

## Report from the International Whiplash Conference in Bristol

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Numb from jetlag and a long night in the air, although mercifully riding in business class, I shuffled past a long crowd of bored chauffeur drivers holding the names of their prospective clients scrawled on various scraps of paper. "I'm Dr. Croft," I said to the man holding my sign, relieved to see things were working out so far.

As we stood waiting for the elevator, he asked, "Have you heard about (Princess) Diana? She was killed last night." We were standing in London's Heathrow airport. He handed me the daily paper.

News of the tragedy, of course, dominated the radio waves during the two hour ride to Bristol, with commentators carefully mixing copious amounts of respectful eulogism with occasional terse accusations directed at the paparazzi, who became the first of the persona non grata in this black affair. In the back seat of the limo, I read the paper. There was nothing yet about the death which had just occurred; instead, only a long lens exposé of swimsuit clad Diana and Dodi on his boat, festooned with cheeky made-up subtitles. They were sadly unfunny, a product of bad timing. The week was getting off to a strange start.

I came to speak at the International Whiplash Conference in Bristol. It was a convening of many of the top experts in the field of whiplash, and I was looking forward to meeting some for the first time while renewing old acquaintances with others. Of course, one never knows about these meetings. They come in a wide variety of colors and flavors. Some consist of a boring rehash of literature, or doctrinaire recitals of outdated dogma; others offer fascinating new research and ideas, or divisive, vitriolic slugfests which, for me, always seem to take place in Canada.

Whiplash programs, by nature, are vulnerable to a lack of balance, usually as an artifact of the organizer's personal opinions on the subject. For example, although I am a loyal member, the Society of Automotive Engineers' (SAE) programs on low speed collisions have taken on a rather uncamouflaged defense character in recent years.

Fortunately, this meeting in Bristol would turn out to mark an unqualified high water mark in the interprofessional exchange of current ideas and science about whiplash injuries. Clearly, the attendees were interested in learning. In fact, the program was quite literally sold out (and you don't see that nearly as often as the promoters advertise it). It was attended primarily by British and European orthopaedists and neurosurgeons, with a smattering of GPs, PTs, osteopaths, and insurance people.

In England, the osteopathic scope of practice is essentially what it is in the U.S. for chiropractors. And, although very few chiropractors attended the meeting, I did get the opportunity to meet some.

The venue was an 800 acre estate, nestled among huge rolling green lawns in the Western English countryside, complete with grazing deer (OK, I grew up in Los Angeles), English hedgerows, and hot air balloons. This magnificent setting served to heighten the grandeur of this remarkable meeting. To solicitor Bernie Rowe of Lyons Davidson, the organizer of the conference, my hat is off.

So thorough was the planning and execution of this event that I never changed a single dollar into British currency over the four days I was there. Nor did I get much sleep between the scheduled events, lavish entertainment, and semi-collegiate barside shop talk sessions that stretched long into the night. But that's another story.

Among the participants at the conference were Martin Gargan, MD, and Gordon Bannister, MD, both orthopaedic surgeons from Bristol whose names might be familiar to many from their important, and occasionally seminal, work in whiplash research. Perhaps of particular interest is their paper published last fall in *Injury*,<sup>1</sup> demonstrating the effectiveness of chiropractic treatment in cases of unresolved whiplash. This was, incidentally, the first paper to demonstrate the value of chiropractic care for this condition. The dearth of such work was pointed out by the Quebec Task Force in 1995. From dearth to paucity. We're making progress.

I'd met Gordon years ago when we both spoke at another such multidisciplinary conference here in the states. As a result of their research experience, both surgeons were enthusiastic about chiropractic care as a means of treatment for these patients, and both are remarkable people in their own right.

Herman Steffan, PhD, from the University of Graz, presented his latest human volunteer low speed rear impact crash tests. Although mostly published in the automotive engineering literature, his name is well known in the area of occupant kinematics and crash behavior. He showed several video clips of human occupant low speed rear impact crash tests -- some of which, he pointed out tentatively, resulted in injuries. In private, I chided him that, in the U.S., we have some difficulty with human subjects committees, Helsinki guidelines, and the like when it comes to exposing humans to potentially injurious events. In Austria, he explained, it's no problem finding volunteers (who, by the way, are not paid). Most are accident reconstructionists themselves, eager to learn more about this work. Well, I've always held the notion that all accident reconstructionists, insurance claims adjustors, and inveterate defense doctors should have the opportunity to experience this type of reality training first hand ... perhaps yearly.

David Viano, PhD, from the General Motors Research and Development Center, has been crash testing Hybrid dummies in the laboratory for many years and has become a virtual icon in this field. Among other of his many contributions, he developed the new "Catcher's Mitt" design seatback/head restraint that will appear shortly in some Saab models. Both his and Dr. Steffan's talks preceded mine, and it was fortuitous that the foundations of what I had to say had been nicely developed by their presentations. There is always a risk at such events that another speaker will present conflicting data or theories which, although a fundamental element of healthy scientific discourse, sometimes do require on-the-spot and unscheduled debates. Such challenges seem to occur to me mostly in Canada for some reason.

John Firth, MD, addressed the issue of the CNS effects of whiplash. Dr. Firth, a neurosurgeon, was one of the early pioneers in CT technology, displaying almost for the sake of proof the 23rd CT scan ever recorded. He discussed popular theories of mechanical brain injury that occur during whiplash, and the subsequent cascade of secondary chemical and structural reactions that develop over the hours and days following the injury. His views, I thought, were very much in keeping with the latest research in this area. Dr. Firth also conducted primate research in the U.S., collaborating with scientist Thomas Gennarelli, MD, and others who have subsequently developed the most popular and contemporary models of traumatic brain injury.

John and I had several interesting meetings together. In one, he regaled me with the story of how a group of misguided antivivisectionists broke into the laboratory in which he and Dr. Gennarelli were conducting primate research, and destroyed all of their data. Ironic, I thought. These

protectors of the animals' rights had rashly erased any benefit that might have resulted from the animals' sacrifice, thus rendering the animals' death truly meaningless.

Bob Teasel, MD, and Allan Shapiro, PhD, were called in from Ontario, Canada to discuss their views on brain injury secondary to whiplash trauma. Many will recall these two as the editors of an excellent treatise on whiplash published in 1993 (Teasel WT, Shapiro AP. Cervical flexion-extension/whiplash injuries, Spine, State of the Art Reviews, by Hanley & Belfus, Inc.). I believe that at the time, it was only the second book on the subject to be published in recent years.

Dr. Teasel's talk was essentially contrapuntal to that of Dr. Firth. The human brain, he said, is not injured in whiplash trauma. Why the clinical manifestations reminiscent of postconcussion syndrome; why the attendant constellation of cognitive difficulties? These, he reasoned, are not the result of brain injury, but rather of chronic pain.

This theory, which was originally developed in his textbook, finds itself at odds with much of the literature. Bogdan Radanov and colleagues demonstrated that, although whiplash patients did register abnormally on standardized neuropsychiatric tests, cognitive and psychological difficulties improved in parallel with somatic complaints. This could be used to support such a theory. However, that study does not allow us conclude that no brain injury occurred in those individuals, because it's equally conceivable that those suffering mild traumatic brain injury might also have experienced neuromusculoskeletal injuries; the two lesions may merely have improved equally as a function of time, without any true connection. Moreover, this chronic pain-generated cognitive model cannot explain the rather immediate onset of cognitive symptoms as seen in many patients right after such an injury. I think it also fails to account for these continuing cognitive symptoms in patients who have not had any significant neuromusculoskeletal injury to begin with.

I don't think there's much argument that chronic pain can produce cognitive effects, but I don't believe it is a necessary condition. Much of the framework of Dr. Teasel's opinion is grounded, as is often the case, in the lack of conclusive clinical or scientific evidence to support the alternative theory -- in this case, that true structural damage to the brain occurs in whiplash injuries. This, of course, begs the bigger question as to what, exactly, constitutes "structural damage." Is it diffuse axonal injury and microhemorrhage, as has been demonstrated in primate studies, where lesions remained undetectable without biopsy? Or do temporary dendritic disruptions also constitute "structural damage?" Even with a microscope, it would be difficult to determine which neurons were still holding hands.

If the scientific verification for such injuries requires CT, MRI, or microscopic section, I suspect the definitive answer will be some time in coming. But, in fairness to my friend Bob Teasel, he was appointed by Mr. Rowe to take the counterpoint position throughout the conference -- a position, clearly with less popularity.

With a touch of grandiloquent British theatre, Mr. Iian Goldring, QC (Queen's Counsel), lectured to attendees on issues medicolegal. In England, there are no juries in personal injury cases and the barristers must prove their case to a judge. Mr. Goldring presented to us his expectations of medical experts. The two pieces of advice I remember were: 1) You should be certain about things, and not vacillate: form your opinions and then stand by them; and 2) Be committed to the case, as opposed to being merely involved. "The chicken," he explained, "is involved in the ham and eggs breakfast: the pig is committed." A mock trial was later presented, with Gargan and Bannister acting out the doctors' parts. I must say that the British do use the English language masterfully.

Perhaps one of the most insightful discussions on the long-term psychological effects of whiplash I've yet heard was presented by Richard Mayou, PhD, of Oxford University. In essence, he reported

that psychological sequelae vary greatly among individuals injured in whiplash, just as with survivors of heart attack. There are no pathognomonic patterns to watch for and no degree of credibility can be assigned or subtracted from the patient based on them. Elegant in its clarity and simplicity, I thought.

My research colleague, Michael Freeman, DC, PhD, MPH, presented, for the first time, the results of our latest large scale case-control study of motor vehicle accidents and chronic pain. This was the first study of its kind and our paper has been submitted for manuscript review, so I am hesitant to discuss the findings at this time. Assisting us with this rather daunting undertaking were nine of my advanced (whiplash) program graduates whose research assistance satisfied their thesis requirements, and I'll acknowledge these doctors in a later paper.

Michael, who is an epidemiologist, began his presentation with a few basic concepts of epidemiology to underscore the nature of our current work. To illustrate some of the errors enfeebling some types of work, he pointed out some of the more significant problems haunting the Quebec Task Force WAD work. And he was not alone in this dirty business of QTF bashing: while among the less informed, this work has gained wide currency and has been highly vaunted, more critical readers frequently have discounted it for its numerous shortcomings -- the most egregious of which, incidentally, will be outlined in our forthcoming paper in Spine.

Meanwhile, just as things were, I suspect, beginning to get thick for the audience, Michael broke into the details of our latest findings. I may be fairly biased, but, for me, any presentation of brand new research is always innervating. And, similar to his presentation of our earlier research at the International Whiplash Conference in Brussels last year, I thought Michael's presentation and delivery was excellent. He and I were subsequently asked to speak at a similar type of conference currently scheduled for late June of 1998 in Switzerland, and I'll provide more details on that as things gel.

During the course of the three day conference, we heard from Cormac Brady, DDS, regarding his research with low speed rear impacts and the TM joint. In contrast to studies by Howard et al., which concluded that injurious forces are not measurable in the human TM joint during low speed rear impact crash testing, Cormac's work confirms the results of earlier studies from UCLA which demonstrated significant torque in the joint.

We also heard from Jonathan Cook, DC, who was one of the authors of the chiropractic treatment for chronic whiplash paper.<sup>1</sup> I must confess that Michael and I were out walking around this incredible estate, Cuban cigars in hand, during Jonathan's presentation, but the truancy was not intentional. Sorry, Jonathan. I've not mentioned all of the presenters, mindful of space limitations here in DC. And as for the last day of the program, I cannot report at all: I had to board a plane for the next seminar -- another one of those occupational hazards.

One other very exciting outcome of our visit was that while there, Michael and I met with several prominent Austrian, British, and Swedish researchers. We all agreed to collaborate on a multinational epidemiological and management research project concerning whiplash. Michael is now busy with the study design, which rightfully fell to him, since it was chiefly his idea. This again will be the first of its kind and promises to be both powerful and informative.

One final note: Dr. Steffan, who developed PC-CRASH, an accident reconstruction program that is probably one of the most robust and sophisticated available today, hastily reconstructed Diana's crash from photographs of the accident scene, while David Viano peered over his shoulder. This laptop computer magic took place during the presentations. Later that night, Michael and I met with him in the hotel lobby. We asked him what he'd come up with. Was it really a 120 mph crash

as the papers said? (This, of course, was based on the speedometer reading; notoriously unreliable as an indicator of crash velocity in this type of collision.) "No," he said. "Only about 50 mph."

On reflection, I think he's about right. The frontal intrusion pattern of the Mercedes would be consistent with a concentrated partial contact with a rigid barrier at moderate speed. Even at 20 mph, the intrusion would have been two feet or more. Of course, the force deflection curve is nonlinear: a crushing vehicle becomes progressively more stiff beyond the first two feet of crush in frontal collisions ... but you knew that.

Throughout my visit, the national pall of the loss of Diana was ever present -- every newspaper and television broadcast virtually saturated, understandably, with outpouring eulogies, sympathy, and, of course, innuendo. In first place were the paparazzi, for whom many wanted murder charges filed. Then, as these subjects began to get stale, and probably as much a feint to divert the public's attention away from themselves, resourceful tabloiders turned their attention elsewhere. It was Charles' fault, one said, for not making sure she had better security. And what about the Queen, said another; she won't even lift the flag at Buckingham Palace -- or speak to us.

The driver was legally drunk, of course. And Dodi's father shouldn't have hired him, they said. And what about Dodi himself? Shouldn't he have insisted on a sober chauffeur? Oh, and then there was the one about the SAS plot to kill the Princess. Please. Tabloid gerbalism.

In any case, I never heard it said while I was there, but it occurred to me that the two people who were really most responsible for the deaths of Dodi and Diana, sadly, were Dodi and Diana. Safety restraints would have saved their lives in that particular crash. The importance of such safety features is something that even a Princess should appreciate, because neither fame, riches, royalty, nor saintly character can immunize one against the immutable and unforgiving forces of worldly physics.

The simple truth is that every time you ride without restraints, you're truly gambling your most precious possession, with little more to be gained than the precious few seconds it takes to fasten them. Not a good bet at all, on balance. I hope amid the farrago of controversy surrounding this tragic loss people will think hard about that. A lot of people, I hope.

### *Reference*

1. Woodward MN, Cook JCH, Gargan MF, Bannister GC. Chiropractic treatment of chronic whiplash injuries. *Injury* 1996, 27(9):643-645.

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