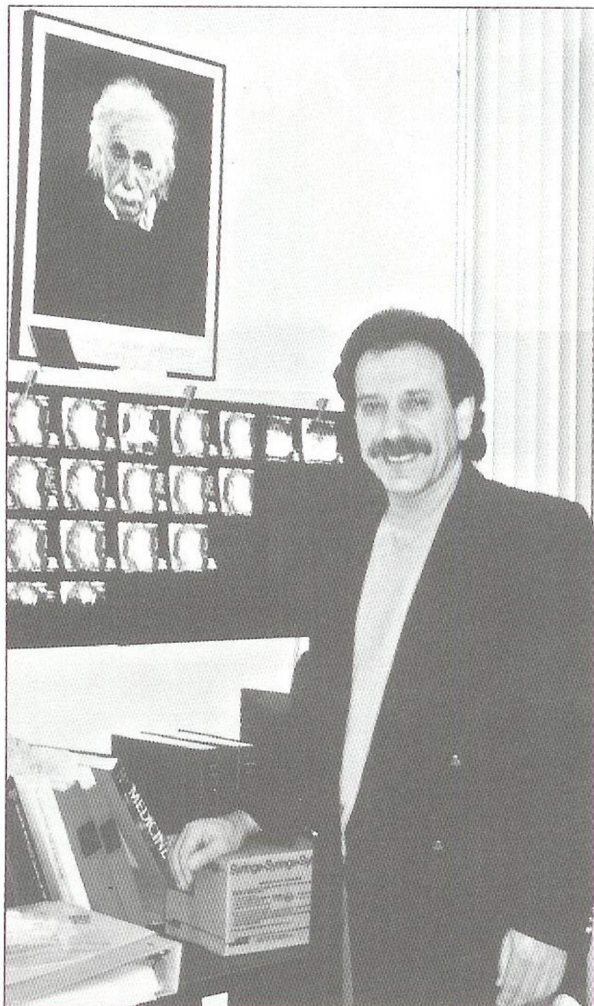
About the Contributor...

Felix Linetsky, M.D.



Felix Linetsky, M.D.
Yes, there's some likeness to "another" genius, Albert Einstein.

In *Prolo Your Pain Away!*, emphasis was placed on the roles George S. Hackett, M.D. and Gustav A. Hemwall, M.D., had on researching and teaching Prolotherapy so that the technique survived. There have been many other courageous, innovative physicians who challenged the, then current, way of thinking to do what was right for their patients. History is not always exciting, but it is necessary if one is to truly grasp a subject. It also puts added pressure on the modern-day physician to use the technique appropriately, because so many have sacrificed to allow today's physicians to practice, in this instance, Prolotherapy.

One of these modern-day Prolotherapists is Felix S. Linetsky, M.D. Like many Prolotherapists, he became interested in the subject because of his own chronic pain problems. Drs. Baum and Chase successfully treated him. He is an Associate Clinical Professor at Nova Southeastern College of Osteopathic Medicine and Assistant Professor at University of South Florida School of Medicine. He completed his medical education in the former Soviet Union, originally as a Physician Assistant and subsequently as a Medical Doctor, in 1966 and 1975, respectively. He practiced Orthopaedic Surgery in Russia until 1979. In the United States, Dr. Linetsky completed two years of General Surgery Residency and then a Residency in Emergency Medicine. He practiced Emergency Medicine for several years until he was treated successfully by Prolotherapy. Since 1990 his practice has been devoted to Prolotherapy, Orthopaedic Medicine, and musculoskeletal pain treatment. He is a frequent lecturer on the subject of Prolotherapy. Subjects of his research include clinical anatomy and its relation to Prolotherapy and the history of Prolotherapy.

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CHAPTER 4

THE HISTORY OF PROLOTHERAPY

FELIX LINETSKY, M.D.

INTRODUCTION

A HISTORICAL OVERVIEW OF PROLOTHERAPY

"THE NATURAL CONSERVATISM OF THE PHYSICIAN OFTEN CAUSES HIM TO CONDEMN A METHOD OF WHICH HE HAS NO DIRECT KNOWLEDGE." [6]

–L.F. Watson, M.D.

The history of the injection treatment of ligaments and tendons, known as Prolotherapy, originated first in the non-surgical treatment of hernias, varicose veins, hemorrhoids, and hydroceles. The treatment of these later conditions was and is known as Sclerotherapy. All the above pathologies, except hydocele, have one common denominator, connective tissue weakness. If the connective tissue in the veins becomes weakened, hemorrhoids and varicose veins form. Weakness in muscular tissue and fascia is responsible for hernias. Weakness in the collagen, of course, causes ligament laxity and tendon degeneration with resultant chronic pain.

STARTING WITH SCLEROTHERAPY

Most of the early innovators in injection treatment methods were surgeons who were looking for methods to improve surgical outcomes or replace surgical treatments with more conservative methods. The injection of hernias, hydroceles, varicose veins, and hemorrhoids was called Sclerotherapy because the injection "sclerosed," or scarred, the area. An easy way to understand this is to consider what an inguinal hernia actually is. Inguinal hernias are common in athletes because of all the heavy weight training. An inguinal hernia is a protrusion of the contents of the abdomen within the peritoneum, resulting from a weakness of the muscles and connective tissue layers of the abdominal wall. The athlete feels a bulging in the groin or the scrotum which is actually the intestines bulging through the abdominal muscles into the scrotal sac via the inguinal canal. The most common method of treatment is surgery to the abdominal muscles to close the area. Surgery causes a scar to form. A non-surgical method to do the same thing is Sclerotherapy. This would involve the injection of substances that induce, if you will, "non-surgical" scar formation. ***(See Figure 4-1.)*** These treatments were and are very effective for small hernias.

Celsus, a Roman encyclopedist and not a physician, described the earliest application of Sclerotherapy in the first century B.C. The "saltpeter" (Potassium nitrate) was injected to treat hydrocele (accumulation of fluid around the testicle). The instrument and method of injection was however not described.[1] It took 17 centuries (things took a long time even then) until a surgeon at Guy's Hospital, the oldest teaching hospital of the University of London Medical School, Samuel Sharp, in 1739 treated hydrocele by Sclerotherapy and started training others.[1]

It took another 100 years for Sclerotherapy to make it over to the United States. In 1836, Professor Joseph Pancoast, a prominent surgeon at the Jefferson Medical College in Philadelphia, published his results of injecting hernia sacs with iodine and cantharides. The technique was apparently very successful.[2]

The next important contribution to the injection treatment of hernia belongs to Dr. George Heaton, who had more than forty years' experience treating hernias with subcutaneous injections (injections beneath the skin). He learned the technique from Dr. Zophar Jaynes. They worked together in 1832 at a penitentiary, treating convicts in Alton, Illinois.[2-4]

Dr. Heaton perfected his own instruments and the solution of Quercus Alba, and gained sufficient, positive experience in treating many patients, and more importantly, realized that the treatment of hernias should be directed toward injecting the connective tissue around the inguinal ring.

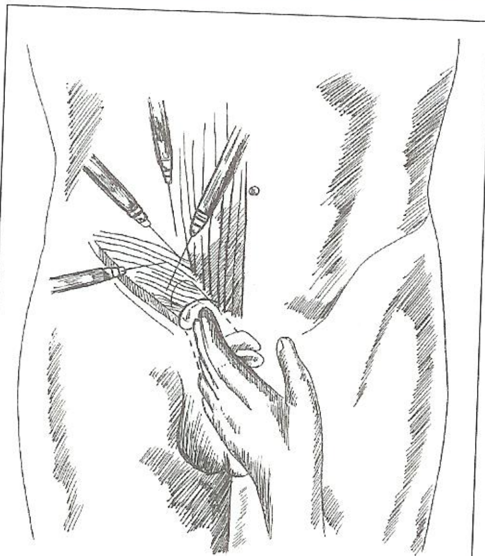

Figure 4-1: Sclerotherapy of an Inguinal Hernia
Sclerotherapy of hernias, hydroceles, varicose veins, and hemorrhoids was the precursor to modern-day Prolotherapy.

Another important decision of his was to marry the daughter of the honored President of the Massachusetts Medical Society. He moved his practice to Boston in the spring of 1842. In 1843 he published an article, "New Treatment of Hernia," in the *Boston Medical & Surgical Journal*.[2,5] This new treatment for hernia was welcomed by patients but unfortunately his medical colleagues in the United States never grasped the technique. This happened despite the fact that medical writers seemed to agree that Heaton **actually cured** more patients of reducible hernia by means of the injection method than had been cured by all other methods combined up to this time. This sounds like what has happened to Prolotherapy.

About 1845 Heaton visited London, where he was elected a member of the Royal Chirurgical, the Westminster and the London Societies. He was similarly honored in Paris. The Heaton injection method of treating hernia grew rapidly throughout Europe despite the fact that it never caught on in the United States. Heaton's monograph on the cure of hernia appeared in 1877, two years before he died.[5-7]

Dr. Joseph H. Warren was a personal physician to Dr. Heaton, as well as his disciple. He inherited Heaton's writings and instruments and incorporated them in his own monograph, "Hernia," in 1881. He described Heaton's method as well as his improvements in this text. Instruments used by both physicians are depicted in detail and the Quercus Alba solution was made public.[5-7]

In 1835 Professor Velpeau, a well-renowned French surgeon, discovered that a mixture containing six drams of tincture of iodine in three ounces of water could cure hydrocele. He continued this technique for more than a decade and published the work in 1846.[5-7]

Dr. Ignatz Mayer of Detroit in 1894 began injecting hernias with the Mayer's solution. The main ingredients were zinc sulfate, phenol crystals, glycerin, aqueous cinnamoni, and an extract of pinus canadensis. Despite the high percentages of cures achieved in 2,000 patients by Dr. Mayer, the local and state medical societies refused to recognize his work. Finally, at the end of his career, Dr. Mayer treated the President of the Michigan State Medical Society, who was suffering from a recurrent hernia, twice operated upon. When the cure was achieved, Dr. Mayer was accepted as a member of the above-mentioned Society, three years before his death.[5-7]

Two other prominent physicians of that time were Dr. McDonald and Dr. Enrique Pina Mestre of Barcelona, Spain. Dr. McDonald's solution contained phenol, alcohol and Lloyd's Specific Tincture of Thuja. He reported an amazing **97 percent** cure rate in over 10,000 cases. Dr. Enrique Pina Mestre called his solution "Hernial." It contained alcoholic extract of the herbs krameria, catechu, moneci, rosa canina, and vaccinium myrtillium. He also reported an amazing **98 percent** cure in over ten thousand cases.[5,7]

Do you see the importance of history? Here is a successful treatment of hernia that is curative, safe, and shown to be effective in thousands of patients, yet not accepted by the then modern medicine. We will continue to go on, but one has to ask oneself, "Why did it never catch on? Why is injection therapy for hernia not done today?" If it weren't for a few tenacious brave souls, Prolotherapy would have had the same fate as injection therapy for hernia. But do not fret, there are still doctors today who treat hernias via injection.

During the early 1900s the injection therapy for varicose veins, hemorrhoids, hydroceles, and hernias continued to some degree in some of the problem-oriented clinics affiliated with prominent university hospitals and medical schools. For instance, Dr. Arthur Bratrud, Assistant Professor of Surgery and the Director of the Clinic for Ambulant Treatment of Hernia at the University of

Minnesota Medical School, by 1937 had published six articles on the subject and became known as a recognized authority on this method.[7] Dr. Penn Riddle, an Assistant Professor of Clinical and Operative Surgery at Baylor University College of Medicine in Dallas, Texas, operated the Varicose Vein Clinic. He wrote a comprehensive textbook in 1940 entitled, *Injection Treatment of Hernia, Hydrocele, Ganglion, Hemorrhoids, Prostate Gland, Angioma, Varicocele, Varicose Veins, Bursea and Joints*.[5]

In 1936, Dr. H.I. Biegeleisen first coined the term "Sclerotherapy" as a name for the injection clinic in New York City. Dr. Biegeleisen was a versatile practitioner of Sclerotherapy who wrote many articles and a textbook on the subject. However, his original contributions pertain to the fact that he tested new solutions, such as sodium morrhuate (one of the Prolotherapy solutions) in 1933, and four fatty acid solutions for the treatment of hernia in 1937.[8-11]

Sclerotherapy for varicose veins was receiving a lot of attention during this time primarily because of the articles and textbook written by Dr. H.O. McPheeters, the Director of the Varicose Vein and Ulcer Clinic at Minneapolis General Hospital.[5,12] Dr. J.K. Anderson was also a Clinical Associate Professor of Surgery at the University of Minnesota Medical School and was on staff at Minnesota General Hospital. He promoted Sclerotherapy for varicose veins, in addition to hemorrhoids. He wrote several articles and a book entitled, *Injection Treatment of Varicose Veins and Hemorrhoids*. One of his teachers, Dr. W.A. Fransler also wrote extensively on the subject of treating hemorrhoids with Sclerotherapy.[13] Most people do not realize that a hemorrhoid is just a dilated vein. Sclerotherapy is often curative for both hemorrhoids and varicose veins.

Sclerotherapy for the treatment of hemorrhoids received a big boost when Dr. Frank C. Yeomans, Professor of Proctology (the study of the anus and anal diseases) and Attending Surgeon at New York Medical School and Hospital, edited a textbook, *Sclerosing Therapy,* for which he wrote a section on the injection treatment of hemorrhoids.[14] Dr. Yeomans was considered an authority on Proctology because he had written a textbook on the subject, and he had been a past president of the American Proctologic Society and a Fellow of the American College of Surgeons.

It is obvious that by the middle of the 1930s, four major applications of the Sclerotherapy injection treatment were established: hernias, varicose veins, hemorrhoids, and hydroceles. How this injection treatment method was then applied to treating painful musculoskeletal conditions, and came to be called Prolotherapy, is also very interesting.

In 1930, one of the premier vascular surgeons of the 20TH century, René Leriche, wrote a small publication in which he described using novocaine in establishing the diagnosis, differential diagnosis, and treatment of injuries to ligaments and tendons of the ankle and other joints at their insertions on the bone.[15,16] This work was confirmed by Drs. Soto-Hall and Haldeman in the mid 1930s when they wrote about the benefits of procaine (another name for Novocaine) in the diagnosis and treatment of painful lesions in the shoulder and derangements of other joints.[17] Then in 1937, B.D. Judovich and W. Bates expressed their experience in treating low back pain arising from the thoracolumbar (low back and mid back junction) utilizing procaine injections.[18] In January 1938, Arthur Steindler and J.V. Luck published a fundamental work with clinical anatomy related to the diagnosis of low back pain based on procaine injections. They provided great evidence that all the structures in the lower back including the ligaments, fascia, tendons, and muscles receive sensory nerve impulses. They pointed out that these structures are all interrelated anatomically and functionally. They also reiterated that based on the clinical presentation, no definite diagnosis could be made. They came up with five criteria that had to be met to prove that an injured structure was causing a pain symptom:

1. Contact with the needle at the injured area must aggravate the local pain.
2. Contact with the needle must aggravate or elicit the radiation of pain (referral pattern).
3. Procaine infiltration must suppress the local tenderness.
4. Procaine infiltration must suppress the referral pain pattern.
5. Positive straight-leg signs must disappear.[19]

This work was monumental in the history of Prolotherapy. Now a method to definitely prove what was causing the pain existed. A person came to the physician with low back pain radiating to

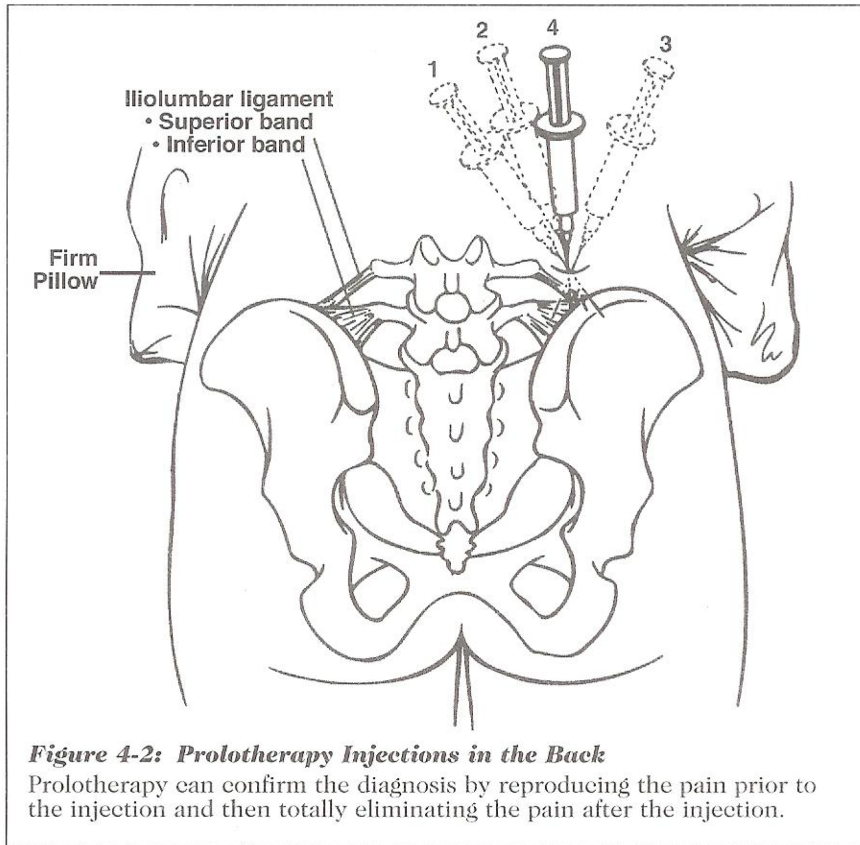

Figure 4-2: Prolotherapy Injections in the Back
Prolotherapy can confirm the diagnosis by reproducing the pain prior to the injection and then totally eliminating the pain after the injection.

the legs. The doctor, with a needle, then tried to exactly reproduce the pain and the radiating pain down the leg. When the exact site was found, an injection of procaine was given. If the correct structures were injected, all of the pain would be completely removed. The latter part of this concept is followed to this day. Prolotherapy can completely remove chronic pain immediately, if the correct structures have been injected, because of the anesthetic, part of the solution. ***(See Figure 4-2.)***

Later in 1938, Drs. Soto-Hall and Haldeman expanded on their earlier work and wrote on the treatment of sacroiliac dysfunction with procaine injections. They observed marked relaxation of spastic muscles after the injections, and added the routine use of manipulation of the sacroiliac joint (most common joint manipulated in the lower back) after injections, thus establishing the precedent of manipulation under local anesthesia.[20]

These early studies showed that a physician could prove a certain structure was the cause of pain because after the injection the pain was totally relieved because of the anesthetic. However, these physicians also noted that many of the patients had complete relief of their pain just with the injection of the anesthetic. ***(See the next chapters to further explain this.)***

The injection method moved into bursa (fluid filled sacs which allow tendons and muscles to glide over bone) in 1931, when Dr. A.E. Poritt reported on the successful treatment of chronic bursitis with this method.[21]

In 1931 and 1933, Dr. R.K. Ghormley published work that the facets (place where the vertebrae meet) could be the source of sciatic and low back pain.[22] This is important because this is a common area treated with Prolotherapy for low back conditions.

THE ONSET OF MODERN-DAY PROLOTHERAPY TECHNIQUES

Modern-day Prolotherapy techniques started to be developed in the 1930s under the research and publications of physician-dentist, Louis W. Schultz; two osteopathic physicians, Earl Gedney and David Shuman; and a medical doctor, George S. Hackett. The tenacious work and development of these great pioneers led to the techniques that are now used in Prolotherapy.

LOUIS W. SCHULTZ, M.D., D.D.S. (1894–1975)

Louis W. Schultz was unique in that he was a dentist and a medical doctor. ***(See Figure 4-3.)*** He published several papers on the treatment of subluxation of the temporomandibular joint

Figure 4-3: Dr. Louis W. Schultz

Dr. Schultz, pioneer doctor-dentist in the technique of Prolotherapy.

Photo courtesy of Betty Knox (daughter) and Michelle Schultz (daughter-in-law).

(TMJ), including one in 1937 in the *Journal of the American Medical Association*.[23] In this paper he described just how common TMJ syndrome was and that the traditional treatments of rest, appliances in the mouth, physical therapy, and surgery were only partially successful. He described a simple method of shortening and strengthening the TMJ capsule by injection (later termed Prolotherapy).

Being familiar with the described research, Dr. Schultz conducted animal experiments using several different solutions, among them, Sylnasol (sodium psylliate) which provided the best results. He laid down the criteria that are needed when choosing a Prolotherapy solution.

"The agent used must not be injurious to the joint or surrounding tissues, the therapeutic response should be painless, the solution should not be injurious if, by chance, it enters the veins, the degree of fibrogenesis (proliferation) should be controllable, and no untoward systemic reactions should follow."[23] He did considerable testing until he found the sodium psylliate solution called Sylnasol.

He first tested the solution in dogs, doing injections into the temporomandibular joint to see if it would cause a strengthening of the ligaments that support the joint capsule. To test the possible side effects of the solution, he injected into the abdominal cavity, nerves, heart, and lungs of the animals as well. He summarized his results on the lack of side effects of Prolotherapy:

- Injections of from 1 to 2 milliliters of sodium psylliate into the mental and infra-orbital foramina (holes where nerves come out) produced no effect. Motor nerves (nerves to muscles) were tested with a similar absence of effect.
- Injections of from 60 to 120 milliliters into the peritoneal cavity (abdomen) produced no effect either immediately or subsequently, as proved at autopsy from one-half to three months later.
- Introduction of this agent into normal pleural cavities (lungs) showed no gross effect on the pleura or lung at autopsy.
- From 30 to 60 milliliters injected directly into the left ventricle of the heart on three successive days and at weekly intervals revealed no effect either immediately or at autopsy.
- Large doses injected directly into the bloodstream were followed by no symptoms.
- No infection followed the treatment.

In regards to the actual Prolotherapy effect of the sodium psylliate solution injected into the temporomandibular joint:

- There was no alteration of the normal joint cavity; the proliferation occurred in the ligaments.
- There were no gross changes in the ligaments other than their thickening and hence the strengthening of the chief factors that hold the joint within its cavity.
- Lymphocytes (immune stimulation) infiltrate the area injected within 30 minutes.
- Proliferation of tissue can be seen in four to six days.

He described the treatment of TMJ syndrome as simply inserting from 0.25 to 0.50 milliliters of solution directly inside the joint. The injections were repeated at weekly or biweekly intervals until the desired proliferative effect occurred. He noted that this occurred generally within three to five weeks. Thus, a person needed in general three to four injection sessions, total, to be **permanently cured** of clicking, pain, and hypermobility of the temporomandibular joint. He introduced the idea that proliferation of other ligaments to strengthen joint capsules might be helpful for other joints to eliminate subluxations and partial or recurrent dislocations. He also concluded that Sylnasol was a dependable proliferant to be used in the ambulatory setting and that Prolotherapy restored normal joint function, and the method was within the scope of the average general practitioner.

Dr. Schultz had discovered a very effective proliferant that, when injected into non-injured areas, was essentially free of side effects. The solution known as Sylnasol (sodium psylliate, Searle) was a five percent solution of the salts of the fatty acids of psyllium seed oil. Dr. Schultz summarized his results in 1956, in "Twenty Years' Experience in Treating Hypermobility of the Temporomandibular Joints," published in the prestigious *American Journal of Surgery*.[24] It was amazing that he could say that the clicking, grating, or popping had been controlled thus far in all of the several thousands of patients who had been under his care. This control had been attained usually during the first six to 24 hours after the Prolotherapy. There had been no complications or deleterious effects to date. Imagine that! He published in a major medical journal that there was a treatment for TMJ syndrome that was essentially 100 percent effective, with only one to four injections, and had no side effects. In his conclusion statement he noted, "...because several thousand patients have been treated to date, this report is more valuable in proportion to the larger experience gained. Attention is directed again to the simplicity and safety of the method and to the fact that it may be used in the treatment of other joints in which function is impaired by lax ligaments."*

Unfortunately, Dr. Schultz never did receive the credit he deserved for the many discoveries he made regarding Prolotherapy, even though he was an Associate Professor in the Department of Surgery at the University of Illinois and the Rush College of Medicine and was published in two of the most prestigious medical journals. Instead of being heralded, the vast majority of medical physicians largely ignored his research. There was, however, one obscure physician in Canton, Ohio, who took Dr. Schultz's research on Sylnasol seriously and began confirming his work and applying it to neck and low back problems. That physician was George S. Hackett.

GEORGE S. HACKETT, M.D. (1888-1969)

George S. Hackett, M.D., was a graduate of Cornell Medical School, class of 1916. In 1939, after 20 years in a busy trauma practice in Canton, Ohio, he came to the conclusion that ligament and joint problems were responsible for the majority of back pain. Sixteen years later he came to another conclusion, that tendon pathologies are another significant contributor to the chronic pain syndromes.[25] He expanded on the original research of Dr. Schultz and used Sylnasol in the successful treatment of low back pain, whiplash injury, and neck pain. In 1955, Hackett reintroduced the term proliferation and in 1956 introduced the term "Prolotherapy" in the first edition of his book.[26] His book, entitled *Ligament and Tendon Relaxation Treated by Prolotherapy*, was the first comprehensive text describing the research and technique of using Prolotherapy to cure chronic pain. Dr. Hackett by this time had treated over 1800 patients with low back pain with Prolotherapy, using Sylnasol, and had an **82% cure rate** at 12 years after the Prolotherapy.[25] In his lifetime he published 16 articles on the subject of Prolotherapy and four editions of his book. He used Prolotherapy in the successful treatment of whiplash injury, low back pain, neck pain, arthritis, and sciatica. He was the first to describe in detail the referral pain patterns of ligaments in the neck and low back region. ***(See Figures 4-4, 4-5, and 4-6.)***

George S. Hackett, M.D.
The doctor who first coined the term "Prolotherapy."

An experienced practitioner and a mature clinical researcher, Dr. Hackett emphasized the importance of the earlier-referenced postulates of Steindler,[19] namely, that the physician could be 100 percent certain that the correct structures were being treated. By knowing the ligament referral patterns and matching them to the history, this would give the physician an idea of where the injured structure was located. The physician would then palpate this area and try to reproduce the pain. An even better method was to needle the area and elicit the local and referral pain pattern. By injecting

**** Ross Hauser, M.D., the author of this book, has had the privilege of treating Louis Schultz, Jr., the son and namesake of Dr. Schultz. The son noted that nothing made his dad happier or more satisfied as a physician/surgeon than doing Prolotherapy. Patients today are still being blessed by the work done by this great physician.***

HACKETT REFERRAL PATTERNS

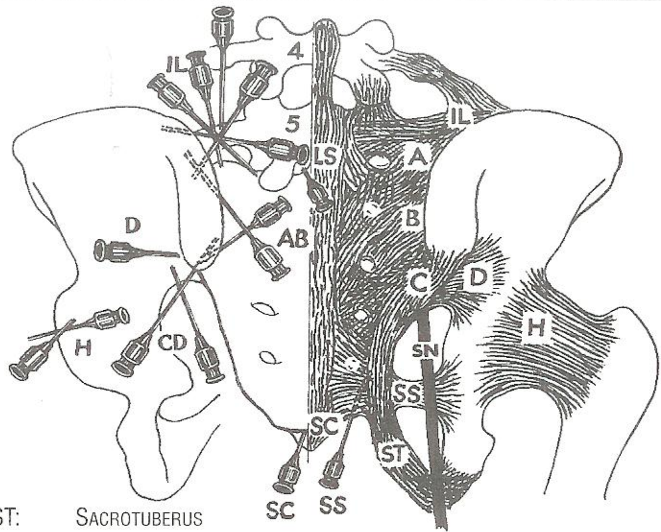

Figure 4-4: Hackett Referral Patterns
Ligamentous structures of the lower back and hip refer pain down the lower leg. The illustration shows the trigger points of pain and the needles in position for confirmation of the diagnosis and for treatment of ligament relaxation of the lumbosacral and pelvic joints.

LOWER BACK AND HIP LIGAMENTS

TRIGGER POINTS OF LIGAMENTS

IL:	ILIOLUMBAR	ST:	SACROTUBERUS
LS:	LUMBOSACRAL—SUPRA AND INTERSPINUS	SC:	SACROCOCCYGEAL
A, B, C, D:	POSTERIOR SACROILIAC	H:	HIP—ARTICULAR
SS:	SACROSPINUS	SN:	SCIATIC NERVE

HACKETT REFERRAL PATTERNS

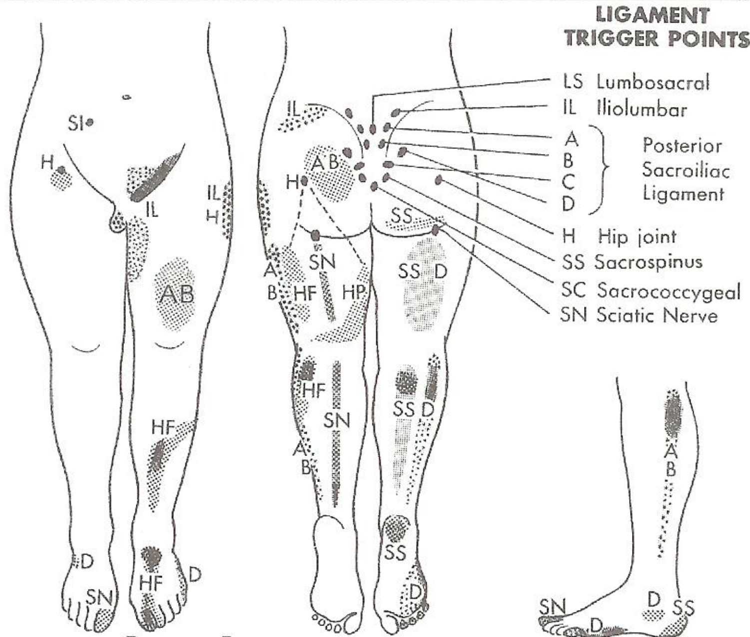

Figure 4-5: Hackett Referral Patterns
Ligament referral pain patterns.

PAIN REFERRAL PATTERNS FROM LUMBOSACRAL AND PELVIC JOINT LIGAMENTS

ABBREVIATION	LIGAMENT	REFERRAL PATTERN
IL:	ILIOLUMBAR	GROIN, TESTICLES, VAGINA, INNER THIGH
AB:	POSTERIOR SACROILIAC (UPPER MEDIAL FIBERS)	BUTTOCK, THIGH, LEG (OUTER SURFACE)
D:	POSTERIOR SACROILIAC (LOWER OUTER FIBERS)	THIGH, LEG (OUTER CALF), FOOT (LATERAL TOES)—ACCOMPANIED BY SCIATICA
HP:	HIP—PELVIC ATTACHMENT	THIGH—POSTERIOR AND MEDIAL
HF:	HIP—FEMORAL ATTACHMENT	THIGH—POSTERIOR AND LATERAL LOWER LEG—ANTERIOR AND INTO THE BIG TOE AND SECOND TOE
SS:	SACROSPINUS AND SACROTUBERUS	THIGH—POSTERIOR LOWER LEG—POSTERIOR TO THE HEEL
SN:	SCIATIC NERVE	CAN RADIATE PAIN DOWN THE LEG

HACKETT REFERRAL PATTERNS

HEAD AND NECK REFERRAL PAIN PATTERNS

LIGAMENT AND TENDON RELAXATION

AREA OF WEAKNESS	REFERRAL PATTERN
OCCIPUT AREA A	FOREHEAD AND EYE
OCCIPUT AREA B	TEMPLE, EYEBROW, AND NOSE
OCCIPUT AREA C	ABOVE THE EAR
CERVICAL VERTEBRAE 1-3 (UPPER)	BACK OF NECK AND POSTERIOR SCAPULAR REGION (NOT SHOWN)
CERVICAL VERTEBRAE 4-5 (MIDDLE)	LATERAL ARM AND FOREARM INTO THE THUMB, INDEX, AND MIDDLE FINGER
CERVICAL VERTEBRAE 6-7 (LOWER)	MEDIAL ARM AND FOREARM INTO THE LATERAL HAND, RING, AND LITTLE FINGER

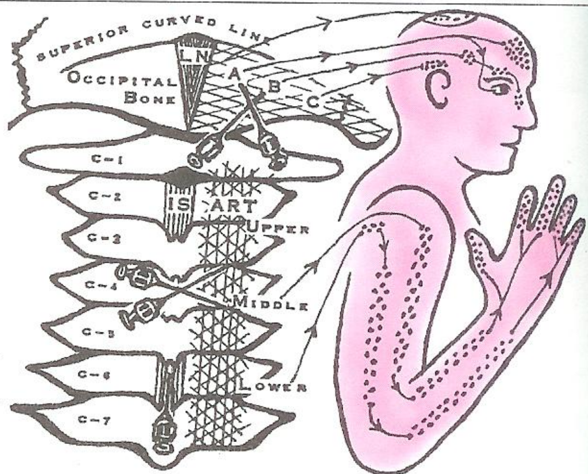

Figure 4-6: Hackett Referral Patterns Head and neck ligament referral pain patterns.

the proliferant solution, the local and referral pain would totally disappear because of the anesthetic in the solution. Following these criteria, both the patient and the physician could be confident that the Prolotherapy would be successful because the correct area was treated.

Dr. Hackett's enthusiasm and pioneering spirit brought many capable physicians to the field of Prolotherapy. Among the most known of his earlier followers were Drs. James Cyriax, Gus Hemwall, Ronnie Barbor, Milne Ongley, Gale Borden, Daniel Kayfetz, Abraham Myers, and Lester Blumenthal. From these physicians came more articles and even textbooks on the technique and efficacy of Prolotherapy. Many of them were published in the 1950s and 1960s.

Figure 4-7: Earl Gedney, D.O. Dr. Gedney's insight led to the use of Prolotherapy in degenerative disc disease, spondylolithesis, and eventually athletic injuries.

EARL GEDNEY, D.O. (1901-1976)

Dr. Gedney was an osteopathic surgeon. His main contributions to Prolotherapy, though he used the term sclerotherapy, are the following:

1. First implementation of Prolotherapy in ligamentous pathology of the knee and sacroiliac (pelvis) ligaments.
2. First applications of Prolotherapy for painful degenerative disc disease by injecting annular ligaments (which hold the discs in place), and describing the technique.
3. Application of Prolotherapy for treatment of painful lumbar spondylolisthesis (slippage of one vertebrae from another).

Impressed with the reported results obtained with the injection treatment of hernia, in 1936 he began injecting the medial and lateral collateral ligaments in unstable knees with a proliferant solution known as Neoplasmoid and obtained good results. Thereafter, he began treating posterior sacroiliac ligaments with the same solution. In June of 1937 his first article on treating hypermobile joints was published in *The Osteopathic Profession*.[27] Dr. Gedney continued working on this method in the clinics of the Philadelphia College of Osteopathy, broadening the scope of its applications to include recurrent shoulder dislocations, acromioclavicular separations, and sternoclavicular subluxations (all shoulder problems). His second article, "The Hypermobile Joint," was published in *The Osteopathic Profession* in 1938.[28] He continued working with Dr. Shuman at the Philadelphia College of Osteopathy until he relocated to Maine in 1939.

While in Maine, Dr. Gedney continued his clinical trials and began injecting the ligaments around the discs (annular ligaments) with the proliferant Sylnasol. Thirteen years later, in 1951, he

published his work entitled "Disc Syndrome."[29] He continued reporting on the phenomenal success of Prolotherapy for disc disease.[30] He reiterated how successful it was for hypermobile sacroiliac joints in further publications.[31,32] Dr. Gedney was the first to emphasize the coexistence of sacroiliac laxity with disc pathology in the lower back.[31] Dr. Gedney, like Dr. Hackett, published many articles on the subject of Prolotherapy and left many followers. By 1954, Dr. Gedney moved back to Pennsylvania, and devoted the rest of his career to Prolotherapy.

In Norristown, Pennsylvania, he became known as a doctor who treated athletes. You were waiting to see when athletic injuries would be discussed in this chapter. Remember, almost all athletic injuries are soft tissue injuries to meniscus, ligaments, joint capsules, and tendons, so all of this information applies. On January 24, 1971 the *Philadelphia Inquirer* wrote an article "Doctor In Norristown Can Stitch Broken Athletes Together Again." The article stated that Dr. Gedney treated The United States Olympic Swimming Team in 1968 and athletes from the State University of New York. Among his patients were Philadelphia Phillies shortstop Bobby Wine and Pittsburgh Pirates shortstop Gene Alley. Both athletes were the top infielders in the National League during the 1970 season, after having overcome injuries, which cast serious doubt on their futures in baseball. Dr. Gedney's experience with athletes began after Phillies Trainer Joe Liscio started sending players to him. Amongst other famous patients of Dr. Gedney's were Johnny Weissmuller, Olympic gold-medal swimmer and Hollywood's Tarzan.

David Shuman, D.O. (1910-1982)

David Shuman, D.O., became an instructor of Osteopathic Technique at Philadelphia Osteopathic College in 1936 and, at that time, along with Dr. Earl Gedney became interested in joint Prolotherapy, though he used the term Sclerotherapy. Thereafter, Dr. Shuman's involvement with the progress of joint Prolotherapy continued until the end of his professional career. In 1953, Dr. Shuman founded The Osteopathic College of Joint Sclerotherapy. ***(See Figure 4-8.)***

Figure 4-8: Osteopathic College of Joint Sclerotherapy, Post-Graduate Class of 1960

Standing, left to right are: Harry Kerr, D.O., Dr. Cook from England, Edward Carlin, D.O., fifth from left, Rodney Chase, D.O. Sitting, second from the left: David Shuman, D.O., third from left, Earl Gedney, D.O., and fourth from left, Simon Green, D.O.

Dr. Shuman wrote several articles on the subject of Prolotherapy.[33,38] In 1954 he published a retrospective survey evaluating the effectiveness of Prolotherapy in the treatment of low back pain, disc disease, and knee and shoulder problems. Improvements ranged from 75 to 98 percent. Only those patients who were able to perform their usual occupations were considered to have positive results.[36]

In 1958, after 20 years' experience with Prolotherapy, Dr. Shuman published a monograph intended to describe in detail the technique of Prolotherapy for low back problems for use by physicians.[39] During the same year, he published the first layman book about Prolotherapy treatments, explaining the method in a simple and easily understood manner.[40]

Dr. Shuman's patients came from far away. As a matter of fact, one of the Gallo brothers, owners of Ernest and Julio Gallo Winery, was one of the patients that benefited greatly from Prolotherapy. It was Dr. Shuman's pioneering spirit, total devotion to Prolotherapy, and organizational skills, which established a strong Sclerotherapy/

Prolotherapy association, initially called the Osteopathic College of Joint Sclerotherapy. It has been renamed several times in its history.[41] In 1996, after this author's proposal, the name was changed to the American College of Osteopathic Pain Management and Sclerotherapy.* It is one of the primary organizations in the world with lists of Prolotherapy physicians, but also teaches Sclerotherapy for hemorrhoids, varicose veins, hydroceles, and hernias.

The other main group of physicians perpetuating the treatment of Prolotherapy stemmed from the original efforts of Dr. George Hackett. The Prolotherapy Association started in 1960 under his direction. It held its first convention in conjunction with the scientific meeting of the American Medical Association in June of 1961.[42] A few of the other conventions of the Prolotherapy Association also took place in conjunction with the American Medical Association Scientific Meetings.[43] Prolotherapy scientific booth exhibits were presented at the American Medical Association Scientific Conventions in 1955, 1957, and 1958. ***(See Figure 4-9.)*** After Dr. Hackett's death the perpetuation of the Prolotherapy Association was governed on a volunteer basis by Drs. Borden, Hemwall, Cronan, Kayfetz, Neff, and Pierpont.

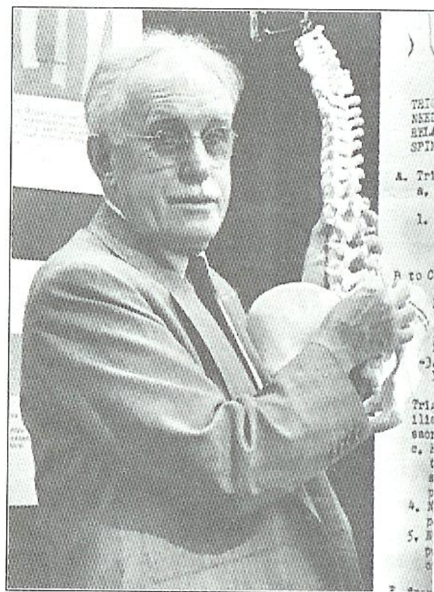

Figure 4-9: George S. Hackett, M.D. Demonstrating Prolotherapy at the AMA Convention in 1955.

During the 1970s and 1980s the Hackett technique of Prolotherapy and perpetuation of the Prolotherapy Association was primarily due to the efforts of Gustav A. Hemwall, M.D. Because he had a heart for missions, every year he would take a group of physicians to Honduras to learn Prolotherapy and help the poor in that country. Upon his death Dr. Hackett left a sum of money to Dr. Hemwall, which became known as the Hackett Foundation, devoted to the teaching of the Hackett technique of Prolotherapy. Today the Hackett Foundation has an annual teaching seminar in the fall.**

With the enthusiasm and organizational skills of Dr. Paul Goodley, the Prolotherapy Association merged into a new organization called the American Association of Orthopaedic Medicine (AAOM)*** in 1984. This merger created a larger audience and brought together allopathic and osteopathic physicians under one umbrella who were interested in all the techniques of treating musculoskeletal pain, including sports injury, and of course, including Prolotherapy.[44] It also sparked interest in the new clinical research and publications related to Prolotherapy by Drs. Ongley, Klein, Dorman, Eek, Delong, Reeves, Schwartz, Montgomery, Kidd, and Hirschberg.

During this decade several new textbooks were written on the subject. In 1991, Drs. Gustav Hemwall and Gerald Montgomery published the significantly updated fifth edition of the Hackett text, *Ligament and Tendon Relaxation Treated by Prolotherapy.*[45] Drs. Thomas Dorman and Tom Ravin wrote *The Injection Techniques in Orthopedic Medicine* and *Prolotherapy in the Lumbar Spine and Pelvis.*[46, 47] The second edition of *Illustrated Manual of Orthopedic Medicine,* by James Cyriax, published in 1993, contains numerous illustrations on the technique of Prolotherapy.[48]

Others who included Prolotherapy in their texts included Ombergt, Vlemming and Mooney, and Lennard.[49–53] The Lennard text is entitled *Physiatric Procedures in Clinical Practice* and is the main text describing the procedures done by Physiatrists (Physical Medicine and Rehabilitation Specialists).[54] Dean Reeves, M.D., wrote a whole chapter on the technique of Prolotherapy for this

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*** ***American Association of Orthopedic Medicine (AAOM), 90 South Cascade Avenue, Suite 1190, Colorado Springs, CO 80909, 800-992-2063.***

text and should be commended. He also helped to get Prolotherapy into mainstream medical literature with his chapter on Prolotherapy in the *Physical Medicine and Rehabilitation Clinics of North America* in 1995.[55] To educate the lay public on Prolotherapy, Dr. Bill Faber wrote *Pain, Pain Go Away*[56] in 1990, and Dr. Ross and Marion Hauser wrote *Prolo Your Pain Away!* in 1998, and four topical books in 1999: *Prolo Your Arthritis Pain Away!, Prolo Your Back Pain Away!, Prolo Your Headaches and Neck Pain Away!*, and *Prolo Your Fibromyalgia Pain Away!* [57-61]

Drs. Reeves, Eek, Darby, Klein, Dorman, Linetsky, Willard, and others are still doing current clinical research related to Prolotherapy. As you can see many have sacrificed, but few have been honored by their devotion to help the myriad of suffering people with pain.

From its inception, the theory that collagen tissue could be stimulated to grow has been proven by the effectiveness of Sclerotherapy Injection Therapy for hernias, varicose veins, hemorrhoids, and hydroceles. Since research has shown that most chronic pain is due to ligament and tendon injury, it was only a matter of time that proliferating injection therapy be attempted for treating chronic pain. Because of the innovative work of Drs. Schultz, Hackett, Gedney, and Shuman, Prolotherapy articles were published in major medical journals and then presented at the most prominent conferences in America, including those held by the American Medical Association. If it were not for the diligent work of the disciples and pupils of these men, Prolotherapy treatment for chronic pain would have ceased to exist.

As more and more patients were treated by Prolotherapy, it became apparent that the initial work showing that between 75 and 90 percent of chronic pain suffers could be cured was true. Prolotherapy did indeed cause ligament and tendon tissue to grow with essentially no side effects. The solutions used were safe and did what they were supposed to do: stimulate the body to repair the painful areas. Perhaps, now will be the time that the pioneers of Prolotherapy will be acknowledged for their monumental work to prove that there is a cure for chronic pain, and that cure is Prolotherapy.

The authors would like to extend a special thanks to Mrs. Pamela A. Ward for her invaluable help in the preparation of this chapter.

Bibliography

1. Hoch, G. *Injection Treatment of Hydrocele as in Sclerosing Therapy, the Injection Treatment of Hernia, Hydrocele, Varicose Veins and Hemorrhoids.* Yeomans (ed.), Bailliere, Tindall & Cox, London, 1939.
2. Warren, J. *Hernia-Strangulated and Reducible with Cure by Subcutaneous Injection.* Charles N. Thomas, Boston, 1881.
3. Van Itallie, P. No man invented the hypodermic syringe. *Pulse Pharmacy,* 19:1, 1965.
4. Van Itallie, P. The rugged beginnings of injection therapy. *Pulse Pharmacy,* 19:1 1965.
5. Riddle, P. *Injection Treatment.* Philadelphia: W. B. Saunders Company, 1940.
6. Watson, L. *Hernia,* Second Edition. St. Louis, Missouri: Mosby Company, 1938.
7. Bratrud, A. *Injection Treatment of Hernia as in Sclerosing Therapy, the Injection Treatment of Hernia, Hydrocele, Varicose Veins and Hemorrhoids.* Bailliere, Tindall & Cox, London, 1939, Yeomans.
8. Biegeleisen, H. Evaluation of sodium morrhuate therapy in varicose veins. *Surgical Gynecology and Obstetrics.* 1933; 57:696-700.
9. Biegeleisen, H. Fatty acid solutions for the injection treatment of varicose veins: evaluation of four new solutions. *Annals of Surgery.* 1937; 105:610-615.
10. Biegeleisen, H. Two fatty acid solutions for the injection treatment of hernia. *American Journal of Surgery.* 1937; 37:413-417.
11. Biegeleisen, H. *Varicose Veins, Related Diseases & Sclerotherapy: A Guide for Practitioners.* Edens Press, 1984.