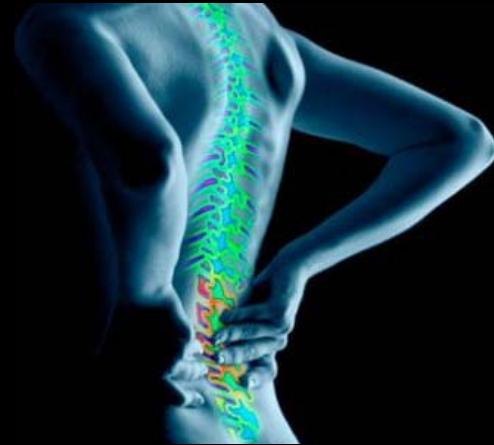




# Overuse of Services for Low Back Pain



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Thanks to: Richard A. Deyo MD, MPH  
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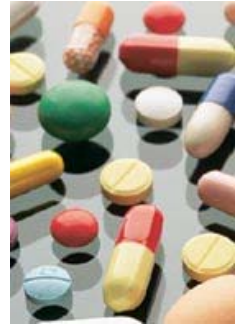
# Disclosures

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- AMA
  - Contributing editor AMA Guides 6<sup>th</sup>
  - Author and consultant
- AADEP Board of Directors
- ACOEM Neck Panel
- ODG Review Panel

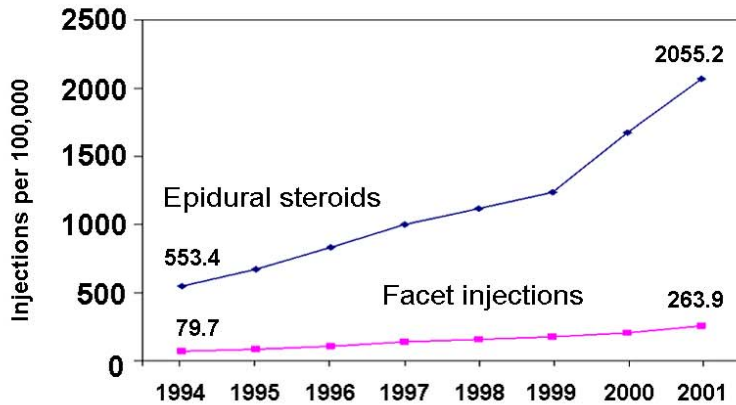
# 4 Controversies Resulting in Possible Overuse

- When to prescribe opioids?
- When to do spine imaging?
- Who needs injections?
- Who needs surgery?

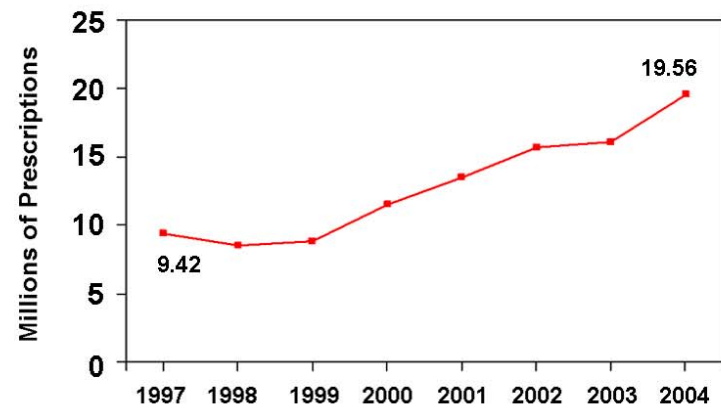


# Increasing Use of Imaging for Low Back Pain

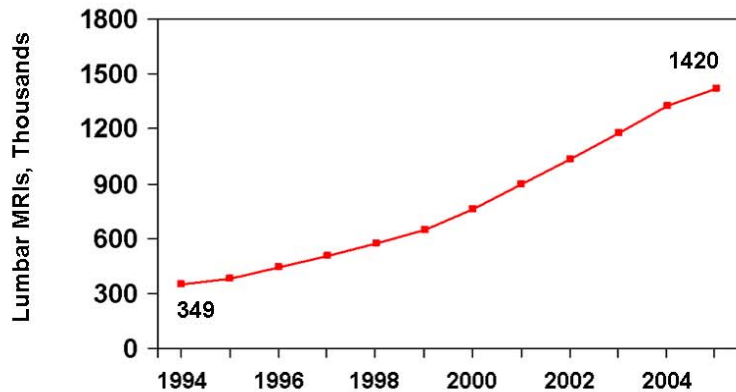
1a. Lumbosacral injection rates, Medicare



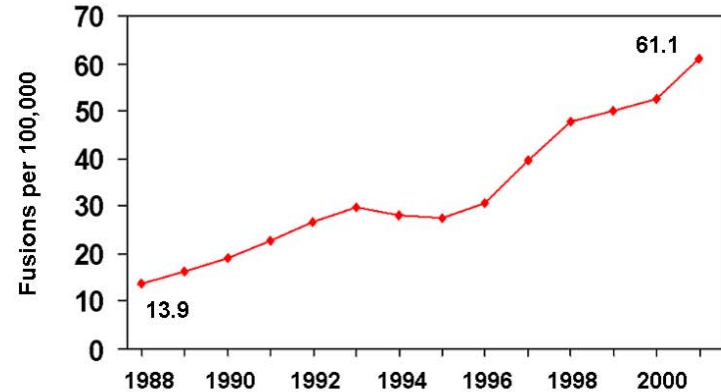
1b. Opioid analgesic prescriptions for spine problems



1c. Lumbar spine MR imaging, Medicare



1d. Lumbar fusion rates, degenerative spine conditions



307% increase in 12 years

# Case Report: Gen. David Fridovich

- 2006: 54 y.o. General doing leg presses Marine gym in Hawaii, after visit to Iraq. Felt a twinge.
- Continued weight training, handball, racquetball several days, then awoke barely able to stand; pain radiating from low back down left leg
- ER: X-ray: “shattered bones”, “pinched nerves”. Motrin, morphine initially, then Roxicet & OxyContin
- “If drugs for pain relief, more drugs = more relief”
- Reported “fogginess”, anxiety, depression: decreased dose, but continued Roxicet & Oxycontin. Became “isolated, combative”



# Gen. David Fridovich, (continued)

- 2008 –Spine fusion; increased dose of opioids postoperatively
- Few weeks later, told he had a long-standing opioid dependency.
- Underwent 4-week detox program, begun on Buprenorphine
- Named deputy commander of special forces in May, 2010
- Detox cleared his head, eased temperament, brightened outlook on life. “I should probably take an ad out... apologizing for everything I’ve said or done, because I’m a different person”



# Some Key Features of the case

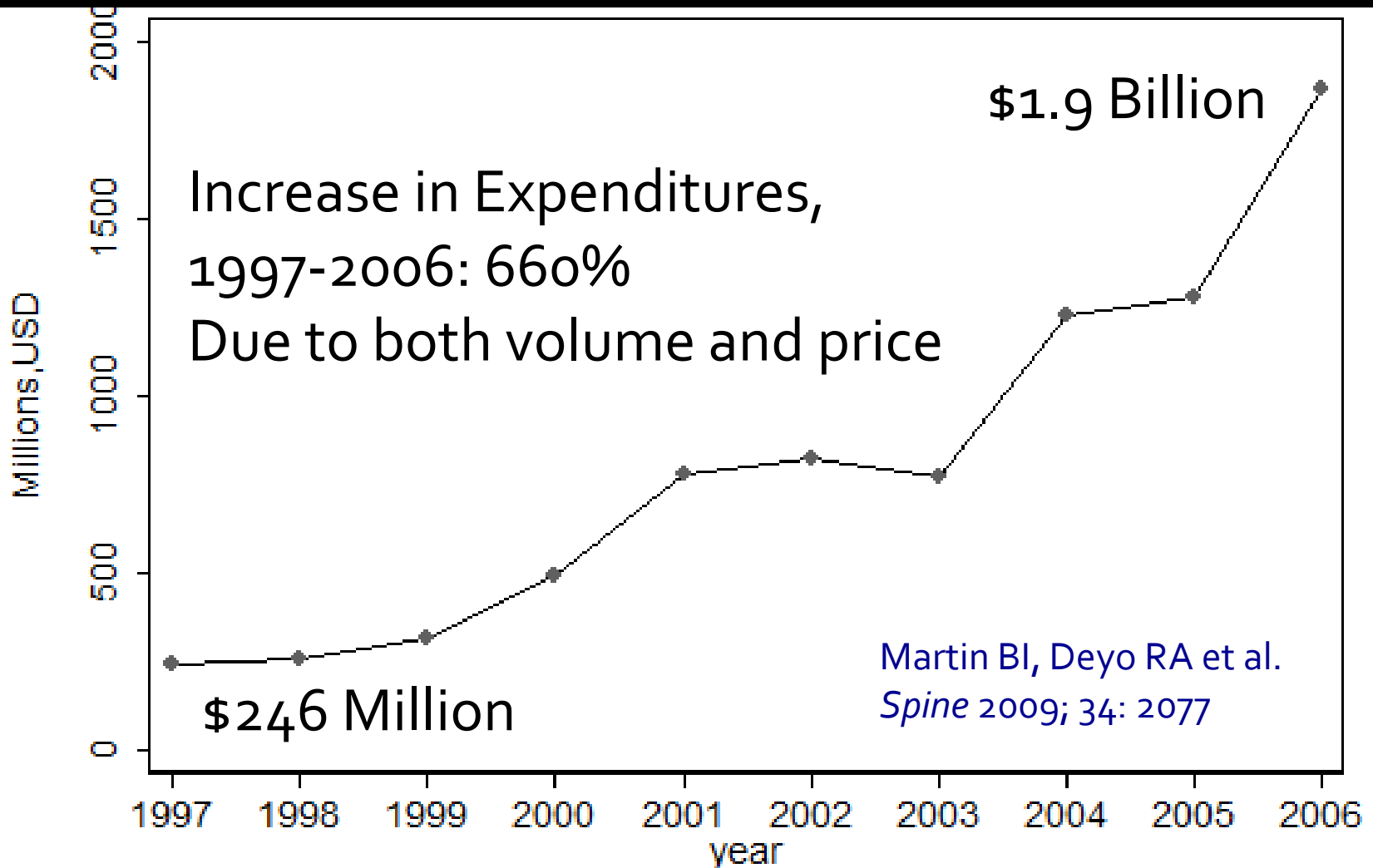
- Successful man, no hx chronic complaints, drug abuse
- Opioids started early; necessary?
- Hard to stop
- Continued even after surgery
- Change in mood (?)
- Felt better when finally tapered (off?)

# OPIOIDS





# Estimated Opioid Expenditures, Adults With Spine Problems: 1997-2006, MEPS



Martin BI, Deyo RA et al.  
*Spine* 2009; 34: 2077

expenditures for all years converted to 2006 equivalents using consumer price index medical component

# Efficacy? Systematic Reviews on Opioids for Chronic LBP (RCTs)

- Poor quality studies; none >16 weeks
- Non-significant reduction in pain compared to non-opioids or placebo
- Diagnosed substance use disorder:
  - Current - up to 24%
  - Lifetime- up to 54%
  - Aberrant med taking behaviors-up to 24%
- Cochrane: benefit for chronic LBP questionable

Martell BA et al. *Ann Intern Med* 2007; 146: 116-127

Deshpande A et al. *Cochrane Database Syst Rev* 2007; 18: CD004959

White AP et al. *Spine* 2011; 36(21 Supp) S131-43

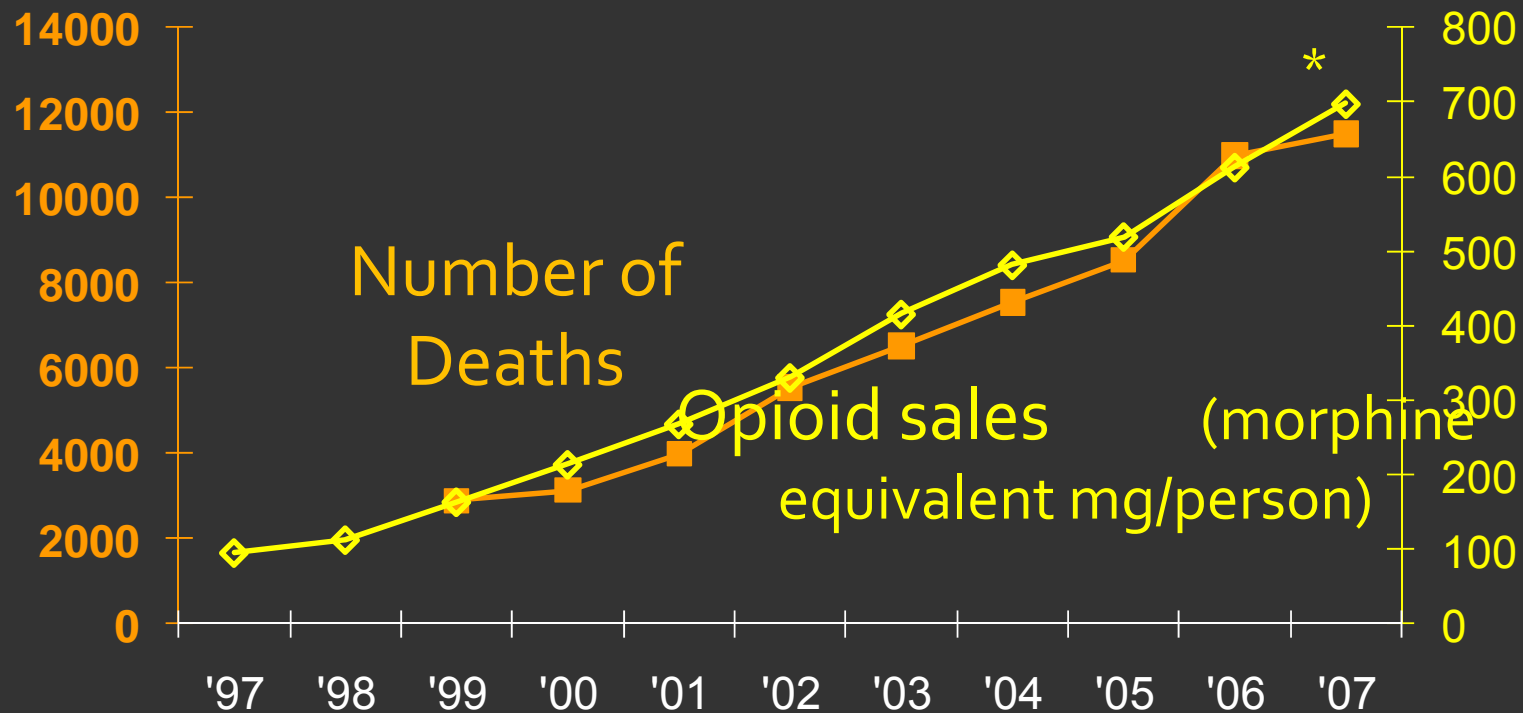
Kuijpers T et al, *Eur Spine J* 2011 20(1); 40-50

# Effectiveness (Observational Studies): Are pts doing well on long-term opioids?

- VA Pts receiving high-dose opioids: higher pain levels (on meds) than patients receiving lower doses
- Danish population survey: chronic pain patients using opioids reported lower Quality of life (SF-36), more severe pain than those not receiving opioids

Morasco B, ...Deyo RA, et al. *Pain* 2010; 151: 625.  
Eriksen J, et al. *Pain* 2006; 125: 172.

# Unintentional overdose deaths involving opioid analgesics vs. per capita sales

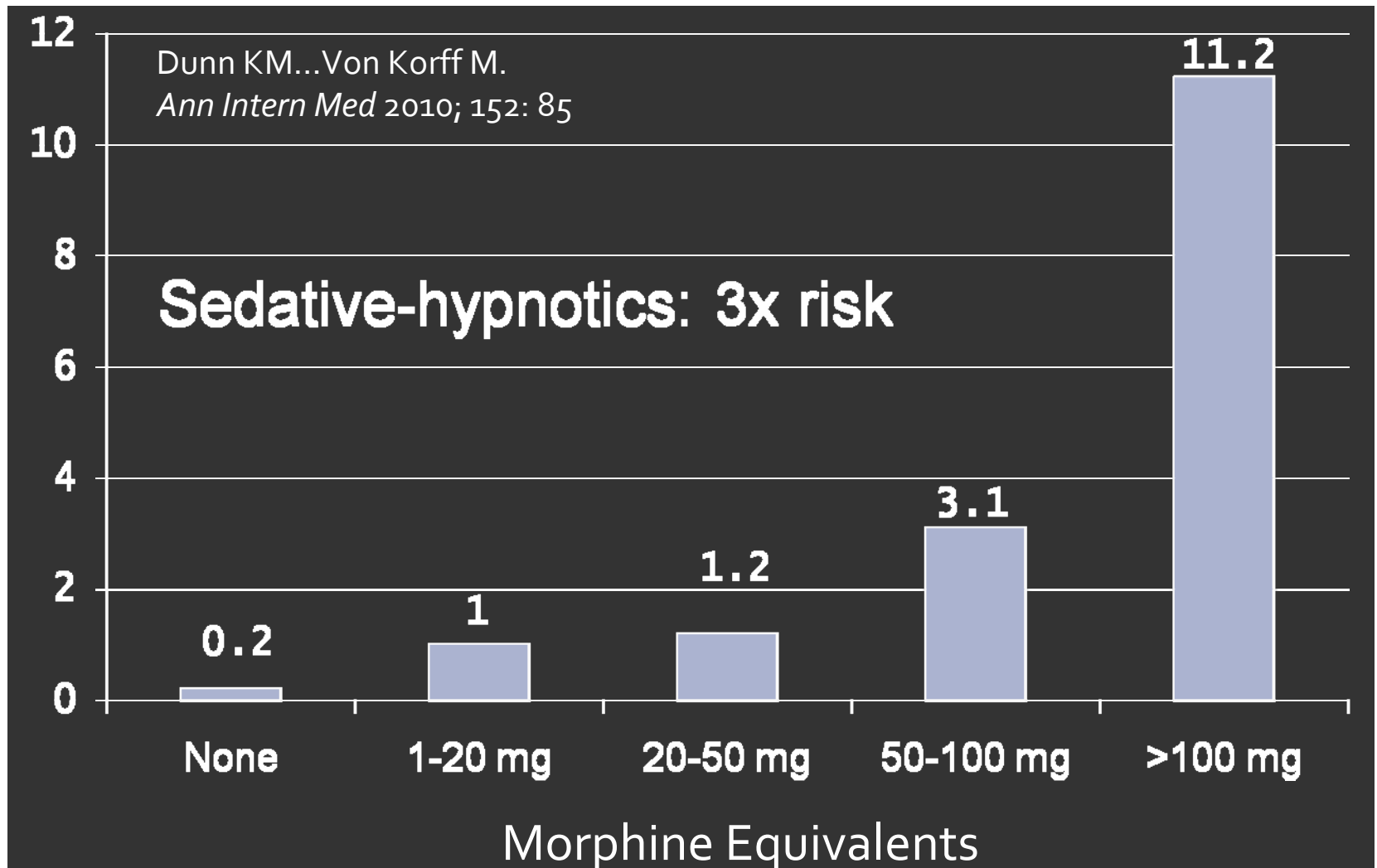


Source: Nat. Vital Statistics System, multiple cause of death dataset, and DEA ARCOS

\* 2007 opioid sales figure is preliminary. Slide from Len Paulozzi

# Opioid Overdose & Prescribed Daily Dose

Hazard Ratios for serious overdose, adjusted for depression, comorbidity, demographics, sed-hypnotics



# Other Concerns about Long-term Opioid Use



- Decreased drive, libido, erectile dysfunction due to hypogonadism
- Osteoporosis, fractures; 2x risk over 50 mg/day (over age 60)
- Hyperalgesia: may paradoxically make pain worse. Neuroplastic changes in brain & spinal cord

Ballantyne JC, Mao J. *N Engl J Med* 2003; 349: 1943-53

Saunders KW...Von Korff. *J Gen Int Med* 2010; 25: 310-15.

Fishbain DA, et al. *Pain Med* 2009; 10: 829-39

# Early Rx with Opioids → Long-Term Use

SPINE Volume 32, Number 19, pp 2127-2132  
©2007, Lippincott Williams & Wilkins, Inc.

## ■ Relationship Between Early Opioid Prescribing for Acute Occupational Low Back Pain and Disability Duration, Medical Costs, Subsequent Surgery and Late Opioid Use

Barbara S. Webster, BSPT, PA-C,\* Santosh K. Verma, MBBS, MPH,†  
and Robert J. Gatchel, PhD, ABPP‡

- 8443 claimants with low back pain
- Those who received high-dose opioids were disabled an average of 69 days more than those who received none
- Early opioid use predicted long-term use

# Early Rx with Opioids and Long-Term Use

- After controlling for covariates, ↑
  - Mean disability duration ( 69 days)
  - Mean medical costs
  - Risk of surgery
- ↑ late use of opioids in patients who received more than 450 MEA in the first 15 days of treatment

Webster et al. *Spine*. 2007 Sep 1;32(19):2127-32.



# Early Rx of Opioids and Long-Term Use

- After adjustment for baseline pain, function, and injury severity, the strongest predictor of longer term opioid prescription was **total MED** in the first quarter.
- Workers receiving at least 40 mg MED per day in the first quarter had 6-fold odds of receiving longer-term opioids.

Franklin, G, et al, Opioid Use for Chronic Low Back Pain: A Prospective, Population-based Study Among Injured Workers in Washington State, 2002-2005.

# Opioid Therapy and Return to Work

- Non-specific LBP: opioids vs no opioids
  - Odds of chronic work loss **6x greater** for patients with Schedule II, strong opioids
  - Odds of chronic work loss **11-14 x** greater for claimants with opioid rx of any type during a period of  $\geq 90$  days
  - Costs of claimants with schedule II opioids were **\$19,500 higher**

Volinn E, Fargo JD, Fine PG. *Pain*. 2009 Apr;142(3):194-201.  
Epub 2009 Jan 31

# Mortality

23% of the deaths in this workers compensation population were attributed to prescription narcotics

Franklin GM et al. Opioid dosing trends and mortality in Washington State workers' compensation, 1996--2002. *Am J Ind Med.* 2005 Aug;48(2):91 - 9.

Narcotics are the **#1** cause of death among workers who have undergone lumbar fusion

Juratli SM, Mirza SK, et al. Mortality After Lumbar Fusion Surgery. *Spine.* 2009 Mar 10; [Epub ahead of print]

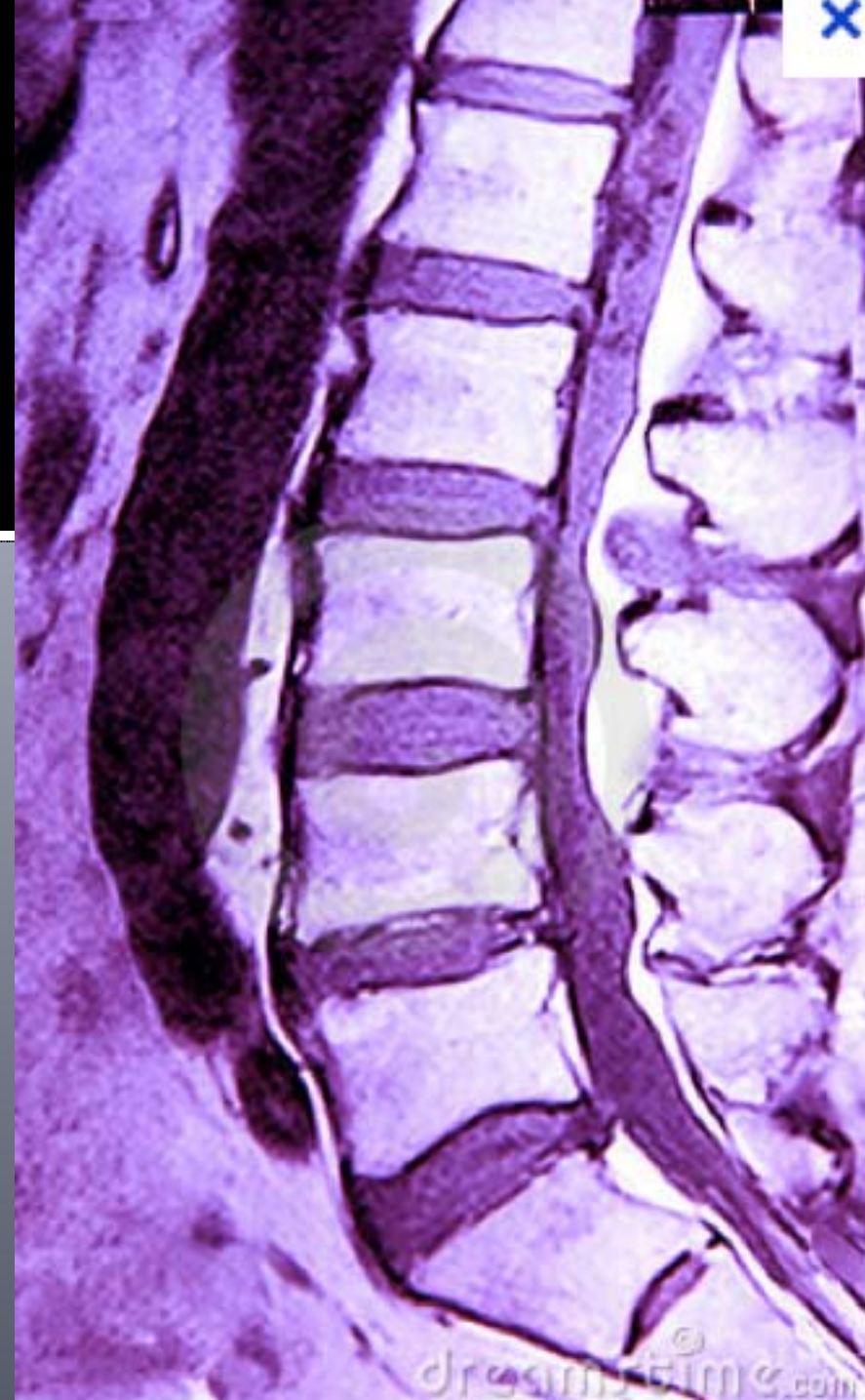
# Deaths

- ED reports of opioid overdose parallel the numbers of prescriptions
- Deaths have increased – exceed combined total involving cocaine or heroin alone
- Diversion is increasingly common
  - Random drug testing

# Cautious opioid prescribing for chronic low back pain

- Useful for **severe** *acute* pain; time-limited use or nighttime use with NSAIDs during day
- Generally switch after 2 weeks of use; announce from the start
- Avoid >100mg/day morphine equivalents
- Avoid co-prescribing benzos and opioids
- Long-term use: screen *very* carefully for hx of substance abuse or depression; informed consent
- ACP/APS Guide: option for severe disabling LBP; carefully weigh benefits, risks; consider alternatives if no response to short course

# Imaging for LBP



# Prevalence: Specific Diagnoses

## Rough estimates from primary care:

Compression fracture	4% (or less)
Spondylolisthesis	3%
Malignant neoplasm	0.7% (or less)
Ankylosing spondylitis	0.3%
Spinal infection	0.1%
Spinal Stenosis	??
Surgically important disc herniation	2%

**Total Specific Diagnoses: ~10%**

# MRI Results: “Normal” Subjects (N = 67)

	Age	
	<u>Under 60</u>	<u>Over 60</u>
Herniated disc	22%	36%
Spinal Stenosis	1%	21%
Bulging disc	54%	79%
Degenerated disc	46%	93%



# Imaging Hazards

A diagnosis based on MRI, in the absence of objective clinical findings, may not be the cause of a patient's pain, and an attempt at operative correction could be the first step toward disaster.

-Boden et al., *JBJS*, 1990

# Impact of Imaging on Outcomes

- 6 RCTs, 1804 patients, no red flags:
  - 4 trials plain x-ray, 2 of MR or CT
- No advantage of imaging in short or long term (up to 1 year) for:
  - pain                      mental health    quality of life
  - function                      satisfaction with care
- Results not affected by trial quality, imaging modality, duration of LBP



# “Cascade Effects” of early lumbar MRI?

Workers Comp, n=3,264, 22% early MRI

- Low-risk patients who received MRI are several times more likely to receive injections, surgery
- Subsequent “cascade” more assoc. with early MR than severity or demographic indicators

Webster BS et al. *J Occup Env Med* 2010; 52: 900

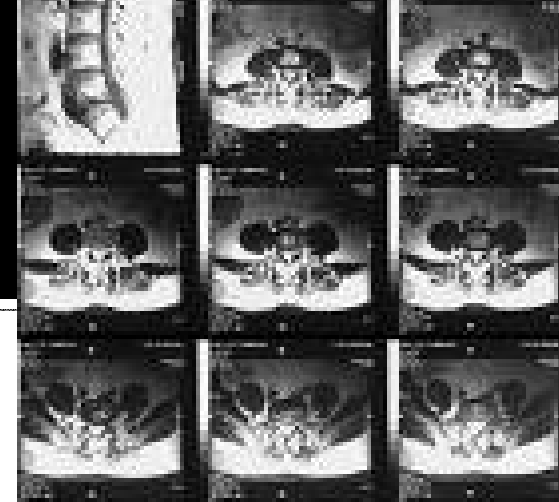
380 pts randomized to plain x-ray vs. MRI

- 2.5x more surgery in MR group (p=.09)
- Equivalent pain & function at 1 year
- MR group more reassured

Jarvik J, Deyo R et al. *JAMA* 2003; 289: 2810

# Could imaging do harm?

## 2 RCTs



OT EBT

British RCT: 421 pts,  $\geq 6$  weeks

After 3 months, those who received x-rays:

- had worse pain
- lower overall self-reported health
- were more likely to see physician during F/U
- but...were more satisfied with care

246 pts with lumbar MR, randomized to receive results or not

Self-rated general health improved significantly more in patients who were blind to the MR results

Kendrick D, et al. *BMJ* 2001; 322: 400

Ash LM et al. *Am J Neuroradiol* 2008; 29: 1098-

# The Doctor's Dilemma: How to be patient-centered *and* evidence-based

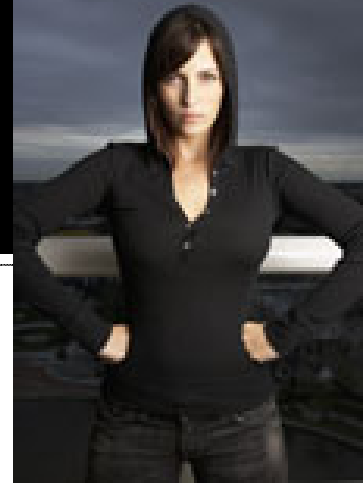
- Providers concerned about patient satisfaction, medico-legal risks
- Pts seek mechanical explanations - cascade effects don't resonate
- Survey: 36% of physicians would order MR for 1<sup>st</sup> episode of acute LBP (2 days) that began in work around house if pt. insisted, even after explaining test unnecessary

# Imaging and Surgery

- The notion that imaging might drive surgery is reinforced by studies of geographic variation
- Spine imaging rates dramatically across geographic regions
- Spine surgery rates are highest when spine imaging rates are the highest
- This correlation held even if the images specifically associated with surgery were factored out.

Lurie, J. D., Weinstein, J.N., et. al., Rates of Advanced Spinal Imaging and Spine Surgery, *Spine* 2003, 28 (6): 616-620.

# Addressing patient demand?



- Satisfaction ≠ better health
- Redouble patient education; some evidence that satisfaction can be maintained
- Imaging itself teaches patients what to expect; in one RCT, doing x-rays raised the expectation they should always be done
- Quality of care defined in part by avoiding overuse
- Patients must learn that more is not always better

# 2007 and 2011 ACP/APS Back Pain Guidelines

Chou R et al. *Ann Intern Med* 2011; 154: 181.

- No routine imaging, dx tests for non-specific LBP
- Image if major Ca risks; progressive neuro deficit, cauda equina, new fever or injection drug use
- Image after Rx trial if risks for comp fx, ankylosing spondy, radiculopathy, stenosis, or minor risks for Ca
- Discography is not indicated

[Carragee E2009 ISSLS Prize Winner: Does discography cause accelerated progression of degeneration changes in the lumbar disc: a ten-year matched cohort study. Spine \(Phila Pa 1976\). 2009 Oct 1;34\(21\):2338-45](#)





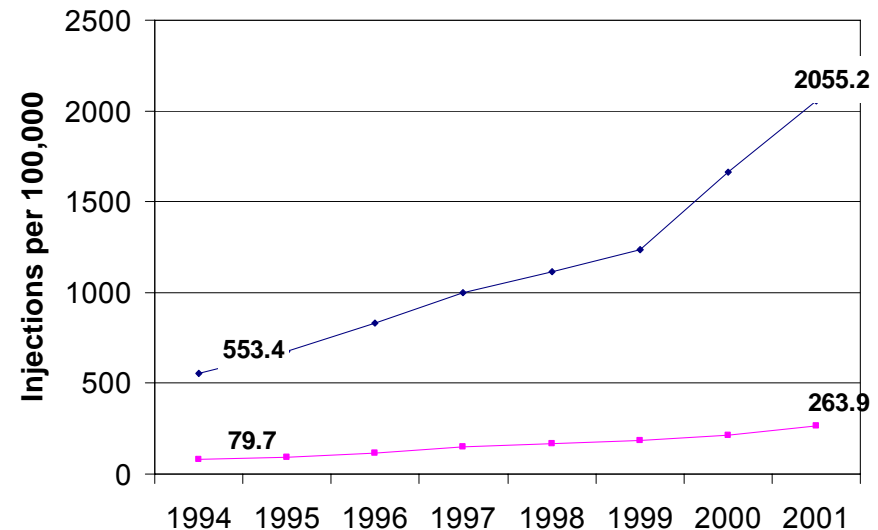
# Injections



# Injections for LBP, Medicare, 1994-2001

- Increase in Medicare population: 12%
- Increase in Epidurals: 266%
- Increase in Facet injections: 231%
- ↑ in reimbursement injection: 100%
- Total increase in cost: 637%, due to rate and charges ↑  
(adjusted for inflation)

Lumbosacral Injections Rates, Age and Sex adjusted, Medicare



# Efficacy of Epidural Steroid and Facet Injections?



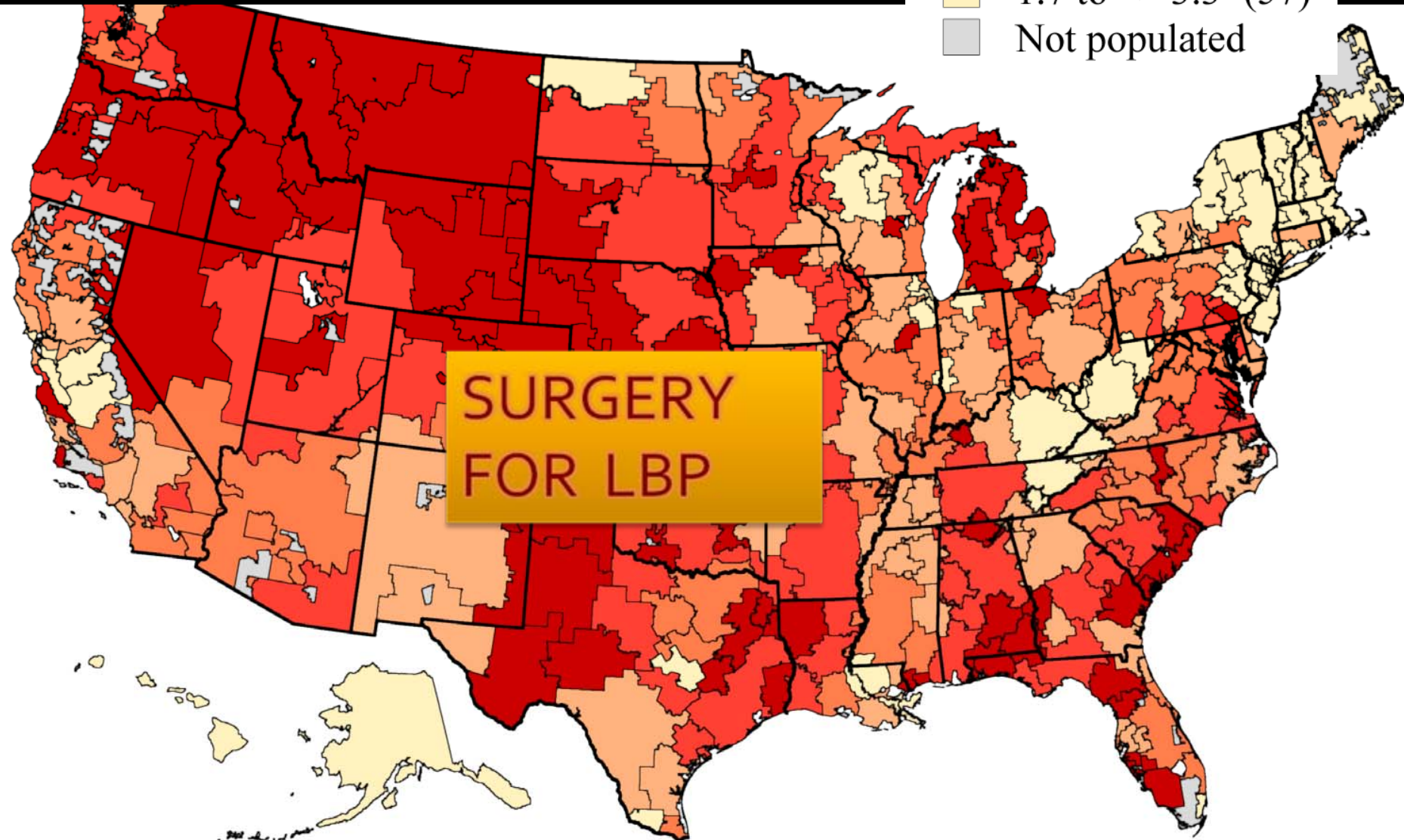
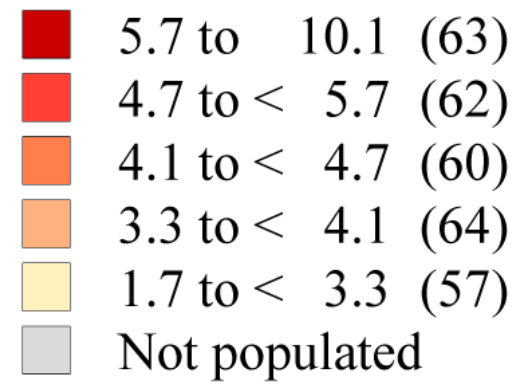
- For sciatica, mixed study results: 1/2 suggest modest benefit, 1/2 suggest none
- Axial back pain: no evidence of benefit; yet 58% of injections not for radiculopathy or HNP
- No reduction in surgery rate in 2 RCT's; surgery rates highest where injection rates highest
- Facet injections: RCT's consistently neg.
- Overall: modest sx relief from epidurals for sciatica, no change in natural history

# Suggestions regarding injections

- ACP/APS *and* Am Acad. Neurol. Guidelines: Epidural steroids for temporary pain relief of persistent lumbar radiculopathy
- AAN: No effect on functional impairment, need for surgery, or pain relief beyond 3mos; routine use for these reasons not recomm.
- Avoid epidurals for back pain alone; avoid facet joint injections

# Back Surgery Rates per 1,000 Beneficiaries

By Hospital Referral Region, 2003-2007

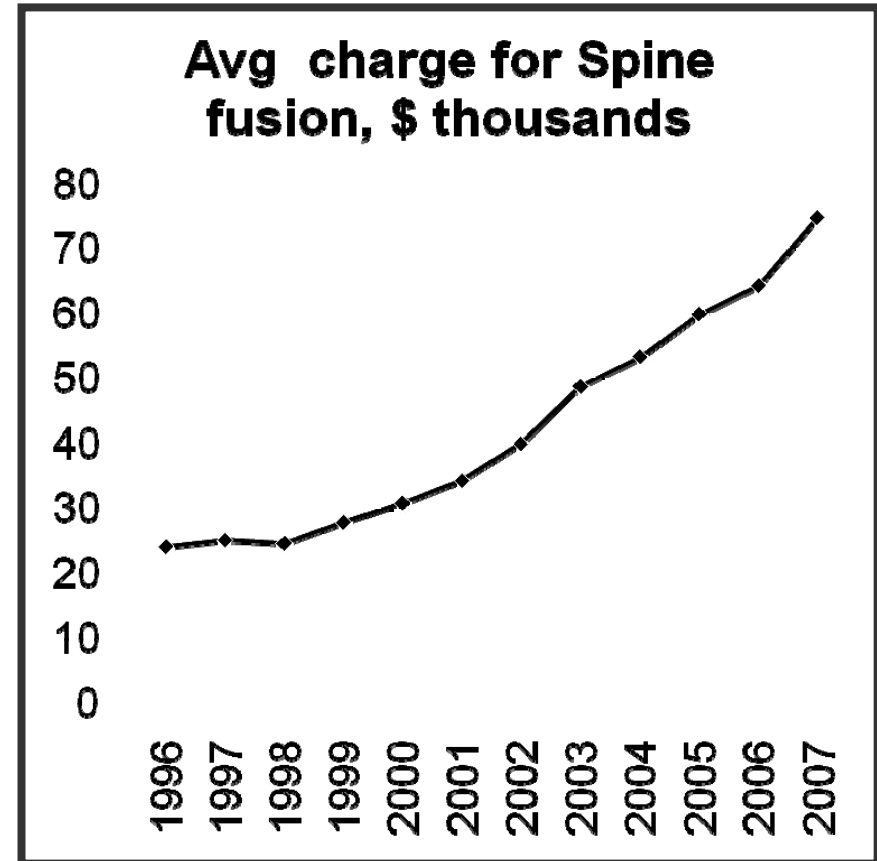
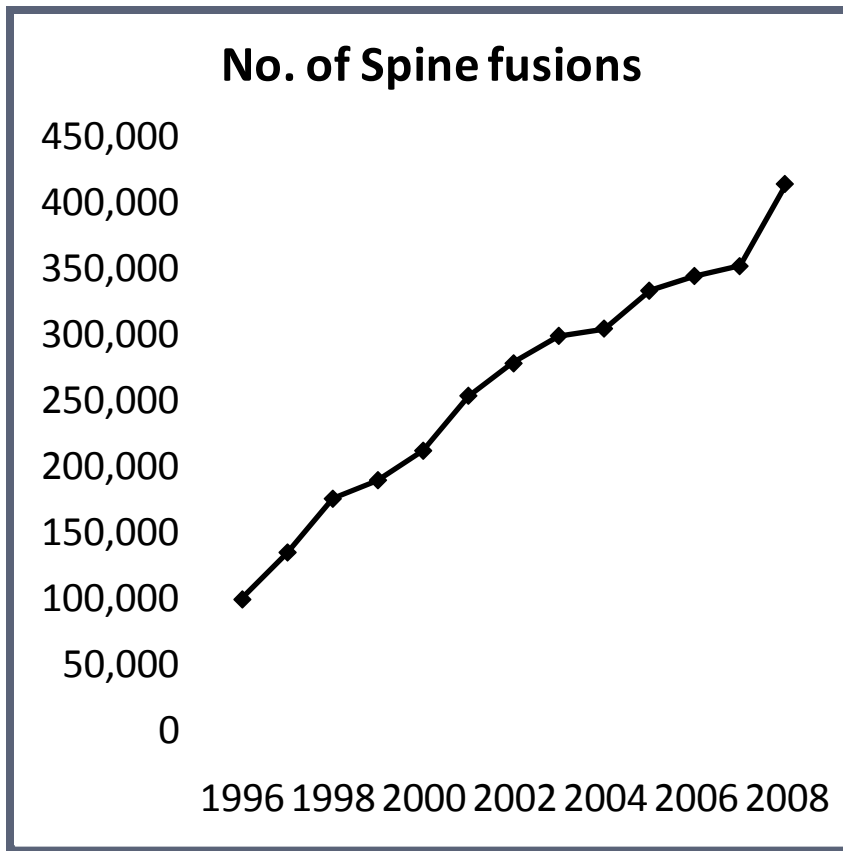


# Outcomes by Surgical Rate: Maine, 2-4 yrs.

	<u>Low Rate</u>	<u>Middle Rate</u>	<u>High Rate</u>
Imp. Roland Score*	13	11	8
Disability Comp.	8%	10%	18%
Satisfied with Outcome*	72%	63%	49%

\*p<0.05

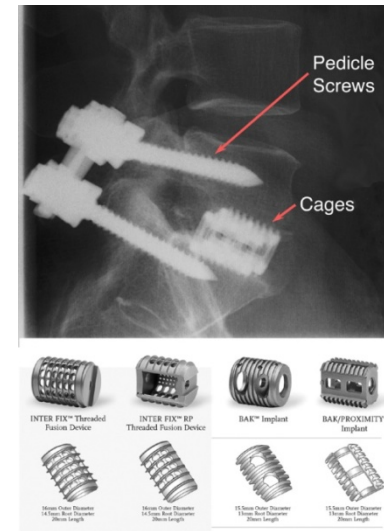
# Nationwide spine fusion numbers & charges (source: HCUPnet, AHRQ)



(All spinal levels, all indications, all techniques)

# Trends in Instrumentation

- Medicare: last five years of the 1990's:
    - 40% increase in spine surgery rates;
    - 70% increase in spine fusion rates;
    - 100% increase in instrumented fusions
  - Published literature:
    - 23% instr. in 80's, 41% in the 90's
    - Fusion rate unchanged
- Clinical outcomes unchanged**





# AHRQ Literature Synthesis: Fusion for LBP & Degenerative Discs alone 2006: Draft

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- **Fusion for axial back pain:** 4 RCT's fail to show clinically meaningful advantage of surgery over rehab (>15 points on Oswestry)
- Instrumentation augments fusion rate, but higher complications, and no advantage in symptoms demonstrated
- **Conclusion:** fusion for DDD has no conclusive advantage over nonsurgical Rx, short-term or long-term

# American Pain Society Clinical Practice Guidelines

- Surgery for radic. with HNP and symptomatic spinal stenosis is associated with short-term benefits compared to nonsurgical rx, but benefits diminish with long-term follow-up in some trials
- For **non-radicular back pain with common degenerative changes**, fusion is no more effective than intensive rehabilitation, but associated with small to moderate benefits compared to standard nonsurgical therapy.

Chou, R, et al. Surgery for low back pain: a review of the evidence for an American Pain Society Clinical Practice Guideline. [Spine \(Phila Pa 1976\)](#). 2009 May 1;34(10):1094-109.

# Long-term outcomes of lumbar fusion in WC subjects (historical cohort)

- 725 lumbar fusion cases / 725 controls WC pts with CLBP
- 2 years post op
  - 26% of fusion cases had RTW
  - 67% of non-surgical cases had RTW
- Opioid Use
  - Increased 41% after surgery, 76% continued opioid use after surgery

Nguyen TH et al, Long-term outcomes of lumbar fusion among workers' compensation subjects: a historical cohort study, *Spine* 2011 Feb 15;36(4):320-31.

# Long-term outcomes of lumbar fusion in WC subjects (historical cohort)

- Days off work
  - 1140 for sx cases
  - 316 for controls
- Predictors of RTW for lumbar fusion pts
  - # days off work before surgery
  - Daily morphine usage
  - Legal rep
  - Reoperation
  - Complications

# Repeat Surgery: Toronto Worker's Comp

	Pt. Eval		Doctor Eval.
	<u>Better</u>	<u>Worse</u>	<u>Good Result</u>
2nd op.	53%	19%	23%
3rd op.	35%	25%	5%
4-5th op.	27%	45%	0%

# When to consider elective surgery?

- Patient with herniated disc, stenosis or spondylolisthesis with *leg pain as well as back pain*
- Poor response to conservative Rx
- Hx, exam, imaging all consistent
- Patient understands benefits, risks, of both surgery and nonoperative care
- Back pain alone? Greatest controversy



# Does More Treatment Necessarily Result in Better Outcomes?

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- Reasonable Expectation: flurry of treatment activity and new technology should lead to:
  - Better patient functioning
  - decreased disability due to musculoskeletal pain

# Current Evidence about Back Pain

- Opioids: uncertain efficacy for long-term use; substantial complications. Caution!
- Precise dx often impossible, even with modern imaging (which may drive unnecessary surg.)
- Rarely surgical; most surgery truly elective
- Wide variations in surgical practice - limited consensus on optimal use, outcomes
- More intensive Rx: not improving outcomes; more complications
- Reassurance – generally good outcome



# Implications for the philosophy of care

- Using acute care model for chronic illness: expecting a drug, an injection, a “program”, or an operation to cure the problem
- Risks overlooking psychosocial, occupational, lifestyle dimensions
- Need “chronic care” model: activate & empower patients; tap family, community, workplace; address multiple dimensions of complex problem; ongoing care