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Diagnostic landmines — Part 2

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The second in a two-part series, this issue will discuss diagnostic landmines in the area of pediatric rehabilitation medicine — potentially serious conditions that, on the surface, may appear to have simple, straightforward diagnoses. Lack of appropriate treatment, or delay in treatment in these cases may lead to less-than-desirable, or even detrimental outcomes. Treatment at an early age often improves long-term outcomes. Conditions experienced early in life may affect the child's ability to explore and respond to their environment. That can have implications for development.

Following are a few tips to help the primary care provider step around these landmines when treating children and adolescents.

1. Habitual toe walking — Think of developmental/ behavioral concerns

Toe walking in young school-age children can have a variety of causes. If passive dorsiflexion of the foot results in ankle clonus (rapid, rhythmic contractions of the calf muscles), spasticity is present, and it is likely that the child has a form of cerebral palsy. There is no spasticity present with idiopathic toe walking.

In children without spasticity, some toe walking is normal up to 3 years of age. If it continues past that age, it usually resolves by age 6 or 7. In approximately 50 percent of idiopathic toe walkers, the condition is hereditary (more likely in males than females) and is not associated with any other problems. Most of these children outgrow their toe walking, although, because it is habitual, some may not. (In cases where idiopathic toe walking leads to detrimental muscle contractures and inflexibility, the child may benefit from the use of orthoses, possibly coupled with Botox® injections to relax the muscles and inhibit toe walking.)

In the other 50 percent of idiopathic toe walkers, the condition is associated with attention deficit disorder, developmental disability, learning disabilities such as dyslexia, or a form of autism. In some cases, these underlying difficulties may be obvious. In other children, however, they may have gone undiagnosed. When toe walking is present in a child who also exhibits difficulties with attention, behavior or cognition, a developmental assessment and an assessment for learning difficulties are indicated. Early intervention can help improve overall outcomes for the child.

2. Behavioral changes after concussion — Think mild TBI

After a mild concussion, students often return to school and sports with relative ease after a brief period of recovery. However, mild concussion can result in more prolonged symptoms in some cases. If a student has a change in behavior in the weeks or months following the concussion, a neuropsychological evaluation may be indicated. These changes may include: having a harder time academically; avoiding homework; and hanging out with a different crowd — particularly with kids who are less academically inclined and prone to behavior problems.

It may be that the student has residual cognitive deficits as the result of a mild traumatic brain injury that make it harder to understand and do school work. As a result, they may drift toward others who do less well in school in order to fit in, while avoiding homework and other activities that have become more difficult.

While the sequelae of mild TBI generally resolve with time, the behavioral patterns that a student develops in the interim may be difficult to counteract once begun. Early evaluation and appropriate interventions may help prevent the development of a negative behavioral cycle. (See table 1 for diagnostic criteria for traumatic brain injury.)

Table 1
Diagnostic Criteria for Traumatic Brain Injury

Various studies over the years have resulted in the development of criteria for diagnosing traumatic brain injury (TBI). However, care providers and families should be aware that even children diagnosed with “mild” TBI (often called minor head injury or post-concussive syndrome) may experience subtle changes in cognitive ability and behavior. These changes are often misinterpreted as deliberate negative behavior. Changes in behavior after a concussion may be a warning sign that mild TBI has occurred and neuropsychological evaluation may be indicated.

Mild	Moderate	Severe
<i>Loss of consciousness</i> none or < 30 min.	30 min.–24 hrs.	> 24 hrs.
<i>Post-traumatic amnesia</i> none or < 1 hr.	1–24 hrs.	> 24 hrs.
<i>Alteration of mental state at the time of accident</i> may/ may not be present	yes	yes
<i>Focal neurologic deficit(s)</i> may/ may not be present	yes	yes
<i>Glasgow Coma Scale</i> 13–15	9–12	3–8

3. Congenital torticollis — Think of the hip

Congenital torticollis is typically associated with a fibrous tumor in the sternocleidomastoid muscle that is present at birth and may either subside on its own, or lead to increasing contracture of the muscle. Torticollis may also be the result of spasticity associated with cerebral palsy.

There are times, however, when torticollis is associated with hip subluxation or dislocation in a newborn or young child. A thorough hip exam and hip X-ray, or ultrasound for children under 4-6 months of age, will help rule out this cause. (See “Diagnostic Landmines — Part 1” in the

Nov./Dec. issue of *A Pediatric Perspective* for information on the Ortolani and Barlow physical examination maneuvers to check for the presence of hip dysplasia.)

4. Strong, early hand dominance — Think hemiparesis

If a child exhibits a strong hand preference before the age of two, hemiparesis ought to be considered. Most children do not show strong hand dominance before age 4 or later. If early dominance is present, examine the child for weakness in the opposite side. Is the leg on that side a little weaker than the other? Does the child walk with an asymmetrical gait? If the child's hand on the non-dominant side is fisted, muscle stiffness associated with cerebral palsy may be the cause. Or, if the non-dominant arm and hand are hanging in a relaxed (perhaps even limp) fashion, and the child is otherwise undiagnosed, you may be looking at a brachial plexus injury, also known as Erb palsy. Asymmetric growth may also be an indicating factor (see number 6 below).

5. Language delay — Think of hearing impairment

When a child presents with a language delay, or seems inattentive, developmental delay may be suspected. However, even if a child's hearing ability has not been questioned in the past, hearing impairment should also be considered with any language delay.

Children with very mild hearing loss may have a mild speech and language delay, miss voiceless consonants, or be inattentive. More significant loss may result in missing unstressed words in conversation, limited vocabulary, and omitted or distorted sounds of speech.

An assessment by an audiologist experienced in working with young children is essential to define any possible hearing problem. Chronic ear infections resulting in fluid in the middle ear can cause conductive hearing problems. There are a number of disorders that can result in sensorineural hearing impairment, including genetic causes.

6. Asymmetric growth — Think of neurologic causes

Asymmetric growth may be an indication of a neurologic impairment. Children with a mild hemiparesis may show a slower rate of growth on the affected side; those with brachial plexus injury may show slower growth of the affected arm. Asymmetry of limb growth may also be due to overgrowth caused by inflammation and increased blood flow, such as with chronic joint inflammation.

Injury to a child's growth plates, either as the result of infection or trauma, can also result in a decreased growth rate. If asymmetry of growth is detected, rule out a previously undiagnosed neurologic or inflammatory problem.

7. Delayed toilet training — There may be a neurologic reason

A child with a neurologic disorder may have a neurologic reason for delayed toilet training. This is well recognized in myelomeningocele, where it is anticipated that children will have lower motor-neuron impairment of bladder function. However, neurologic reasons for delay in toilet training are less frequently thought of in relation to cerebral palsy, but can occur.

This may be related to hyperreflexia of the detrusor or bladder muscle, or urinary sphincter, but depending on the type of CP, may also relate to lower motor-neuron type injury as well. Incontinence is, in fact, an issue across the life span for many people with CP. Pushing children

with these neurologic difficulties to toilet train may only lead to increasing frustration for both the parent/caregiver and child.

The good news is that, in most cases, continence can be achieved with the help of medications, toileting programs and time. When a child with CP is having difficulty with continence well beyond the typical toilet training years, the primary care provider may want to refer the patient to a pediatric physiatrist for intervention and treatment.

8. Lack of self-care in spina bifida patients — There may be neurologic causes

When giving spina bifida patients instructions on self-care — including bladder and bowel management, pressure relief and skin care to maintain skin integrity, as well as wound care — they typically appear to have no problem understanding what it is they need to do. And they are usually able to repeat the instructions with seemingly capable comprehension. However, in many cases, follow-through simply does not happen. In fact, it is not unusual for unattended pressure sores and lack of wound care to lead to the need for amputation.

This can be true even with patients who are otherwise able to function successfully in society — from parenting to succeeding in the workplace to being active members of the community. In younger patients, such as teenagers, parents may become frustrated that their child is simply apathetic or lazy when it comes to self-care. Studies have shown, however, that despite their apparent understanding, patients with spina bifida often have cognitive deficits that impair their ability to follow through on life management and independent living skills.

For this reason, care providers should monitor these patients closely. Wounds should be treated aggressively to avoid complications and help prevent amputations, and bowel and bladder management, as well as other self-care skills should be closely followed. Some patients may require regular assistance, such as by a personal care attendant.

9. Spina bifida and hydrocephalus — Consider cognitive deficits

Children with spina bifida who have had hydrocephalus may not only have deficits in motor control and sensation below the “site of lesion” but may have additional difficulties that are not readily apparent based on physical examination alone. These might include difficulties with eye-hand coordination as well as problems with math and reading skills. It is crucial to the overall well-being of these patients that they receive the academic assessment and help they need, including an individual education plan, therapy services, etc.

10. Patients with neurologic conditions — Don’t forget the teeth

Patients with some neurologic conditions have tongue thrusting and poor oral motor skills that contribute to malalignment of their teeth and poor maintenance of dentition (gingival hypertrophy, bruxism (clutching and grinding of the teeth) and/or drooling). Patients who breathe through their mouth may have more dental caries if their mouth remains dry.

Early dental examination, care and regular follow-up are therefore important when a child has a neurologic condition that may compromise dentition. Delays in appropriate dental care may lead to dental caries and/or other dental pathology that might otherwise be avoided.

A note on oncology patients: Patients who receive radiation therapy to their face and neck may have trouble healing after dental surgery later on. Therefore, comprehensive dental care before radiation starts is recommended if at all possible.