**Introduction: A Terrible Affliction**

*roughly $100 billion a year*  

“In an effort to resolve my back problems” Andrea Gardner, in correspondence with the author, June 12, 2016.


**Chapter One: Back Pain Nation**

*31.4 million people each year*  


“regular folks who happened to answer the phone” Tim Carey, MD, in discussion with the author, June 17, 2009.


50 percent chance of having a second MRI  Freburger et al., “The Rising Prevalence of Chronic Low Back Pain.”


In 1871, in a wily political move Ibid.
The idea caught on  Ibid.

Everything changed in 1934  Hadler, Stabbed in the Back, 105.


roughly a quarter of the population reported  United Health Foundation, America’s Health Rankings (Minnetonka, MN: United Health Foundation, 2014), http://cdnfiles.americashealthrankings.org/SiteFiles/AnnualDownloads/Americas%20Health%20Rankings%202014%20Edition.pdf.


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“Sitting too much is not the same as exercising too little”  “Your Office Chair Is Killing You,” *Bloomberg Businessweek*.


**Chapter Two: A Tale of Two Tables**


*spending $13.5 billion* Ibid.

they were unidentifiable on X-rays David Chapman-Smith, *The Chiropractic Profession: Its Education, Practice, Research, and Future Directions* (Des Moines, Iowa: NCMIC Group, 2000).


In Trick or Treatment Singh and Ernst, *Trick or Treatment*, 171.

all that the popping or cracking noise means Samuel Homola, DC, in discussion with the author, May 31, 2011.


the possibility that a cervical (neck) adjustment  Singh and Ernst, *Trick or Treatment*, 174.


Daniel David Palmer  Singh and Ernst, *Trick or Treatment*, 157.

established the Committee on Quackery  Singh and Ernst, *Trick or Treatment*, 163.


tripling between 1970 and 1990  Singh and Ernst, *Trick or Treatment*, 147.

“Sore Throat”  Ibid., 164.


The AMA, said Gertzendanner  Singh and Ernst, *Trick or Treatment*, 165.


three quarters of the chiropractic participants Ibid., tables IV and V.

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the Texas Board of Chiropractic Examiners  Michael E. Speer, MD, president of the Texas Medical Association, in correspondence with Yvette Yarbrough, executive director of the Texas Board of Chiropractic Examiners, July 12, 2012.


“We need to focus on function”  Craig Liebenson, DC, in discussion with the author, March 15, 2010.

he invented a device  Singh and Ernst, *Trick or Treatment*, 161.

Hippocratic bench  Ibid., 156.


thirty-six hundred MDT practitioners in the United States  Trish Elise, executive assistant to the CEO of McKenzie Institute International, in correspondence with the author’s
assistant, June 28, 2016; and Stacey Lyon, executive director of The McKenzie Institute USA, in correspondence with the author’s assistant, June 24, 2016.

“They don’t recognize” John D. Childs, PT, PhD, MBA, in discussion with the author, January 16, 2013.

“At the end of the day” Ibid.


Medicare limits treatment Justin Elliott, Vice President, Government Affairs at the American Physical Therapy Association, in discussion with the author’s assistant, May 12, 2016.


“When physicians hire physical therapists” John D. Childs, PT, PhD, MBA, in discussion with the author, January 16, 2013.


“What was demonstrated” John D. Childs, PT, PhD, MBA, in discussion with the author, January 16, 2013.


“It's hoping the PT knows” Heidi Prather, DO, in discussion with the author, November 14, 2009.

“If the therapist has ten people” Sheila A. Dugan, MD, in discussion with the author, October 7, 2009.

“Never let anyone do that to you again” Brian Beaudoin, in discussion with the author, January 14, 2009.


“I made a decision, years ago” Brian Beaudoin, in discussion with the author, August 31, 2009.

**Chapter Three: Hazardous Images**


“A diagnosis that is based” Ibid.


Until the 1930s “Theories About the Origins of Back Pain Have Changed from Decade to Decade,” The Back Letter 26, no. 2 (2011): 19, doi:10.1097/01.BACK.0000394098.94631.27.


“The confusion about lumbago”  Lutz et al., “Looking Back on Back Pain.”


Scan ten patients a day  John Sollenberger, National MRI Business Manager for Phillips, in discussion with the assistant to the author, August 27, 2013.

“You’d get a fast-talking salesman”  Brian Nelson, MD, in discussion with the author, July 21, 2010.


“We were surprised at the magnitude of the effect”  Ibid.


In *Annals of Internal Medicine*, physician Roger Chou  Chou et al., “Diagnosis and Treatment of Low Back Pain.”

cauda equina syndrome  Ibid.


Fever or vomiting  Ibid.


As a result of this increase Ibid.


“There’s not enough diagnostic talent afoot” John Bruno, MD, in discussion with the author, June 30, 2015.

Chapter Four: Needle Jockeys


*“The bottom line”* James Rathmell, MD, in discussion with the author, August 22, 2013.


“You always do three”  Charles Burton, MD, in discussion with the author, April 17, 2013.


“having a blowtorch up your rectum”  “

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In response, large pharmaceutical companies “The Meningitis Outbreak – An Important Announcement to the Public,” PainCare Centers, Inc., 2012.


“From the practitioners’ point of view” James Rathmell, MD, in discussion with the author, August 22, 2013.


NECC’s purchase orders included Eichenwald, “Killer Pharmacy: Inside a Medical Mass Murder Case.”

By spring of 2013, 751 patients “Multistate Outbreak of Fungal Meningitis and Other Infections – Case Count,” Centers for Disease Control and Prevention, October 23, 2013,


After her adult daughter’s lumbar fusion surgery Harriet Hodgson, in correspondence with the author, October 31, 2012.


NECC filed for bankruptcy Eichenwald, “Killer Pharmacy.”

Although the presiding judge Ibid.; and Department of Justice, “14 Indicted in Connection with New England Compounding Center and Nationwide Fungal Meningitis


The government prosecutors employed  Loftus, “Ex-Synthes Officers in Court.”

Kallmes made sure the two groups  Kolata, “Spinal Cement Draws Patients and Questions.”

almost thirty thousand vertebroplasty procedures annually  Gray et al. “Costs and State-specific Rates of Thoracic and Lumbar Vertebroplasty.”


**Chapter Five: The Gold Standard**

*About 60 percent of patients*  Gary Michelson, MD, in discussion with the author, March 16, 2010.


*Eighty to 85 percent of the time*  Brian Nelson, MD, in discussion with the author, July 21, 2010.

They “have their own inherent conflict” Hyun Bae, MD, in discussion with author, March 15, 2010.


“adjacent segment deterioration” Ragab and deShazo, “Management of Back Pain in Patients with Previous Back Surgery.”

A second back surgery Ibid.

“If [the surgeon] said” Roger Chou, MD, in discussion with the author, June 15, 2010.


Dr. Amaral is also an assistant professor of surgery at Albert Einstein College of Medicine.


costing about $40 billion annually “Spinal Fusion for DDD,” The Back Letter.


“I end up sending most of my patients” Jeremy Fairbank, MD, in discussion with the author, October 29, 2009.

in Asia-Pacific countries GlobalData MediPoint, Spinal Fusion.

“It’s gone now” Alexander Ghanayem, MD, in discussion with the author, October 6–7, 2009.


two hundred thousand provocative lumbar discography procedures  “Will a New Study End the Use of Discography as a Diagnostic Test for Painful Disc Degeneration?” *The Back Letter* 24, no. 7 (2009): 73,79–81, doi:10.1097/01.BACK.0000357539.86986.9e.

“Before Gene’s study”  Francisco Kovacs, MD, PhD, in discussion with the author, October 25, 2009.


there was no demarcation  Ibid.


“It was part of the culture” Larry Kessler, ScD, in discussion with author, November 24, 2010.

*It was meant to make spinal fusion so simple* Gary Michelson, MD, in discussion with the author, March 6, 2010.


*Studies showed that no matter how many* Gary Franklin, MD, MPH, in discussion with author, June 23, 2010.


assailed Carragee’s credibility Fauber, “Madison Surgeon’s Letter Bashes Author.”


The Wall Street Journal reported Ibid.


“Science has the power to be self-correcting” “YODA: Clear Win For Open Science,” The Back Letter 28, no. 8 (2013): 94, doi:10.1097/01.BACK.000043513.37538.06.


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“No one is using it” “Does a Once Dominant Spinal Technology Still Have a Future” Back Letter.


$22 million Fauber, “Medtronic Makes $22 Million Down Payment.”


“Spinal instability” was vague enough  Groopman, How Doctors Think, 227.


The number of spinal fusion procedures in that nation  GlobalData, “China’s Spinal Fusion Market to Surge in Value and Double its Global Share by 2020, Says GlobalData,” news release, June 12, 2014,
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when a hospital switched to buying from a POD  According to information from a Medicare database; see Daniel R. Levinson, Spinal Devices Supplied by Physician-

*within weeks of his purchase of a five-thousand-dollar stake*  Complaint, United States v. Sabit, Civil Action No. 13-03363, *17 (C.D. Cal. 2014); and United States v. Reliance, complaint.


*Sabit moved to Birmingham, Michigan*  Carreyrou, “Surgeons Eyed Over Deals.”

*billed providers for ghost devices*  United States Department of Justice, “Detroit-Area Neurosurgeon Admits Causing Serious Bodily Injury to Patients in $11 Million Health


He pleaded guilty  Department of Justice, “Detroit-Area Neurosurgeon Admits Causing Serious Bodily Injury.”


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Between 2001 and 2010 Ibid., 16.

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$7 million in Medicare reimbursements  

*In 2013, the state of Ohio brought charges*  

*Medical boards in both Kentucky and Ohio*  

*The surgeon fled*  

*One lawsuit charged*  

*It was* “highly doubtful”  

he had established his own spine surgery clinic Walter Eisner, “Spine Fugitive Durrani Found in Pakistan, Orthopedics This Week, June 26th, 2015, https://ryortho.com/2015/06/spine-fugitive-durrani-found-in-pakistan/

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“percutaneous procedure”  “Minimally Invasive, Endoscopic, and Laser Spine Surgery:

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a well-designed Cochrane Collaboration review  “Shining a Light on Laser Disc Surgery
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10.1097/01.BACK.0000466232.64004.93; and Patrick A. Brouwer et al. “Percutaneous
Laser Disc Decompression Versus Conventional Microdiscectomy in Sciatica: A


“It’s not because the procedure is good” Hyun Bae, MD, in discussion with the author, March 15, 2010.


*Rob and Ginger Stage* Rob and Ginger Stage, in discussion with the author, November 14, 2008.

*Lauren,* who after many conversations Lauren*, pseudonym, in discussion with the author, November 20, 2008.


When the FDA approved chymopapain Ibid.


cciId=215&ver=10&NcaName=Thermal+Intradiscal+Procedures&bc=BEAAAAAAEA&fromdb=true.


if I’d been a fly on the wall  James St. Louis, in discussion with the author, February 26, 2010.

I was so sedated  Dotty Bollinger, Chief Operating Officer of Laser Spine Institute, in correspondence with the author, February 3, 2012.

“It’s like he went to Las Vegas”  Ginger Stage, in discussion with the author, September 12, 2011.

“That’s Facebook life”  Lauren*, pseudonym, in discussion with the author, February 5, 2010.

“I want to be positive”  Lauren*, pseudonym, in discussion with the author, April 8, 2015.


Sam Bailey, the Arkansas preacher, met Bonati  Sam Bailey, in discussion with the author, October 30, 2013.

Bailey ran about 150 “educational seminars”  Chris Lloyd, in discussion with the author, March 1, 2011.

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Revision date: February 22, 2017
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“I knew exactly who I was getting in bed with”  Chris Lloyd, in discussion with the author, March 1, 2011.

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the State Medical Board of Ohio permanently revoked  Swanson, “Problems Persist.”


Instead, it sold marketing and office services  Swanson, “Problems Persist.”

a total bill of $94,514  Swanson, “Problems Persist.”

Myrda Sue Ford sustained  Ibid.

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LSI’s other new product  Briley Cienkosz, Chief Marketing Officer at Laser Spine Institute, in correspondence with the author, August 20, 2012.


“It’s a litigious world out there” Dotty Bollinger, in discussion with the author, March 7, 2011.

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Dotty Bollinger told me  Dotty Bollinger, in correspondence with the author, September 28, 2011.


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According to court documents  Eisner, “Dr. Richard Kaul.”

The Bergen County Record reported  Washburn, “Pompton Lakes’ Pain Doctor.”
In March 2014, after twenty-three days of deliberation Hannaford, “Trust Me, I’m a Doctor.”


“one man…testified” Washburn, “Pompton Lakes’ Pain Doctor.”

Instead of slipping away Ibid.

He pointed out Eisner, “Dr. Richard Kaul.”

Chapter Seven: Replacement Parts


Papers published in European journals See e.g. Michael Putzier et al., “Charité Total Disc Replacement – Clinical and Radiographical Results after an Average Follow-up of


At the same meeting, André van Ooij Ibid.

Dallas spine surgeon John Peloza Ibid.

a retrospective clinical and radiological study Putzier et al., “Charité Total Disc Replacement – Clinical and Radiographical Results after an Average Follow-up of 17 Years.”

FDA’s approval panel voted unanimously Orthopedic and Rehabilitation Devices Panel of the Medical Devices Advisory Committee, meeting transcript.

the approval’s labeling Charité’s labeling can be seen here: [http://www.accessdata.fda.gov/cdrh_docs/pdf4/P040006C.pdf](http://www.accessdata.fda.gov/cdrh_docs/pdf4/P040006C.pdf).


Wall Street Journal reporters described  Rundle and Hensley, “J&J’s New Device.”

implanted more than three thousand devices  Mahar, Money-Driven Medicine, 284.


“Patients were coming in”  Charles Rosen, MD, in discussion with the author, August 14, 2010.

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“Real discs,” he explained  Charles Rosen, MD, in discussion with the author, August 14, 2010.

“the American people potentially at great risk”  Rundle and Hensley, “J&J’s New Device.”

The start-up capital  Reed Abelson, “Financial Ties Are Cited as Issue in Spine Study,”  

“You know,” he said  Rudolf Bertagnoli, MD, in discussion with the author, October 18, 2009.

In Europe, the procedure cost  Rick Delamarter, MD, in discussion with the author, 
February 9, 2010.

*Brian Bohn*  Brian Bohn, in discussion with the author, June 25, 2010.


*I sent a request to Stenum Hospital*  Malte Peterson, in correspondence with the author, 
March 24, 2011.

“Every time my superior returned”  Charles Rosen, MD, in discussion with the author, 
August 14, 2010.


In ten patients, with a posterior surgical approach Charles Rosen, MD, in correspondence with the author, June 13, 2016.

The other nineteen patients Ibid.

“everything was scarred over” Charles Rosen, MD, in discussion with the author, August 14, 2010.

Silverman, who had worked Gary Silverman, in correspondence with the author, May 15, 2015 and February 6, 2016.

In 2008 the U.S. Supreme Court had upheld Robert J. Axelrod, Esq., in correspondence with Gary Silverman, December 17, 2008.

“pittance” Gary Silverman, in correspondence with the author, July 16, 2016.

His lawyer had told him Gary Silverman, in correspondence with the author, February 6, 2016.

wrote a strongly worded letter Charles D. Rosen, MD, in correspondence with Senator Chuck Grassley, February 12, 2006.


In a remarkably plainspoken letter Anne Milgram, in correspondence with Joshua M. Sharfstein, May 5, 2009.
about $600 an hour  Richard Guyer, MD, of the Texas Back Institute, in discussion with the author, February 25, 2010.

pay $236,000  Abelson, “Medical Device Maker Settles Conflict Inquiry in New Jersey.”

Delamarter had been one of the investigators  See e.g. Jack Zigler et al., “Results of the Prospective, Randomized, Multicenter Food and Drug Administration Investigational Device Exemption Study of the ProDisc-L Total Disc Replacement Versus Circumferential Fusion for the Treatment of 1-level Degenerative Disc Disease,” *Spine* 32, no. 11 (2007): 1155–1162; doi:10.1097/BRS.0b013e318054e377.

He was also an author of several papers  See, e.g., Rick B. Delamarter et al., “P37. 1 versus 2 versus 3-Level Lumbar Artificial Disc Replacement: A Prospective Report of Clinical Outcomes With the ProDisc-L Device,” *The Spine Journal* 6, no. 5 (2006): 101S–102S, [http://dx.doi.org/10.1016/j.spinee.2006.06.296](http://dx.doi.org/10.1016/j.spinee.2006.06.296).

During our interview in 2010  Rick Delamarter, MD, in discussion with the author, February 9, 2010.

“From the second I woke up”  Haley Smith, in discussion with the author, September 3, 2010.

“four little beauties”  Lou Gram, in discussion with the author, April 30, 2010.

more than thirty-five thousand ProDiscs had been implanted  Jack Zigler, “The Insurance Industry Strikes Again!”  *Orthopedics This Week*, October 16, 2013, http://ryortho.com/2013/10/the-insurance-industry-strikes-again/.


*Aetna followed*  Zigler, “The Insurance Industry Strikes Again!”


*“It’s intense all the time”*  Lou Gram, in correspondence with the author, January 3, 2016.

*the Centers for Medicare and Medicaid reported*  The database can be accessed at cms.gov/openpayments.


**Chapter Eight: The Opioid Wars**


The history of opium. Unless otherwise noted, information on the history of opium and its derivatives is from Marvin D. Seppala, MD, Prescription Painkillers: History, Pharmacology, and Treatment (Center City, MN: Hazelden, 2010), Chapter 1, “The History of Opioids.”


annual sales of $1.5 billion  Eban, “OxyContin.”


*To that end, Purdue harnessed*  Meier, *Pain Killer*, 49.


“be safely and effectively prescribed”  Ibid., 184.


In the first five years that OxyContin was on the market United States General Accounting Office, Prescription Drugs: OxyContin Abuse and Diversion and Efforts to Address the Problem, GAO-04-110 (Washington, D.C.: US General Accounting Office, 2003), 22.

$3,000 for telling their colleagues Meier, Pain Killer, 96.


distributed another promotional video General Accounting Office, Prescription Drugs, 24.

Purdue also produced a sequel Purdue Pharma L.P., I Got My Life Back: A Two-Year Follow Up of Patients in Pain, audiovisual recording, Purdue Pharma L.P. (Norwalk, CT: 2000), DVD.

Purdue had doubled the size of its sales force General Accounting Office, Prescription Drugs, 20, 28.

Reps were encouraged Ibid.

The average income Ibid.

Purdue’s collateral patient advocate website Ibid., 24.

By July 2001, patients had redeemed Ibid., 23.


The Decade of Pain Control and Research Victims of Trafficking and Violence Protection Act of 2000, Pub. L. No. 106-386, 114 STAT. 1539 (2000); see Title VI, Sec. 1603 “Decade of Pain Control and Research.”

“The reality is that the vast majority of people” United States Drug Enforcement Administration, “DEA to Join Pain Advocates.”


Portenoy had appeared on Good Morning America Good Morning America television broadcast, ABC News (August 30, 2010).

Revision date: February 22, 2017
I’d speak with Portenoy on the phone  Russell Portenoy, MD, in discussion with author, November 15, 2011.

“If I’d had an inkling”  Physicians for Responsible Opioid Prescribing, “Opioids for Chronic Pain: Addiction is NOT Rare,” YouTube video, 5:35, posted by Andrew Kolodny, October 30, 2011, https://www.youtube.com/watch?v=DgyuBWN9D4w; quote can be heard at 4:06.

Olivier Laude  Olivier Laude was gracious enough to provide the information about his condition and treatment over the course of several interviews conducted between April 2010 and January 2014.


she told Kolodny Andrew Kolodny, in correspondence with the author’s assistant, April 28 2016.


“pseudo-addiction” City of Chicago v. Purdue Pharma et al., complaint, 33.


IOM issued an erratum statement  Institute of Medicine, *Relieving Pain in America*, 1.

“Nobody asked me”  Fauber, “Chronic Pain Statistic Called Exaggerated, Misleading.”

“I totally disagree”  Ibid.

By 2015, the IOM’s tally  Jae Kennedy et al., “Prevalence of Persistent Pain in the U.S. Adult Population: New Data from the 2010 National Health Interview Survey,” *The


*could be better tolerated* Thomas R. Frieden and Debra Houry, “Reducing the Risks of Relief — The CDC Opioid-Prescribing Guideline,” *New England Journal of Medicine*


“Overall, one out of every 550 patients” Dowell, Haegerich, and Chou, “CDC Guideline for Prescribing Opioids for Chronic Pain.”


In many parts of the country, cognitive psychologists “Has the Lack of Alternative Treatments Fueled the Opioid Crisis?” The Back Letter 29, no. 2 (2014): 17.


**Chapter Nine: Head Case**


Woolf explored the ways in which neurons  Koman, “The Science of Hurt.”


“When we started this research in 1999” Apkar Vania Apkarian, PhD, in discussion with the author, October 5, 2009.


there was a noticeable change  Amelia A. Mutso et al., “Reorganization of Hippocampal Functional Connectivity with Transition to Chronic Back Pain,” *Journal of Neurophysiology*, published online December 11, 2013, doi:10.1152/jn.00611.2013.


**producing fewer gastrointestinal side effects**  Coxib and traditional NSAID Trialists’ (CNT) Collaboration, “Vascular and Upper Gastrointestinal Effects of Non-


*Vioxx and Bextra came off the shelves* “COX-2 Selective (includes Bextra, Celebrex, and Vioxx) and Non-Selective Non-Steroidal Anti-Inflammatory Drugs (NSAIDs),” U.S. Food and Drug Administration, accessed February 17, 2017, https://www.fda.gov/drugs/drugsafety/postmarketdrugsafetyinformationforpatientsandproviders/ucm429364.htm.

*Celebrex, manufactured by Pfizer, was allowed to remain*  Shannon Brownlee and Jeanne Lenzer, “Painkiller Trial Raises Questions for FDA, Pfizer,” *The Center for Public Integrity*, March 11, 2009, http://www.publicintegrity.org/2009/03/11/2929/painkiller-trial-raises-questions-fda-pfizer


*the FDA expanded the black box warning*  Brownlee and Lenzer, “Painkiller Trial Raises Questions for FDA, Pfizer.”
the PRECISION trial  See “Prospective Randomized Evaluation of Celecoxib Integrated Safety Vs Ibuprofen or Naproxen (PRECISION),” https://www.clinicaltrials.gov/ct2/show/record/NCT00346216.


Sativex was tested in Phase III clinical trials  GW Pharmaceuticals, “GW Pharmaceuticals and Otsuka Announce Results from Two Remaining Sativex® Phase 3 Cancer Pain Trials,” news release, October 27, 2015, http://www.gwpharm.com/GWPOTsukaResults271015.aspx.
I had actually spoken with the rock star of the back world John E. Sarno, MD, in discussion with the author, November 30, 2009.


“Your muscles, your mind, your heart” Hans Kraus, Backache, Stress and Tension (New York: Simon and Schuster, 1965), 71.


“tension myositis syndrome” Ibid.


over a million copies Alice Fried Martell, John Sarno’s literary agent, in discussion with the author’s assistant, May 2, 2012.

*a TV special on Sarno* “Dr. John Sarno Healing Back Pain 20/20 episode—A Touch of Wellness Health Center” YouTube video, 14:47, from an episode of 20/20, posted by ATouchofWellnessVI, August 15, 2013, https://www.youtube.com/watch?v=2B2IE0o7diU.


*“He takes the fear out of the equation”* Tony Schwartz, in discussion with the author, November 20, 2012.

*“Three or four times a year”* Renn Kaminski, in discussion with the author, January 20, 2010.

*“they rolled their eyes”* Ken Malloy, in discussion with the author, January 26, 2012.
“They’re thinking like mechanics”  John Sarno, MD, in discussion with the author, January 18, 2011.


*Soon after his moment on Capitol Hill*  Steven Peskin, MD, “A Tribute to Dr. John Sarno,” Managed Care Magazine, accessed July 30, 2014, [http://www.managedcaremag.com/content/tribute](http://www.managedcaremag.com/content/tribute).

“*What if I just talked*”  Ira Rashbaum, MD, in discussion with the author, March 16, 2014.


*sometimes they dropped off shopping bags*  Meier, Pain Killer, 61.

The percentage of claims  Ibid., Table 1.


the American Medical Association’s metric of range of motion  Stuart McGill, Low Back Disorders: Evidence-Based Prevention and Rehabilitation (Champaign, IL: Human Kinetics, 2002), 3.

Within six weeks that worker would  John Loeser, MD, in correspondence with the author, September 15, 2014.


shut down their chronic pain rehab programs  Marek Wyszynski, physical therapist and co-founder of the Feldenkrais Institute of New York, in discussion with the author, March 17, 2012.


moved from the University of Vermont  Elizabeth Ossen, Continuing Care Manager at Dartmouth-Hitchcock’s Spine Center, in correspondence with the author’s assistant, April 26, 2016.


*a fifth of those who enter do not graduate* Steven Stanos, DO, in discussion with the author, April 8, 2011.

“this [was] training for life”  Ibid.


“We’ve seen some patients”  Steven Stanos, DO, in discussion with the author, April 8, 2011.

*Her academic research*  “Caryn S Feldman, PhD,” Northwestern University Feinberg School of Medicine, accessed August 2, 2014, https://fsmweb.northwestern.edu/faculty/FacultyProfile.cfm?xid=11270.

“I try to help present people”  Caryn Feldman, PhD, in discussion with the author, April 8, 2011.

“There’s no way patients are going to manage”  Steven Stanos, DO, in discussion with the author, April 8, 2011.

Gayle Parseghian  Gayle Parseghian, in discussion with the author, April 18, 2011.


Nearly half were workers’ compensation claimants  Elizabeth Ossen, Continuing Care Manager at The Spine Center at Dartmouth Hitchcock Medical Center, in correspondence with the author’s assistant, May 8, 2015.
“thirteen eight-hour sessions” Rowland Hazard, MD, in correspondence with the author, July 12, 2012.

“frankly, their jaws drop” Rowland Hazard, MD, in discussion with the author, December 2, 2009.

“People cry” Eric Hartmann, in discussion with the author, December 2, 2009.


“So, this is how you start” Clifford, patient at Dartmouth’s Functional Restoration Program, in discussion with the author, December 2, 2009.


Chapter Ten: The Back Whisperers


More than two hundred thousand people search  Social media research, Lily Casura, February 13, 2016.

physical therapist Brian Beaudoin  Brian Beaudoin, in discussion with the author, August 31, 2009.


“There’s this faulty logic”  Alexander Vaccaro, MD, PhD, in discussion with the author, September 21, 2009.

“Patients come in to see me”  Todd J. Albert, MD, in discussion with the author, September 21, 2009.
“This process is not about feeling good or relaxed” Joe Zarett, in discussion with the author, September 21, 2009.

“you have a little bit of scoliosis” Joe Zarett, in discussion with the author, September 22, 2009.


McGill was in command of two laboratories Spine Biomechanics Laboratory, University of Waterloo, accessed Jun 8, 2015, http://www.ahs.uwaterloo.ca/kin/people/SpineBiomechanicsLab.html.

the in vitro lab Stuart McGill, Low Back Disorders: Evidence-Based Prevention and Rehabilitation (Champaign, IL: Human Kinetics, 2002), 20.

“virtual spine” Ibid.

the notion that back pain is caused by an inciting event Ibid., 12.
“If you start strength training” Stuart McGill, PhD, in discussion with the author, August 5, 2010.

“Since neither workers nor athletes” McGill, Low Back Disorders, 261.

“Our job today” Stuart McGill, PhD, in discussion with the author, August 5, 2010.

“gimping along” Rick, in discussion with the author, August 5, 2010.


McGill’s textbook McGill, Low Back Disorders.


“If you had facet arthritis” Stuart McGill, PhD, in discussion with the author, August 5, 2010.

“When people come in with their scans” Stuart McGill, PhD, in discussion with the author, June 19, 2010.
Stuart McGill described a young woman patient McGill, Low Back Disorders, 7.

“Too many exercises are prescribed” McGill, Low Back Disorders, 104.


“‘Child’s Pose’ is killing you” Ibid.

“the glutes are the motor.” Ibid.


the “Big Three” McGill, Low Back Disorders, 245.

“It is not enough to simply perform an exercise” McGill, “The Painful Lumbar Spine.”

“Your back will be bulletproof” Stuart McGill, PhD, in discussion with the author, August 5, 2010.

McGill recommended keeping a journal McGill, Low Back Disorders, 206.

“Then, when you have a series of setbacks” Stuart McGill, PhD, in discussion with the author, August 5, 2010.

“the midnight movement” McGill, Low Back Disorders, 209.


“To my amazement” Mark Schoene, in correspondence with the author, April 6, 2010.


“People believe that they have no alternative” Unless otherwise noted, Rainville’s quotes come from: James Rainville, MD, in discussion with the author, September 15, 2009.


“We began to simplify a lot” Lisa Childs, in discussion with the author, February 29, 2012.
In 2009, Rainville’s program moved Scott Taylor, Clinical Supervisor at New England Baptist Hospital, in discussion with author, December 10, 2012.

“A lot of it is trust-building” Lisa Childs, in discussion with the author, February 29, 2012.


In his late twenties, he’d just completed Jerome Groopman, MD, in discussion with the author, January 9, 2013.

Groopman continued to hunt for a willing orthopedic surgeon Groopman, The Anatomy of Hope, 148.

“The desire to be healed” Jerome Groopman, MD, in discussion with the author, January 9, 2013.
“the orthopedist postulated” Groopman, The Anatomy of Hope, 148.

“I was in bed all day” Ibid.

“because quick flexion was risky” Ibid., 150.

“with severely arthritic hips and knees” Ibid., 149.

“I would lie on my back” Ibid.

“I would shift my legs” Ibid., 150.

“One had badly hurt me” Ibid.

“I had a narrative in my head” Jerome Groopman, MD, in discussion with the author, January 9, 2013.

Rainville performed a detailed physical examination Groopman, The Anatomy of Hope, 154.

“incredibly forceful personality” Jerome Groopman, MD, in discussion with the author, January 9, 2013.

“You are worshipping the volcano god of pain” Ibid., 155.

“unsure how to respond” Groopman, The Anatomy of Hope, 156.

“You think what I am saying” Ibid., 155.
“It doesn’t mean anything serious”  Ibid., 156.

“To my mind, it looked like a Roman torture chamber”  Jerome Groopman, MD, in discussion with the author, January 9, 2013.

“My body was so feeble”  Groopman, The Anatomy of Hope, 158.

“I’d leave the sessions depleted”  Ibid., 159.

“cacophony of pain”  Ibid.


“about to scale Mount Everest”  Jerome Groopman, MD, in discussion with the author, January 9, 2013.


“So when I started having pain”  Unless otherwise note, Ronald Siegel’s quotes come from: Ronald D. Siegel, PsyD, in discussion with the author, August 5, 2011.
“avoid going down unproductive paths” Ronald D. Siegel, PsyD, in discussion with the author, January 6, 2011.

“the central emotional issue” Ibid.

“There’s nothing like an image” Ibid.

When a surgeon told a patient never to arch his back Siegel, Back Sense, 59.

“Most people thought it would be better” Ronald D. Siegel, PsyD, in discussion with the author, January 6, 2011.

“I’m doing things I never dreamed I’d do” Kim Greenberg, in discussion with the author, June 25, 2013.

“First, I took tons of Vicodin” Bruce Kaiser, in discussion with the author, April 5, 2013.

Chapter Eleven: The Right Kind of Hurt


$2,500 for twenty-four individual sessions Brian Nelson, MD, in discussion with the author, August 1, 2012.

115 new patients each week Ibid.


*nearly three hundred thousand members*  Werner Kieser, in discussion with the author, October 4, 2012.


He filmed and produced wildlife movies  Ibid.


other gym equipment manufacturers rushed to copy it  James Graves, in discussion with the author, August 9, 2012.

Jones recognized that this first effort had failed  Ibid.


Arthur Jones sold his controlling interest in Nautilus  Sullivan, “Arthur Jones; Revolutionized Exercise Industry.”

“It was like these muscles had never been trained before” Ibid.

“like German tanks” Dave Carpenter, in discussion with the author, April 7, 2011.

When a hurricane struck Ibid.

“a license to print money” Ibid.

a utilization steering committee Ibid.


Medicare lumped it into the same category Dave Carpenter, in discussion with the author, April 7, 2011.

MedX therapy would be reimbursed Ibid.

Arthur Jones announced Sullivan, “Arthur Jones; Revolutionized Exercise Industry.”

Jones had already agreed to sell MedX Thomas Dreisinger, PhD, in correspondence with the author, July 29, 2015.

Werner Kieser and his wife, Gabi, bought Werner Kieser, in correspondence with the author, August 23, 2012.
“the deadly enemy of orthopedists”  Ibid.

“I always tell people, when we’re talking about surgery”  Brian Nelson, MD, in discussion with the author, July 21, 2010.

“One of the things we ask”  Brian Nelson, MD, in discussion with the author, August 1, 2012.

“Back pain is an incurable disease”  Brian Nelson, MD, in discussion with the author, July 21, 2010.


one of his colleagues would tell me  Thomas E. Dreisinger, PhD, in discussion with the author, August 29, 2012; and in correspondence with the author’s assistant, July 28, 2015.

“I prefer to say”  Brian Nelson, MD, in discussion with the author, April 7, 2011.


“If you had recent eye or abdominal surgery”  Brian Nelson, MD, in discussion with the author, July 21, 2010.

“We believe in objective measurements”  Ibid.

“The kind of exercise done in health clubs”  Brian Nelson, MD, in discussion with the author, April 7, 2011.
“I often hear, ‘You guys almost killed me,’”  Brian Nelson, MD, in discussion with the author, April 7, 2011.

“We tell them that they will be worse”  Brian Nelson, MD, in discussion with the author, July 21, 2010.

“We want people to understand”  Brian Nelson, MD, in discussion with the author, April 7, 2011.

“It was the spring of 2008”  Heather Barnes, in discussion with the author, April 7, 2011.


The gene is found in 8 percent  Ibid.


In 2013, sales throughout the franchises  Werner Kieser, in correspondence with the author’s assistant, July 30, 2015.

For $1,050 a year  Werner Kieser, in discussion with the author, October 9, 2012.
When Werner Kieser, who is well into his seventies, picked me up Unless otherwise noted, information about the Kiesers and Kieser Training come from this visit, October 9, 2012.

“I realized that he was” Werner Kieser, in correspondence with the author, August 23, 2012.

“Although I was quite strong and fit” Ibid.


who said that Arthur Jones had “captured” him” Thomas E. Dreisinger, PhD, in discussion with the author, August 29, 2012.


“one brief exercise session each week” Jones, *The Lumbar Spine*, 42.
The buzzword in health care was “EBM” Thomas E. Dreisinger, PhD, in discussion with the author, August 29, 2012.


Pure HealthyBack opened its first facility Ibid.

The second Pure HealthyBack clinic Ronald Wisneski, MD, in discussion with the author, August 26, 2014.


The investigation’s outcomes revealed Ronald Wisneski, MD, in discussion with the author, August 26, 2014.

“MedX by itself is not a panacea” Ibid.

“I do think there’s some progress being made” Brian Nelson, in discussion with the author, October 14, 2015.

Chapter Twelve: The Posture Mavens


“When you are working in chairs that let you move” David Kahl, in discussion with the author, April 16, 2014.

“our habits, our jobs, our social situations, our general dispositions” Deane Juhan, Job’s Body (Barrytown, NY: Barrytown/Station Hill Press, 2003), 220.

there were two aspects to this form of training Marek Wyszynski, “The Feldenkrais Method for People with Chronic Pain,” The Pain Practitioner 20, no. 1 (Spring 2010): 56.


In our initial conversation Marek Wyszynski, in discussion with the author, March 17, 2012.

a useful one called Learn to Learn Moshé Feldenkrais, Learn to Learn (San Diego, CA: Feldenkrais Resources, 1980).


From the beginning, he focused on Marek Wyszynski, in correspondence with the author, May 6, 2012.


Since 1999, the number of teachers worldwide David Zemach-Bersin (co-founder, Feldenkrais Institute of New York), in correspondence with the author’s assistant, August 7, 2012; and Marek Wyzynski, in discussion with the author, March 17, 2012.

there was no right way Wyzynski, “The Feldenkrais Method for People with Chronic Pain,” 56–61.

“Do everything slowly” Feldenkrais, Learn to Learn.

“A year ago” Courtney King, in discussion with the author, April 4, 2012.

“So many people have been injured” Deborah Bowes, in discussion with the author, June 12, 2010.

“This is about finding out” Ibid.


“If there is constant excess muscle tension”  Thomas Myers, in correspondence with the author, September 7, 2012.

she was a 1960s flower child  Unless otherwise noted, information on Ida Rolf comes from Mirka Knaster, Discovering the Body's Wisdom (New York: Bantam, 1996).

“the rehabilitation of internal subjective awareness”  Michael Salveson, in discussion with the author, December 23, 2009.

“It’s is a lot like trying to calm down a mob”  James Schwartz, in discussion with the author, January 26, 2010.

When the small intestine  James Schwartz, in correspondence with the author, September 7, 2012.

“I was suddenly in control”  David Homan, executive director of the America-Israel Cultural Foundation, in a discussion with the author, March 19, 2010.


“When you’ve been in chronic pain for years” Judith Stern, in discussion with the author, December 4, 2009.


worth $10 billion Ibid.


often certified in one hundred hours of training Broad, The Science of Yoga, 135.

Some have done their coursework online Ibid.


*about five years before aspiring Iyengar teachers* Broad, *The Science of Yoga*, 135.


“But when that needle went into the disc” Lisa Miller, in discussion with the author, April 25, 2010.

“Some people call it ‘hope for the hopeless,’” Lisa Miller, in discussion with the author, June 11, 2010.

“There is a hardening that has taken place” Manouso Manos, in discussion with the author, June 11, 2010.

“This thing I do is an amazing kind of dance” Ibid.


Revision date: February 22, 2017

no known benefit to “drawing your navel to your spine,” “Is Pilates Bad for Your Back?” Daily Mail.


As a dance medicine specialist Elizabeth Larkam, in discussion with the author’s assistant, August 17, 2015

Larkam had second thoughts Elizabeth Larkam, in discussion with the author, March 23, 2011.

“Unlike most trainers” Elizabeth Larkam, in discussion with the author, March 23, 2011.


Many of the 10,500 trainers Ibid.

“I also worked a lot” Dwight Etheridge, in discussion with the author, August 21, 2015.


“It took a while for the aches and pains” Nicholas Griepentrog, in discussion with the author, December 5, 2015.


For $30, Lam sells an eight-hour DVD  Paul Lam, Tai Chi for Arthritis (Tai Chi Productions, 1996), DVD. Available at: http://us.taichiproductions.com/dvds/arthritis/12-lessons-free-first-lesson/.


The Arthritis Foundation of Australia  Hall et al., “Tai Chi Exercise for Treatment of Pain and Disability.”


“Do everything slowly”  Feldenkrais, Learn to Learn.

“neck to be free so that the head can go forward and up”  Judith Stern, in discussion with the author, December 4, 2009.

“to suspend the spine like a string of pearls from heaven”  Peter M. Wayne and Mark L. Fuerst, The Harvard Medical School Guide to Tai Chi: 12 Weeks to a Healthy Body (Boston: Shambhala, 2013), 46.