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By Bruce H Dobkin

The Receptionist's note about my next patient read, "Rear-ended 2 months ago – whiplash. Headaches, irritable, not herself. Referred by boss". Terrific, I thought. A straight forward whiplash injury, not another university medical centre second-opinion case with a four-inch stack of records. The impact of the collision had probably stretched and twisted the woman's neck muscles as well as ligaments and joints along the spine. Proper physical therapy mixed, if

again, "Are you okay?"

She rolled down her window. "I will be," she answered. But she wanted to sleep.

Nancy pulled over and waited, unsure about what should happen next. After a while a highway patrol officer came by, asked how she felt, and asked to see her license and registration. She thought about

an **INSULT** to the brain

needed, with a bit of medication would melt away the tender and sprained areas and the headache pain they transmit. Then I made out the less legible words that followed: "No mental agility." Maybe I had jumped the gun.

Nancy turned her head and shoulders at the same time, like a statue rotating on a lazy Susan, as she explained what had happened. She had pulled onto the freeway at rush hour and stayed in the outside lane, where a heavy line of traffic was moving at about 30 miles an hour. A few minutes later, the car in front of her braked to a stop. As Nancy slowed to a halt, she glanced in her rearview mirror and saw a pickup truck bearing down on her. She clutched the steering wheel and the truck slammed into her, throwing her body forward and back. She remembered crying out "Oh, no" as she careered into the car ahead. After that jolt, she was hit again from behind and again lurched forward against her seat belt and back.

Moments later someone knocked on her windshield and asked if she was okay. Nancy looked into her rearview mirror, which now tilted toward her awkwardly. The nose and mouth it reflected seemed unfamiliar. Her foot brushed against a coffee mug holder with a sandbag bottom. It must have fallen off the console, she thought. She gradually connected the holder with the collision, then heard someone ask

what he had said. He explained, for the second time, that he needed her license and registration for his report; then he asked which lane she had been in. A picture drawn by her six-year-old niece came to mind: a red bus on a single lane surrounded by green hills. "If the fast lane is number one, which one were you in?" he asked softly. She looked at him as if he had posed an impossibly difficult mathematical problem. He repeated the question. She studied the traffic that dribbled past, deliberately counted the lanes, and answered "four." Because she had been so slow to respond, the officer called an ambulance.

When the paramedics finally arrived, they checked her blood pressure, asked her the date and the name of the governor, and flashed a light into her eyes. No apparent injuries, they said, but her muscles might feel real stiff tomorrow. Nancy thanked them, then took a look around her car. The headlights were cracked and the trunk was sprung open. She tied the trunk shut with a wire clothes hanger, drove home, threw the mail on her bed, and flopped on her back.

Spasms slowly gripped her spine and neck as she replayed the accident in her mind. Although she tried to remember the details clearly, the images bounced around as if she were dreaming. When her

husband came home and heard her story, he decided her thinking was slow. Despite Nancy's protest that she hadn't hit her head or lost consciousness, he took her to a nearby emergency room. The doctor took X-rays of her sore neck, which turned out to be normal, and gave her pain medication, a muscle relaxant, and a foam-rubber collar for neck support. She guessed that Nancy would be better within a week.

Although the soreness in her neck and shoulders began to fade over the next two months, an almost constant dull headache persisted. Nancy traced the source of the pain by running both hands from her brows over her head and resting them on her neck. I noticed that to prevent pain when she moved, she held her neck as rigidly as she possibly could. And she slept poorly, she said, because her neck hurt when it twisted on the pillow. At night she often found herself mulling over the despair that had crept into her waking hours.

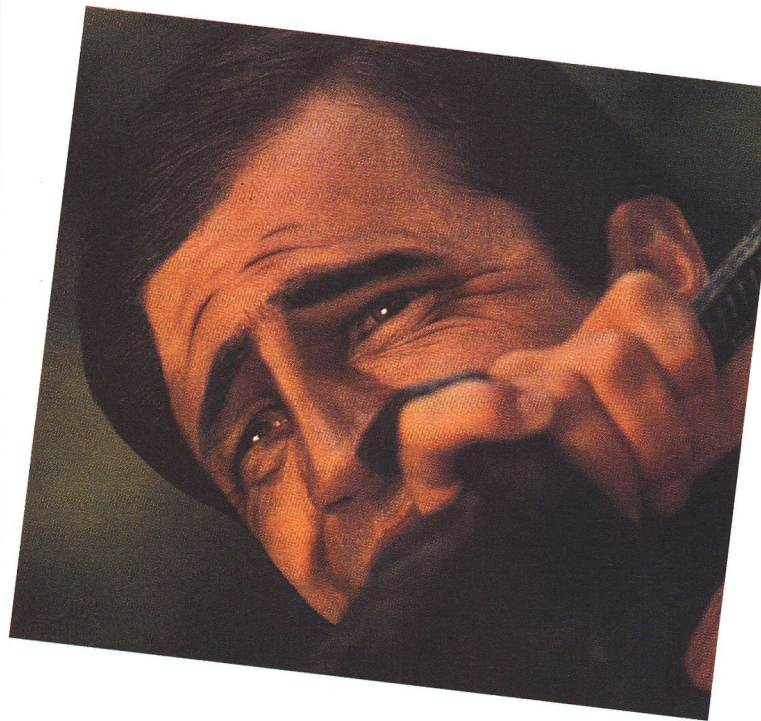
"I can't seem to do things automatically anymore," she said. "I mean, I'm incompetent, like someone on the first day of a new job."

When I asked for some examples, Nancy told me how she ordinarily set a quick pace, handling a stream of daily meetings, presentations, memos, and phone calls. She had also recently been assigned the difficult task of organising the layoffs of nearly 50 white-collar employees. Since the accident, however, she almost always lost track of what she was doing if a colleague or phone call interrupted her. She snapped at anyone who sought her failing attention. If she did not keep notes during a conversation or meeting, she forgot key details. Yet she could not write while someone spoke and still keep up with what was being said.

"What is wrong with me?" she pleaded tearfully. "Before the accident I'd get tension headaches, but they didn't interfere with my work."

I handed Nancy a box of tissues and examined her. Her neck and shoulder girdle muscles felt tight, and pressure over several tender areas just below the back of the skull caused pain in her temples. But her strength, balance, memory, language skills, and judgement tested normal, and she was very bright and perceptive. Still, from what she had told me, she would fall apart when tasks competed for her attention. This co-ordination – one of the highest

Remember when he was ace of clubs?



Then someone better came along...



functions of the human brain – is orchestrated by the frontal lobes, and pain, poor sleep, and depression can overwhelm the complex mechanisms for concentrating and shifting attention. But something more seemed to be going on here.

I upped the ante in my testing to see if I could bring out the impairment. I asked Nancy to add a series of single digits two at a time, adding the second to the first, the third to the second, and so on. I gave her the series 8,6,9,3,5. She added the first two, which equalled 14, and correctly added the 9 to the preceding 6, which equalled 15. But then she stumbled by adding the 3 to 15 instead of the preceding 9 and the 5 to the sum 18, instead of to the 3. When I corrected her, she added only the first two sums correctly and couldn't work the rest of the sequence.

Nancy's slowed responses and the dazed, dreamlike state she described following the accident reminded me of someone with a concussion from a minor head injury. In Nancy's case, I suspected the violent front and rear jolts had sheared and stretched the delicate, gelatinous tissue of her brain. The frontal lobes might even have whacked against the bony skull, creating scattered microscopic tears in some of the connections between neurons, the cells that transmit messages in the brain. When trauma like this occurs, some of the long nerve fibres that carry signals ball up and retract, and chemical messengers that enable neurons to communicate with one another get dislodged, interfering with the smooth commerce of cognitive messages.

Although the amount of the tissue damaged was probably slight, any injury to the brain can have dramatic consequences on thinking. I asked why she had not gone back to a doctor before seeing me.

"It was just a whiplash, I kept telling myself. I didn't want to take off a lot of time just for some headaches."

I explained that it was still worthwhile to try physical therapy for her neck and added that an antidepressant at night might help her sleep and feel less blue. I suggested that she try to limit the demands on her at work. She could hold the line on getting caught up in multiple tasks, tape-record important meetings and later make notes, and take time to rehearse what she wanted to say at

meetings. I sent a note to her boss explaining her limitations and asking for his co-operation for a few months. I also arranged for a magnetic resonance imaging scan of Nancy's brain to reassure her that no unsuspected complications was interfering with her gradual recovery.

As she left, Nancy shook my hand and said, "Thanks for letting me know that I'm not going crazy."

Three weeks later the headaches were gone. Nancy moved more fluidly and she could sleep through the night. But she still felt frightened and vulnerable.

"All along," she began, "I've kept up hope I'd be myself again. But it's just so grim not to be able to gracefully fit things together. It's even worse when my friends and co-workers tell me I look and sound fine. They say, 'Work harder and you'll get past it.' Sure, I'm not in a cast or paralysed or scarred or suddenly stupid. But I'm not fine. And it hurts that people – I mean, even my husband doubts me."

If an injury can't be seen, it's easy to toss away the idea that anything's really wrong. Even doctors can slip into disbelief about the symptoms patients describe after a seemingly minor head, neck, or back injury. As long ago as the 1870s, when the first laws compensating employees for work-related injuries were passed, German and English doctors came up with the term "accident neurosis" to describe the condition of patients who had sustained apparently minor injuries but continued to have symptoms. And today, personal-injury lawyers and health care practitioners of every bent argue over whether some patients are malingerers out for a buck, or just worried, well meaning people who exaggerate their symptoms.

In Nancy's case we could not point to physical evidence of a brain injury. No patches of bleeding, swelling, or other damage had shown up on her MRI scan. Even if she had cracked her skull against the windshield, the microscopic source of her problems might have been difficult to document. While the biological basis for Nancy's cognitive symptoms could not be explained in precise physical detail, what she said was enough for me to recognise that parts of her brain – and life – were still in disarray. Although relieved that the pain was now gone, Nancy went on to explain what had happened the previous week-end when she tried to run a few errands. She had drawn up a shopping list and

made a note to get gas and pick up clothes at the dry cleaner. But while she was driving, she couldn't decide which errand to do first. If she went to the market, her frozen foods might melt while she waited at the gas station and cleaner. On the other hand, the market would be crowded if she didn't get there by 10 a.m. She could go to the cleaner, but it was a bit out of the way, and her gas gauge read close to empty. A fill-up, though, often took a while, because her car leaked oil and that had to be checked. But then, the lines at the market were terrible on Saturdays ... Bewildered, she pulled over and cried. This executive with an MBA could no longer set priorities for even a simple list of errands.

"I know the stuff is in here," she said, tapping her head, "but I'm so afraid that the loose connections will never mend." I reminded her that they can and do when the damage, like hers, is limited. And I silently hoped that time would soon restore her brain's intricate electrical and chemical signaling processes to normal. The repair was overdue; most people recover within 6 to 12 weeks.

I tried a higher dose of the antidepressant drug but stopped it after two weeks when it didn't seem to help. I decided to ask Nancy's husband to be more supportive. As it turned out, her boss understood her problem a lot better than her husband did. He told Nancy he had suffered a slight concussion while playing rugby in college, and for two months his concentration and memory were so poor that he barely passed his courses. So he gave Nancy what he wished his teachers had given him: he let her take on one assignment at a time, and he scheduled a weekly session with a rehabilitation therapist to help her organize her work load.

By the fourth month after the accident, Nancy told me about several mornings when her energy was high and she could concentrate on whatever was thrown at her. She zipped through the addition test that had stumped her before. By six months, the deep fear that she might never recover gave way to the pleasure of handling most of the demands she faced.

In the eighth month Nancy declared herself recovered. "I feel light and clear again," she told me. "It's as though my mind has finally pulled out of that surreal line of slow-moving traffic."

Remember when she couldn't be faulted?



Then someone better came along...

