

E•QUAL | EMERGENCY QUALITY NETWORK

Opioid Initiative Wave I –
ED-Initiated Buprenorphine: The Business Perspective

Presenter



Eric Ketcham, MD, MBA

The Economic and Business case for utilizing BUPRENORPHINE in the ED

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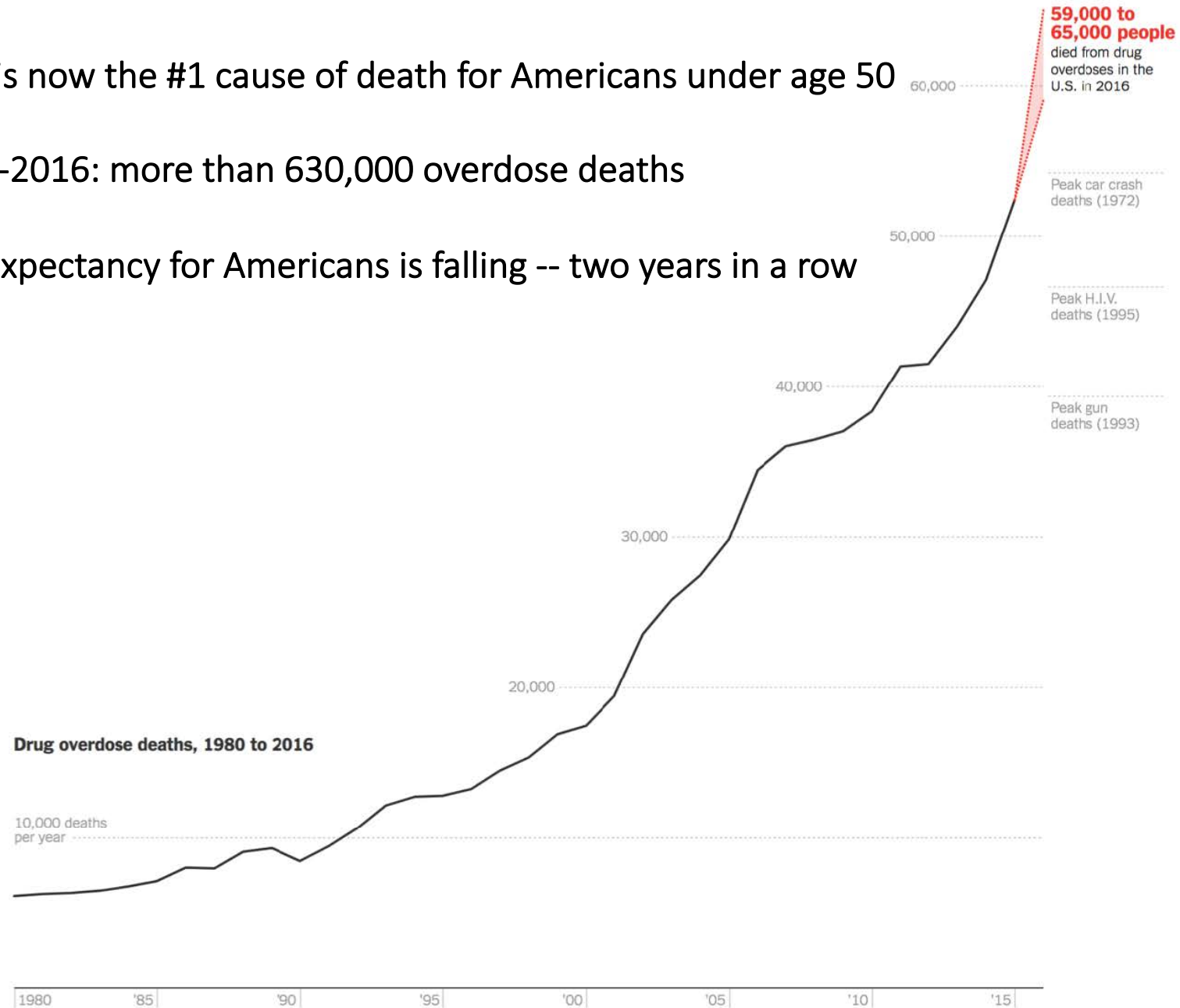
Staff Emergency Physician:
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O.D. is now the #1 cause of death for Americans under age 50

1999-2016: more than 630,000 overdose deaths

Life expectancy for Americans is falling -- two years in a row



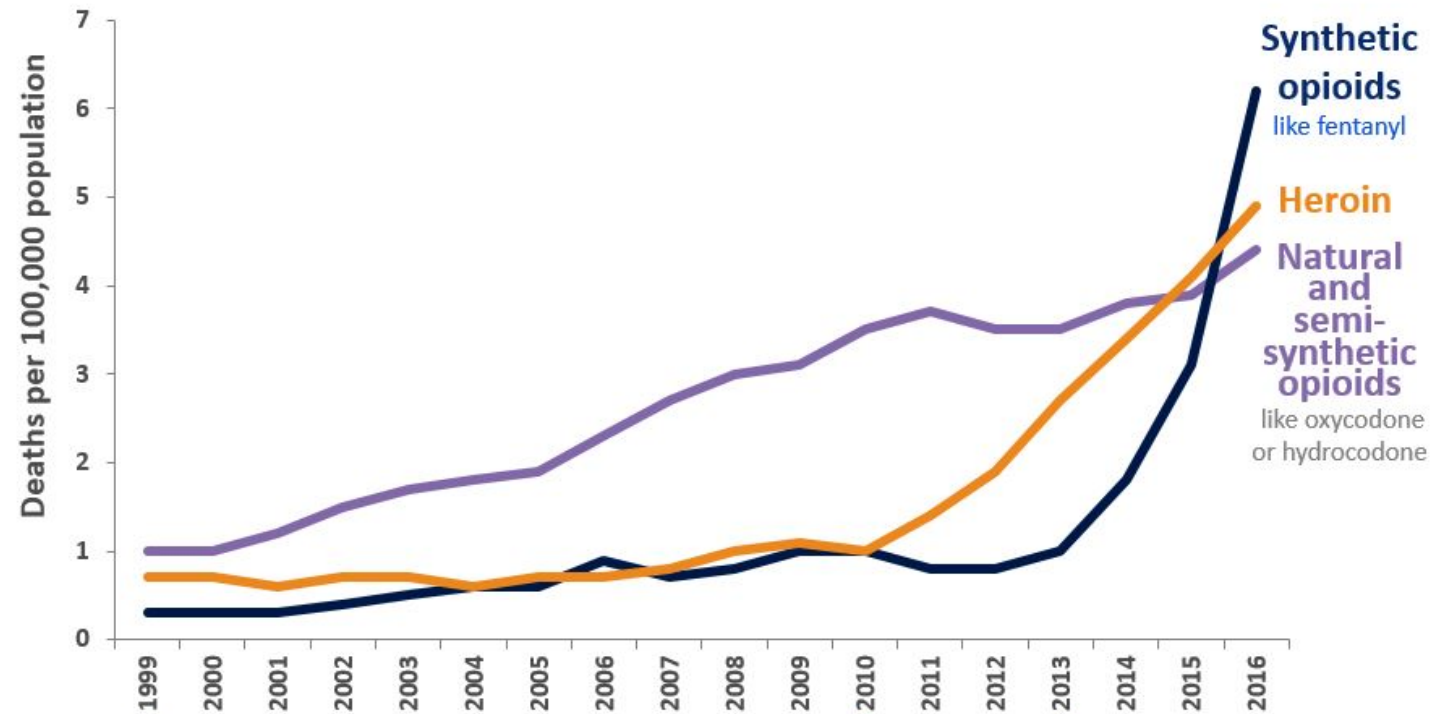
2016

Around 66% of the more than 63,600 drug overdose deaths in 2016 involved an opioid.

In 2016, the number of overdose deaths involving opioids was 5 times higher than in 1999.

On average, 115 Americans die every day from an opioid overdose.

3 Waves of the Rise in Opioid Overdose Deaths



Wave 1: Rise in Prescription Opioid Overdose Deaths

Wave 2: Rise in Heroin Overdose Deaths

Wave 3: Rise in Synthetic Opioid Overdose Deaths

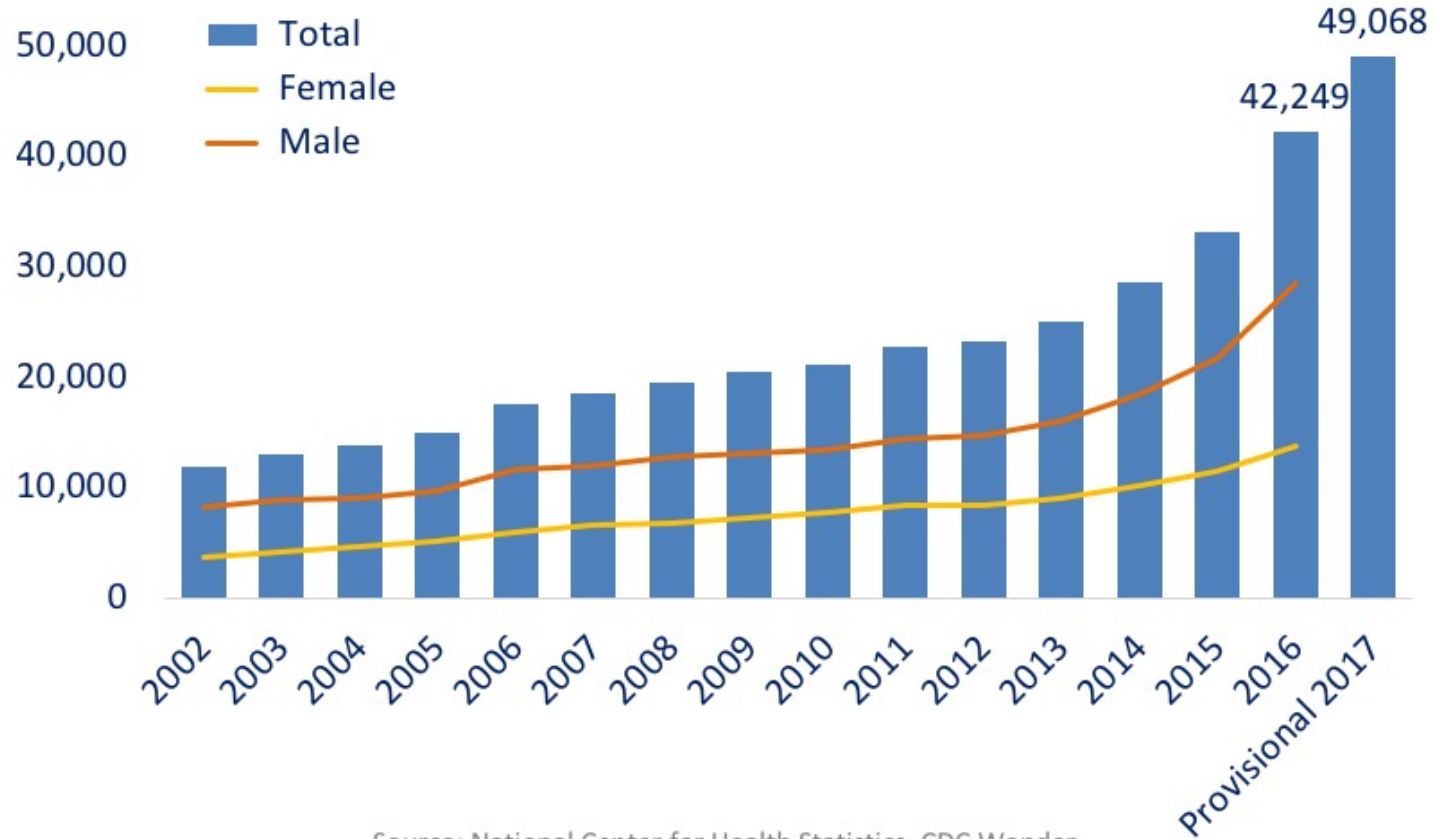
SOURCE: National Vital Statistics System Mortality File.

PRELIMINARY 2017 DATA:

Opioid overdose deaths increase to ~ 134 Americans per day.



National Overdose Deaths Number of Deaths Involving Opioids



Source: National Center for Health Statistics, CDC Wonder

ADDICTION & OVERDOSE: DEADLIER THAN STEMI @ 1 YEAR

Annals of Emergency Medicine
An International Journal

2017 ACEP Abstract (adjusted)

402 One-Year Mortality of Opioid Overdose Victims Who Received Naloxone by Emergency Medical Services

[S.G. Weiner](#), [O. Baker](#), [D. Bernson](#), [J.D. Schuur](#)
Brigham and Women's Hospital, Boston, MA
Massachusetts Department of Public Health, Boston, MA

Of discharged patients who survived after 3 days:

- **7.5 % Morality Rate @ 1 Year**
- OUD – a disease primarily of age 20 - 50

BMJ Journals

2016 Open Heart

Interventional cardiology

openheart Mortality pattern and cause of death in a long-term follow-up of patients with STEMI treated with primary PCI

Ataollah Doost Hosseiny,¹ Soniah Moloi,¹ Jaya Chandrasekhar,² Ahmad Farshid^{1,3}

Of all patients (including patients not surviving to d/c):

- **7.3% Morality Rate @ 1 Year**
- CAD – a disease primarily of age 60+

MAT: MEDICATIONS FOR ADDICTION TREATMENT is the MOST EFFECTIVE Treatment for Opioid Addiction

- Opioid addiction does not respond to the same treatments as alcoholism.
- **Abstinence based therapies generally DO NOT WORK: ~95% annual relapse rate.**
- Twelve Step programs have a ~5% rate of sobriety at one year, when treating Opioid Use Disorder.
- **Retention rates in MAT programs vary broadly, dependent upon multiple factors, with 1 year sobriety of ~10 to 80%, but average ~40-50%.**

SPOILER ALERT

Compared to patients receiving MAT,
UNTREATED patients with OUD have at 1 year:

- >2.5 X all cause mortality
- > 8 X overdose mortality

Ma J, Bao YP, Wang RJ, et al. **Effects of medication-assisted treatment on mortality among opioids users: a systematic review and meta-analysis.** *Mol Psychiatry*. 2018 Jun 22. doi: 10.1038/s41380-018-0094-5.

MAT: Medication Assisted Treatment is the MOST
EFFECTIVE Treatment for Opioid Addiction

MAT:

Naltrexone

Methadone

Buprenorphine (“bupe”)

IN 1996, FRANCE RESPONDED TO ITS HEROIN OVERDOSE EPIDEMIC BY TRAINING GP'S TO PRESCRIBE BUPE

Over 8 years....

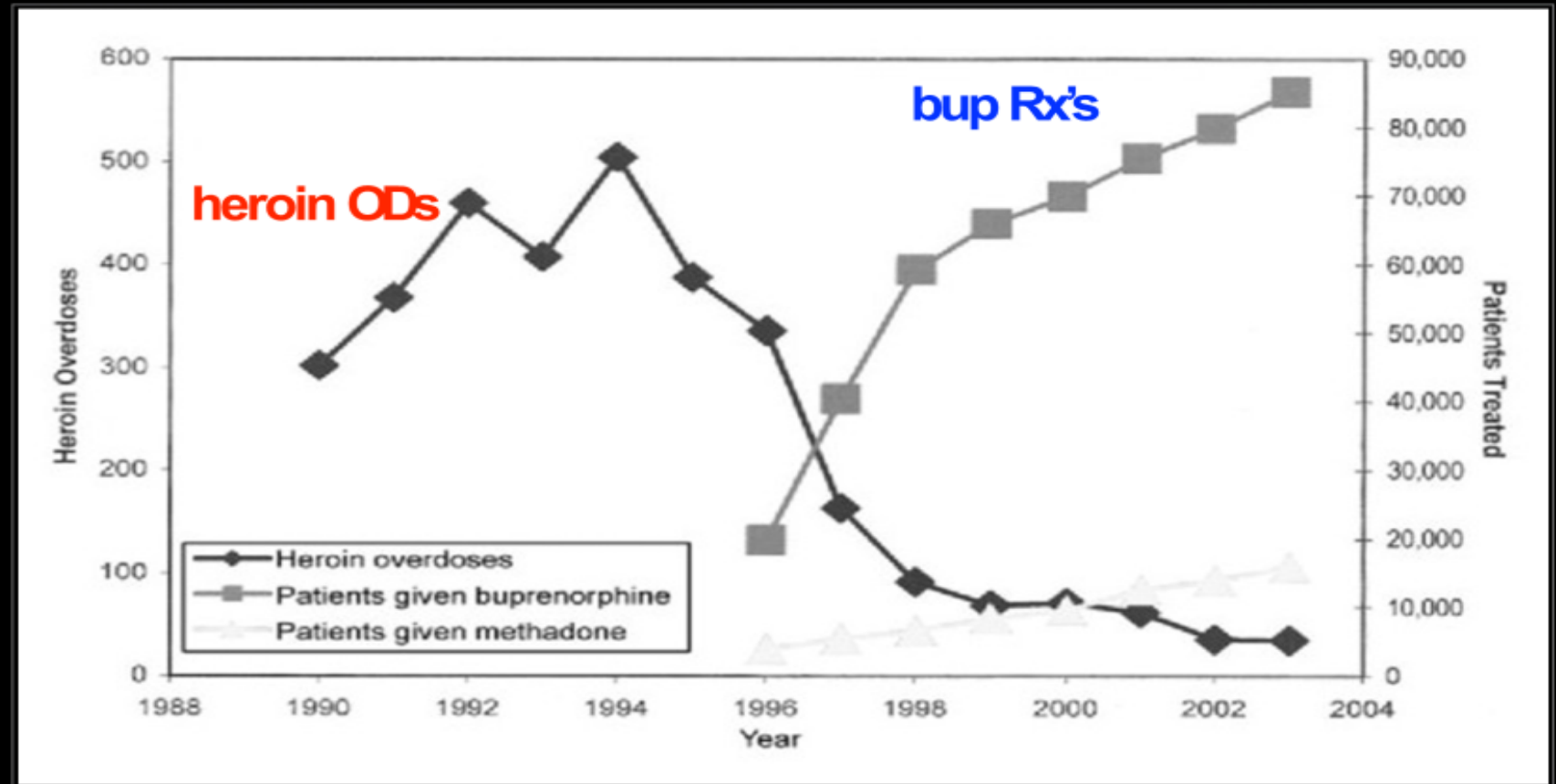
3x increase methadone treated patients (~15K pts)

+

4.5x increase in bupe tx pts (~90K pts)

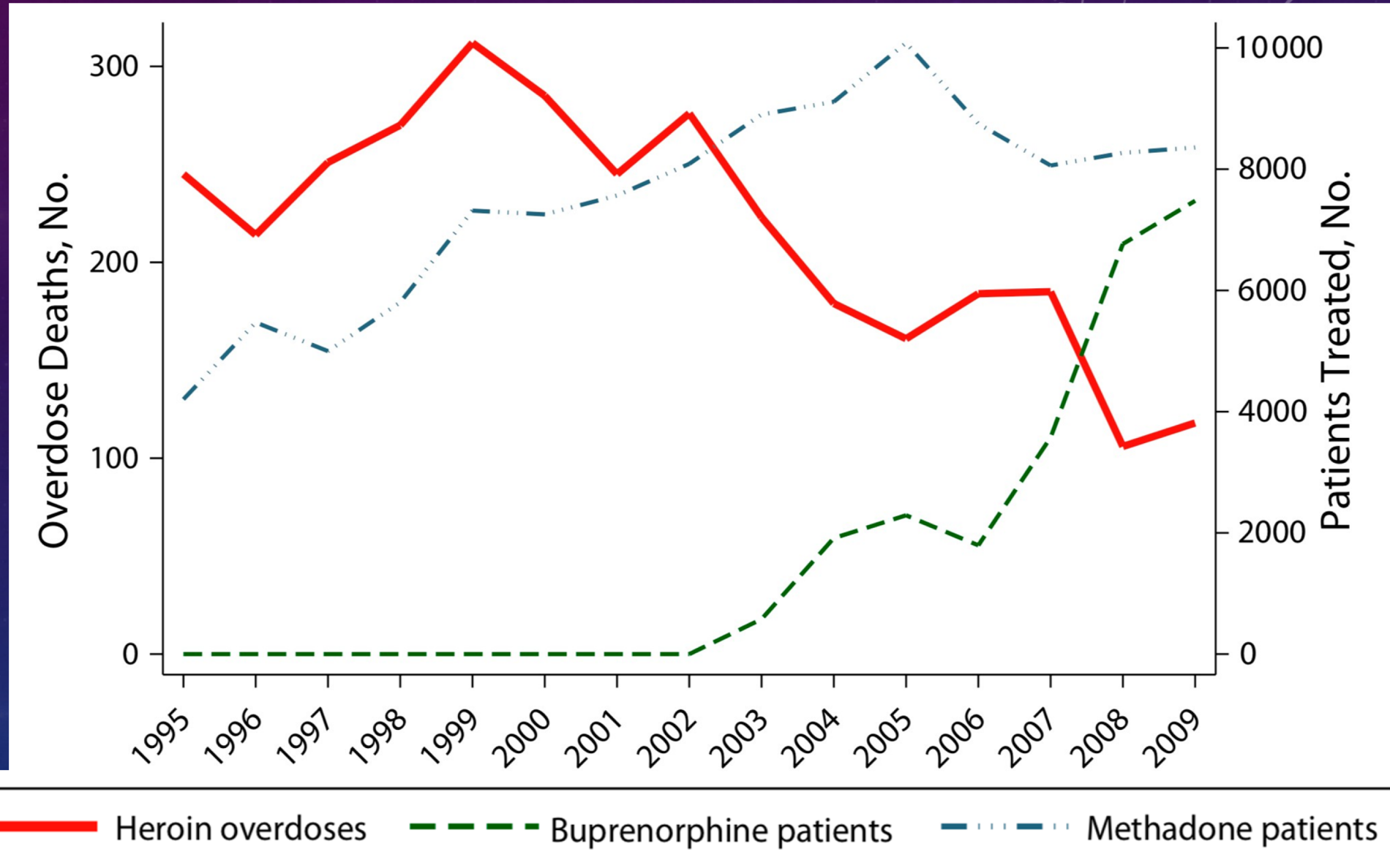


90% reduction in heroin overdoses!!



HEROIN OVERDOSE DEATHS AND OPIOID AGONIST TREATMENT: BALTIMORE, MD, 1995–2009

- Rapid expansion of access to buprenorphine treatment
- Rate of heroin overdose deaths drops in half.
- Despite a substantial increase in local heroin purity



Schwartz et al, Am J Public Health. 2013 May;103(5):917-22

Opioid Agonist Therapy is Much More Effective than Drug Counseling!!

Swedish Study:

- 40 patients randomized
- Daily supervised med administration for the first 6 months

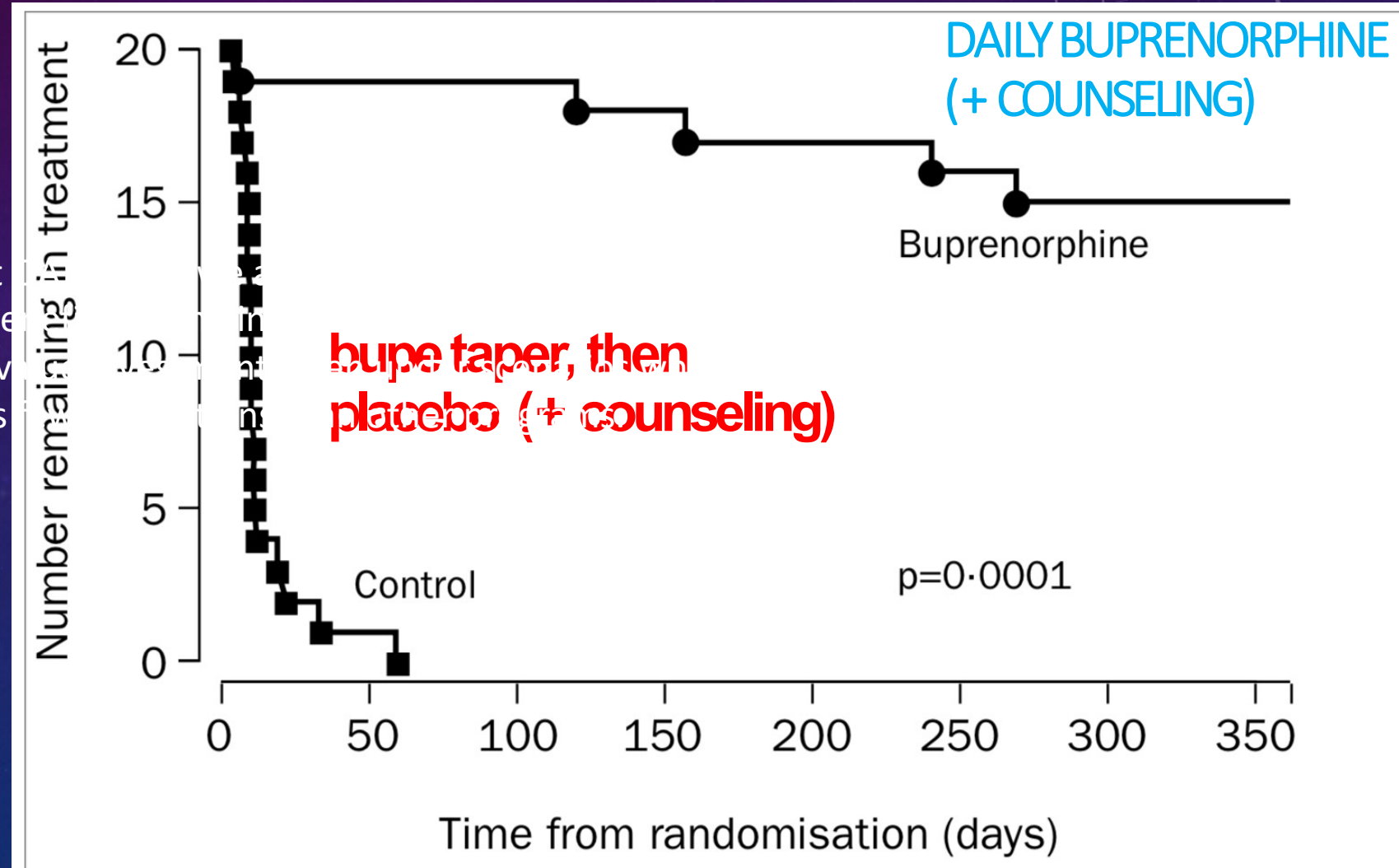
Retention at 1 year:

75% in the bupe group
0% in the placebo group

1 year Mortality:

0% in the and that OAT,
which we assume to have
immediate and direct
health benefits for the
individual, has the

and that
health be
highest v
prevents



“TREATMENT AS PREVENTION”

HCV:

- “Persons who inject drugs (PWID), most of whom are opioid dependent, comprise the majority of the HCV infected in the United States.”
- “Expanding MAT provides an unprecedented opportunity to access and treat persons with HCV, reducing HCV transmission, morbidity and mortality.”
- “Expanding access to MAT is deemed critical to achieving a substantial reduction in the incidence and prevalence of HCV in rural America.”
- “If just 50% of Americans with OUD had access to MAT and syringe service programs(SSP), achieving a 90% reduction in HCV prevalence and incidence by 2030 could be done with a ~50% reduction in patients treated for HCV annually.”
- Treating HCV is expensive! \$~26,400 (Macyret) to \$94,00 (Harvoni)

“TREATMENT AS PREVENTION”

HIV:

- “The World Health Organization (WHO) estimates that up to 30% of HIV infections are related to drug use and associated behaviors”
 - “... a major factor fueling the global epidemic of HIV infection.”
- “Drug users in substance abuse treatment are significantly more likely to achieve sustained viral suppression, making viral transmission less likely.”
- “The scientific literature leaves no doubt about the effectiveness of drug treatment as an HIV prevention strategy”
- “Irrespective of setting or culture, drug treatment using MAT is not only effective but also cost-effective at reducing opioid use and linked injection and sexual risks”
- “MAT has immediate and direct health benefits ... [and] has the potential to be the highest value investment, even under scenarios where it prevents fewer HIV infections than other programs.”

“TREATMENT AS PREVENTION”

Fraser H, Zibbell J, Hoerger T, et al. **Scaling-up HCV prevention and treatment interventions in rural United States-model projections for tackling an increasing epidemic.** *Addiction*. 2018

Jan;113(1):173-182.

Metzger DS1, Donnell D, Celentano DD, et al. **Expanding substance use treatment options for HIV prevention with buprenorphine-naloxone: HIV Prevention Trials Network 058.** *J Acquir Immune Defic Syndr*. 2015 Apr 15;68(5):554-61

Springer SA, Larney S, Alam-Mehrjerdi Z, et al. **Drug Treatment as HIV Prevention Among Women and Girls Who Inject Drugs From a Global Perspective: Progress, Gaps, and Future Directions.** *J Acquir Immune Defic Syndr*. 2015 Jun 1;69 Suppl 2:S155-61.

Metzger DS, Woody GE, O'Brien CP, et al. **Drug treatment as HIV prevention: a research update.** *J Acquir Immune Defic Syndr*. 2010 Dec;55 Suppl 1:S32-6.

Kresina TF, Bruce RD, McCance-Katz EF. **Medication assisted treatment in the treatment of drug abuse and dependence in HIV/AIDS infected drug users.** *Curr HIV Res*. 2009 Jul;7(4):354-64.

Metzger DS, Zhang Y. **Drug treatment as HIV prevention: expanding treatment options.** *Curr HIV/AIDS Rep*. 2010 Nov;7(4):220-5.

Bone C, Eysenbach L, Bell K, et al. **Our Ethical Obligation to Treat Opioid Use Disorder in Prisons: A Patient and Physician's Perspective.** *J Law Med Ethics*. 2018 Jun;46(2):268-271

Norton BL, Beitin A, Glenn M, et al. **Retention in buprenorphine treatment is associated with improved HCV care outcomes.** *J Subst Abuse Treat*. 2017 Apr;75:38-42.

Bernard CL, Owens DK, Goldhaber-Fiebert JD, et al. **Estimation of the cost-effectiveness of HIV prevention portfolios for people who inject drugs in the United States: A model-based analysis.** *PLOS Med J*. doi.org/10.1371/journal.pmed.1002312

Sullivan LE, Metzger DS, Fudala PJ, et al. **Decreasing international HIV transmission: the role of expanding access to opioid agonist therapies for injection drug users.** *Addiction*, 100 (2), Feb 2005, Pages 150-158

Wammes J, et al. **Cost-effectiveness of methadone maintenance therapy as HIV prevention in an Indonesian high-prevalence setting: A mathematical modeling study.** *International Journal of Drug Policy*, 23 (5), Sept 2012, Pages 358-364

Williams AR, and Bisaga A. **From AIDS to Opioids — How to Combat an Epidemic.** *N Engl J Med* 2016; 375:813-815

Bruce RD. **Methadone as HIV prevention: High Volume Methadone Sites to decrease HIV incidence rates in resource limited settings.** *International J of Drug Policy*. 21 (2), Mar 2010, 122-124

Vashishtha D, Mittal M, Werb D. **The North American opioid epidemic: current challenges and a call for treatment as prevention.** *Harm Reduction J* 2017;14:7

ALL CAUSE BURDEN TO U.S. SOCIETY

Admission rate for individuals abusing prescription opioids increased from 1997 to 2007, from 7 to 36 per 100,000 population (an increase of 414%).

Patients with OUD were generally more likely to utilize medical services, such as emergency department, physician outpatient visits, and inpatient hospital stays, relative to non-abusers.

The mean annual excess health care costs for opioid abusers with Medicaid ranged from \$5874 to \$15,183

Societal costs attributable to prescription opioid abuse were estimated **at \$55.7 billion in 2007**

SURGE IN NEONATAL ABSTINENCE CASES

- From 2000 to 2009 N.A.S. incidence increased from ~ 1.19 to ~ **5.63** per 1000 hospital births per year.
- Mean hospital charges for discharges with NAS increased from ~ \$39,400 in 2000 to ~ **\$53,400** in 2009.
- By 2009, 77.6% of charges for NAS were born by state Medicaid programs.

Patrick SW, Schumacher RE, Benneyworth B, et al, **Neonatal Abstinence Syndrome and Associated Health Care Expenditures, United States, 2000-2009**. *JAMA*. 2012;307(18):1934-1940.

OPIOID OVERDOSES ARE CRIPPLING HOSPITALS

- Rates and costs of heroin and prescription opioid OVERDOSE related admissions in the United States increased substantially from 2001 to 2012.
- Total in-patient costs increased by \$4.1 million dollars per year (95% CI = 2.7, 5.5) for Heroin Overdose admissions and by \$46.0 million dollars per year (95% CI = 43.1, 48.9) for Prescription Overdose admissions, with an associated increase in hospitalization costs to more than \$700 million annually!!
 - **For opioid overdoses alone!**
- “The rapid and ongoing rise in both numbers of hospitalizations and their costs suggests that the burden of POD may threaten the infrastructure and finances of US hospitals.”

ENDOCARDITIS COST BURDEN EXAMPLE

During 2010–2015, a total of 505 *North Carolina* residents aged ≥ 18 years were hospitalized with the diagnoses of drug dependence and endocarditis

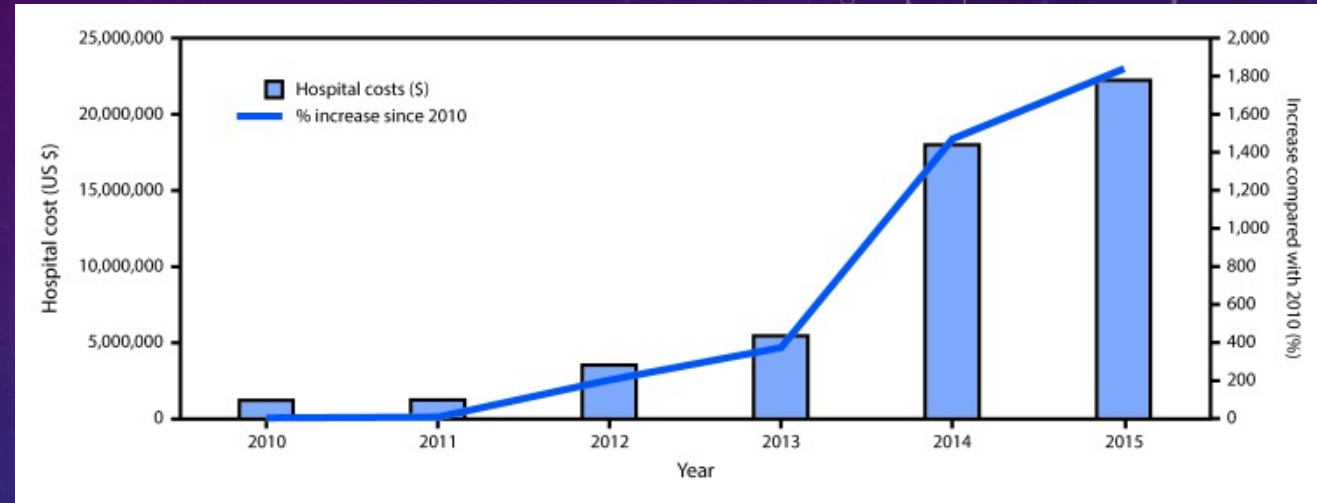
~ half the patients were aged 26–40 years.

Payor Mix for these patients:

- 19% uninsured
- 23% were on Medicaid.

36% of patients had past or current HCV infections.

An increase from 0.2 to 2.7 cases per 100,000 persons per year.



The median hospital charge for drug dependence–associated endocarditis hospitalization was \$54,281;

total costs of hospitalizations for drug dependence–associated endocarditis increased 18X during 2010–2015, from \$1.1 to \$22.2 million

A BIGGER VIEW

-- BEYOND HEALTHCARE

- There are many societal harms & costs beyond opioid overdose, endocarditis, neonatal abstinence and other infectious complications: victims of crime and violence, incarceration (direct costs), and costs in lost labor.
- **In Bosnia-Herzegovina, which was also suffering from a growing opioid use disorder problem:**
- MAT “program with Buprenorphine/ Naloxone (Suboxone) implemented in 2009 at the Department of Psychiatry at the University Clinical Center (UCC) in Tuzla.”
- **“Annual costs of the substitution therapy amount to BAM 4,734 [~\$7,900 USD] per patient.”**
- “The monetary value of the substitution therapy benefits for the society, as the result of reduction in criminal activities of involved addicts, amounts to BAM 53,534” (~87,500 USD).
- **A benefit/cost ratio is 11.31:1 !!**

Hasanovic M, et al. Cost-Benefit Analysis Of The Opiate Substitution Treatment With Buprenorphine/Naloxone In Bosnia And Herzegovina. *Global Fund for the United Nations Development Programme*. 2017

DOES M.A.T./BUPE REALLY MAKE A DIFFERENCE?

Will treatment with buprenorphine help keep patients with OUD out of the ED?

Will bupe help patients with OUD stay out of the hospital?

DOES M.A.T./BUPE REALLY MAKE A DIFFERENCE?

- Length of treatment study in a Cohort of Medicaid 945 OUD patients in Pennsylvania:
 - Bupe Tx for <3 mo, 3-5 mo, 5-8 mo, >8 mo, and >12 mo.
- **Bottom line:** the longer the patients stayed in treatment with persistent use of buprenorphine, the lower the risk of all-cause hospitalizations and emergency department visits.
- For those patients receiving bupe at 12 months, there was 14% decrease in ED utilization, and an 18% decrease in all-cause hospitalization.

DOES M.A.T./BUPE REALLY MAKE A DIFFERENCE?

- A smaller study (began with 209 pts), tracked patients on bupe for MAT for up to 43 months.
- **The cohort still taking bupe at 12 months had a 17.5% less than expected rate of ED visits.**
- The study did not demonstrate an reduction in rate of hospitalization, but may not have been powered enough to do so.

Schwarz R, Zelenev A, Bruce RD, et al. Retention on buprenorphine treatment reduces emergency department utilization, but not hospitalization, among treatment-seeking patients with opioid dependence. J Subst Abuse Treat. 2012 Dec;43(4):451-7

DOES M.A.T./BUPE REALLY MAKE A DIFFERENCE?

- A larger Vermont cohort study over 5 years.
- Serial cross-sectional design from 2008 to 2013 to evaluate medical claims for Vermont Medicaid beneficiaries with opioid dependence or addiction (6158 in the intervention group, 2494 in the control group).
 - Vast majority treated with bupe vs. methadone.
- Assessed the treatment and medical service expenditures for those receiving MAT compared to those receiving substance abuse treatment without medication.
- In each of the four expenditure subcategories (inpatient, outpatient, professional services, and special Medicaid services expenditures) the MAT group's medical expenditures were significantly lower, with the largest difference seen in inpatient expenditures (-\$1625/year).

DOES M.A.T./BUPE REALLY MAKE A DIFFERENCE?

MAT 5 year observation study: cohort of 35 out of 40 patients April 1999 and January 2005 in a Norwegian district town.

Bupe and methadone, but majority treated with methadone.

There was a reduction in all incidents by 35% ($p = 0.004$), in substance-related incidents by 62% ($p < 0.001$) and in injection-related incidents by 70% ($p < 0.001$).

Inpatient and outpatient days were reduced by 76% ($p = 0.003$) and 46% ($p = 0.060$), respectively.

Disease incidents which did occur were less often drug-related during MAT ($p < 0.001$).

Patients experienced a reduction in substance-related disease incidents regardless of ongoing substance use,

- **trend towards greater reductions while compliant with medication.**

Skeie I, Brekke M, Lindbaek M, et al. Somatic health among heroin addicts before and during opioid maintenance treatment: a retrospective cohort study. BMC Public Health. 2008 Jan 31;8:43

DOES M.A.T./BUPE REALLY MAKE A DIFFERENCE?

A total of 145 eligible patients consented to participation in the randomized clinical trial. Of these, 139 completed the baseline interview and were assigned to the detoxification (n = 67) or **linkage (n = 72)** – “warm hand off” group.

Five-day buprenorphine detoxification protocol **or buprenorphine induction, intrahospital dose stabilization, and postdischarge transition to maintenance buprenorphine MAT affiliated with the hospital’s primary care clinic (“linkage”)**.

Linkage participants were more likely to enter buprenorphine outpt MAT than those in the detoxification group (52 [72.2%] vs 8 [11.9%], $P < .001$).

At 6 months, 12 linkage participants (16.7%) and 2 detoxification participants (3.0%) were receiving buprenorphine MAT ($P = .007$).

Compared with those in the detoxification group, participants randomized to the linkage group reported less illicit opioid use in the 30 days before the 6-month interview (incidence rate ratio, 0.60; 95% CI, 0.46-0.73; $P < .01$)

➤ Liebschutz JM, Crooks D, Herman D. Buprenorphine Treatment for Hospitalized, Opioid-Dependent Patients A Randomized Clinical Trial. JAMA Intern Med. 2014 Aug; 174(8): 1369–1376

BUT IF I GIVE A DOSE OF BUPE FOR OPIOID WITHDRAWAL, WILL THOSE PATIENTS KEEPING COMING TO THE E.D.?

During a 10 week study period, of 158 ED patients in acute opioid withdrawal:

- 56% received bupe
- 26% received usual symptomatic Tx
- 18% received no pharmacologic Tx.

Patients who received bupe were less likely to return to the same ED within 30 days for a drug-related visit (8%) compared to those who received symptomatic treatment (17%) ($p < 0.05$).

Beginning MAT in the ED: the warm hand-off

Yale: D'Onofrio: Emergency department-initiated buprenorphine/naloxone treatment for opioid dependence: a randomized clinical trial.

- **329** ED patients with OUD, screened, and randomized:
- ~1/3 to the referral group (patient is handed a pamphlet)
- ~1/3 to the brief intervention group (meets with a social worker or pt advocate)
- ~1/3 to the **buprenorphine treatment group (and above)**

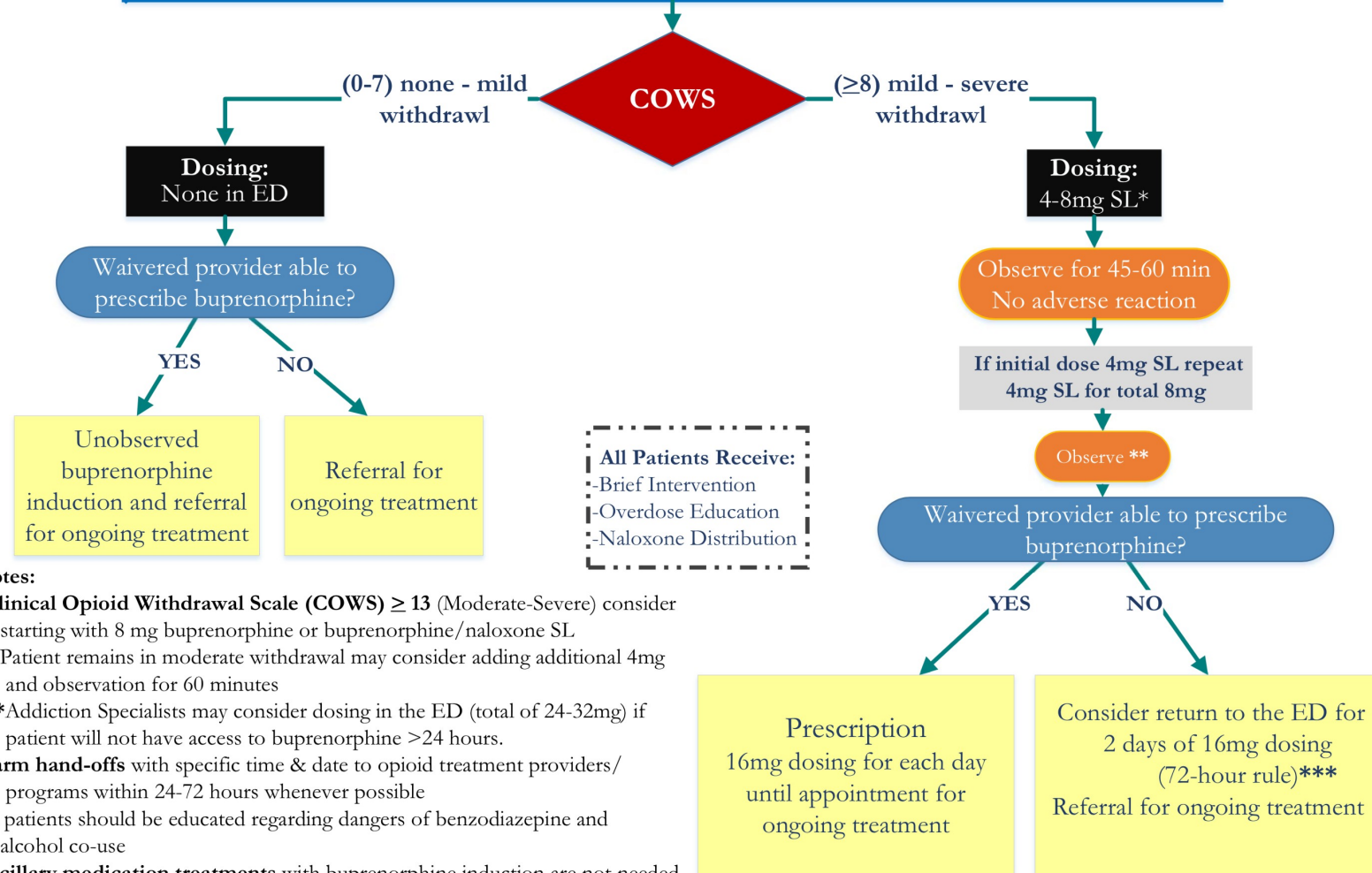
MAIN OUTCOMES AND MEASURES:

- Enrollment in, and receiving, addiction treatment 30 days after randomization was the primary outcome.

YALE (D'ONOFRIO) ED-B PROTOCOL

ED-Initiated Buprenorphine

Diagnosis of Moderate to Severe Opioid Use Disorder
Assess for opioid type and last use
 Patients taking methadone may have withdrawal reactions to buprenorphine up to 72 hours after last use
 Consider consultation before starting buprenorphine in these patients

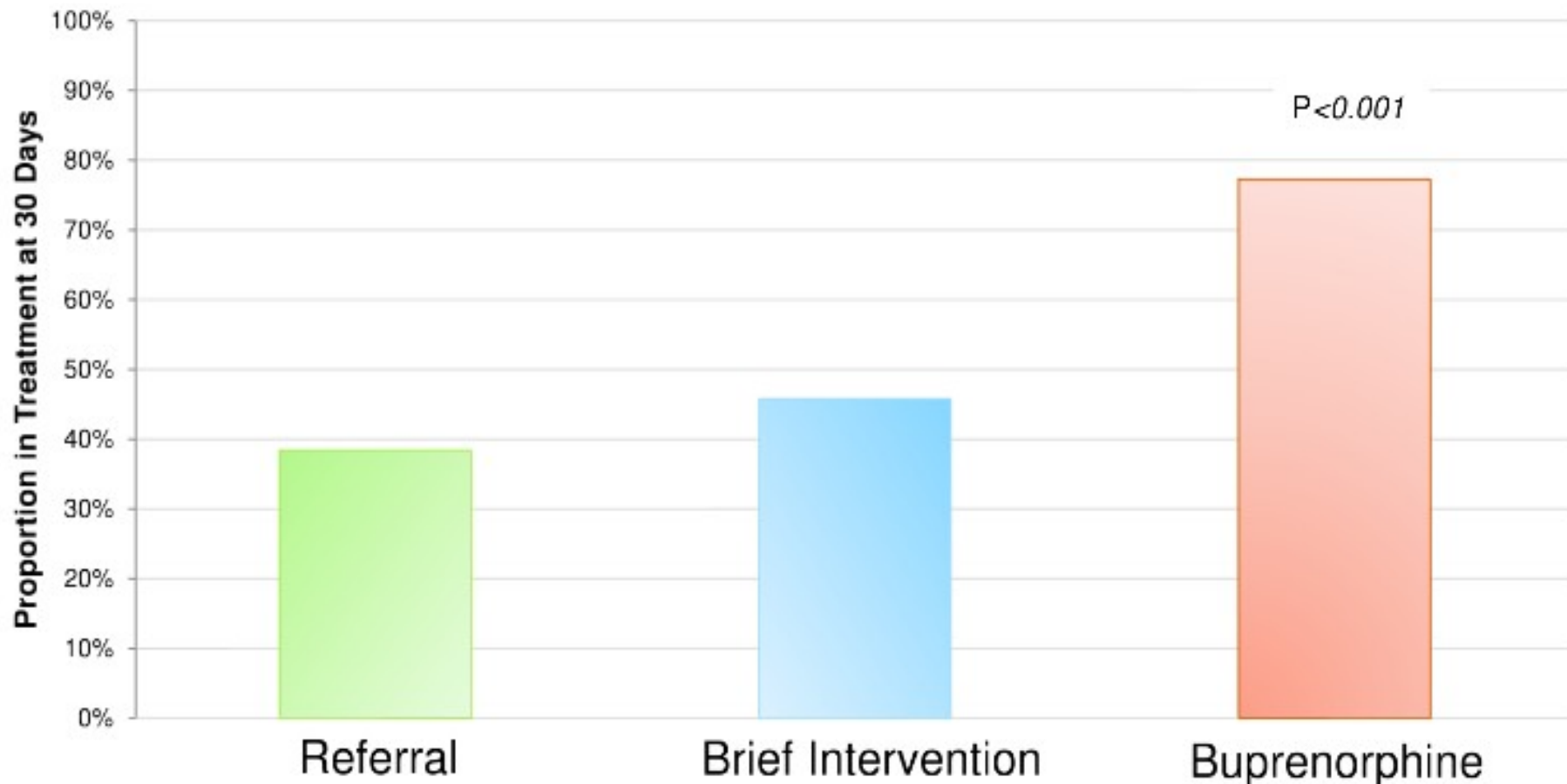


Notes:

- *Clinical Opioid Withdrawal Scale (COWS) ≥ 13 (Moderate-Severe) consider starting with 8 mg buprenorphine or buprenorphine/naloxone SL
- ** Patient remains in moderate withdrawal may consider adding additional 4mg and observation for 60 minutes
- ***Addiction Specialists may consider dosing in the ED (total of 24-32mg) if patient will not have access to buprenorphine >24 hours.
- Warm hand-offs** with specific time & date to opioid treatment providers/ programs within 24-72 hours whenever possible
- All patients** should be educated regarding dangers of benzodiazepine and alcohol co-use
- Ancillary medication treatments** with buprenorphine induction are not needed

YALE (D'Onofrio) ED-IB ... continued

Engaged in Treatment at 30-Days



YALE (D'ONOFRIO) ED-IB continued

Needed inpatient addiction treatment services?

- **Bupe group: 11%** (95% CI, 6%-19%, P <0.001)
- **Referral Group: 37%** (95% CI, 27%-48%, P <0.001)
- **Brief Intervention Group: 35%** (95% CI, 25%-37%, P <0.001)

IS THERE ANY STUDY, AS TO THE COST-EFFECTIVENESS OF E.D. INITIATED BUPE?

As a follow up to Yale group's 2015 JAMA publication:

Busch SH, Fiellin DA, Chawarski MC, et al. Cost-effectiveness of emergency department-initiated treatment for opioid dependence. *Addiction*, 2017, 112, 2002–2010.

- Considered a health-care system perspective, constructed cost-effectiveness acceptability curves that indicate the probability each treatment is cost-effective under different thresholds of willingness-to-pay for outcomes studied.
- Self-reported 30-day assessment data were used to construct cost-effectiveness acceptability curves for patient engagement in formal addiction treatment at 30 days and the number of days illicit opioid-free in the past week.
- **Considering only health-care system costs, cost-effectiveness acceptability curves indicate that at all positive willingness-to-pay values, ED-initiated buprenorphine treatment was more cost-effective than brief intervention or referral.**

BUPE IS THE SUPERIOR DRUG FOR TREATING OPIOID WITHDRAWAL

The old and inferior treatment of opioid withdrawal:

ED RN flogs to get an IV placed (and the nurse is miserable)

Multiple doses of Zofran, Phenergan, clonidine ...

Perhaps Haldol, benzos, ketamine ...

The Patient is eventually sedated and sleeps a long time in the ED – consuming a lot of bed space and RN resources.

Although the patient isn't vomiting, he/she doesn't feel much better.

None of these medications address the underlying problem. Patient returns to using opioids.



BUPE IS THE SUPERIOR DRUG FOR TREATING OPIOID WITHDRAWAL

The New and Improved method:

- 1) Ondansetron 8mg ODT
- 2) Buprenorphine (usually 8mg)
[If needed, repeat in 30 minutes]
- 3) Pt feels much better, engages in dialogue with a social worker or peer counselor about a clinic follow up.

The entire ED visit: 60-90 minutes.

No difficulty IV start, no conflict. And ... rapid turnaround, happier nurses!

Best of all: the patient has experienced treatment for opioid use disorder!!



HOW CAN IMPLEMENTING BUPE IN THE E.D. IMPROVE OUR DOCS' AND THE HOSPITAL'S MARGIN?

Throughput! Throughput! Throughput!

Most ED's have limited bed space, and a limited nursing staff.

Getting patients in acute opioid withdrawal stable faster with SL bupe, with reduced IV starts will significantly free up bed space, and nursing time – so you and the nurses can see more patients.

Improved management of patients with OUD, who are often agitated and restless when in acute withdrawal, can only help nursing morale and retention.

- Initiating treatment with bupe, especially if the patient can be linked to outpatient treatment will facilitate the patient continuing MAT, and have less need to return to the ED.
- Patients who continue in MAT, are less likely to present to the ED in a drug overdose, or with infectious complications: endocarditis, skin abscesses, joint infections, etc.
- Patients with OUD, who come to the ED with OUD related complications disproportionately have a poor payor mix: Medicaid and self-pay.



THANK YOU!

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For More Information

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