" the document from the internet and route it to unknown recipients.

Tips for making your CV stand out — in the right way

Be careful about how you label your CV document. Keep the recipient in mind when you create a filename, so that recruiters or others who might be reviewing candidates' CVs can readily identify you, advises Brenda Reed, a senior recruitment and retention consultant at Massachusetts-based Atrius Health. The ideal filename would be ordered like this: Last name, first name, discipline, and specialty. "That way, reviewers can quickly figure out whose CV it is. I've received CVs with document names like 'JoesCV.' That makes it hard for recipients to figure out whose document it is," Ms. Reed said. The same filename structure should also be used for the cover letter, she added.

Don't "over-stuff" the CV. Sometimes, physicians think that because they're trying to cover a lot of ground in a few pages, it makes sense to fill every available inch. That's not helpful to the readers who have to make their way through a densely packed document, according to John Lastinger, manager of candidate experience for Merritt Hawkins. "White space is your friend. Make sure to leave plenty of white space," he said, which makes it easier on readers' eyes when they're navigating the document. He also stresses the importance of including a name header and page number on every page of the CV, so that the document is readily identifiable. "Formatting is very important when it comes to having a document scanned, which it likely will be," he said.

Create and submit your CV in a .pdf format rather than a .doc or other word-processing program format — and protect your personal information. The benefit of using a .pdf format is that the document can't be readily altered by someone in the receiving chain, noted Scott Edwards, chief executive officer of Metropolis. "That might be unlikely, but it can happen if someone who is unscrupulous gains access to your CV, so it's better to be safe," he said. On another note, physicians who plan to submit their CVs and other materials to numerous entities and are engaging in a broad search should consider purchasing a dedicated email address specifically for their search activities. "It's also a good idea to consider getting a dedicated cellphone number for the job search, to avoid being contacted on their personal cellphones while they're at work," Mr. Edwards said.

When physicians "launch" their CV, they should be prepared to respond to the flurry of inquiries that will ensue. Putting the CV out into the universe of potential job opportunities is a serious undertaking, and physicians should be ready to adjust their schedules accordingly to accommodate the responsiveness and professionalism required to manage a search, according to Peter Angood, MD, chief executive officer of the American Association for Physician Leadership. "I often tell physicians that it's close to a $2^1/_2$-time job when they're trying to get a new full-time job, because so many of the activities happen after hours," he said.

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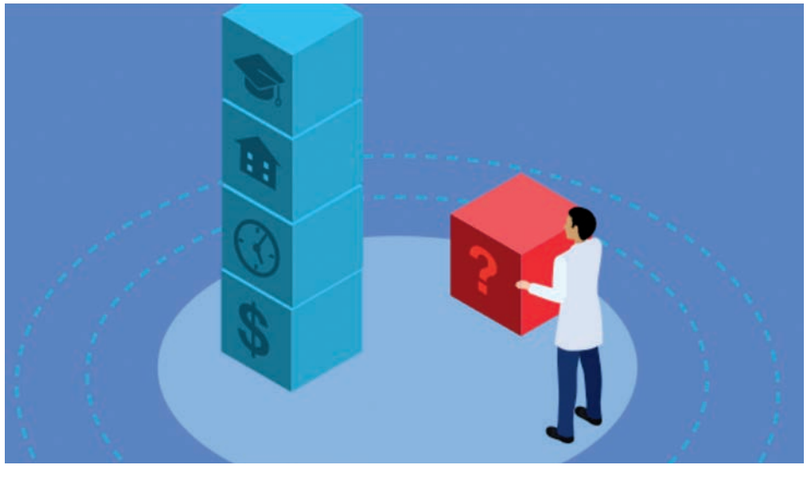

Unusual Parts of Compensation Packages

By Nisha Mehta, MD, *a physician leader whose work focuses on physician empowerment, community building, and career longevity in medicine*

In speaking to so many about their job offers, I've realized that we're often myopic in terms of what we think can be negotiated when discussing a contract. There are the traditional things everyone asks about — salary, bonus structure, call responsibilities, vacation schedule, and signing bonuses, to name a few. However, when talking to people about what their ideal job looks like, there's often more random things on a wish list. What we fail to realize is that those are all things that can be asked for, but that nobody else would even think to offer them to sweeten the deal.

Some examples of these?

- An early start and end to the day
- Dedicated academic or administrative time
- Unique FTEs such as 0.7 or unique structuring of their FTEs, such as alternating four- and two-day weeks
- Bonuses for creation of alternative revenue streams for the practice
- Changes in the amount of allotted CME money or money for office furnishings or technology

- The ability to work from home a certain number of days a week (for example, doing telehealth)
- A specified patient population according to their area of academic interest/desired practice panel
- An increased number of support staff such as scribes or medical assistants
- The speaker system which you will have in your operating room

Some of these may sound silly to you to ask for, but I know of physicians who have asked for and received these things as part of their contract negotiations. Remember, what brings happiness in your day-to-day life as a physician is very individualized, and therefore, asking for those things that will enhance your satisfaction (e.g., career longevity) at that job is not unreasonable.

Of course, asking for these things can be an art form. Understand that every institution has different flexibility or bandwidth for accommodating individual requests. You may want to look at what other accommodations have been made for other physicians on staff as precedent for what may be realistic prior to compiling your list of asks. Also, be careful about how many of these additional things you ask for. If you have 10 unusual requests, even if they are relatively minor, the message to the employer could be that this is a pattern of behavior where you will always be asking for exceptions to normal operating procedures.

Figure out which ones mean the most to you. Also figure out which ones are going to be harder to negotiate later, as your negotiating power is always greatest before you sign a contract. Be prepared to justify the asks so they understand why they would make accommodations. For example, if you are able to clearly articulate why something will lead to increased efficiency, lead to better patient outcomes, or contribute to your career longevity and prevent burnout, this would help your case. It would also help them to explain to others who question why these special accommodations were granted.

As demographics in medicine change, unusual asks will become more frequent. The sustainability of our health care workforce requires out-of-the-box solutions, and for some of you, these may be part of them! If you don't ask, you won't get it.

CLINICAL PRACTICE

Patrick G. O'Malley, M.D., M.P.H., *Editor*

Sport-Related Concussion

John J. Leddy, M.D.

This Journal *feature begins with a case vignette highlighting a common clinical problem. Evidence supporting various strategies is then presented, followed by a review of formal guidelines, when they exist. The article ends with the author's clinical recommendations.*

A 17-year-old female high school soccer player presents to the primary care office 5 days after striking the back of her head on the ground during a game. She did not lose consciousness but had a headache and dizziness and had been observed to have a "wobbly" gait as she walked off the field. She has had persisting symptoms (dizziness, nausea, trouble falling asleep, photosensitivity, and headache) that have kept her out of school. She had had a concussion 2 years earlier that took 4 weeks to recover from fully. On examination, her vital signs are normal, but she reports lightheadedness on standing. On confrontation visual testing, her eye movements are not smooth, and she has increased dizziness while finger-tracking back and forth slowly across her visual field (smooth-pursuit eye movements). Motion of the cervical neck is painful, with muscle tenderness. During tandem gait testing for balance assessment, in which the patient walks in a straight line with one foot in front of the other, she takes a sidestep multiple times. During a tandem stance test, in which the patient stands with one foot in front of the other, she takes a sidestep four times in a 20-second period. How would you further evaluate and treat this patient? When can she return to school and soccer?

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CME

THE CLINICAL PROBLEM

The recent American Congress of Rehabilitation Medicine diagnostic criteria[1] define concussion as a mild traumatic brain injury (TBI) and indicate that these terms can be used interchangeably when results of neuroimaging are normal or when neuroimaging is not clinically indicated. The descriptor "mild" does not mean that the brain injury is trivial, rather that no trauma-related intracranial abnormality is seen on computed tomographic or structural magnetic resonance imaging (MRI) scans.[1] The consensus statement from the Sixth International Conference on Concussion in Sport,[2] held in Amsterdam in 2022, defines sport-related concussion as "a traumatic brain injury caused by a direct blow to the head, neck, or body resulting in an impulsive force being transmitted to the brain that occurs in sports and exercise-related activities…. Symptoms and signs may present immediately, or evolve over minutes or hours, and commonly resolve within days, but may be prolonged." Preexisting and cooccurring health conditions (e.g., migraine and depression) should not fully account for the clinical signs, acute symptoms, or clinical examination findings.[3] These formal definitions are consensus definitions to facilitate research.

KEY POINTS

SPORT-RELATED CONCUSSION

- Sport-related concussion is a mild traumatic brain injury that typically resolves within weeks, but symptoms may persist beyond 1 month.
- Diagnosis depends on relevant signs and symptoms appearing within 72 hours after injury as well as on vestibular and oculomotor findings. Adjunctive tests such as exercise testing are not typically necessary for making the diagnosis.
- Cervical injury often accompanies concussion and, if untreated, may delay recovery.
- Cognitive, mood, and sleep problems frequently have psychosocial origins that may be preinjury conditions that were exacerbated by the concussion.
- Strict cognitive and physical rest (referred to as "cocooning") does not facilitate recovery.
- Light physical activity and graduated aerobic exercise that are tailored to symptoms and heart rate and that are initiated within 24 to 72 hours after injury facilitate recovery and reduce the incidence of symptoms persisting beyond 28 days.

Concussion or mild TBI affects approximately 42 million persons worldwide each year,[4] including 1.6 to 3.8 million sport-related concussions in the United States.[5] Risk factors include previous concussion, game or match play (as opposed to practice sessions), adolescent age, attention deficit–hyperactivity disorder or learning disability, and personal or family history of migraine or mental health problems.[6] In a recent cohort study, female soccer players had a higher incidence of concussion than male soccer players, and regardless of sex, the incidence of concussion was higher among goalkeepers than among forwards.[7] The acute clinical signs and symptoms of concussion largely reflect a physiological disturbance rather than structural injury, so no traumatic abnormalities are seen on standard neuroimaging studies.[2]

STRATEGIES AND EVIDENCE

DIAGNOSIS

Concussion is a clinical diagnosis that is based on a detailed history, a concussion-relevant physical examination,[8] and adjunct testing (e.g., exercise testing)[2] when indicated. Obtaining some of the history from an observer is helpful. Loss of consciousness is uncommon after sport-related concussion, is typically brief (<1 minute), and as opposed to post-traumatic amnesia, is not associated with worse outcome.[9] After a plausible mechanism of injury (e.g., vigorous acceleration–deceleration of the head, the head being struck by a hard object, or the head striking the ground), concussion-related symptoms and signs (Table 1) typically appear or worsen within minutes to hours but sometimes may be delayed for up to 72 hours.[1] The 72-hour time frame for headache to appear and to count toward a diagnosis of concussion or mild TBI is shorter than the 7-day period that is allowed for the diagnosis of post-traumatic headaches.[10] Abnormal vestibular findings (e.g., on the tandem gait test, in which the patient walks in a straight line with one foot in front of the other) and oculomotor findings (e.g., abnormal repetitive saccades) are common on examination and help to establish the diagnosis beyond subjective symptoms.[11] Lightheadedness on standing suggests orthostatic intolerance from autonomic nervous system baroreflex impairment.[12] Exercise intolerance (i.e., the inability to exercise to the maximum level expected for the patient owing to the exacerbation of concussion symptoms) is common. If there is uncertainty about the diagnosis, exercise testing (e.g., with the Buffalo Concussion Treadmill Test)[13] within 14 days after injury has excellent sensitivity (94.4%; 95% confidence interval [CI], 90.8 to 97.2) and specificity (94.6%; 95% CI, 91.1 to 97.3) as compared with the standard of expert clinical examination for the diagnosis of sport-related concussion.[14]

Athletes should be removed from activity immediately if a concussion is suspected in order to avoid another such event, which would worsen the concussion and prolong recovery.[15] A study of the natural history of concussion involving athletes in the National Collegiate Athletics Association (NCAA)[16] showed that many athletes returned to participation within the same game or 1 day after the concussion and often had another concussion within 7 to 10 days after returning to play. Now, athletes are given additional time for brain recovery, which has reduced the risk of repeat concussion during the critical period of early cerebral vulnerability.[17]

Table 1. Signs and Symptoms of Concussion or Mild Traumatic Brain Injury.

Domain	Symptoms	Signs
Cognitive	Confusion, feeling "in a fog" or "zoned out," inability to focus	Anterograde amnesia, retrograde amnesia, loss of consciousness, disorientation, delayed verbal and motor responses, vacant stare, slurred or incoherent speech
Somatic	Headache, dizziness, nausea or vomiting, visual disturbances, photophobia or blurry or double vision, phonophobia	Balance disruption, abnormal eye tracking, abnormal vestibulo-ocular reflex, abnormal near-point convergence
Affective	Emotional lability, irritability, fatigue, anxiety, sadness	Irritable behavior, flat affect
Sleep disturbance	Trouble falling asleep, sleeping more or less than usual	Excessive drowsiness

Most athletes recover within days to a few weeks after sport-related concussion.[18] Nevertheless, approximately one third of untreated adolescents will have symptoms that persist for more than 4 weeks.[19] The term "post-concussion syndrome" is no longer used; the current preferred term is "persisting symptoms after concussion." Patients often have multiple causes of persisting symptoms (e.g., vestibular dysfunction and cervical injury), and the symptoms frequently overlap.[20,21] The differential diagnosis of persisting symptoms depends on a symptom assessment that is temporally related to a TBI, as well as on the medical history (e.g., anxiety or migraine), abnormal examination findings in the vestibular and oculomotor subsystems (objective abnormalities and symptom exacerbation),[8] and examination of the cervical spine.

Cervical injury frequently accompanies concussion,[22] produces similar symptoms (e.g., dizziness and cervicogenic headache),[23] and is a risk factor for persisting symptoms.[22] Early treatment of cervical injury facilitates symptom resolution and medical clearance to return to sport after concussion.[22]

Cognitive, mood, and sleep problems frequently have psychosocial origins that may be exacerbated by concussion.[2,20] Measurement of these symptom burdens with the use of validated instruments to assess mental health and sleep quality (e.g., the Sport Mental Health Assessment Tool–1[24]) can be useful.

The strongest predictor of persisting symptoms is the burden (i.e., number and severity) of symptoms in the first days after injury.[2] The 5P (Predicting and Preventing Postconcussive Problems in Pediatrics) study,[19] which involved 3063 patients (median age, 12 years) who were seen in the emergency department a mean of 3 hours after injury, developed a clinical score for the risk of persisting symptoms beyond 28 days (range, 0 to 12, with higher scores indicating a higher risk of persisting symptoms after concussion) (Table 2). The score was validated in the original study[19] and in a subsequent study conducted in an outpatient setting.[25] A score of 4 to 8 points, consistent with medium risk, had high sensitivity, and a score of 9 to 12 points, consistent with high risk, had high specificity for predicting symptoms persisting beyond 4 weeks. In a prospective cohort study involving 230 children (mean age, 15 years; 50% of whom were female) who were seen within 1 week after injury in the clinical office setting, 82% of the participants with a 5P score of 9 to 12 points had symptoms that persisted for more than 28 days (area under the curve, 0.75; 95% CI, 0.66 to 0.84).[25]

MANAGEMENT

The Amsterdam statement[2] recommends that all patients with concussion be followed serially in the clinical office setting beyond 72 hours after injury and in the following weeks. New freely available tools, such as the Sport Concussion Office Assessment Tool–6 (SCOAT6), which is used in adults and adolescents (Fig. S1 in the Supplementary Appendix, available with the full text of this article at NEJM.org), and the Child SCOAT6, which is used in persons younger than 13 years of age (Fig. S2), are clinical guides to management, although they await prospective validation.[26] A suggested clinical approach to the

Table 2. 5P Risk Score for Persisting Symptoms after Concussion in Children and Adolescents.*

Factor and Description	Score
Age	
13 to <18 yr	2
8 to <13 yr	1
5 to <8 yr	0
Sex	
Female	2
Male	0
Longest duration of previous concussion	
Symptoms lasted ≥1 wk	1
No previous concussion or symptoms lasted <1 wk	0
History of migraine	
Yes	1
No	0
Slowness in answering questions	
Yes	1
No	0
Balance errors on tandem stance testing†	
≥4 Errors or could not complete	1
0–3 Errors	0
Headache	
Yes	1
No	0
Sensitivity to noise	
Yes	1
No	0
Fatigue	
Yes	2
No	0

* Adapted from the Children's Hospital of Eastern Ontario Research Institute (https://www.cheoresearch.ca/research/projects/clinical-risk-score-for-persistent-postconcussion-symptoms-among-children-with-acute-concussion-in-the-ed/). The 5P (Predicting and Preventing Postconcussive Problems in Pediatrics) risk score is a clinical score for assessing the risk of symptoms of concussion persisting beyond 28 days. Total scores range from 0 to 12, with a score of 0 to 3 indicating low risk, 4 to 8 indicating medium risk, and 9 to 12 indicating high risk.

† In the tandem stance test, the patient stands heel to toe on a firm surface with the nondominant foot (defined as the leg opposite the preferred kicking leg) in the back. The heel of the dominant foot should be touching the toe of the nondominant foot. Hands are on the hips, and eyes are closed. The patient should attempt to hold the position for 20 seconds. Any of the following counts as an error: a step, stumble, or fall; moving the hands off the iliac crests; opening the eyes; abduction or flexion of the hip beyond 30 degrees; lifting the forefoot or heel off the testing surface; or remaining out of the proper testing position for more than 5 seconds.

evaluation and management of concussion is presented in Figure 1.

Sport-related concussion was traditionally managed with strict cognitive and physical rest until all symptoms resolved (colloquially referred to as "cocooning").[27] However, in a randomized, controlled trial[28] involving patients with concussion who were seen in the emergency department within 24 hours after injury (99 participants; median age, 14 years), participants who had been assigned to strict rest for 5 days did not have better neurocognitive function or balance at 10 days after injury than those who had been assigned to usual care (defined as 1 to 2 days of rest, followed by a stepwise return to activity). Participants who had been assigned to usual care, however, may have underreported their symptoms in order to get back to sport faster. The requirement for the resolution of all symptoms before a return to activity failed to account for the "daily life" symptoms that substantially overlap with postconcussive symptoms (e.g., fatigue and sleep problems).[29] Clinicians must consider that postconcussive symptoms may be preexisting, concussion-related, or both.[1,20]

A more active, individualized approach to concussion management has emerged, with a focus on early physical activity and graduated aerobic exercise (initiated within 24 to 72 hours after injury) that are tailored to symptoms and heart rate.[30] In an approach modeled after cardiac rehabilitation, the heart rate at the patient's threshold for more-than-mild concussion-symptom exacerbation on exercise testing is used to prescribe an aerobic "exercise as medicine" rehabilitation program.[13] "More than mild" is defined as an increase of more than 2 points in the severity of concussion symptoms at any stage during testing or treatment as compared with the preactivity resting value on a scale from 0 to 10 (with

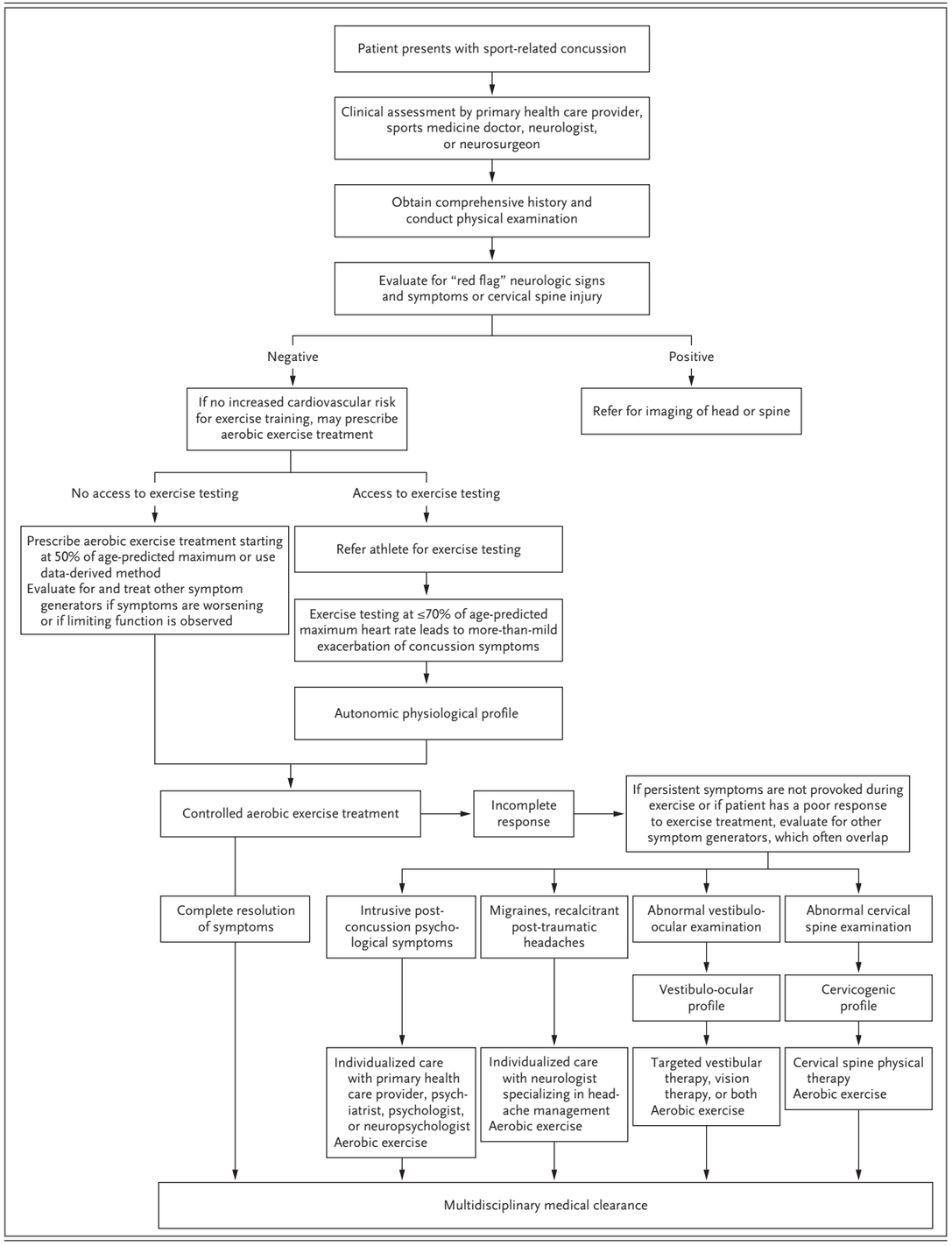

Figure 1 (facing page). Clinical Approach for the Classification and Treatment of Sport-Related Concussion.

Red flags for urgent referral include seizure or convulsion; double vision at a distance; loss of consciousness (especially if duration was >30 seconds); weakness or paresthesia in both arms or in the legs; deteriorating consciousness; uncontrolled vomiting; severe or increasing headache; increasingly restless, agitated, or combative status; Glasgow Coma Scale score below 15 (on a scale from 3 to 15, with a score of <13 indicating moderate or severe brain injury); visible deformity of the skull; and focal neurologic deficit.

higher scores indicating greater symptom severity).[30] A strong, consistent relationship exists between increased heart rate during exercise and the degree of concussion-symptom exacerbation, and aerobic exercise treatment alleviates emotional and vestibular symptoms as much as it does headache or fatigue.[13,31,32]

In a randomized, controlled trial,[31] symptomatic adolescents who had received a prescription for controlled aerobic exercise treatment 2 to 10 days after concussion had a faster recovery than those who had been assigned to placebo-like stretching exercise (median recovery time, 13 days [interquartile range, 10 to 18.5] vs. 17 days [interquartile range, 13 to 23]; P=0.009). In a similar randomized, controlled trial,[32] 21% of adolescents who had been assigned to aerobic exercise 2 to 10 days after injury had persisting symptoms beyond 28 days, as compared with 32% of those who had been assigned to stretching exercise (P=0.04). Persisting symptoms have been associated with impaired academic performance and quality of life.[33]

Aerobic exercise, as part of a multidisciplinary program, is effective regardless of initial symptom burden[34] and is effective in persons with persisting symptoms.[35] In situations in which access to exercise tests is lacking, light activity (e.g., activities of daily living and walking) that is started within 24 to 72 hours after injury (even in symptomatic patients) facilitates recovery more effectively than resting until symptoms resolve.[30,36] Exercise treatment can be prescribed without an exercise test with the use of a target intensity of 50% of the patient's age-predicted maximum heart rate in beats per minute (i.e., 220 minus patient age)[37] or with the use of a data-derived method with heart-rate training ranges that are based on patient sex and the time from injury.[38] The patient systematically advances through the program according to the degree of symptom exacerbation experienced during the previous exercise bout.

Reduced sleep quality early after concussion may prolong recovery,[30] so good sleep hygiene should be emphasized. Regarding electronic-device screen use, a randomized, controlled trial[39] involving 125 patients (mean age, 17 years) who presented to the emergency department with concussion showed that unrestricted screen use during the first 48 hours after injury resulted in a longer time to recovery than relative abstinence from screen use (8.0 vs. 3.5 days, P=0.03).

A recent systematic review that included seven randomized trials[40] showed that cervical and vestibular physical therapy facilitated a return to sport in adolescents and adults with dizziness, neck pain, or headaches persisting for more than 10 days after concussion (hazard ratio vs. rest, 3.91; 95% CI, 1.34 to 11.34). Rigorous studies involving humans to investigate whether medications or supplements facilitate concussion recovery have not been conducted, and the sustained use of short-acting analgesic agents increases the risk of headache due to medication overuse.[41]

RETURN TO SCHOOL AND SPORTS

Concussion management guidelines traditionally focused on a return to sport, but more important for children and adolescents is a return to school.[42] Abnormal vestibulo-ocular symptoms or physical findings (e.g., smooth pursuits and the vestibulo-ocular reflex) beyond 10 days are commonly associated with persisting symptoms of concussion and warrant vestibular physical therapy.[43] After concussion, adolescents (13 to 17 years of age) report more difficulty with school than do children (5 to 12 years of age) or adults (≥18 years of age), especially with regard to greater initial symptom burden, persisting symptoms, and specific symptoms such as difficulty in concentrating, headaches, dizziness, and fatigue; some patients will benefit from academic supports (Table 3).[42] Recent observational data show that early cognitive activity, including an early return to school, is associated with faster recovery, whereas prolonged absences from school and other life activities may delay recovery.[44] Students who are provided with a letter from the health care provider outlining specific academic supports (Fig. S3) are more likely to receive them.[42]

It has been shown that early (within 1 week after injury)[45] and weekly[31,32] medical follow-up facilitate recovery from sport-related concussion. In a systematic review (age range of participants, 5 to 22 years), the mean number of days until the participant was free from symptoms was 14.0 (95% CI, 12.7 to 15.4) and the mean number of days until the participant returned to school (including college or university) was 8.3 (95% CI, 5.6 to 11.1), with 93% of the students

Table 3. Return-to-School Strategy.*

Step No. and Activity	Example	Goal
1. Daily activities that do not result in more than mild exacerbation of symptoms related to the concussion	Typical activities during the day (e.g., reading) while minimizing screen time; start with 5–15 min at a time and increase gradually	Gradual return to typical activities
2. School activities	Homework, reading, or other cognitive activities outside the classroom	Increased tolerance to cognitive work
3. Return to school part-time	Gradual introduction of schoolwork; may need to start with a partial school day or with greater access to rest breaks during the day	Increase in academic activities
4. Return to school full-time	Gradually progress in school activities until a full day can be tolerated without more than mild exacerbation of symptoms	Return to full academic activities and catching up on missed work

* After an initial period of relative rest (24 to 48 hours after an injury at step 1), athletes can begin a gradual and incremental increase in their cognitive load. Progression through the strategy for students should be slowed when more than mild and brief exacerbation of symptoms occurs. Mild exacerbation of symptoms is defined as an increase of no more than 2 points (scale, 0 [no symptoms] to 10 [worst symptoms imaginable]) for less than 1 hour as compared with the baseline value reported before cognitive activity.

in school by 10 days without new academic supports.[42] Unrestricted return to sport is typically accomplished within 1 month after concussion but only after full school reintegration, especially for sports that involve risks of contact, collision, or fall.[46]

Blood biomarkers (e.g., glial fibrillar acidic protein and total tau) for aiding in making a diagnosis of concussion are under investigation but are not ready for clinical use. Results of imaging studies (e.g., functional MRI and arterial spin labeling) may remain abnormal for months after signs and symptoms have resolved and are presently used as research tools only.[47] A buffer zone of a gradual increase in activity before an unrestricted return to sport is therefore recommended (Table 4).[46] This approach includes physical activity (e.g., walking) and controlled aerobic exercise (e.g., stationary cycling or jogging outdoors) as early therapeutic stages to prepare athletes for sport-specific drills and contact. In a recent prospective observational study[48] involving 1751 collegiate athletes with concussion (mean age, 19.2 years; 63% of whom were male), participants began the return-to-play protocol within a median of 6.4 days (interquartile range, 3.7 to 11.8) after the concussion and spent a median of 12.8 days (interquartile range, 8.7 to 20.1) in the protocol, yet it was not until 1 month after injury that most participants (85%) were cleared for unrestricted sport participation.

AREAS OF UNCERTAINTY

The establishment of objective biomarkers to diagnose concussion and establish recovery is important given that the signs and symptoms of concussion can be subtle and nonspecific and that most conventional diagnostic tools have limited sensitivity.[49] Large prospective cohort studies are needed to investigate persisting symptoms of concussion with the use of a common set of tests and measures and to determine the incidence of long-term cardiovascular and neurodegenerative diseases such as chronic traumatic encephalopathy (CTE). Some studies involving former professional athletes suggest an increased risk of dementia, not necessarily from concussions but from the cumulative burden of repetitive impacts to the head.[50] This observation needs to be confirmed in higher-quality prospective cohort studies that better control for confounding factors. Evidence-based strategies to facilitate return to school and validation of the SCOAT tools await prospective trials.

GUIDELINES

Table 5 compares various current guidelines about concussion and mild TBI occurring in nonmilitary contexts. The assessment and management of concussion and mild TBI is generally consistent among them. The recommendations in this article are concordant with the guidelines from

Table 4. Return-to-Sport Strategy.*

Step No. and Exercise Strategy	Activity	Goal
1. Symptom-limited activity	Daily activities that do not more than mildly and briefly exacerbate concussion symptoms (e.g., walking)	Gradual reintroduction to work or school
2. Aerobic exercise†	Stationary cycling or walking at a slow-to-medium pace; may start light resistance training that does not result in more than mild and brief exacerbation of concussion symptoms	Increased heart rate
3. Individual sport-specific exercise‡	Sport-specific training away from the team environment (e.g., running or change-of-direction or individual training drills away from the team environment); no activities that risk impact to the head	Addition of movement and change of direction
4. Noncontact training drills	Exercise to high intensity, including more-challenging drills (e.g., passing drills and multiplayer training) that can integrate the athlete into a team environment	Resumption of usual intensity of exercise and coordination and increased thinking
5. Full-contact practice	Participate in normal training activities	Restoration of confidence and assessment of functional skills by coaching staff
6. Return to sport	Normal game play	—

* Mild and brief exacerbation of concussion symptoms is defined as an increase of no more than 2 points on a scale ranging from 0 points (no symptoms) to 10 points (worst symptoms imaginable) for less than 1 hour as compared with the baseline value reported. Athletes may begin step 1 (symptom-limited activity) within 24 hours after the injury, with progression through each subsequent step typically taking a minimum of 24 hours. If more than mild exacerbation of concussion symptoms (>2 points) occurs during steps 1, 2, and 3, the athlete should stop and attempt to exercise the next day. Steps 4, 5, and 6 should begin after the resolution of any symptoms or abnormalities in cognitive function, including with and after physical exertion. Athletes who have concussion-related symptoms during step 4, 5, or 6 should return to step 3 to establish full resolution of symptoms with exertion before engaging in an at-risk activity. Written determination of readiness to return to sport should be provided by a health care provider before unrestricted return to sport, as directed by local laws and sporting regulations.

† Aerobic exercise in step 2 has two stages: light exercise (defined as approximately ≤55% of the maximum heart rate) and moderate exercise (approximately ≤70% of the maximum heart rate). The predicted maximal heart rate (in beats per minute) according to age is used (i.e., 220 minus patient age).

‡ If sport-specific training involves any risk of inadvertent impact to the head, medical clearance should occur before step 3.

the Sixth International Conference on Concussion in Sport.[2]

CONCLUSIONS AND RECOMMENDATIONS

The soccer player in the case vignette fulfills diagnostic criteria for concussion or mild TBI on the basis of a plausible mechanism of injury, immediate signs ("wobbly" gait), current symptoms, and clinical signs (oculomotor and vestibular impairments). Her 5P score of 10 (on a scale from 0 to 12)[19] and her cervical injury[22] raise her risk of persisting symptoms. I would treat the cervical injury immediately with physical therapy to reduce the risk of delayed recovery.[22] Oculomotor and vestibular impairments can cause or contribute to many of her symptoms (cognitive intolerance, headache, nausea, and dizziness) and, combined with her poor sleep and physical inactivity, raise her risk of delayed recovery.

I would encourage a return to school, even while symptoms are present, and would provide a letter outlining supportive measures, including more time for assignments, rest breaks, and a recommendation that tests be postponed until her recovery. I would recommend good sleep hygiene and a return to light physical activities (e.g., walking and activities of daily living) and cognitive activities (e.g., reading with scheduled breaks) while avoiding activities that more than mildly increase symptoms (e.g., video games). For exercise, I would prescribe daily walking or stationary cycling at 50% of her age-predicted maximum heart rate, with each session continued until her symptoms increase more than mildly. I would endorse a return to gym class to perform aerobic exercise with an avoidance of team or contact sports. I would have her follow up with me weekly until her concussion symptoms resolve. I would endorse a return to unrestricted contact sport only after she completed the Amsterdam return-to-sport strategy program (i.e., graduated symptom-limited activity until resolution of symptoms at high exercise intensity, with tailoring to the relative contact nature of the sport) without a return of concussion symptoms.[46] Finally, I would educate the patient and her parent that current evidence does not support a greater risk of neurologic diseases (e.g., CTE) among former amateur athletes after exposure to a single concussion or repetitive impacts to the head.[50]

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Table 5. Practice Guidelines for Concussion or Mild Traumatic Brain Injury in Civilians.*

Variable	Guideline Reference (Level or Strength of Evidence)		
	Ontario Neurotrauma Foundation†	CDC‡	Sixth International Conference on Concussion in Sport§
Prompt diagnostic evaluation	Section 1.4 (B)	Consistent	Page 699
No routine neuroimaging	Section 2.1c (A)	Sections 1A, 1B, and 2 (B)	Consistent
No clinical use of serum biomarkers	Consistent	Section 6 (R)	Page 702
Use validated symptom scales for initial assessment and to track recovery	Section 2.1a (B)	Sections 5A and 10B (B)	Page 702
Perform a comprehensive physical examination	Section 2.1b (B)	Consistent	Pages 700–701
Note common modifiers that may delay recovery and use a clinical risk score to predict risk of prolonged symptoms	Section 2.2 (A)	Section 9B (C)	Pages 701–702; modifiers but no risk score
Early education for patient and family members	Sections 2.2 and 2.10 (B)	Sections 7A and 7B (B) and 12 (A)	Consistent
Recommendation for an initial 24–48 hr of rest	Section 2.3a (A); relative rest	Section 13A (B); strict rest	Page 701; relative rest
Guidance on gradual stepwise return to preinjury activities	Section 2.3b (A: physical activity; B: cognitive activity)	Sections 13B, 13C, 13D (B)	Pages 703–704
Prescribe physical activity and aerobic exercise early after injury to facilitate recovery and reduce the incidence of symptoms persisting for >4 wk	Section 2.3b (A)	Section 13C (B)	Page 701
Return-to-school protocols should be customized based on the severity of postconcussion symptoms.	Section 12.1 (B)	Section 15B (B)	Consistent
Referral to specialists or higher level of care for patients with symptoms persisting for >4 wk	Section 2.3d (A)	Sections 11B and 15F (B)	Page 701

* Information that is consistent with but not explicitly recommended in the guideline or statement is noted as such. Definitions for levels of evidence or strength of the recommendations are provided below for the various guideline references.

† Adapted from the Ontario Neurotrauma Foundation.[51] Levels of evidence are defined as follows: A indicates consistent, good-quality evidence (e.g., from a randomized, controlled trial; meta-analysis; or large, high-quality, multicenter cohort study), B lower-quality evidence (e.g., from small cohort studies, case studies, or controlled trials with limitations), and C consensus or opinion.

‡ Adapted from the Centers for Disease Control and Prevention (CDC).[52] The strength of the recommendations is defined as follows: A indicates that the recommendation should almost always be followed, B that it should usually be followed, C that it may sometimes be followed, and R that the intervention generally should not be done outside a research setting.

§ Adapted from the Sixth International Conference on Concussion in Sport.[2] Information about levels of evidence or the strength of the recommendations is not applicable.

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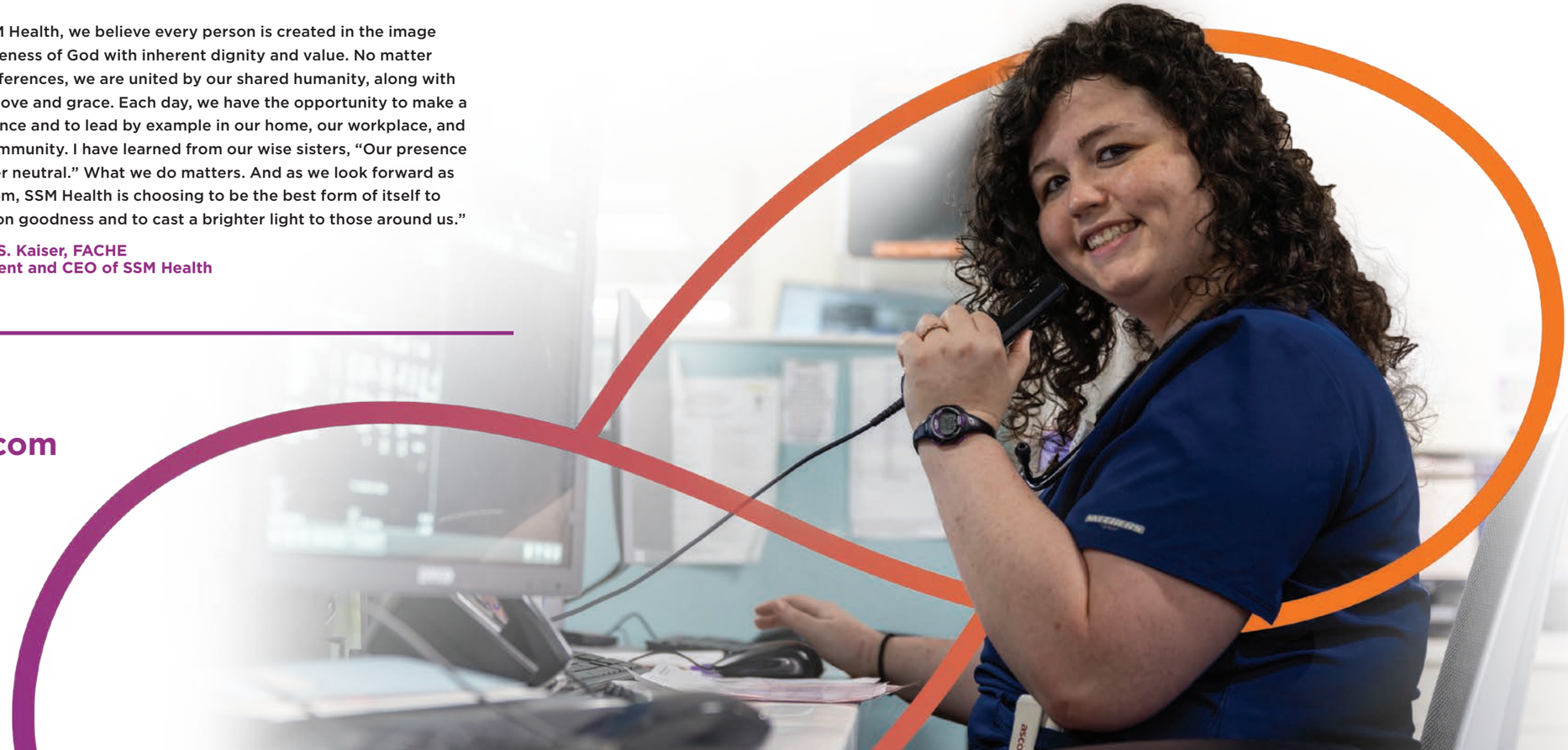

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Dalton, MD 01622 ..... = 3 words

As a further example, here is a typical ad and how the pricing for each insertion is calculated:

MEDICAL DIRECTOR — A dynamic, growth-oriented home health care company is looking for a full-time Medical Director in greater New York. Ideal candidate should be board certified in internal medicine with subspecialties in oncology or gastroenterology. Willing to visit patients at home. Good verbal and written skills required. Attractive salary and benefits. Send CV to: E-mail address.

This advertisement is 56 words. At $11.20 per word, it equals $627.20. This ad would be placed under the Chiefs/Directors/ Department Heads classification.

Classified Ads Online

Advertisers may choose to have their classified line and display advertisements placed on NEJM CareerCenter for a fee. The web fee for line ads is $140.00 per issue per advertisement and $240.00 per issue per advertisement for display ads. The ads will run online two weeks prior to their appearance in print and one week after. For online-only recruitment advertising, please visit nejmcareercenter.org for more information, or call 1-800-635-6991.

Policy on Recruitment Ads

All advertisements for employment must be non-discriminatory and comply with all applicable laws and regulations. Ads that discriminate against applicants based on sex, age, race, religion, marital status or physical handicap will not be accepted. Although the *New England Journal of Medicine* believes the classified advertisements published within these pages to be from reputable sources, NEJM does not investigate the offers made and assumes no responsibility concerning them. NEJM strives for complete accuracy when entering classified advertisements; however, NEJM cannot accept responsibility for typographical errors should they occur.

Classified Ad Deadlines

Issue	Closing Date
April 24	April 4
May 1	April 11
May 8	April 17
May 15/22	April 25

Gastroenterology

GASTROENTEROLOGIST — Looking for a board eligible/board certified gastroenterologist to join a well-established, successful, single specialty 6 physician group which has a physician owned endoscopy center and looking to expand; Located in Massachusetts, 30 minutes outside of Boston. Reasonable call schedule at one hospital. Very friendly working environment! EUS preferred but not required. Contact: MPhillips@ssubgastro.com

Hematology-Oncology

SSM HEALTH CARE GROUP, D/B/A SLUCARE PHYSICIAN GROUP — Is seeking multiple full-time Physicians (Hematology/Oncology) in St. Louis, Missouri, to Diagnose cancer through tests including magnetic resonance imaging (or MRI), computed tomography (or CT) scans, or biopsies; Evaluate and prepare cancer treatment plans, which may include radiation, chemotherapy, hormone therapy and/or surgery; and Inform patients about the treatment options available for their cancer. Contact Christine Coleman, Legal Counsel Manager, Employment, 12800 Corporate Hill, St. Louis, MO 63131, Christine.Coleman@ssmhealth.com

Hospitalist

PHYSICIAN (HOSPITALIST) — Full-time position working for Lifespan Physician Group, Inc., d/b/a Brown Health Medical Group, based at Rhode Island Hospital in Providence, RI. May also provide Hospitalist services at The Miriam Hospital in Providence, RI. Day, semi-nocturnist, and nocturnist shifts available. Requirements include medical degree, Board Eligibility in Internal Medicine or Family Medicine, and eligibility for a RI medical license. If interested, apply on-line at: https://www.brownhealth.org/about/careers by searching job number #61999.

Psychiatry

LICENSED INDEPENDENT CLINICAL SOCIAL WORKER/CLINICIAN — Full-time position providing services at Emma Pendleton Bradley Hospital, 1011 Veterans Memorial Parkway, East Providence, RI. Under the general supervision of the Clinical Director/Unit Chief provides comprehensive clinical services as part of a multidisciplinary team. This includes the evaluation and treatment of patients presenting with a wide range of psychiatric and physical/environmental stressors using a full range of psychiatric therapeutic interventions, including evaluations, and individual, family, and group psychotherapy. Requires a Master's Degree in Psychology, Social Work, Mental Health Counseling, or Marriage and Family Therapy; two years' experience as a licensed Independent Clinical Social Worker, licensed Mental Health Counselor, or licensed Marriage and Family Therapist providing individual, group, and family therapy for children and families with psychosocial and/or psychiatric issues; and eligibility for a Rhode Island professional license as a licensed Independent Social Worker, licensed Mental Health Counselor, or a Licensed Marriage and Family Therapist. Salary range offered for this position is $66,397–$109,529 per year. If interested, please; https://jobs.brownhealth.org/ requisition #70456.

NEJMCareerCenter.org

Stony Brook Medicine
Stony Brook Community Medical Group, PC

Electrophysiologist

North Suffolk Cardiology is seeking an electrophysiologist to join their rapidly growing practice. Excellent compensation package.

North Suffolk Cardiology (NSC), an affiliate of Stony Brook University Hospital, is a full-service, outpatient, cardiology physician practice, offering a wide range of expertise in cardiovascular health and wellness. North Suffolk Cardiology has four office locations that span the north Suffolk region of Long Island, and fourteen highly specialized, well-trained physicians and 11 advanced practice providers who see over 40,000 patient visits per year - making NSC the largest cardiology physician practice on the north shore.

NSC provides comprehensive cardiovascular care by using state-of-the-art technology in PET/CT, SPECT, echo/ vascular ultrasound services, as well as education in nutrition and lifestyle management to promote proper cardiovascular health. NSC offers interventional procedures to treat coronary artery disease, heart valve disorders, and other heart conditions, and also houses a device clinic that offers holter and event monitoring for patients with heart rhythm disorders. Intensive cardiac rehab services are also offered on-site for patients who are rehabilitating after a experiencing significant cardiac event and procedure.

Apply at: **https://www.appone.com/MainInfoReq.asp?R_ID=6686879**

Stony Brook Medicine
Stony Brook Community Medical Group, PC

North Suffolk Cardiology is seeking an interventional cardiologist to join their rapidly growing practice. The ideal candidate is BE/BC in cardiology and interventional cardiology, with echocardiography and RPVI certification a plus. Candidate should be proficient in the interventional treatment of all facets of coronary artery disease, including complex coronary intervention. Additional expertise in structural heart disease and peripheral vascular disease, while attractive, is not mandatory. All procedures are performed out of one location, Stony Brook University Hospital. There is no responsibility for acute STEMI call with this position. Excellent compensation package commensurate with experience.

North Suffolk Cardiology (NSC), an affiliate of Stony Brook University Hospital, is a full-service, outpatient, cardiology physician practice, offering a wide range of expertise in cardiovascular health and wellness.

North Suffolk Cardiology has four office locations that span the northern Suffolk county region of Long Island, and thirteen highly specialized, well-trained physicians and eleven advanced practice providers who see over 40,000 patient visits per year - making NSC the largest cardiology physician practice on the north shore.

NSC provides comprehensive cardiovascular care by using state-of-the-art technology, including PET/CT, SPECT, echo/ vascular ultrasound services, as well as education in nutrition and lifestyle management to promote proper cardiovascular health. NSC offers the full complement of interventional and non-invasive and invasive electrophysiologic services. Intensive cardiac rehab services are also offered on-site.

Salary range is 458,000-750,000

Apply at: **https://www.appone.com/MainInfoReq.asp?R_ID=6678224**

NEJMCareerCenter.org

Connect. Inspire. Belong.

The heart of SSM Health's advanced integrated system lies in our Primary Care ministry. Our healing presence can be felt throughout every community we serve and within each life we touch. At SSM Health, it's our calling to be where we're needed and to support the physicians on whom on our patients depend.

"SSM Health offers the unique opportunity to build a thriving, community-focused practice with the full support of a large health system. With its size, resources, and capabilities, SSM Health helps their clinicians be successful in their practices. Here, I'm able to make a meaningful difference in the lives of my patients but I also get to participate in larger systemwide initiatives and pursue other professional passions like teaching medical students. It's truly the best of both worlds."

Nelson Wong, MD
Family Medicine
SSM Health Medical Group in Mount Vernon, Ill

With great salaries, comprehensive benefits, and unrivaled practice support, SSM Health is helping Primary Care clinicians reconnect with what matters most to them — professionally and personally.

Join SSM Health and experience medicine the way it should always be.

Together – We Care.
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