



HISTORY OF OSTEOPATHIC RESEARCH

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Objectives and Reading

- 1. The participant will be exposed to the panoramic flow of osteopathic research from the time of the profession's founding.
- 2. The participant will identify on a written examination the research styles and primary contributions of A. T. Still, Louisa Burns, J. Stedman Denslow, Irvin Korr and William Johnston.
- 3. The participant will identify on a written examinations the four periods of osteopathic research and their characteristics.
- Reading: Foundations for Osteopathic Medicine, pp. 1021-1037, 1053-1061

4 Periods of Osteopathic Research

- 1874-1939 Research by Still and the early osteopaths
- 1940-1969 Rigorous research based largely at Kirksville (Denslow, Korr et al)
- 1969-2000 University based research (starting at MSUCOM); establishment of AOA research awards
- 2001-? Establishment of new research centers

Historical Foundations (1874-1939)

- The definition of research used to be personal investigation. The founder of the osteopathic profession, A.T. Still, used:
 - Observation
 - Investigation
 - Dissection
 - Therapeutic trial
 - To arrive at foundations for osteopathic theory and practice

“An osteopath reasons from his knowledge of anatomy. He compares the working of the abnormal body to the working of the normal body.” A.T. Still, MD, DO, *Osteopathy, Research and Practice*, p.12

Dr. Still's Personal Research

- Personal experience
 - Treatment of his own headaches
- Extensive anatomical studies
 - As a hunter who skinned and butchered his family's food supply
 - As physician to a Native American tribe, he obtained permission from the Chief to do dissection on cadavers
- Clinical trials
 - Between 1865 and 1874, therapeutic trials on his patients
- Recorded his findings scattered through:
 - *Autobiography of A.T. Still*
 - *Philosophy of Osteopathy*
 - *Philosophy and Mechanical Principles of Osteopathy*
 - *Osteopathy: Research & Practice*

Historical Foundations

- 1897 American Osteopathic Association helps to fund research after its creation
- The Journal of the American Osteopathic Association was created to publish research
- 1938 AOA Bureau of Research founded
- Research is still presented annually at the AOA Research Conference.

Initial Osteopathic Research

1898 First recorded osteopathic research

- John Martin Littlejohn, M.D., D.O.
- reported on the impact of spinal manipulation
- Research was done at American School of Osteopathy on humans and dogs, to test and record the effects of stimulation and inhibition, effects of lesions and their attempted correction, between 1898 and 1899.

William Smith, M.D., D.O.

- used the second x-ray device west of the Mississippi River to create angiograms of cadavers, using medium mercury in a base of tallow and beeswax. Interestingly, the x-ray exposures were as long as 70 minutes at a time.
- used early radiography to document effects of OMT on circulation

Louisa Burns, DO, et. al.

- conducted research in animal models (1903-1958) to investigate the structural and functional aspects of somatic dysfunction.

Louisa Burns, D.O.

- (1870-1958)
- Native of Indiana
- Earned a BS degree from the Borden Institute in that state in 1892
- Career as a school teacher was cut short by spinal meningitis, the disabling effects of which were reversed by osteopathic treatment
- Became interested in the osteopathic profession and enrolled in the Pacific College of Osteopathy
- Became interested in developing an osteopathic research program

Louisa Burns, D.O.

- 1903 earned D.O. from the Pacific College of Osteopathy, then an MS degree from the Borden Institute and a D.Sc.O. degree from the Pacific College of Osteopathy.
- Joined the faculty of the Pacific College in 1906
 - taught physiology and acted as a clinician
- 1914 moved to Chicago to head the A.T. Still Research Institute
- Remained head of that group until 1936, when it became part of the research program of the AOA
- Became head of the Louisa Burns Osteopathic Research Laboratory and a faculty member at the College of Osteopathic Physicians and Surgeons, LA (successor to her alma mater)
- Produced five books and many articles
- Research was on the "Osteopathic Lesion"

Louisa Burns DO, 1870-1958

- Pioneer career osteopathic researcher
- Director, AT Still Research Institute 1917-1935
- Paid as AOA researcher until 1950
- Experimentally induced spinal fixations in animals & then noted the effects of these lesions on brain, heart, GI, reproductive organs, lungs, kidneys
- Many of her findings supported the concept of somatovisceral and viscerosomatic (SV and VS) reflexes
- She retired in 1957 due to poor eyesight, and died in California in 1958

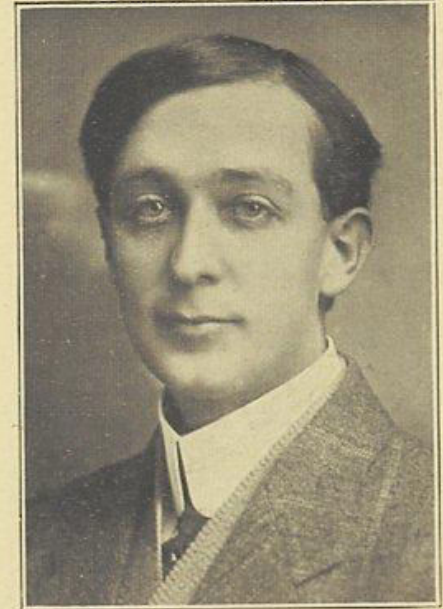
Wilbur Cole, DO

- Studied with Dr. Burns 1948-50
- Reproduced her experiments and data
- Internal Validation



Osteopathic Research 1901-1920

- 1901 Dain Tasker, D.O. reported on the effect of stimulation of the vagus nerve on the heart in *The Osteopath*, the journal of the Pacific College of Osteopathy in Los Angeles.
- 1906 A.T. Still Postgraduate College of Osteopathy-\$16,000 raised from donations.
- 1909 Above name was changed to A.T. Still Research Institute
- 1913 A.T. Still Research Institute laboratories opened in Chicago.
 - Headed by Wilborn J. Deason
- 1917 Branch opened in CA in 1917
- 1918 Chicago property was sold and the California branch became the only center for the A. T. Still Research Institute



J. DEASON

Ph. G., Valparaiso University, 1904.
B. S., Valparaiso University, 1906.
M. S., Valparaiso University, 1908.
D. O., American School of Osteopathy, 1910.
Embryology, Bacteriology, Physiology and
Research, Practice.

Early Research-Findings

- Examination and graphic tracings of spinal structural relationships reveal that certain definite alterations of the normal relationships are associated with the disorders in the organs anatomically associated with that portion of the spine where such alterations occur.
- In the hundreds of dissections of bodies that have been made at osteopathic colleges, observations have been made and recorded of existing altered relationships in the framework of the body which, it could be demonstrated, interfered with the blood or nerve supply of organs that were found to be diseased.
- Animal experiments over a 10 year period showed that spinal lesions experimentally produced and observed for several months revealed on autopsy that at the site of the lesion, "In EVERY CASE", the associated nerves and the organs to which the nerves supplied showed congestion and inflammation.

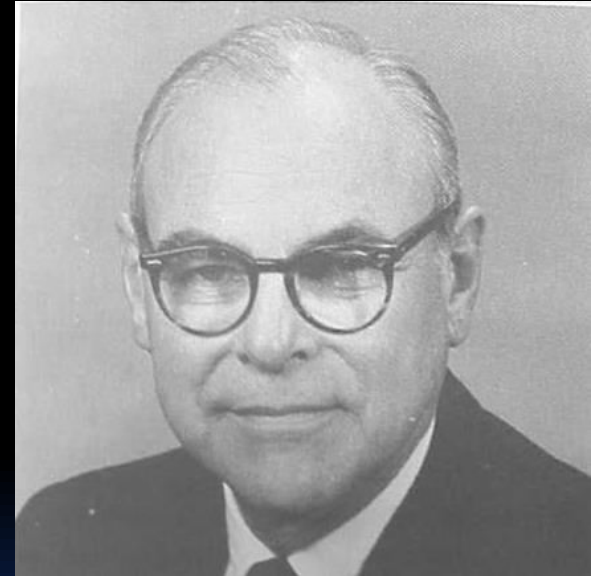
Historical Foundations

- H.V. Halladay, DO and Angus Cathie, DO pursued research related to the anatomical basis of the “osteopathic lesion.”



The Second Period of Osteopathic Research (1939-1969)

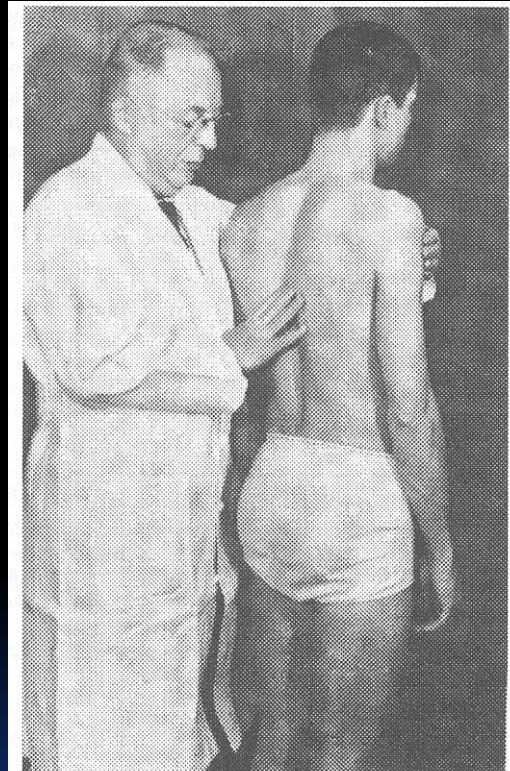
- J. Stedman Denslow, DO (1906-1982)
- Directed research programs at Kirksville
- “Osteopathic research must be done by scientists trained in osteopathic methods.”
- Did research himself and built a team which lasted from the late 1938 to about 1975
- Established collaborative efforts as he recruited and coordinated work with Korr, Hix and others



J.S. Denslow, DO (1906-1984)

- Did numerous studies documenting & quantifying muscle, muscle reflex & autonomic changes in areas of somatic dysfunction (“osteopathic lesion”).
- “Reflex Activity in the Spinal Extensors”, utilized EMG/palpation correlation: documented spinal muscle reflex changes in areas of osteopathic lesions.
- Proponent of using standard terminology
- Elaborated on spinal cord facilitation

J. S. Denslow, DO



2. 1A. The patient is standing comfortably and at ease (he may also be examined while prone or lying on his side) and is supported by the physician's left hand, on the patient's shoulder. The tip of one finger of the physician's right hand presses moderately against the area to be examined. If hyperalgesia is present the patient experiences discomfort.

I.M. Korr, Ph.D (1909-2004)

- “The Second Great Philosopher of Osteopathic Medicine”
- Took Still’s anatomical foundation and scientifically elaborated related physiological function.
- Promoted the entire DO – patient interaction as a research paradigm, not just OMT

I.M. Korr, Ph.D. (1909-2004)

- Performed studies documenting:
 - changes in galvanic skin resistance as a result of disturbances in autonomic function, in areas of subjects' skin associated with palpatory findings of somatic dysfunction (with Denslow)
 - Axoplasmic flow of proteins & the trophic function of nerves
 - Facilitation of spinal cord segments (with Denslow)
 - Sympatheticotonia (elevated sympathetic tone)

- Identified decreased firing thresholds in facilitated spinal segments

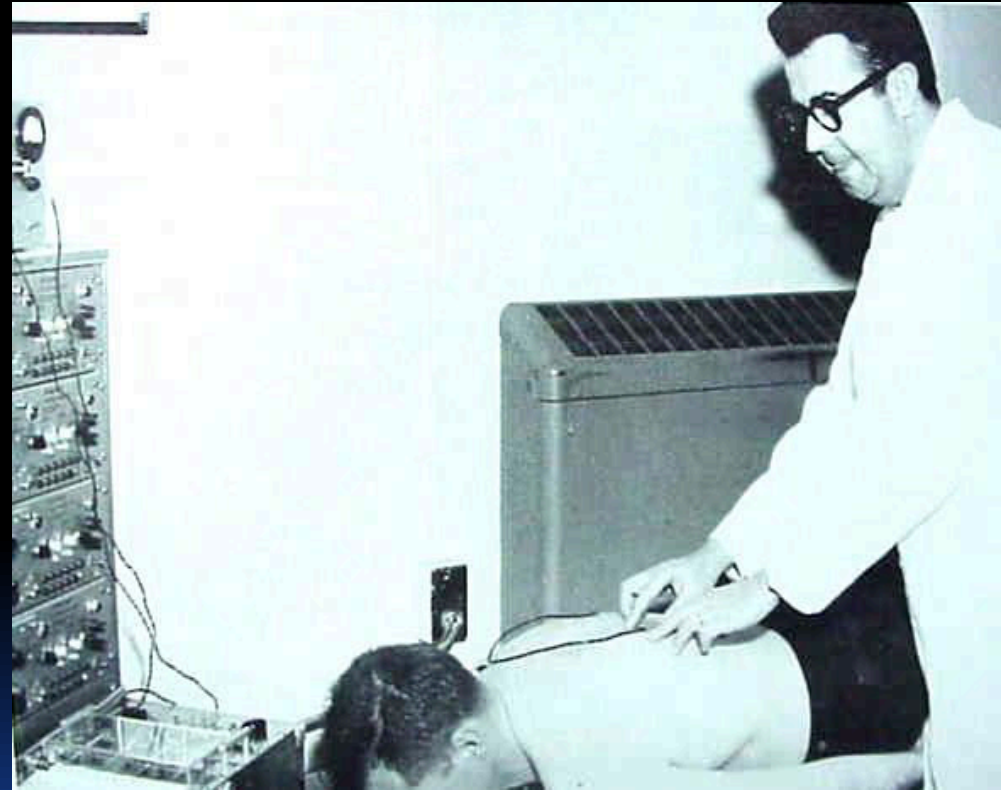
- Stimulus at non-facilitated segments results in higher output at facilitated segments rather than at their own level

- Emotional states also impact facilitated segments more heavily

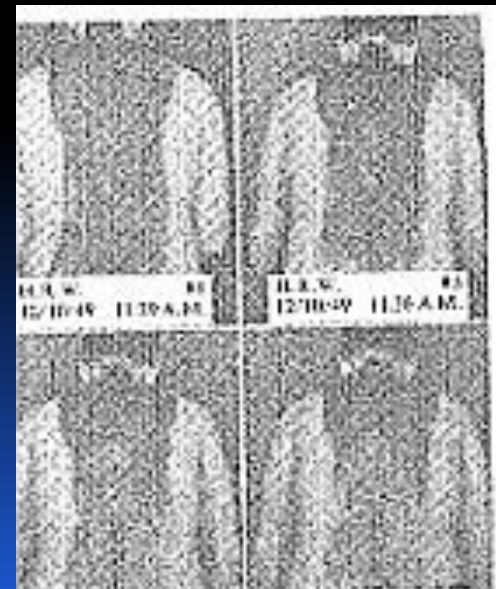
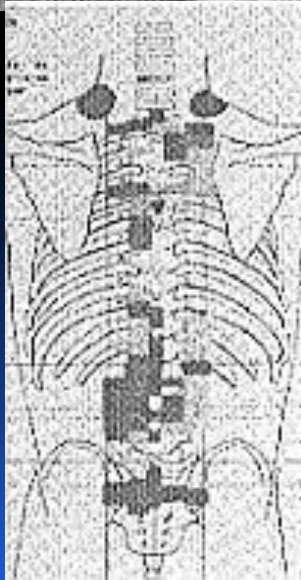
- Determined that facilitation produces focal effects from divergent afferent inputs (facilitated segment acts as a neurological lens)

- Demonstrated axonal transport of proteins

Irvin Korr, Ph.D.



Measurement of Electrical Skin Resistance

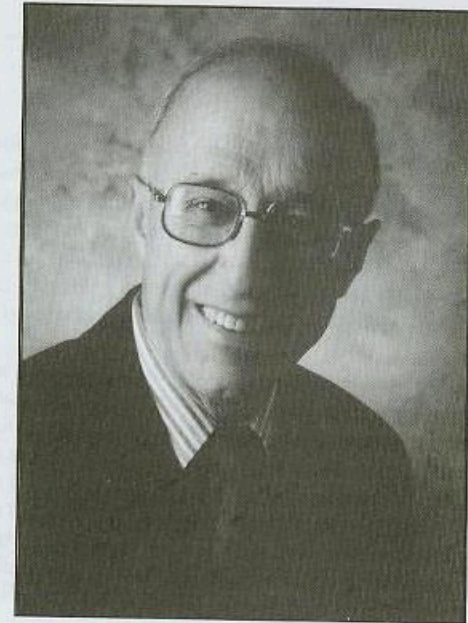


William L. Johnston, DO, FAAO (1921-2003)

- Reliability Studies
- Validity Studies
- Viscerosomatic Reflexes


1998 Yearbook

*Scientific contributions
of William L. Johnston, DO, FAAO*



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Research from the 20th Century

DO and MD Patient Care Comparisons

20th Century Research

- 1918 - Spanish Influenza Epidemic
- 1932 - Unit II L.A. County Osteopathic Hospital
- 1999 - NEJM- LBP RCT

Influenza epidemic 1918

Data on n of 110,120 patients
submitted by 2445 DOs

MD data was collected similarly

	Medical care	Osteopathic Manipulation
Overall Mortality	5%	0.25%
Mortality with pneumonia complication	30-60%	10%

Unit II L.A. County Hospital 1928



Ochsler Unit, Los Angeles General Hospital

LA County Osteopathic Hospital ("Unit II")

- MD unit ("Unit I") had 3574 beds
- DO "Unit II" had only 196 beds (1928)
- Every 10th patient was assigned to Unit II
- But DOs saw one-seventh of total # patients (many pts. transferred over)
- DOs Delivered $\frac{1}{3}$ of the OB patients

LA County “Unit II” 1928

- 6,000 inpatients per year
- 200 outpatients per day

LA County Osteopathic Hospital 1933



LA County Hospital DO / MD
care 1930-32
published in JAOA

MD + DO

- 9.7% mortality
- 16 days average LOS
- 14% coroner's cases

DO only

- 5.53% mortality
- 9.7 days average LOS
- 14% coroner's cases

Definition of Research

- “A diligent search to seek, to inquire, to seek facts or principles, a laborious or continued search after truth, or to examine cause.”
 - Medical research relates to the knowledge of health, its nature and maintenance, and to a knowledge of disease, its nature, prevention, and treatment.
 - Specific osteopathic research expands medical research by adding study of biologic phenomena pertinent to an explanation of the osteopathic concept in preventing and eliminating disease.

Difficulties in Osteopathic Research

- Funding
- Methodology
 - Long period in scientific investigation when only double blind studies were considered respectable
 - Difficulty in blinding the investigator and the patient
 - Solutions included having an independent investigator/data analyzer who did not provide the treatment or know who was being treated, and the use of sham manipulation

OMM Research Funding Sources

- Providers (consumers)
- AOA Bureau of Research
- NIH National Center for Complementary and Alternative Medicine
- Osteopathic Medical Schools and Hospitals
- Private individuals and foundations (e.g., Osteopathic Heritage Foundation)
- The national Osteopathic Research Center (at TCOM)

Factors Affecting the Development of Unique Osteopathic Research

- FUNDING was limited through the 20th century
 - Small number of osteopathic colleges, tuition driven
 - Initially, most research was funded by drug (pharmaceutical) companies.
 - Drug companies weren't interested in providing research funds to institutions that were trying to decrease their use.
 - Private institutions (most osteopathic colleges) not only had no funding, but couldn't afford to pay extra faculty to do research.
- University affiliation:
 - The large expansion in research funding in the U.S. during the 1960s and 70s occurred at the time the osteopathic profession was in danger of being absorbed, and had no university based colleges.

Factors Affecting the Development of Unique Osteopathic Research


- Osteopathic Colleges were more focused on training doctors to treat people instead of doing research.
- Technology: The technology available made it difficult to document cause/effect relationship of OMM.
- Double blind model popularity: It's hard to do manipulation without knowing what you're doing.
- From 1975-1995 very little research done due to the above factors.
- The adaptations for the double blind methods and current interest in outcomes studies works better for the osteopathic model.

Our Greatest Challenge

- Building a research base to support the osteopathic paradigm
- “Expanding our claims of efficacious and unique practices. Without demonstrable substantiation of its claims to a unique role in health care, the osteopathic profession risks its existence.” FOM, ed. 2, page 1219
- Data exists to show that the osteopathic profession has made unique contributions to health care and its philosophy is sound. (Kirksville group 1940’s and 1950’s); Chicago College and others, papers published in the JAOA over the years shows substantial research contribution.
- Further substantiating the unique/emerging quality of osteopathic medicine requires NEW and INNOVATIVE ways to measure health and clinical outcomes, as well as the development of new and innovative research techniques.

Osteopathic Research

- Funding began to increase for osteopathic research when:
 - Osteopathic medicine became involved with state universities (e.g. Michigan State University, 1969)
 - Osteopathic medicine began participating in pharmaceutical research
 - More faculty were hired and devoted increased time to research
 - AOA began to develop a fund for research
 - 1986-1996 attached a \$50.00 fee to AOA member renewal dues that went directly into a research fund
 - A decision was made to fund a major study, and to establish a major center (Study: Anderson; Center: ORC in Texas)



A Comparison of Osteopathic Spinal Manipulation with Standard Care for Patients with Low Back Pain, 1999, Andersson G, et al.

- “at least 3 weeks but less than 6 months”
- 20-59 years old, 155 patients
- variety of techniques, including thrust, muscle energy, counterstrain, articulation, and myofascial release
- Standard care vs. osteopathic manipulation plus standard care

Osteopathic Spinal Manipulation + Standard care for Subacute LBP

-Andersson NEJM 11/4/99

OMT+PT+Meds

MD+PT+Meds

n 83

72

NSAIDS 24%

54%

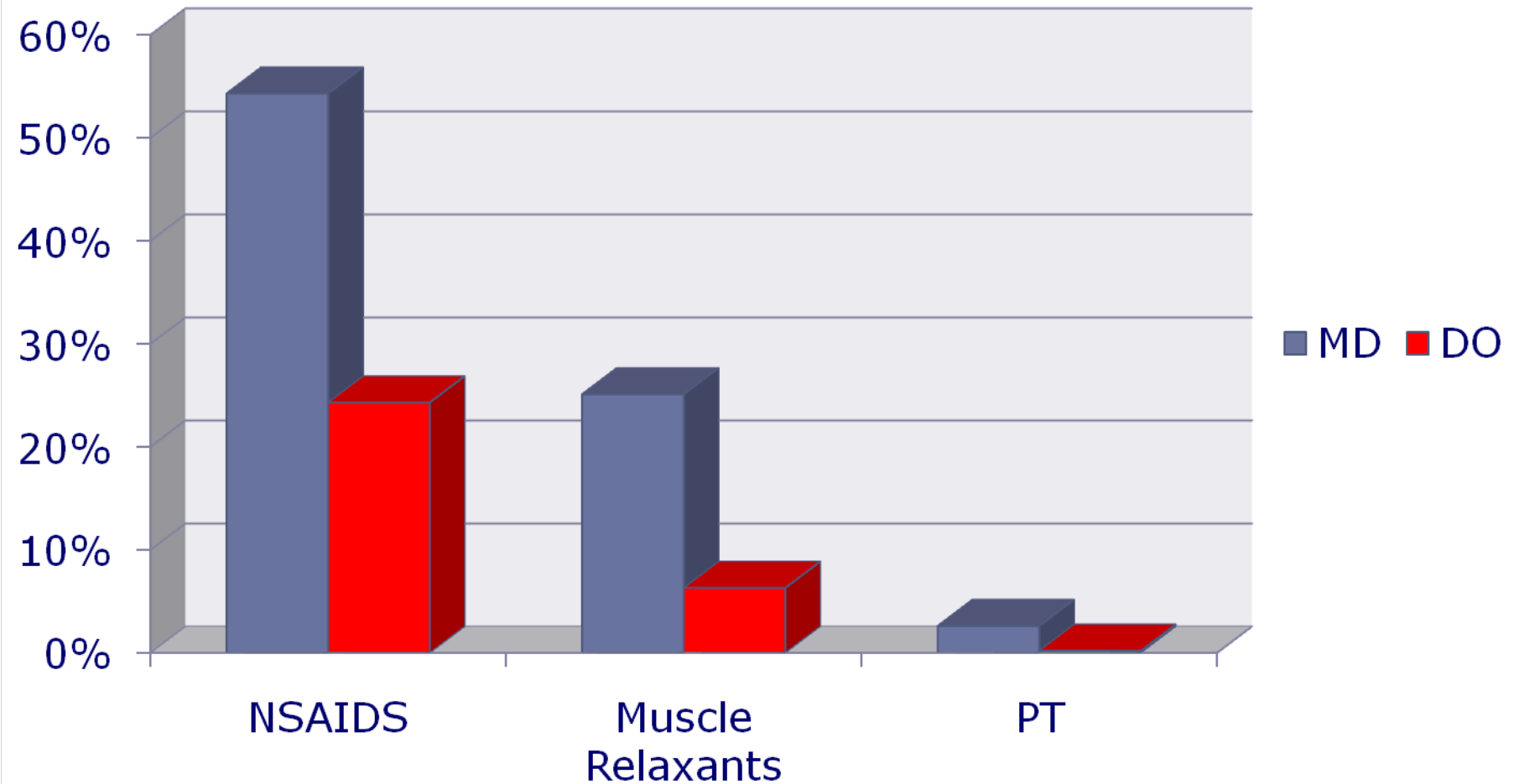
M. Relax. 6%

25%

PT 0.2%

2.6%

OMT + Standard Care vs. Standard Care of Subacute LBP



OMT + Standard Care vs. Standard Care of Subacute LBP

- Results
 - Outcomes for patients were no different, except that the osteopathic group required less medication and less PT
 - About 90% of the patients were satisfied with the care they received in both groups

Development of the Osteopathic Research Center

1997

- Discussion of formation of osteopathic center for research

1999

- Apparent that NIH funding would not be available to establish it

2000

- AOA secured funds for a single center

2001

- Announcement of Center for Osteopathic Research would go to the University of North Texas Health Sciences Center at Fort Worth, College of Osteopathic Medicine