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February 23, 2015

It is a distinct privilege to be able to present my views in support of the Medical Cannabis Act in the committee hearings. I regret that my patient care responsibilities do not allow me to speak in support of the bill in person, but am grateful for the opportunity to provide the distinguished members of the committee with medical and scientific information that supports the use of cannabis to treat serious medical conditions.

I am a graduate of the University of Heidelberg School of Medicine and did post-graduate work at major teaching hospitals of the Harvard Medical School, completing a residency in internal medicine and clinical fellowships in nutritional medicine and behavioral medicine. I also served as a research fellow at the Harvard Medical School. My curriculum vitae documenting my training and experience is available for your review.

I have been privileged to have advised state legislators in Colorado and several other states and foreign countries on legislation enabling the medical use of cannabis. I also served on the Colorado Department of Revenue Medical Marijuana Advisory Work Group which drafted the rules that regulate the medical cannabis program in Colorado, and am one of 13 members of the Medical Marijuana Scientific Advisory Counsel of the Colorado Department of Public Health. This counsel and the Department of Public Health recently approved \$9 million in state funds for scientific investigations into the medical use of cannabis.

I have followed the debate on medical cannabis in Pennsylvania with great interest, particularly since I have cared for many patients with serious medical conditions for the past 6 years in Colorado and have seen first-hand how many of them have benefitted from the medical use of cannabis. I hope that patients in Pennsylvania will have access to the same treatments with medical cannabis that I have found to be so beneficial in Colorado.

Although there is a great deal of discussion and publicity about the use of cannabis for medical purposes, it is in fact nothing new, for cannabis has been used medically for a very long time.

The earliest written references to the use of cannabis as a medical treatment indicate that it was used in China nearly 5,000 years ago for the treatment of gout, rheumatism and

malaria. It was also used extensively in India starting more than 4,000 years ago, where it was used for rheumatic pain, nausea due to cholera, and tetanus, among other disorders. Dr. William O'Shaughnessy, a physician serving with the British East India Company, observed the successful use of cannabis by Indian physicians and wrote a treatise in the late 1830's which introduced cannabis extracts to Western physicians.

Cannabis was rapidly adopted and widely prescribed for many different symptoms and medical conditions in the United States. Sajou's Analytic Cyclopaedia of Practical Medicine, a standard medical reference text in the 19th and 20th centuries, listed 56 different conditions for which cannabis was routinely prescribed, and thousands of patients were treated with cannabis extracts with exemplary safety and efficacy.

When a ban of cannabis for all purposes, including medical, was proposed and then enacted by Congress in 1937, the American Medical Association opposed it, to no avail. Despite the ban, however, many physicians continued to prescribe cannabis for their patients for several years thereafter, until stocks of cannabis extracts held by pharmacies were exhausted.

Nonetheless, people continued to use cannabis medically on their own to treat many different symptoms and diseases, including many serious conditions such as Lou Gehrig's disease, severe pain and nausea. There is mounting anecdotal evidence of significant benefit and that has been supported by increasing numbers of research studies on cannabis.

Estimates are that between 20,000 and 30,000 scientific studies on medical uses of cannabis have been conducted, primarily outside the United States due to various rules that have made it difficult to conduct trials in this country that might show medical benefit of cannabis.

This is borne out by a statement by Shirley Simson, a spokeswoman for the National Institute on Drug Abuse (NIDA), reported in a January 18, 2010 New York Times article entitled "Researchers Find Study of Medical Marijuana Discouraged". Ms. Simson was quoted as saying: "As the National Institute on Drug Abuse, our focus is primarily on the negative consequences of marijuana use. We generally do not fund research focused on the potential beneficial medical effects of marijuana."

It should be noted that NIDA funds 85% of research done world wide on substances like cannabis, and that approval by NIDA as well as by DEA, FDA and the Public Health Service is required before clinical studies on cannabis can be conducted in the US. It is not surprising, therefore, that very few studies are done here.

Opposition by the Federal government notwithstanding, 23 states and Washington, D.C. as well as six other countries have established medical cannabis programs benefitting millions of patients with debilitating medical conditions. I hope that Pennsylvania will soon join them.

You will likely hear from a number of different experts in these hearings. Few if any of them will be able to cite personal experience in the care of patients using medical cannabis or attest personally to the benefits patients in other states experience from its use.

I have cared for hundreds of patients whose lives have been improved significantly by the use of medical cannabis. In many cases, patients have been able to reduce or eliminate prescription medications, including the opiate pain medicines that are responsible for the alarming rise in unintentional narcotic overdose deaths seen in recent years.

Clinical research studies conducted at renowned medical centers, such as the University of California at San Francisco and McGill University in Montreal, Canada, have verified that cannabis has powerful pain-relieving effects (1,2) and that adding cannabis to a regimen of narcotic pain medicines can make it possible for patients to reduce their pain medication doses by as much as 30% while still maintaining excellent pain control, reducing the potential for unintentional overdoses of narcotics and other side effects (3).

Many of my patients have experienced such benefits and have been able to return to productive work and provide for their families, while others have seen the pain and suffering of loved ones with terminal illnesses reduced to tolerable levels, spending the last months of their lives in relative peace and dignity by using medical cannabis.

I have also been privileged to treat children with seizures whose prescription antiepileptic medications were ineffective, a problem that affects 30% - 40% of patients with a seizure disorder.

You may be familiar with the case of my patient Charlotte Figi, who has Dravet syndrome, a rare genetic epileptic encephalopathy that begins in the first year of life in an otherwise healthy infant. Charlotte's treatment with cannabis extracts was documented in the CNN special report with Dr. Sanjay Gupta entitled "Weed". Charlotte is but one of the many children who have benefitted from cannabis.

You will probably hear that cannabis is addictive, and while an estimated 5-9% of heavy, chronic users may experience some form of withdrawal symptom such as disrupted sleep, decreased appetite or irritability, these symptoms are generally mild and resolve quickly over a few days with no long-lasting negative effects for most people (4). By this measure alone, cannabis does not meet the criteria for Schedule 1 classification under the Controlled Substances Act.

It is important to put those withdrawal effects in context. The side effects of abrupt cessation of the use of caffeine, for example, which is the most widely used psychoactive substance on earth, include muscle and joint pain, headaches, fatigue, insomnia and in some cases diarrhea, and can last for days (5). This explains in part why coffee shops are found on nearly every corner.

Some may tell you that marijuana is dangerous because it is not regulated by the FDA. There are many reasons why marijuana is not FDA regulated, but it is not because

marijuana is dangerous. It is also important to know that FDA regulation does not necessarily equate with safety.

There is no known lethal dose of cannabis in humans, and there have been no verified deaths from a marijuana overdose in its nearly 5,000 years of recorded human use, whether for medical or recreational purposes (4). That cannot be said of many prescription medications approved by the FDA.

Reports from the Centers for Disease Control indicate that nearly 40,000 people died from unintentional narcotic overdoses and drug interactions in 2009, with nearly equal numbers of deaths in more recent years. In fact, more people die from unintentional drug overdoses and drug interactions than from traffic accidents in the United States (6).

Of great importance in this context is a 2014 analysis of opiate overdose death rates published in the Journal of the American Medical Association that showed that “States with medical cannabis laws had a 24.8% lower mean annual opioid overdose mortality rate...compared with states without medical cannabis laws.” The authors concluded that “Medical cannabis laws are associated with significantly lower state-level opioid overdose mortality rates.” (7)

Note that the number of unintentional drug overdose deaths in Pennsylvania is “skyrocketing”, according to a recent report (8), and that Pennsylvania now ranks 14th in drug overdose mortality deaths in the United States (9).

You may hear that marijuana suppresses the immune system and might pose a danger to HIV and AIDS patients. In fact, recent studies have shown that cannabis has no negative effects on HIV viral load, CD4 cell counts, or on the efficacy of medications used to treat HIV infection and it may in fact improve those measures (10,11).

Nor is marijuana a gateway drug. There is no credible research evidence that marijuana use leads to the use of other drugs (4). The gateway to heroin, cocaine and crystal meth use is the back alley and the dealer who also has those other products available for sale. A regulated medical cannabis industry with state oversight completely removes the back-alley dealer and the gateway from the equation.

Smoked cannabis also poses no risk of long-term lung damage. Although it can cause chronic bronchial and throat irritation and I do not advise patients to smoke cannabis as their primary means of using it, there is no evidence that smoking cannabis is harmful to the respiratory system (12), and some studies even suggest that it may actually prevent the development of lung and head and neck cancers (13,14).

Some of my patients prefer to smoke it because it is easier to regulate their dose when compared with oral dosing forms, which may be inconsistent and lead to inadvertently taking too much. Smoking also results in faster effects and may be more effective for treating symptoms such as nausea from chemotherapy.

It should be noted that effective alternatives to smoking such as vaporizers exist and they eliminate the many products arising from the combustion of cannabis.

You may be told that marijuana use can cause schizophrenia, and while recent reports that cannabis use can cause some forms of mental illness and may damage the brain must be taken seriously, equally credible reports by equally reputable researchers contradict those findings. One such study indicates that alcohol rather than cannabis is responsible for changes seen in the brains of adolescents who abuse alcohol or cannabis. (15).

Indeed, many medical scientists consider alcohol to be more dangerous than heroin or cocaine (16), and the World Health Organization reports that 3.3 million people die each year from the physical effects of alcohol (17).

Furthermore, if cannabis caused schizophrenia, one would expect the number of cases of schizophrenia to increase as cannabis use increases, but exactly the opposite has been observed in Britain in recent years, where the number of cases of schizophrenia is dropping even as cannabis use increases (18).

Clearly, more research is needed to address those concerns more definitively. As with all therapeutic substances, the potential risks and the potential benefits for each patient must be weighed by the patient's doctors.

Even though additional research is needed, however, the many medical and scientific studies that already support the use of cannabis for medical purposes are compelling. These studies provide more than enough evidence of safety, and above all efficacy in treating many serious medical conditions that defy current therapies, that passage of this bill is warranted.

Allowing physicians in Pennsylvania to add medical marijuana to the treatment options available to them to help their patients will improve the quality of life for a great many people in Pennsylvania.

The foresight and compassion you and this body are showing in considering this legislation is exemplary, and I commend and applaud you for making available to the people of Pennsylvania those same benefits now being experienced by patients in 23 other states and Washington D.C..

REFERENCES

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3. Abrams DI et al. Cannabinoid-Opioid Interaction in Chronic Pain. *Clinical Pharmacology & Therapeutics* 2011 90, 844-851.
4. Joy E et al. *Marijuana and Medicine: Assessing the Science Base*. Division of Neuroscience and Behavioral Research, Institute of Medicine (Washington, D.C.: National Academy Press, 1999).
5. Sigmon SC et al. Caffeine withdrawal, acute effects, tolerance, and absence of net beneficial effects of chronic administration: cerebral blood flow velocity, quantitative EEG and subjective effects. *Psychopharmacology (Berl.)* 2009 Jul; 204(4): 573-585.
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7. Bachhuber MA et al. Medical Cannabis Laws and Opioid Analgesic Overdose Mortality in the United States, 1999-2010. *JAMA Intern Med.* 2014;174(10):1668-1673.
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9. *Prescription Drug Abuse: Strategies to Stop the Epidemic*. Trust for America's Health and the Robert Wood Johnson Foundation, Washington, D.C., 2014.
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11. Molina P et al. Cannabinoid Administration Attenuates the Progression of Simian Immunodeficiency Virus. *Aids Research and Human Retroviruses.* 2011 27(6): 585-592.
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15. Bava S et al. Longitudinal Changes in White Matter Integrity Among Adolescent Substance Users. *Alcoholism: Clinical and Experimental Research* 2013 37: E181–E189.
16. Nutt DJ et al. Drug harms in the UK: a multicriteria decision analysis. *The Lancet* 2010; 376 (9752): 1558-1565.
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18. Frisher M et al. Assessing the impact of cannabis use on trends in diagnosed schizophrenia in the United Kingdom from 1996 to 2005. *Schizophrenia Research* 2009 Sep;113 (2-3): 123-128.

CURRICULUM VITAE

Name: Alan Eugene Shackelford

Education:

1971 B.A. Grinnell College, Grinnell, IA
1984 M.D. University of Heidelberg
School of Medicine, Heidelberg, Germany

Postgraduate Training:

Internship, Residency, and Fellowship Training:

- 1984 Rotating internship, University of Heidelberg and Harvard Medical School: 4 months internal medicine, 4 months general surgery, 4 months pediatrics.
- 1984-1985 Intern, Department of Medicine, Brigham & Women's Hospital and Harvard Medical School, Boston, MA
- 1985-1987 Resident, Department of Medicine, New England Deaconess Hospital and Harvard Medical School, Boston, MA
- 1987-1988 Clinical Fellow, Nutrition Support Service and Department of Medicine, New England Deaconess Hospital and Harvard Medical School, Boston, MA
- 1988-1989 Clinical and Research Fellow, Nutrition Metabolism Laboratory and Department of Medicine, New England Deaconess Hospital and Harvard Medical School, Boston, MA
- 1989-1991 Fellow, Division of Behavioral Medicine and Department of Medicine, New England Deaconess Hospital and Harvard Medical School, Boston, MA

Shackelford, A.E. (2)

Additional subspecialty training:

- 1996: Course in Clinical Hyperbaric Medicine,
Medical College of Wisconsin, Milwaukee,
Wisconsin
- 1997: Taucherarztlehrgang (Diving Medicine)
Schiffahrtmedizinisches Institut der Marine
(German Naval Medical Institute),
Kronshagen/Kiel, Germany
- 1999: Traditional Chinese herbal medicine, Dr.Chen
Tung, University of Hong Kong.
- 2003: Level II Certification, Colorado Worker
Compensation Board (Recertification 2006)

Licensure:

Massachusetts Board of Registration (inactive)
Rhode Island Board of Regulation (inactive)
Colorado Board of Registration (active)

Academic Appointments:

- 1984-1987 Clinical Fellow in Medicine,
Internal Medicine
Harvard Medical School, Boston, MA
- 1987-1988 Clinical Fellow in Medicine,
Nutrition Support and
Hyperalimantation, Harvard Medical
School, Boston, MA
- 1988-1989 Research Fellow in Medicine,
Nutrition/Metabolism Laboratory
Harvard Medical School, Boston, MA
- 1989-1991 Clinical Fellow in Medicine,
Section on Behavioral Medicine
Harvard Medical School, Boston, MA

Shackelford, A.E. (3)

Membership in Professional Societies:

Massachusetts Medical Society
Undersea and Hyperbaric Medical Society

Gesellschaft für Tauch- und Überdruckmedizin
(Society for Diving and Hyperbaric Medicine)

American Society for Enteral and Parenteral
Nutrition (A.S.P.E.N.)

Research Experiences and Techniques:

Experimental studies of cystitis and
prostatitis, Department of Urology,
University of Heidelberg School of Medicine,
1977-1980; microsurgical and
immunofluorescent microscopy techniques.

Evaluation of alternative lipids in total
parenteral nutrition, Nutrition-Metabolism
Laboratory, New England Deaconess Hospital
and Harvard Medical School, 1988-1989;
microvascular surgical techniques.

The application of cognitive restructuring
and stress management techniques to the
treatment of obesity, and the treatment of
performance anxiety in Olympic athletes,
Mind/Body Medical Institute, New England
Deaconess Hospital and Harvard Medical
School, 1989-1991.

Teaching Experience:

Instructor in German and in genetics,
University of Maryland, European Division,
Heidelberg, Germany, 1974-1984.

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Teaching Experience (cont'd):

Proctor, Course in Clinical Skills and
Physical Diagnosis, New England Deaconess
Hospital and Harvard Medical School,
1986-1989; 1991.

Lecturer, Clinical Training in Behavioral
Medicine, Harvard Medical School Department
of Continuing Education, 1989-1991.

Group Leader and Facilitator, Basic and
Specialty Mind/Body Groups, Section on

Behavioral Medicine, New England Deaconess
Hospital and Harvard Medical School,
1989-1991.

Work Experience:

General medicine practice: staff physician,
Mid-Cape Medical Center, Barnstable MA, 1987-
1992.

Family medical/urgent care center; patient
population included infants, children and
adults with acute medical problems, routine
evaluations, urgent/acute injuries.

Staff physician, Centers for Nutritional
Research, a division of New England Deaconess
Hospital and Harvard Medical School, Boston,
Massachusetts, 1987-1992. Duties included
oversight and management of medical care of
patients undergoing treatment for obesity in
the Boston, Wellesley, and Hannover,
Massachusetts centers.

Shackelford, A.E. (5)

Work Experience (cont'd):

Staff physician, medical intensive care
units, Symmes Hospital, Arlington, MA; Tobey
Hospital, Wareham MA 1991-1992.

Private practice: Internal medicine,
nutritional medicine, behavioral medicine,
impairment ratings, Colorado, 1992 to
present.

Manager, North American operations,
GetWellness, AG, Basel, Switzerland:
Development of international medical referral
network (physicians, hospitals, clinics),
supervision of medical on-call staff,
development of on-line medical information
and referral services and materials, manage
emergency medical calls from clients
worldwide, 1998-2001.

Obesity treatment: Development of treatment protocols and post-treatment weight maintenance programs, 1992 to present.

Patient evaluations and impairment ratings, Rocky Mountain Medical Center, Aurora, Colorado, 2003-2006.

General internal medicine practice, Rocky Mountain Medical Center, Lakewood, CO, 2005-2006.

Medical Director, WestCare Infusion Services, Inc., Denver, CO: Oversee home nutrition support services, review medical records, consult with prescribing physicians, 2006 to 2011.

Rehabilitation and injury treatment, Intermedical Consulting, LLC, Aurora Colorado, February, 2007 to present.

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Work Experience (cont'd):

Worker Compensation/Occupational Medicine, Concentra Medical Centers, Colorado
May 2008 to April 2010.

Principle physician, Amarimed of Colorado
Patient evaluations and observational research, medical cannabis, Denver, Colorado
2009 to present.

Chief Science Officer, OWC Pharmaceutical Research Corp., Israel, 2014 to present.

Current Professional Responsibilities:

Obesity treatment: Establish and supervise treatment protocols for obese patients; establish and supervise post-treatment weight maintenance programs;

Nutrition support: Consultant to medical colleagues and home care companies on nutrition support modalities for hospitalized or home care patients in need of enteral or

parenteral nutritional management. Medical Director of home infusion company.

Out-patient evaluation and treatment of medical illnesses and work-related injuries;

Consultant on medical cases to attorneys and legal firms; Patient evaluations; Impairment ratings and patient evaluations, Colorado Workers' Compensation Board.

Behavioral medicine, stress management, chronic pain, hypertension and performance enhancement: identify sources of stress and performance limiting behavioral factors and develop, implement and oversee individualized treatment programs for

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Current Professional Responsibilities (cont'd):

patients and for athletes (professional and amateur) and performers (actors, musicians

Formulation of nutritional supplements.

Evaluation of patients for use of medical cannabis as a treatment option and observational studies of clinical efficacy.

Design and conduct basic science and clinical trials of medical uses of cannabis and cannabis derivatives.

Bibliography:

1. Riedasch G, Shackelford AE, Möhring K. Immunologische Untersuchungen zur chronischen Prostatitis unter besonderer Berücksichtigung des Anti-Body-Coating-Phänomens. Immunological studies of chronic prostatitis with particular emphasis on the antibody-coating phenomenon). Münchner Med. Wochenschrift, 1978;48:1605-1608.
2. Riedasch G, Bersch W, Shackelford AE, Schneider E, Möhring K. Local immune response to urinary tract bacteria in experimental cystitis. Urol. Res. 1979; 1:36-40.
3. Riedasch G, Möhring K, Shackelford AE, Schneider E. Zur Behandlung der bakteriellen Prostatitis mit Cotrimoxazol

(The treatment of bacterial prostatitis with cotrimoxazol). Kongressbericht, 20. Tagung Norddeutscher Urologen, Kollé, P.(ed.), Hansisches Verlagskontor, Lübeck (1979).

4. Schneider E, Shackelford AE, Riedasch G. Application of immunofluorescence techniques to distinguishing flora of the urinary tract. In: Immunofluorescence and Related Staining Techniques. Elsevier Biomedical Press, Amsterdam (1978).

Shackelford, A.E. (8)

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5. Hirschberg Y, Shackelford AE, Mascioli E, Babayan VG, Bistrián BR, Blackburn GL. The response to endotoxin in guinea pigs after TPN with black currant seed oil. *Lipids*, 1990; 25:191-196.

6. Shackelford AE, Palken JL. Nutrition in cancer and HIV infection. In: *The Wellness Book*. Benson H and Stuart E, editors; Carol Publishing Co., New York (1992).

7. Palken JL, Shackelford AE. Eating for good health. In: *The Wellness Book*. Benson H and Stuart E, editors; Carol Publishing Co., New York (1992).

8. Friedman R, Shackelford AE, Reiff S, Benson H. Stress and weight maintenance: The disinhibition effect and the micromanagement of stress. In: *Obesity: Pathophysiology, Psychology and Treatment*. Blackburn G and Kanders BS, editors; Chapman and Hall, New York and London (1994).

Academic Presentations and Lectures:

1. Immunologische Untersuchungen zur chronischen Prostatitis unter besonderer Berücksichtigung des Antibody-Coating-Phänomens (Immunological studies of chronic prostatitis with particular emphasis on the antibody-coating phenomenon). Riedasch G, Shackelford AE, Möhring K.I. Internationaler Prostatitis Kongress, Bad Nauheim, Germany (1978).
2. Local immune response to urinary tract bacteria in experimental cystitis. Riedasch G, Bersch W, Shackelford AE, Schneider E, Möhring K. Symposium für experimentelle Urologie, Kassel, Germany (1978).
3. Zur Behandlung der bakteriellen Prostatitis mit Cotrimoxazol. (The treatment of bacterial prostatitis

with cotrimoxazol) Riedasch G, Möhring K, Shackelford AE, Schneider E. 20.Tagung Norddeutscher Urologen, Hannover, Germany (1978).

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Academic Presentations and Lectures (cont'd):

4. Nutrition--physiological basis of current diets. Shackelford AE, Plaisted C, Blackburn GL. 74th Annual Meeting, American College of Occupational Medicine, Boston, MA (1989).
5. The role of nutrition in the development of disease. Shackelford AE, Palken JL. Section on Nutrition, Clinical Training in Behavioral Medicine, Harvard Medical School, Department of Continuing Education, Boston, MA (1989).
6. Dietary treatment of obesity. Shackelford AE. 12th Annual Meeting, Grand Rapids Medical Society, Grand Rapids, MI (1990).
7. Appropriate and inappropriate treatment of obesity. Shackelford AE. Section on Nutrition, Clinical Training in Behavioral Medicine, Harvard Medical School, Department of Continuing Education, Boston, MA (1990).
8. The response to endotoxin in guinea pigs after TPN with black currant seed oil. Hirschberg Y, Shackelford AE, Mascioli E, Babayan VG, Bistran BR, Blackburn GL. Poster session, 14th Clinical Meeting, American Society for Parenteral and Enteral Nutrition, San Antonio, TX (1990).
9. The application of behavioral methods to the treatment of eating disorders. Shackelford AE. Section on Nutrition, Clinical Training in Behavioral Medicine, Harvard Medical School, Department of Continuing Education, Boston, MA (1991).
10. Seminar: Application of behavioral medicine interventions to obese populations. Shackelford AE. Section on Nutrition, Clinical Training in Behavioral Medicine, Harvard Medical School, Department of Continuing Education, Boston, MA (1991).

Shackelford, A.E. (10)

Academic Presentations and Lectures (cont'd):

11. Seminar: Self-regulation and mind/body medicine. Borysenko M, Shackelford AE. Konferenz über Religion und Medizin, ZIST, Garmisch-Partenkirchen, Germany (1993).
12. Mind/Body medicine. Borysenko M, Shackelford AE, Borysenko J. Professional development certificate in caring and healing, The Center for Human Caring, University of Colorado School of Nursing, Denver, Colorado (1995).
13. Hyperbaric medicine practice in the USA. Shackelford AE. Taucherarztlehrgang, Schiffahrtmedizinisches Institut der Marine (Course in Diving Medicine, German Naval Medical Institute), Kronshagen/Kiel, Germany, (1997).
14. Medical Cannabis: What we know, what we don't know, and where we go from here. 2011 NORML National Conference, Denver CO, April 2011.
15. Medical Marijuana: Its uses and benefits. Grillo Medical Center Stahl Lecture Series, Boulder CO, June 2011.
16. Medical cannabis and the elderly. Colorado Bar Association, Elder Law Section Summer Retreat, Vail CO August 2011 and regular quarterly meeting, Denver CO, December 2011.
17. Featured, CNN documentary "Weed" with Dr. Sanjay Gupta, 2013.
18. The Pharmacology of Cannabis. Foro Internacional: Actualizacion sobre los usos medicales y terapeuticos de Cannabis (International forum on the medical and therapeutical uses of cannabis). National Drug Board, Republic of Uruguay, Montevideo, April 2014.
19. Cannabis: Pharmacy Considerations. Medical Cannabis Symposium, Connecticut Pharmacists Association, Plantsville, Connecticut, June, 2014.
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Academic Presentations and Lectures (cont'd):

20. Medical Cannabis: Science and Practice. Cannabis Medicinal en Mexico. Sen. Mario Delgado, Senate of the Republic of Mexico, Mexico City, September, 2014.
21. Cannabis as a Medical Treatment Option. Foro Marihuana Medicinal, Sen. Juan Miguel Galan and Fundacion Buen Gobierno, Senate of the Republic of Colombia, Bogota, December 2014.
22. Medical Cannabis, Past and Future. Keynote speaker, CannaTech Forum, Jaffa, Israel, February 2015.

Consultancies and Representations:

1. Consultant on mind/body health to Prof. Dr.med. Ursula Lehr, Minister of Health, Women's Issues, and Youth, Federal Republic of Germany, 1990.
2. Consultant on mind/body health to Senator Ingrid Stahmer, Senator for Health, West Berlin, 1990.
3. Representative, Mind/Body Medical Institute and Section on Behavioral Medicine, New England Deaconess Hospital and Harvard Medical School to German health care institutions and universities, 1990-1991.
4. Advisor to Colorado State Senator Chris Romer on medical marijuana research and clinical applications, Colorado State Legislative Session 2010.
5. Consultant to Connecticut Governor Dan Malloy, Connecticut Senate Judiciary Committee Chairman Sen. Eric Coleman, House Judiciary Committee Chairman Jerry Fox, Senate President Donald Williams, 2011.
6. Consultant to New York State Senator Diane Savino on medical cannabis legislation, 2012.
7. Physician member, Colorado State Department of Revenue Medical Marijuana Advisory Work Group, 2010 to present.

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Consultancies and Representations (Cont'd):

8. Physician member, City and County of Denver Medical Marijuana Advisory Work Group, Denver CO, 2011 to 2013.

9. Member, State of Colorado Department of Public Health and Environment, Medical Marijuana Scientific Advisory Counsel, 2014 to present.

Avocations:

Acting: Principal roles: Discovery Channel's Animal Planet series "Busted!", National Geographic Channel "Explorer" series, independent films, medical training video series. Represented by Big Fish Talent Agency, Denver, Colorado.

Private pilot.

Musician; drummer (trap, hand drums), string bassist, learning to play Scottish bagpipes.