

Testimony

“Restoring Lives, Capacity and Self-Control to Save Millions in  
North Dakota’s Health Care, Disability, Education and Incarceration Costs”



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Before the

North Dakota Commission on Alternatives to Incarceration

Senator Joel C. Heitcamp, Chairman

State of North Dakota

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TESTIMONY OF WILLIAM A. DUNCAN, Ph.D.  
APRIL 21, 2008  
STATE OF NORTH DAKOTA  
COMMISSION ON ALTERNATIVES TO INCARCERATION  
HELD AT  
NORTH DAKOTA STATE UNIVERSITY

Chairman Heitkamp and other distinguished members of this Commission, thank you for the opportunity to address the Commission on Alternatives to Incarceration.

I come to you as a representative of the American Association for Health Freedom, a non-profit organization dedicated to the right of the consumer to choose the health care modality they believe works best for them, and the right of the Health Care Practitioner to practice medicine in accordance with their education, clinical experience, and state licensure requirements.

In 1995, I became one of 34 congressional staff in the Congress of the United States, responsible for oversight and expenditure of all health care, welfare, and criminal justice expenditures in the United States with responsibility to review and track nearly 90 agencies of the Federal government, and work with the state government we served on specific health, education, and law enforcement issues. I served the taxpayer for 10 years, and continue to serve. During that time I paved the way for Medicare to approve the first new indication for hyperbaric oxygen in 18 years, diabetic foot wounds. Hyperbaric oxygen prevents 75% of all diabetic foot amputations. With Oklahoma's Native American population, that has saved the state millions in unnecessary surgeries and unneeded prostheses. I remain on the Oklahoma State Health Care Advisory Board.

On the law enforcement side, I wrote the "Child Internet Protection Act" to put filters on computers in schools and libraries and successfully fought for this all the way to the Supreme Court where it was ruled constitutional. Because of two meetings convened at the National Institute of Occupational Safety and Health, the stupid bureaucratic road blocks were removed and our police officers were able to get NIOSH approved protective masks and other gear to protect them from hazardous things like fumes from burning Meth labs.

When my congressman hired me, I received a commission to find health care treatments that would have an impact on public health to reduce costs, increase effectiveness and improve patient's lives. I also was told to find a drug treatment program more effective than what was standardly being used, and to help solve the chronic disease epidemic we saw coming.

Today I am here to report the results of 13 years of continued service, still dedicated to my original commission.

Let me tell you a story. This first slide is what a normal brain with proper blood flow that has never been traumatized looks like.

[Discussion of Slide Presentation Handout provided with this testimony.]

Page 5: Traumatic Brain Injury and Substance Abuse – 23 year old male  
Page 9: Acute & Chronic Treatment of Traumatic Brain Injury & Coma – 19 year old male  
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Page 18: Alcoholism and Stroke – 68 year old male  
Page 20: Substance Abuse – 19 year old male  
Page 22: Alzheimer's Disease – 58 year old male  
Page 24: Gun Shot Wound to the Brain – 29 year old female  
Page 26: Autism – 3 year old female  
Page 28: Article published in Pediatrics on Fetal Alcohol Syndrome—NO treatment available yet a 14 year old mentally retarded boy achieves normal high school test scores!

We were all taught that brain cells don't regenerate. In 1998, NIH announced to Congress that medicine had been in error all of these years and challenged the medical community to begin searching for a way to do so. Hyperbaric Medicine has been repairing brain injuries right here in America for 30 years, but no one would look at it because everyone "knew" that it was not possible.

Hyperbaric oxygen therapy (HBOT) involves the delivery of 100% oxygen in a pressurized environment created by a chamber. Some of these chambers are the size of this table, and others are the size of a small room. The pressure serves to saturate the tissues of the body, not only the hemoglobin in the blood, but the plasma, lymph and cerebral spinal fluid, all of which go many places that hemoglobin cannot reach, especially in cases of traumatic injury. The average treatment takes 1 to 1 ½ hours and Medicare reimburses at \$250 per hour for this treatment. It is approved for 13 indications by the FDA and Medicare and 10,000 treatments every day provided in 800 clinics across the nation, with new ones opening every month. Treatment is provided for the bends, burns, crush injury, diabetic foot wounds, carbon monoxide poisoning, and suppression of reperfusion injury and prevention of scar tissue formation (plastic surgery), strokes and brain injury. It is safe and effective to saturate the body's tissues with 12X as much oxygen as you breathe at sea level.

I know you have many conflicting priorities Mr. Chairman. Unlike many who come before the legislature, I have no financial stake in whether you adopt these suggestions. My interest is to provide North Dakotans who may commit otherwise crimes in the future, or have already committed crimes and have paid their debt to society, an opportunity to become fully functional and rational human beings. Many of them would then be able to choose to become contributing members of society. They would pay taxes, raise families, and enjoy the North Dakota way of life.

## **Treating the Cause, not the Symptoms**

In our society, and in our sick-care system, we tend to treat the symptoms of problems, not the cause.

Our nation's incarceration rate is a direct reflection on our lack of treatment for brain insults, ineffective treatment for mental illness and a lack of effective treatment for follow-on self-medication we call drug abuse. I never used drugs as a youth and think it would be completely insane to legalize them. That would lead to more destroyed lives and injured people, not less. It would cause less freedom, not more freedom. Taking the first steps to make sure hyperbaric oxygen treatment, this simple and scientifically proven treatment is available to North Dakotans would save the state millions in incarceration, mental health, and misery costs, and make sure these facilities were here in the state so that crush injury, blunt trauma and automobile accident victims would have the fastest and most complete recovery possible. Thus I really am here to save you money. The economics of this will reach into every area of the state budget from restoring the mental capacity of disabled or handicapped children, helping moms on welfare with new capabilities, making sure a high school football player with a concussion is treated so he never has a life-altering personality change, making sure veterans who have seen combat do not suffer the same fate as veterans before them, etc. In the words of one distinguished public health official the savings nationwide would be "zillions of dollars." This money could be used to fund other pressing priorities and even return some to the taxpayers.

When the Department of Justice looked, they discovered 50% of all prisoners are ADHD. Though twice as much is spent educating this population as the children without ADHD, many simply cannot adapt because of their problems. In addition, BJS discovered mental health problems in 56% of State Inmates, 64% of Jail Inmates, and only 45% Federal prisoners. (Anyone notice who is bearing the brunt of this financial burden?)

In addition, this ADHD population had a significant lack of Lack of Impulse Control which is expressed as "Aberrant Violent Behavior." This helps drive the violent crime rate, and many of these persons have mental health issues. When their medical history is examined it is discovered they have TBI or other brain trauma – Seizure Disorders (10-20%), Abnormal Metals in their brains, with manganese as a marker & cause of violent tendencies (shows up in Standard Hair Analysis that costs \$50.)

Substance abuse has been common in this population as they "self-medicate" to try to make their brain more functional. Unfortunately there are historically poor outcomes from mental health treatment and therefore insurance companies and state legislatures have been reluctant to fund treatment. Part of this is because our sick-care system treats symptoms, not causes, and a brain injury or insult, even from the same "cause" can manifest itself in many ways. Thus by rebuilding neural pathways, Dr. Harch has seen improvement in 70 neurological conditions.

## **The Forgotten Epidemic: Brain Injured**

What happens to brain injured individuals in our society? The tendency of human beings is to respond to their environment in order to survive and where possible, reproduce. Males who cannot function in society tend to go to jail to survive! Fertile Females can get pregnant and go on welfare (avg IQ=85) or get married.

### **Improving Drug Treatment Effectiveness**

Under this proposal the current personnel, behavioral component and techniques are retained. This is not about turf; it is about putting together the components of the most effective programs I was able to discover with oversight over the Substance Abuse Mental Health Services Administration, the National Institute of Drug Abuse, and the National Institute of Alcoholism & Alcohol Abuse, plus the National Institute of Mental Health. I have a bachelor's degree in Counseling Psychology underneath my MBA and Ph.D.

Addition of a drug treatment protocol from Toxicology/ Environmental/ Integrative Medicine that focuses on detoxification of drug residues in the body, largely retained in fat and thus frees former addicts from recidivism. The relapse that has been defined as "normal" for this group is not normal but is likely a result of residual abused substance residues that restimulate addiction receptors in the brain and send the former addict back to the substance of choice.

It is anticipated that addition of the niacin-sauna protocol will increase effectiveness to 70+% and addition of hyperbaric medicine will increase effectiveness to in the 90% range. Though the program is initially more expensive per patient, the fact that repeat patients (and thus repeat inmates) compensate for this challenge.

The treatment protocol is actually used by toxicologists, environmental and Integrative Medicine physicians to detoxify for pesticides, Agent Orange victims, organic & inorganic chemicals, etc. This is where I first heard about the technique. Obviously once these techniques are more widely known, agricultural chemical poisoning can also be more effectively treated.

This technique tends to be caught up in an extraneous controversy because of who practices it the most. Moving it back to medical oversight will overcome the difficulty.

Funding for this program has previously come from the Drug Czar's office. Federal treatment program funds can be used, and additional funding secured as reportable results are collected and experience is gained.

The addition of HBOT according to Russian Literature, will enable withdrawal times cut in half with great decrease in discomfort to addict, regardless of the substance abused. Neurological function and neurochemistry, from current data, are restored as SPECT scans demonstrate.

I know the physician assigned by the State of Oklahoma to oversee this program in Oklahoma, a former OSU School of Medicine professor, and he would be willing to assist in setting up the protocols. He is an environmental mental medicine physician and uses hyperbaric medicine to treat his patients for numerous conditions as well.

### **Triage for Hyperbaric Oxygen**

Obviously not every prisoner should automatically receive hyperbaric oxygen. A case history would examine things like:

- Concussions?
- Fever?
- Birth Trauma?
- Substance Abuse? (Self-Medication & Common among TBI victims)
- CO poisoning?
- Post Traumatic Stress Disorder? (It is reflective of organic injury)
- Beaten up in a fight?

Any period of unconsciousness leaves organic brain injury. Concussive events without unconsciousness also leave injury.

### **Aberrant Violent Behavior Reduction Through Nutrition**

There are four University supervised studies, 3 in adults and one in youth. They were conducted in California, Chicago, Great Britain and the Netherlands. Nutritional supplements were provided to inmates in 4 distinct randomized trials, and the supplements were not mega-doses, just Recommended Daily Allowance Nutrition of vitamins, amino acids, and essential fatty acids.

Persons suffering from ADHD have challenges with dopamine. Ritalin® works by extending the presence of dopamine in the brain, but does not create new dopamine. These supplements are formulated to foster dopamine and other neurotransmitter production, plus making the dopamine receptors work better. The result of the studies was a 37-39% Reduction in Violent Behavior Adults while youth enjoyed a 50% reduction. The program in California saved \$10 in incarceration costs for each \$1 spent. That does not include savings from Workman's Comp injuries to guards nor decreased costs of medical care for injured fellow inmates.

This same program will likely help those sentenced to "anger management" after harming loved ones.

The cost is \$25 per month or \$300 per year + 1 time \$50 Lab test. This national program is being coordinated by University of California at Riverside – Presley Center for Crime & Justice Studies. All of the protocols, sentencing guidelines, National IRB, etc., are being developed with the coordination of UC Riverside, Judges, and a team of expert medical doctors and nutritional specialists. The team includes one of the top

neurologists in the nation who uses both nutrition and hyperbaric oxygen to repair brains (Paul Harch's techniques.)

Compliance by participants tends to be good because reports from participants relate that they felt like they were getting their lives back.

### **The Coming Storm: Iraqi & Afghani War Vets**

North Dakota has the Highest Number of Iraqi War Vets Per Capita! RAND Corp is releasing a study 4/28/2008 that states that 320,000 veterans of the war with Traumatic Brain Injury!

The service has not been screening or treating them for TBI. They are dumping them back into society, into homelessness, broken homes and a future of crime DESPITE THE FACT THAT THEY SAW HYPERBARIC MEDICINE REPAIR GENERAL PATT MANEY'S BRAIN!!!

The Bureau of Justice Statistics report from 2004, showed 64% Fed & 54% State Veterans Prisoners served in War time. They also tend to commit more violent crimes and abuse drugs less than the non-veteran population. A large percentage of this population is from Vietnam but in 2004, we already saw some Iraqi war vets.

History is about to repeat itself and North Dakota already beginning to see the effects of these problems in broken homes, alcohol abuse and Post Traumatic Stress Disorder symptoms!!! Unless effective intervention takes place we can expect to see this population progress to the criminal justice events just like after the Vietnam War.

### **War Veterans Solution**

ImPACT Diagnostic: \$1,000 Software and conduct immediate postconcussion assessment & cognitive testing for this population. The ImPACT test was developed for football player injuries at University of Pittsburg. There is unlimited testing per license and no practice effect. The test is simple to administer.

General Patt Maney, a Walter Reed Patient and IED victim received 80 treatments and today is back on the bench in Florida. He is willing to talk to any of you.

We today are treating a Marine machine gunner – 7 IEDs, Discharged:  
Migraines of 2 years stopped after 1 treatment  
Slept through the night longer than 2 hours after 5  
PTSD virtually gone after 10 treatments  
Clinical Experience shows it improved patients up to 44 years after injury!

### **Cost of Restoring a Life!**

- Incarceration Cost=\$27,000 per Inmate/year

- Combination of Therapies (if all are necessary)
  - Hyperbaric Medicine: 80 treatments x \$200 = \$16,000
    - Treatment Time: 5 weeks 40 T+ 4 off + 5 weeks = 14 weeks to a rebuilt brain
    - One time cost = \$16,000 for HBOT treatment + \$1,500 for diagnostics + \$1,500 for Administration = \$20,000 per inmate
  - Niacin-Sauna Protocol = \$1,000 for 3 week protocol
    - Medical Specialist for State of Oklahoma available (OSU Medical School Professor.)
  - Nutritional Supplements for eligible participants:
    - \$25 per month or \$300 per year + 1 time \$50 Lab test
    - University of California at Riverside – Presley Center for Crime & Justice Studies coordinating national program.
      - Developing IRB approval, Sentencing Guidelines, Lab Test Reading, etc.
      - Top Medical Expertise involved
  - Annual Cost per Inmate (if prescribed Nutritional Regimen) = \$300

### Cost Savings per Inmate

- Cost: 27,000/inmate X 1,000 = \$27 Mil
  - Avg Sentence 4 years: \$108 Mil/4 years
  - If 20X eligible for protocol = \$21,300 = \$4.26 Mil
  - Charge to State Medicaid (-50% Fed Cost-Sharing): \$2.13 Mil
- Savings:
  - Incarceration/inmate: Year 1: \$5,700 + \$81,000 yrs 2-4 = - \$86,700 per success
  - Assume 75% effectiveness per 200: - \$13.05 Mil
  - 12.5% success rate is break even!
- Cost Infrastructure & Training: \$500,000 Start up

### Chronic TBI Treatment for Vets!

- Triage All Vets who Served
  - Concussive Events?
  - Loss of Consciousness?
  - ImPACT Diagnostic
- Those Positive: SPECT Image – PTSD -Neuropsych Eval
- Treat: With 80 1.5 ATA treatments
- Reevaluate
- Charge to VA under State-VA Contract at \$25,000 per patient (Medicare Reimbursement Rate per 1 Hr)
- Track Under UND IRB so results can be published
- Do Not Forget Econometrician!

Let me give you a few examples.

The Federal Labor-HHS appropriations bill provides \$68.7 million nationwide for reintegration of veterans into society after they have served time. Over 50% of this population according to Bureau of Justice Statistics is back in jail within 3 years. Would it save North Dakota money to break this cycle and allow them to become fully functional again?

Forty percent of Dr. Harch's medical practice is neurologically injured children. You would consider them IDEA children, who cost on average, 2.1 times as much to educate as a non-injured child. There are 6.9 million IDEA children in the nation (500,000 more than 6 years ago), and in FY2008 the Congress appropriated \$12.3 billion to pay for part of the obligations of the federal government to the states. These children are costing the state's educational system \$47 billion, for a total of \$55.7 billion. On average, nationally, they cost \$8,510 more per year to educate than a "normal" child. Many cannot learn due to their injuries. The therapy I am here discussing would cost an average, one time expenditure of between \$14,000 for most children treated long after the injury, the cost of educating them for two of the 13 years they are in public school. The effects would be permanent and last throughout their lifetime. For many of these children, if they had been treated immediately upon injury, the costs drop to often less than \$1,000. With 50% of all prisoners in prison diagnosed as ADHD, a good percentage of these children are going to wind up in your prison system! Would it be a good idea to break that cycle and restore lives?

Many of these adults and children have neurological injuries that affect their motor skills, learning, speech, etc. As children they may have suffered birth trauma, high fevers, accidents, child abuse, fetal alcohol syndrome, maternal drug use, or other such events. Current practice deals with the brain that is still there and tries to re-train it. The therapy we are discussing has effectively recovered and rebuilt brain tissue through reactivation of stunned tissue, revascularization and, possibly, stimulation of adult stem cells in the brain to repair existing neural pathways and grow new ones.

Follow many of these children into adulthood, and you discover that many wind up in prison, on welfare, Social Security Disability, in long-term care facilities at state or insurance company expense or become a drain on the system in some other fashion. Many of these children suffering from Mental Retardation or Developmental Disabilities, when they grow to adulthood, cost, on average, \$43,000 per year in group home or institutional settings. (3.8 million, 59% under 17, 38% between 17 & 64) Dr. Harch's hyperbaric medical practice, replicated by many others throughout the nation, has demonstrated that nearly all of these children can be helped, including many with genetic disorders, and many, many, can lead full, normal and productive lives. This is something current medical practices cannot provide for most of them.

Hyperbaric medicine can have significant positive impact on the North Dakota state budget for members of your committee with other jurisdictions. For example, in Health & Human Services, patients with diabetic foot wounds would normally be

amputated and many would join the disability roles,. Hyperbaric oxygen has been shown to decrease major amputations by over 75%. There are currently 54,000 amputees on the Social Security Disability Income or SSI roles, at an average cost of \$8,467 per year. Many of these amputations could have been prevented through acute and chronic treatment of their medical condition with Hyperbaric Oxygen prior to amputation. One clinic in Oklahoma has less than a 1% amputation rate for those who receive Hyperbaric Treatment. CMS decided in 2003 that hyperbaric oxygen treatments in this population are cost effective. All of the other major insurance companies, including Blue Cross/Blue Shield already pay for diabetic wound treatment.

In addition, the Journal of the American Medical Association in 2002 on heart bypass surgery showed that 30% of those undergoing this procedure have residual brain damage, which could be largely solved by a single \$250 Hyperbaric treatment. Further treatments applied under a surgical protocol could possibly heal patients between 25% and 50% faster, concurrently reducing costs to the insurance company, the government, malpractice insurance and physicians time and fees. The Navy has applied HBOT to fractures and returned many soldiers to duty who would have otherwise been discharged from service, saving the VA hundreds of thousands over the life of a veteran.

In the year 2000, the government spent 5.5 billion Medicare dollars on strokes, or \$3,169 per patient, with little hope of full recovery. Hyperbaric medicine, especially acute treatment, cost effectively offers many such hope. Even chronic stroke patients can experience significant improvement in function and quality of life. [Pages 11, 12]

Social Security disability currently has 61,500 brain injured people on the Disability or SSA roles at a cost of \$8,459 per person per year. Many of these people could be returned to full and productive lives.

I welcome the opportunity to answer any questions the committee has.



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for Alternatives to Incarceration, April 21, 2008  
By  
William A. Duncan, Ph.D.

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## Hyperbaric Oxygen Therapy and SPECT Brain Imaging in the Treatment of Chronic Brain Injury

Paul G. Harch, M.D.  
Director, Hyperbaric Medicine Fellowship, L.S.U. School of Medicine

- Refined low-pressure Hyperbaric Oxygen Therapy (HBOT) protocols for neurological injuries.
- Presentation includes selective sampling of nearly 700 chronic brain injuries over the past 17 years.
- Original case was demented diver with residual brain decompression sickness 7 months after injury.
  - Diver achieved clinical, psychometric, & functional brain imaging improvement.
- Discovery then generalized to patients with:
  - Chronic traumatic brain injury.
  - Cerebral palsy.
  - Chronic carbon monoxide poisoning.
  - Toxic brain injury.
  - Chronic stroke.
  - Alzheimer's Disease.
  - Autism.
  - Substance abuse.
  - 70 neurological conditions.
- After demonstrating effectiveness in humans, a 1996 and 2001 animal study demonstrated the first ever improvement in chronic brain injury.
- Treatment protocol developed by Dr. Harch now being used in research/clinical practices by multiple centers throughout the United States and internationally.
- World-wide experience has demonstrated the generic rehabilitative potential of low pressure HBOT in chronic brain and neurological injury.

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## Case Presentation

*Triple head SPECT Scan of Normal Brain*

SPECT is a tool to directly measure brain blood flow and indirectly measure metabolism.

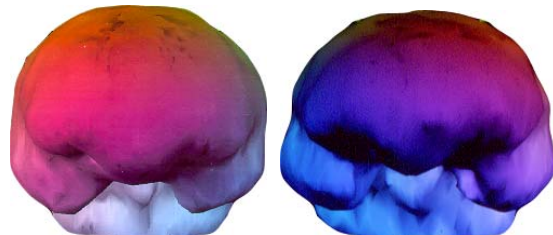
- 26 year old female (left scan).
- 34 year old male (right scan).
- No alcohol or substance abuse.
- No brain traumas.
- No diseases to affect brain blood flow or metabolism.
- Notice smooth appearance.

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## Case Presentation

*Triple head SPECT Scan of Normal Brain*



female

male

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## Case Presentation

*Traumatic Brain Injury and Substance Abuse*

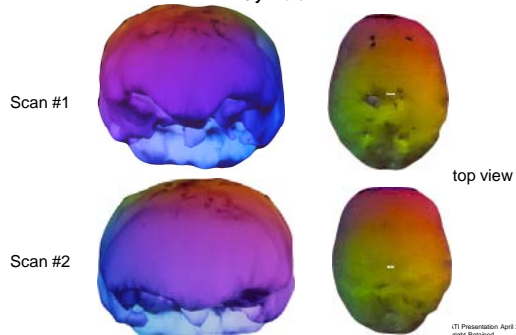
- 23 year old male, Navy Medical Corpsman, graduated second in class.
- 5 TBIs; (4 w/loss of consciousness) the 3<sup>rd</sup> resulted in largest loss of memory and started migraines.
- Complaints of migraines, short & long-term memory loss, speech problems, serious alcohol abuse. Treated at Bethesda and Walter Reed Brain Injury Center.
  - Discharged from Navy with 60% VA disability.
- Unable to remember anatomy and physiology during rehab training; 14 jobs in 2 years.
  - 1<sup>st</sup> scan: Extensive frontal lobe injury & top scan shows extensive tissue damage.
- Jan. 2001: 40 HBOT treatments over 4 weeks.
  - 2<sup>nd</sup> scan: Extensive improvement in blood flow to frontal & parietal lobes.
- Dramatic cessation of migraine headaches.
  - Cessation of marijuana use & dramatic reduction in alcohol use.
- 1 month after treatments: Return of memory, tremendous improvement in speech, cognition, math skills, and energy levels.
- 8 months after treatment: Married & remains functional to date; patient to return for additional HBOTs.

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## Case Presentation

*Traumatic Brain Injury and Substance Abuse*  
23 y. male



Scan #1

top view

Scan #2

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## Case Presentation

### Acute & Chronic Treatment of Traumatic Brain Injury and Coma

- 19 year old male; college freshman. Ejected from motor vehicle at 65 mph in 1991 (1<sup>st</sup> HBOT began 19 hours post accident).
- Impacted left frontal/parietal skull region.
  - Within ¼ hour Glasgow coma scale was 6-7, ventilator dependent.
  - CT revealed diffuse edema, midline shift, petechial hemorrhages, subarachnoid hemorrhage, small subdural hematoma, basilar skull fracture.
- 1<sup>st</sup> scan: SPECT image 1 month after accident shows significant injury to left frontal area and contra coup injury to right parietal/occipital with luxury perfusion.
  - Scan shows very large defects in brain blood flow.
- After initial treatments patient became conversant & independently ambulatory with slight spasticity.
- Within 8 weeks of accident patient went from ventilator to walking and talking.

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## Case Presentation

### Acute & Chronic Treatment of Traumatic Brain Injury and Coma (continued)

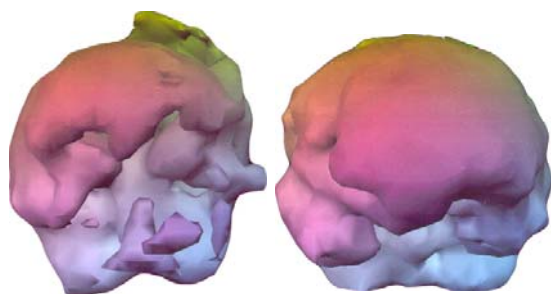
- 2<sup>nd</sup> scan: 1 year later after 188 HBOT treatments.
  - Improved perfusion in ischemic penumbral areas of right-sided lesions.
  - Noticeable improvement in cognition (40% gain written computation math).
  - Patient verbalized insight to condition and that he could no longer aspire to be a surgeon.
  - Balance and gait improvement from 3-wheel trike to 2-wheel bike.
- Treatments discontinued when patient enrolled in remedial college courses.
- Patient referred to as "Lazarus" by his doctor.
- In Jan. 2001, 12 years post injury, patient called physician to tell him of 2<sup>nd</sup> promotion at the bank. Patient active, functional, and employed.
- Current cost of 188 HBOT treatments at \$150-\$200 each: **\$28,200-\$37,600**
  - Note: treatment during immediate acute phase of injury could cost more.

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## Case Presentation

### Acute & Chronic Treatment of Traumatic Brain Injury and Coma 19 y. male



Scan #1

Scan #2

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## Case Presentation

### Physical Abuse

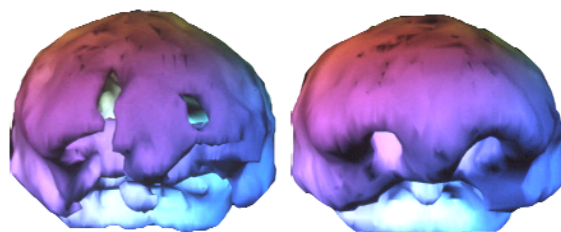
- 21 year old female, gang raped and beaten extensively at age 12.
- Significant cognitive deficit though apparently normal motor coordination.
  - Severe difficulties with sleep.
- 1<sup>st</sup> scan: SPECT shows significant frontal lobe injury with severe frontal lobe tissue damage.
- 60 HBOT treatments.
- 2<sup>nd</sup> scan: SPECT shows greatly increased blood flow to frontal lobe manifested by thickening & filling in on scan.
- Improved cognitive function enables patient to operate in a higher capacity in a mentally demanding job.
- Patient promoted 6 months post treatment.
  - Sleep difficulties improved.

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## Case Presentation

### Physical Abuse 21 y. female



Scan #1

Scan #2

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## Case Presentation

### *Mental Retardation*

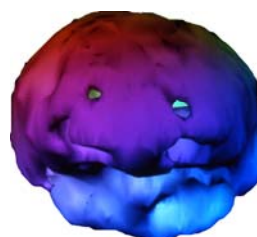
- 44 year old male. Mentally retarded from likely combination of delivery-induced trauma and TBI at 2 weeks old.
- Unable to read or spell more than a few words. No abstract reasoning ability. Difficulty understanding concepts, i.e., food will spoil if left out.
- Seizures bi-weekly with constant tremors; on medication. Worked 2 days/week at Goodwill doing menial tasks.
  - 1<sup>st</sup> scan: SPECT shows reduction in blood flow to frontal lobe (extensive frontal lobe damage).
- 40 HBOT treatments.
  - 2<sup>nd</sup> scan: SPECT shows a marked increase in blood flow in the frontal lobe, manifest by closure of fissures.
- Work attendance from 2 days to 4 days per week.
- Seizure rate fell to 1 per month on medication. Noticeable reduction in motor tremors.
- Presently learning to read at a Kindergarten level.
- Able to understand abstract concepts better, i.e., that food spoils.
- Able to do more complex work tasks. Increased rational behavior.

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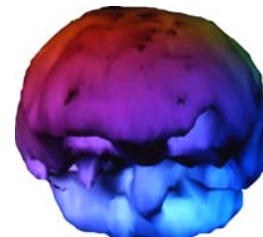


## Case Presentation

### *Mental Retardation* 44 y. male



Scan #1



Scan #2

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## Case Presentation

### *Traumatic Brain Injury from Child Abuse*

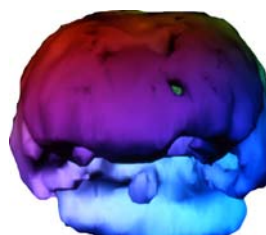
- 48 year old male. 45 years post injury; extensive physical damage to right parietal bone at age 3.
- Apparently normal motor coordination.
- Difficulty with higher math and remembering names.
- Dreamed in black and white.
  - 1<sup>st</sup> scan: Before
- 63 HBOT treatments.
  - 2<sup>nd</sup> scan: After
- Improved motor coordination, math skills, and name memory.
  - Now dreams in color.

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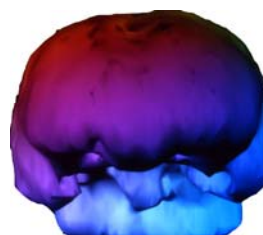


## Case Presentation

### *Traumatic Brain Injury from Child Abuse* 48 y. male



Scan #1



Scan #2

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## Case Presentation

### *Alcoholism and Stroke*

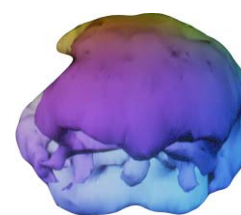
- 68 year old male. 1 month post embolic stroke right middle cerebral artery.
- Chronic heavy drinker. Developed atrial fibrillation, likely secondary to the alcohol.
- Severe weakness left side of body; profound left-sided neglect.
  - Noticeable cognitive deterioration (power of attorney to son).
- 1<sup>st</sup> scan: Multiple areas of decreased perfusion in frontal & temporal lobes.
  - Slightly coarse appearance to brain surface. Note large gap on left side of each image denoting right hemispheric stroke.
- 1 month of HBOT treatments:
  - Dramatic improvement in cognition, speed of thinking, decrease in neglect.
  - Markedly improved motor function on left side of body.
  - Rescinded power of attorney & resumed active pursuit of business affairs.
- 2<sup>nd</sup> scan: Improved flow to all lobes. Global smoothing of brain surface.

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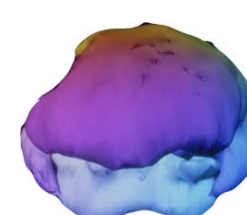


## Case Presentation

### *Alcoholism and Stroke* 68 y. male



Scan #1



Scan #2

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## Case Presentation

### Substance Abuse

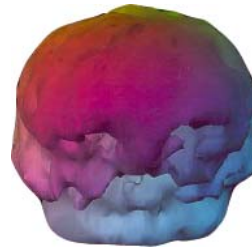
- 19 year old male. Extensive drug abuse history for past 4 years (since 15).
  - Heavy dosing, chronic marijuana.
  - LSD & 5-6 episodes of hallucinogenic mushrooms.
  - Extensive Rohypnol use (patient believes caused most memory problems).
  - Cocaine, crack abuse for 1 month earlier in year of 1<sup>st</sup> brain scans.
  - Extensive use of Valium.
  - Concentrated glue sniffing & White Out typewriter correction solvent.
  - Alcohol abuse.
- Complaints of chronic headaches, irritability, impulsive behavior, and short-term memory problems.
- History of loss of consciousness in the past due to trauma and an episode of syncope that same year, 5 years before 1<sup>st</sup> first brain scan.
  - 1<sup>st</sup> scan: Grossly heterogeneous pattern of brain blood flow with multiple areas of decreased perfusion in frontal and temporal lobes.
  - 2<sup>nd</sup> scan: 1 HBOT. Global smoothing & improvement in blood flow. Inferior frontal lobe defects likely due to patient's trauma. **Note: Single HBOT improvement is predictive that the full course of HBOT treatment (40 HBOTs minimum for treatment of a chronic injury) would permanently improve the patient's brain and brain function.**
- Patient did limited course of 20 HBOTs, then defaulted on treatments due to feeling better and the 200 mile commute.

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## Case Presentation

### Substance Abuse 19 y. male



Scan #1



Scan #2

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## Case Presentation

### Alzheimer's Disease

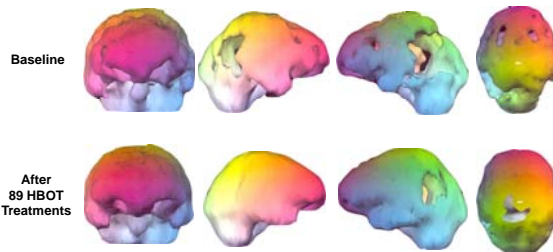
- 58 year old male.
  - Accomplished architect with decline in work & memory 8 years ago.
- Alzheimer's diagnosis 5½ years ago; started on Aricept.
  - Continued to decline over next 3 years. Started CPAP (for sleep apnea) 9/98 without effect 3 years prior to HBOT treatments.
  - Switched to Neotrophin for 9 months – limited improvement.
  - 9/2000 began Exelon; dose increased to maximum level 6 weeks before HBOT.
    - Wife notes improvement in cognition & behavior.
- 89 HBOT treatments.
  - During treatment progressive slow improvement in cognition/behavior.
  - Generalized non significant improvement in scores.
  - Some new learning ability.
  - Symptomatically patient better.
  - Patient taken off Exelon due to side effects.
  - Continuing HBOT & beginning to resume normal life activities.

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## Case Presentation

### Alzheimer's Disease 58 y. male



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## Case Presentation

### Gun Shot Wound to Brain

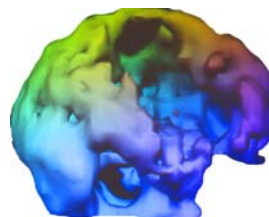
- 29 year old female; self-inflicted .38 caliber hollow point to right temple.
- 6 years post trauma:
  - Severe spasticity arms and legs.
  - Paraplegia with severe weakness in arms.
  - Poor trunk control.
  - Insomnia secondary to muscle spasms.
  - Intractable constipation.
  - Headaches.
- 1<sup>st</sup> scan: baseline SPECT: Marked diffuse decrease in blood flow with worst area along path of bullet.
- 80 HBOT treatments.
  - Physiatrist reports: Generalized decrease in spasticity, increase in left hand grip, and movement in knees.
  - Patient reports:
    - Increased trunk and extremity motor function.
    - Marked decrease in insomnia.
    - Natural bowel movements without constipation.
    - Decreased headaches.
- 2<sup>nd</sup> scan: Generalized increase in brain blood flow with pattern of diffuse smoothing.

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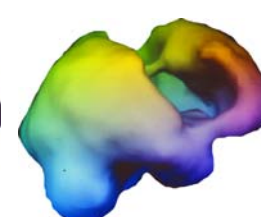


## Case Presentation

### Gun Shot Wound to Brain 29 y. female



Scan #1



Scan #2

right view

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## Case Presentation

### Autism

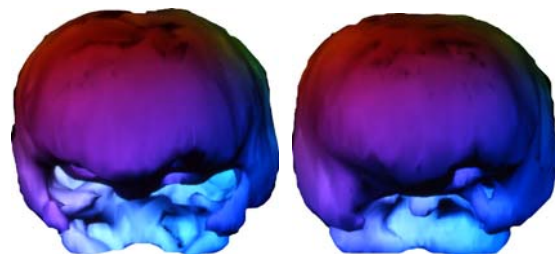
- 3 year old female born 3 weeks premature to a mother with mild toxemia; fetal distress, emergency C-section. Extensive neurological workup over the next year.
- Final diagnoses: Persistent Developmental Delay/Autism/Mild, Mental Retardation.
  - Can't talk or walk (walks on knees).
  - Minimum eye contact.
  - Afraid of crowds and people.
  - No self-help.
  - Self-abusive behavior.
- 1<sup>st</sup> scan: Marked reduction in blood flow to temporal lobes, less so to cerebral lobes.
- 80 HBOT treatments.
  - Walks with a walker.
  - Makes eye contact and is interactive and playful.
  - Comfortable in crowds and with people.
  - Feeds self.
  - Decreased self-abusive behavior.
- 2<sup>nd</sup> scan: Marked improvement in blood flow to temporal and cerebral lobes. Generalized increase to rest of brain.
- 7 months later: Continued generalized improvement.
  - Full ambulation.
  - Playful, interactive, affectionate, loving.
  - Self-abusive behavior nearly gone.

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## Case Presentation

### Autism 3 y. female



Scan #1

Scan #2

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**Dr. Harch's cost-effective, refined low-pressure Hyperbaric Oxygen Therapy protocols have improved the quality of life for 1,000's of brain and neurologically injured patients. Treatment is here today!**

**Dr. Harch's success has been replicated by physicians in multiple treatment centers throughout the United States and many other countries around the world.**

For further technical information please visit [www.hyperbarics.org](http://www.hyperbarics.org)  
or call Dr. Paul Harch, President of IHMA, at 504-348-1660, email: [hmr@bellsouth.net](mailto:hmr@bellsouth.net)

Anita W. Duncan, Executive Director 540-720-3844 email: [AnitaWDuncan@msn.com](mailto:AnitaWDuncan@msn.com)  
[www.hyperbaricmedicalassociation.org](http://www.hyperbaricmedicalassociation.org)

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Presentation prepared by Anita W. Duncan CPSCAP

## PEDIATRICS

Quantification of Neurocognitive Changes Before, During, and After Hyperbaric Oxygen Therapy in a Case of Fetal Alcohol Syndrome  
Leland P. Swley  
Pediatrics • 2005; 115 (Suppl 3):e100. Copyright © 2005 by American Academy of Pediatrics  
DOI: 10.1177/0007122605271101

This information is current as of October 1, 2005

The online version of this article, along with updated information and services, is located on the World Wide Web at  
<http://www.pediatrics.org/cgi/content/full/115/4/e100>

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## Incarceration Cause & Solution

- Discovery: 50% of all prisoners ADHD
- Mental Health Problems (Bureau of Justice Statistics)
  - 56% State Inmates
  - 45% Federal Prisoners
  - 64% Jail Inmates
- Lack of Impulse Control ➡ Aberrant Violent Behavior
- Mental Health Issues
  - TBI or other brain trauma – Seizure Disorders (10-20%)
  - Abnormal Metals in Brain-Manganese as a marker & Cause-Shows up in Standard Hair Analysis \$50
  - Substance Abuse
- Historically poor outcomes from mental health treatment therefore no mental health parity
- Sick-Care system treats symptoms, not causes
- Males who cannot function in society tend to go to jail to survive!
- Fertile Females can get pregnant and go on welfare (avg IQ=85) or get married

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## Triage before HBOT

- Case History
  - Concussions?
  - Fever?
  - Birth Trauma?
  - Substance Abuse? (Self-Medication & Common among TBI victims)
  - CO poisoning?
  - PTSD? (It is reflective of organic injury)
  - Beaten up in a fight?
- Any period of unconsciousness leaves organic brain injury
- Concussive events without unconsciousness also leave injury

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## Effective Drug Treatment Niacin-Sauna + HBOT

- Current Personnel, Behavioral Component and Techniques Retained
- Addition of a drug treatment protocol from Toxicology/ Environmental/Integrative Medicine that focuses on detoxification of drug residues in the body, largely retained in fat and thus greatly reduces recidivism. Relapse is often from residual abused substance restimulating addiction sites in brain
- Increases program to 70+% effective with failures tending to be those with remaining mental impairments from brain injury
- Technique used by Toxicologists, Environmental and Integrative Medicine physicians to detoxify for pesticides, Agent Orange victims, organic & inorganic chemicals, etc.
- Tends to be caught up in an extraneous controversy because of who practices it the most.
- Got funding for program from the Drug Czar's office
- HBOT according to Russian Literature demonstrates withdrawal times cut in half with great decrease in discomfort to addict, regardless of the substance abused. Neurological function and neurochemistry restored as seen in SPECT scans.

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## Reduction In Aberrant Violent Behavior In Inmates through Nutrition

- Four University supervised Studies-3 adults, 1 youth study
  - California/Chicago/Great Britain/Netherlands
  - Supplements not mega-doses, just Recommended Daily Allowance Nutrition, vitamins, amino acids, essential fatty acids
- Rebuilds Dopamine in the Brain
- 37-39% Reduction in Violent Behavior Adults, 50% Youth
- Program in California saved \$10 in incarceration costs for each \$1 spent
- Does not include savings in Workman's Comp, injury to others
- Reports from Participants that they felt like they were getting their lives back.
- Program being coordinated by University of California at Riverside for Nationwide (The Presley Center for Crime & Justice Studies)

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## The Coming Storm-War Veterans

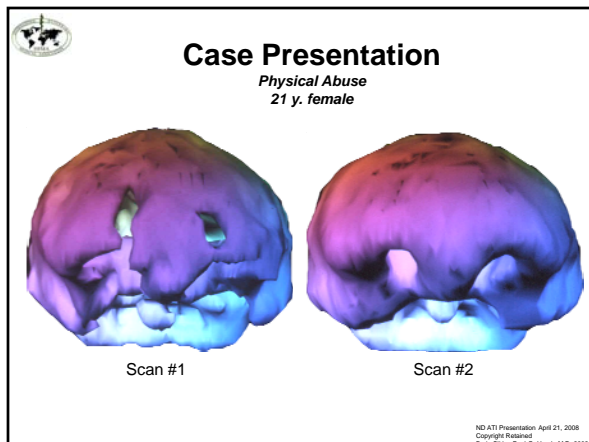
- North Dakota has the Highest Number of Iraqi War Vets Per Capita!
- Rand to Release study 4/28/2008
- 320,000 veterans of the war with Traumatic Brain Injury!
- Not screened nor treated
  - Dumped back into society
  - Homelessness/Broken Homes/Crime
- BJS report 2004, showed 64% Fed & 54% State Veterans Prisoners served in War time. Tend to be violent crimes!
- Large Percentage from Vietnam
- History is about to repeat itself.

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## War Veterans Solution

- ImPACT Diagnostic: \$1,000 Software
  - Immediate Postconcussion Assessment & Cognitive Testing
  - Developed for Football player injuries, University of Pittsburg
  - No Practice Effect & Simply Administered
- General Patt Maney – Walter Reed Patient-IED
  - 80 Treatments
  - Back on the Bench in Florida
- Marine Machine gunner – 7 IEDs, Discharged
  - Migraines of 2 years stopped after 1 treatment
  - Slept through the night longer than 2 hours after 5
  - PTSD virtually gone after 10 treatments
- Clinical Experience shows it improved patients up to 44 years after injury!

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## Putting Therapies Together

- 21 Year old Female a Family Friend's Daughter
- Lived with My Wife & I for 7 years
- Tried many therapies including standard psychiatric treatment
- These three readily available therapies were the most effective
- Today at 28, she is getting married, has been making \$80,000 per year as a writer & her life is restored. Without our intervention today she would be dead.
- Could now have done it all in 1 year instead of 7!

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## Cost of Restoring a Life

THIS IS NOT EXPERIMENTATION, IT IS IMPLEMENTATION!  
EXTENSIVE RESEARCH ALREADY CONDUCTED!  
IRB SO RESULTS AND COST SAVINGS CAN BE  
CALCULATED, TRACKED & PUBLISHED

- Incarceration Cost=\$27,000 per Inmate/year
- Combination of Therapies (if all are necessary)
  - Hyperbaric Medicine: 80 treatments x \$200 = \$16,000
    - Treatment Time: 5 weeks 40 T+ 4 off + 5 weeks =14 weeks to a rebuilt brain
    - One time cost = \$16,000 for HBOT treatment + \$1,500 for diagnostics + \$1,500 for Administration = \$20,000 per inmate
  - Niacin-Sauna Protocol = \$1,000 for 3 week protocol
    - Medical Specialist for State of Oklahoma available (former OSU Medical School Professor.)
  - Nutritional Supplements for eligible participants:
    - \$25 per month or \$300 per year + 1 time \$50 Lab test
    - University of California at Riverside – Presley Center for Crime & Justice Studies coordinating national program.
      - Developing IRB approval, Sentencing Guidelines, Lab Test Reading, etc.
      - Top Medical Expertise involved
  - Annual Cost per Inmate (if prescribed Nutritional Regimen) = \$300

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## Cost Saving Per 1,000 Inmates

- Cost: 27,000/inmate X 1,000 = \$27 Mil
  - Avg Sentence 4 years: \$108 Mil/4 years
  - If 20% eligible for protocol = \$21,300 = \$4.26 Mil
  - Charge to State Medicaid (-50% Fed Cost-Sharing): \$2.13 Mil
- Savings:
  - Incarceration/inmate: Year 1: \$5,700 + \$81,000 yrs 2-4 = - \$86,700 per success
  - Assume 75% effectiveness per 200: - \$13.05 Mil
  - 12.5% success rate is break even!
- Cost Infrastructure & Training: \$500,000 Start up

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## Chronic TBI Care for Vets

- Triage All Vets who Served
  - Concussive Events?
  - Loss of Consciousness?
  - ImPACT Diagnostic
- Those Positive: SPECT Image – PTSD -Neuropsych Eval
- These tools screen out malingers
- Treat: With 80 1.5 ATA treatments
- Reevaluate as desired
- Charge to VA under State-VA Contract at \$25,000 per patient (Medicare Reimbursement Rate per 1 Hr) (VA has reimbursed in other states NM, AZ & DoD paid for Gen Patt Maney)
- Track Under UND IRB so results can be published
- Do Not Forget Econometrician!

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**DR. WILLIAM A. DUNCAN**  
SENIOR VICE PRESIDENT

Dr. William A. Duncan serves as Senior Vice President of Capitol Hill Consulting Group, where he represents clients in the education, health care and biomedical research arenas. His clients benefit from his extensive background in the congressional appropriations process and health care regulation.

Prior to joining Capitol Hill Consulting Group, Dr. Duncan served Congressman Ernest Istook (R-OK) for ten years as his staff representative to the House Committee on Appropriations Labor, Health and Human Services, and Education Subcommittee. During his congressional service he also handled welfare, Veterans Affairs, Commerce Justice State appropriations, taxation, along with economic and budgetary issues. His key projects included the Child Internet Protection Act, the Balanced Budget Amendment, hyperbaric oxygen treatment expansion, a major new abstinence education program, National Labor Relations Board reforms and entitlement reform.

In the medical realm, Dr. Duncan supervised numerous legislative priorities including National Institutes of Health reforms for setting research priorities, expansion of biomedical research infrastructure, AHRQ and evidence-based medicine initiatives, NIH & CDC initiatives in environmental medicine, amputee services, and addressing chronic disease including diabetes and public health. He dealt with Centers for Medicare & Medicaid Services problems, including getting CMS to approve a new indication for hyperbaric oxygen to reduce amputations, reducing the regulatory burden on health care, prescription drug, and FDA issues.

He also served on several task forces including privatizing Railroad Retirement Board pension fund, non-profit lobbying reform, creation of the National Center for Complementary and Alternative Medicine at NIH, Commissioned Corps reform, and the Medical Information and Treatment Access task force.

Prior to joining Congressman Istook's staff, Dr. Duncan worked at the National Taxpayers Union Foundation, where he served as the Director of the Congressional budget tracking system. He also taught graduate and undergraduate courses in economics, political science and business management.

Before his service in Washington, Dr. Duncan received his Doctorate in Political Science, Economics and Public Law from Idaho State University and his Masters in Business Administration from Boston University. He also majored in Economic Development and worked in his local community on several development initiatives before leaving for Washington, D.C.

Dr. Duncan also served in the United States Army for six years, and was a licensed insurance agent in the State of California.



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