

Day-1 Conference Welcome Keynote Speaker: Jeffrey Runge, MD

Jeffrey Runge, MD

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Day 1 (May 28, 2003)

Dan Hungerford: It is my distinct pleasure to introduce Dr. Jeffrey Runge, the administrator of the National Highway Traffic Safety Administration (NHTSA). He will talk about some of the primary issues that we will be addressing in the conference. Dr. Runge is an emergency physician and an educator whose research has focused on injury prevention and control, with particular emphasis on injuries sustained in motor vehicle crashes. Before becoming the NHTSA administrator, he served on the faculty of the Emergency Medicine Residency at the Carolinas Medical Center in Charlotte, North Carolina.

Jeffrey W. Runge, MD, NHTSA Administrator: Good morning. It's nice to see so many choir members here today. I want to welcome all of you. Let me begin by giving you a little history about myself and why I'm standing here. In August 2001, I was nominated by President Bush and confirmed by the Senate to be the 12th administrator of the National Highway Traffic Safety Administration. This agency has a long history of being headed by physicians. Our first administrator, Dr. Bill Haddon, now deceased, was former commissioner of the Department of Public Health in New York State. He was tapped by Congress to head the national Traffic Safety Bureau in 1966, when traffic deaths were 55,000 per year and the rate of motor vehicle fatalities was 5.5 per 100 million vehicle miles traveled. This was a national epidemic that had gotten very little attention before the advent of the Traffic Safety Bureau. One of the things that changed my life as a young practitioner in the early 1980s

was reading Dr. Haddon's seminal article on injury as a treatable disease. I know many of you have read the article and many of you knew Dr. Haddon personally. His influence lives on. We still believe in Haddon's matrix approach to injury control with the preevent, event, and postevent phases of the host, agent, and environment interaction. Therefore, we use countermeasures in crash avoidance, crashworthiness, and emergency medical systems and trauma systems in the aftermath of the injury. We deal with the entire range of human factors, vehicle factors, and environmental factors. This is a time-tested methodology that works very well, and I'm committed to it. Thus, today you find yourselves in the "precrash host" cell of the Haddon Matrix—that is, attempting to positively influence the precrash behavior of the driver by studying and addressing alcohol problems.

When I came to the first of these meetings that Dan organized in this city in March 2001, I spoke on behalf of myself and my colleagues in emergency medicine and about our work on a screening and intervention project. I'm in different shoes today. Now I speak for my bosses—President Bush and Secretary Mineta. As I look around the room, I see a lot of public servants and civil servants who feel very passionately about safety as the primary reason for their life's work. This dedication comes from the top. President Bush says that the safety and security of the American people is his number one priority, and Secretary Mineta, my immediate boss, reminds us that safety is a number one priority of the U.S. Department of Transportation (DOT). Why? Because motor vehicle crash injuries are the leading cause of death in Americans aged 1 to 34. Thus, we must believe, as Secretary Mineta does, that the safety and security of the American people begins with traffic injury control.

If we look at the Centers for Disease Control and Prevention's Web-based Injury Statistics Query and Reporting System (WISQARS) regarding the 10 leading causes of death in the United States in the year 2000, injury is shown to be the leading cause of death for every age group from 1 to 34 years old.* In 2002, it's even worse. In fact, if you separate motor vehicle crash injury from unintentional injury, motor vehicle

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*WISQARS is an interactive database system that provides customized reports of injury-related U.S. mortality data and national estimates of non-fatal injuries treated in U.S. hospital emergency departments. WISQARS can be accessed at Centers for Disease Control and Prevention's National Center for Injury Prevention and Control website: <http://www.cdc.gov/ncipc/wisqars>.

crash injury would have the same top position. This is an epidemic. However, it's an epidemic with a cure. At the kick-off press event for our national "Click It or Ticket" campaign, Secretary Mineta, appearing with Dr. Richard Carmona, one of our colleagues who is now surgeon general, made a very important policy statement. Secretary Mineta reminded everyone that the events of 9/11 changed the entire focus of the DOT. Aviation safety became paramount. In fact, our department responded by setting up the Transportation Security Administration in just 12 months, meeting all 35 congressional mandates on time. At our press event, Secretary Mineta stated, "We're done with that." The Transportation Security Administration is now a part of Homeland Security. Now, we can focus on highway safety with the same vigilance that allowed us to set up a 6,000-person agency. Secretary Mineta is very serious about highway safety, and you will see an unprecedented focus from the federal government on this issue. Many of you represent other federal agencies. Whether you represent the Substance Abuse and Mental Health Services Administration, the National Institute on Alcohol Abuse and Alcoholism, or the Surgeon General's Office, we all realize the focus is shifting toward injury as an "epidemic" and must be addressed appropriately.

Not only is there a dreadful human toll here, it is also in our nation's economic interest to do something about the issue of highway safety. Our analysts ran the numbers again last year and looked at year 2000 data very carefully. Every year, motor vehicle crashes and related injuries cost our nation \$230.6 billion. Among the costs are \$33 billion per year in medical care. That's on par with the entire budget appropriation for building roads in this country. Failure to wear safety belts directly accounts for \$20 billion; costs related to impaired driving is over \$50 billion; and speed-related crashes cost approximately \$40 billion.

Seventy-four percent of the entire cost of motor vehicle crashes is not borne by those involved in the crash but by society as a whole. Therefore, it is definitely in our national interest to meet the problem head-on.

I asked our analysts to look at preventable deaths and the countermeasures we already have in place (i.e., seat belts, impaired driving control, child safety, large-truck safety, intersection crashes, and infrastructure development) and to determine which we could focus on to realize the largest reduction in fatalities in the shortest possible time. The answers were actually very simple and not surprising. If safety belt use could be increased to 90%, a third of highway deaths could be avoided. This 90% figure is not wishful thinking. California, Oregon, Washington State, and Hawaii all have belt-use rates over 90%. Other states have belt-use rates in the 80% range. With the exception of one state (two states as of June 2003), states with high belt-use rates are also those with primary safety belt laws. These laws allow officers to cite a motorist or passenger for not wearing a safety belt or for having an unrestrained child in the vehicle. However, 32 states (30 states as of December 2003) still have laws pro-

hibiting police officers from enforcing safety belt laws unless a motorist is committing another traffic violation. This is a travesty. Thus, in the President's Highway Reauthorization Proposal, the Department of Transportation establishes an annual \$100 million incentive program for states to enact primary safety belt laws. As public policy advocates, I hope all of you will consider the importance of primary safety belt laws nationwide.

In this session, the focus is on impaired driving. It causes a third of all deaths on our nation's highways, and these deaths are preventable. Unfortunately, unlike the safety belt issue that has a very simple cure, impaired driving is a much harder issue to get our arms around, and the work cannot be done by law enforcement only. The problem must be addressed from the point of sale through adjudication and treatment. Thus, the medical community plays a crucial role in reducing these "preventable" highway deaths.

Impaired driving in our country kills approximately 18,000 people per year. This represents a fatality rate of 0.643 per 100 million vehicle miles traveled; 80% of these crashes involve drivers with a blood alcohol concentration (BAC) greater than 0.08. We made great progress on reducing impaired driving during the 1980s to the mid-1990s.

Consequently, alcohol-related crash fatalities dropped from 26,000 in 1982 to a low of around 15,000 to 16,000 fatalities in 1996. However, we have made no progress since. The population of impaired drivers today is different from that population in 1982 when it seemed like everyone drove drunk. People winked at each other about, "how much did you drink last night before you made it home?" There was no societal imperative that impaired driving would not be tolerated. But now there is. Just as the social norms on smoking have changed over the same time period, societal attitudes toward impaired driving have also changed. Some people say this problem is impossible to solve. I disagree.

I was telling a story the other day about my first research paper. As a senior resident in 1983, I presented my paper at a North Carolina Medical Society meeting in Pinehurst. I remember looking back at the slide projector and wondering how the light beams were going to penetrate the waves of smoke coming up from the physicians' lungs in the audience. Consider how far we have come in 20 years. Today, if you smoke, you go outside. You don't offend people or put their lives at risk with secondhand smoke.

Perhaps the same will be said 20 years from now on the issue of impaired driving. Unfortunately, impaired drivers are not only different individually, they also vary as a population geographically. Figure 1 compares U.S. states having high numbers of alcohol fatalities, those having high rates of alcohol fatality, and states that have both.

The high-rate states are in black; the high-numbers states are in gray; and states with both high rates and high numbers are denoted by hash marks. As you can see, we have an issue in the South. Alcohol fatalities are fairly low in some less-populated states, yet these states have high rates of alcohol-related fatali-

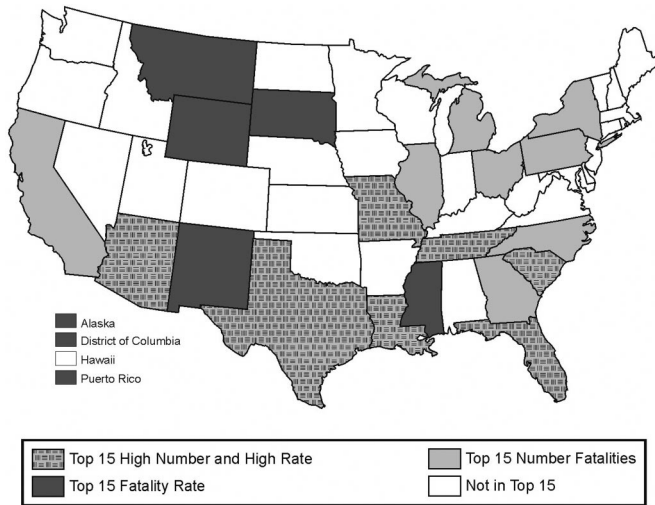


Fig. 1. Number and rate of alcohol-related impaired driving fatalities by state, 2001.

ties. For example, Montana has a low number of deaths but a very high rate of alcohol fatalities. Interestingly, Montana just failed to pass an open-container law in the most recent legislative session. Unfortunately, it is still part of the culture to drink and drive in many places in our nation, and policy makers are often “enablers.” Attitudinal and cultural differences are obstacles we must overcome if we are going to curb impaired driving across the country.

How has the population of impaired drivers changed? We’ve picked the “low-hanging fruit.” The remainder of impaired drivers appear to have more severe alcohol problems. In 2001, the median and the mode blood alcohol content (BAC) for alcohol-positive drivers involved in fatal crashes was 0.16. Fifty percent of drivers tested had a BAC above 0.16. This is no surprise to those of you who treat trauma patients. In the early 1990s, I conducted a study on all drivers presenting to my emergency department who had a BAC greater than 0.10. These were drivers either identified by emergency medical services or those who admitted to being the driver. The average BAC in this population was 0.204. By definition, this is a sick population. These people were drinking to get drunk. They were not people who committed the social indiscretion of having one glass of wine too many at a 3-hour dinner. These were people with an obvious disease needing medical treatment.

Although driving skills deteriorate after only one drink, the relative risk of a crash increases dramatically when the BAC rises above 0.08. Therefore, to keep drivers with low BACs healthy, we’re going to continue to use general deterrence, such as high-visibility enforcement campaigns. Even though we think it’s better that people drive stone-cold sober, data show it is not people with BACs of 0.04, 0.05, or 0.06 who cause the majority of traffic crash injuries and fatalities in our nation. Trauma patients with high BACs do the most damage to themselves and to others.

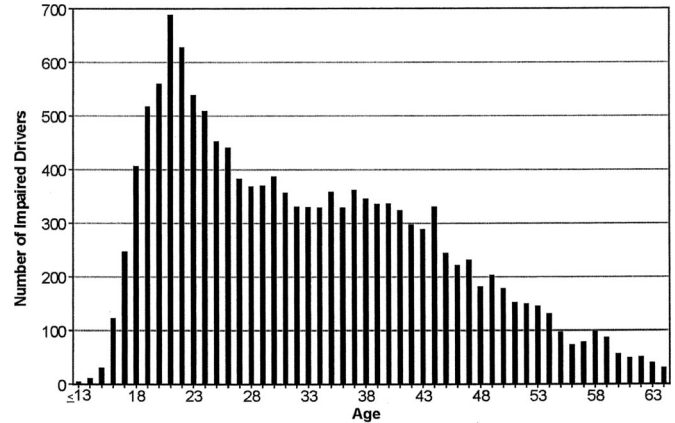


Fig. 2. Number of alcohol-related impaired-driving fatalities by age, 2001.

Who are these problem drivers and what leads them to believe that they are, somehow, not subject to the laws of physics? Eighty-two percent of drivers in fatal alcohol-related crashes are male drivers. The majority are younger than 35 years old. They wear safety belts much less frequently.

Eighty percent of this group drink beer. Unfortunately, we are a society that consumes our young. The spike on Figure 2 occurs at age 21. Therefore, what has been the effect of changing the legal drinking age to 21? It has pushed the curve to the right, which is a great accomplishment. In fact, we’re saving our teenagers from alcohol-related crashes at unprecedented levels—that’s the good news. The bad news is that ages 19, 20, 21, and 22 are the nexus of inexperienced driving, inexperienced drinking, and high-risk-taking behavior. When we think about screening and intervention, we’re not just talking about the old guy with spider angiomas and the big red nose. We can screen him, perform an intervention, and send him to treatment—and we should. The bigger problem of alcohol-use disorder and driving occurs in a much younger population—young people who drink to get drunk and who didn’t just start doing this yesterday.

What characterizes the fatalities? Over half of alcohol-related fatalities are impaired drivers, but pedestrians are also killed. Some pedestrians are killed by impaired drivers; others are impaired pedestrians who walk into the path of sober drivers. What types of vehicles show an increased involvement in alcohol-related fatal crashes?

Motorcycles present a particular problem for us. In fact, if you look at data over time, alcohol-related fatalities in passenger vehicles increased by only 0.3%. Alcohol-related sport utility vehicle (SUV) fatalities increased by only 7%, although the number of SUVs on the road has increased. In vans, the increase was 9%; for large trucks, there was a 37% increase. I mentioned earlier that the current alcohol-related fatality rate is 0.63 per 100 million vehicle miles traveled. Motorcycle fatality rates are well above this. In fact, the alcohol-related fatality rate for motorcyclists is at least twice that of the rest of the population. If we compare alcohol crash

fatality rates for car, van, and SUV drivers, the fatality rates are approximately 0.42, or 0.43 per 100 million vehicle miles traveled. Thus, there is a huge disparity in fatality rates by vehicle type.

Our goal for this year was to reduce the alcohol-related fatality rate to 0.53 per 100 million vehicle miles traveled. We relayed this goal to Congress, but it appears we will not achieve our goal this year unless we begin to directly address the behavior of those who are actually causing the problem. The educable have been educated. Those who are afraid of the social implications of getting a ticket for driving while impaired (DWI) drink less or they don't drink at all before they get behind the wheel.

We've seen a welcome growth in designated-driver programs. As with other high-visibility enforcement, these programs work well for people who are educable and can make rational decisions about their drinking. However, the problem drinker continues to cause problems. Until everyone in the medical community agrees to take some responsibility for detecting this illness, we won't be able to solve the problem of impaired driving. We need to research behavioral issues that cause people to behave in this way.

What is the federal government doing to combat the problem? The answer lies in both interagency collaboration and funding priorities. NHTSA's authorization for the money that we are appropriated each year expires in September 2003, as part of the large DOT authorization known as TEA-21. We need another authorization from Congress for funding through the next 6 years to address safety issues affecting our highway system. The Administration has been working on this for about a year and a half now. The president just sent the new bill over to the Hill last week. Secretary Mineta wanted this bill titled the Safety Authorization Act. We call the bill SAFETEA 2004 (the Safe, Accountable, Flexible, and Efficient Transportation Equity Act). Basically, this is how the bill works: when we buy a gallon of gas at the pump, our federal gas tax goes into a separate fund called the Highway Trust Fund. The NHTSA uses these funds for its safety programs and behavioral research. The goal is to distribute money to the states for safety programs that will be aligned with federal goals.

The amount each state receives is based on a particular state's crash data. States will have to start using those data to determine how they are going to spend their traffic program money. States searching for funds to support worthwhile traffic safety programs should look to the state's Highway Safety Program and to the state's Department of Transportation. I would also encourage you, the taxpayer, to hold your state accountable for the way these funds are spent.

At the federal level, we are involved in a high-visibility enforcement campaign using targeted television advertising. How many of you have seen a "Click It or Ticket" ad in the last 2 weeks? That's very good, because we targeted the male demographic (ages 18–34 years), so congratulations to those of you who saw the commercial. In July, we plan to air a

national ad called "You Drink, You Drive, You Lose." This ad will be repeated during the winter holiday period.

Congress appropriated money to our agency specifically for national advertising so that we could support the work of law enforcement. We have done that. Once again, high-visibility enforcement campaigns help to ensure that people continue to be educated on the dangers of impaired driving and that those who drink responsibly can make it home safely from the restaurant. Meanwhile, we ask you to focus on the sicker part of the population that has not responded to general deterrents.

What can we do as health care providers to make the situation better? There are several things within your power that do not require much extra effort or resources. The first is to improve our data on impaired drivers. All the data that I showed you earlier regarding alcohol-related fatalities are based on known cases, with a mathematical model applied to impute a nationwide number. This modeling is necessary because states still do not require (or in some cases, states discourage) testing people for BAC even after serious or fatal crashes. When a driver dies in a motor vehicle crash, the body is usually taken to the medical examiner's office, where a BAC sample is obtained from the vitreous humor of the eye. However, if the drunk driver survives, the hospital is a safe place to avoid detection. There are some financial disincentives to BAC testing because of noncoverage by insurance carriers, as well as expenditure of resources in an era of shrinking health care resources. Still, this should not dissuade us from having protocols in place to detect problem drivers or to facilitate their treatment or their prosecution.

The medical community must have uniform systems in place to screen patients at risk for alcohol-use disorders, even if they are sober when presenting for treatment. All of you are leaders in your particular field. Some of you are already choir members and some are skeptics. However, it is my opinion that just as none of you would discharge a patient from your trauma service with a blood glucose level of 280, neither would you discharge a patient with a high BAC test result who may likely leave the emergency room and resume drinking. Alcohol misuse must be dealt with just as we deal with other concurrent medical problems our patients may have.

Many of you are influential in your state medical societies and have other avenues for garnering the attention of your state legislatures. I need your help to change public policy. We need to wake up the legislatures to our data needs and the need to increase postcrash BAC testing. We also need uniform state traffic crash data. We still have many states without basic traffic safety laws, like administrative license revocation, 0.08 laws, and graduated driver's licensing.

The National Highway Traffic Safety Administration is working toward reforming the adjudication process. In many jurisdictions, the least experienced prosecutors are assigned to DWI cases and routinely go up against experienced defense attorneys who have full-page ads in the phone book advertising, "Got your DWI? Come see me." We are also

working to establish more DWI courts across the country using the drug court model, which allows repeat offenders the option of receiving help or suffering certain legal consequences.

Another issue worthy of discussion is insurance parity. A patient with a blood glucose level of 280 needs follow-up treatment. If that patient has insurance to cover your bill, then there is insurance available for continued treatment of the glucose problem.

Unfortunately, the same is not true for the patient with a high BAC and an obvious alcohol-use disorder. In many states, there is no insurance coverage for psychiatric care or for substance-abuse treatment. This lack of parity certainly needs to be addressed.

To recognize and treat the at-risk group (young risk-taking male drivers under age 35), screening and intervention protocols should be an integral part of every history and physical examination. Before I came to the NHTSA, I conducted a study in which thousands of drivers who had just crashed their cars were screened for alcohol problems. We used the TWEAK (tolerance, worried, eye-opener, amnesia, k/cut down) screening instrument,² but others also work. Every patient in our study was sober at the time of their crash, yet 14% still tested positive for alcohol use or alcohol dependency. We randomized them either to a control group or to a brief intervention group. The bottom line was this: of those who received intervention, 28% agreed to further evaluation; 49% of those who agreed to further evaluation actually followed up. I found this really interesting. We screened sober people, 14% were positive, and then we randomized them. We used a very brief intervention, which took approximately 2 minutes or less. When family was present, they remained in the room during the intervention. After I had performed the intervention on every patient for a while, I reduced my own anxiety in talking about this sensitive subject. I was amazed at how easy it was and how receptive people were to discussing the issue with their doctor. My intervention experience was very rewarding, because my success was the opposite of what I had expected. I received a lot of positive feedback from patients and their families. Although I used the TWEAK, you can use alcohol screening instruments such as CAGE, or the Michigan Alcoholism Screening Test (MAST), or the brief MAST.³⁻⁵ The important thing is to screen.

There are some action items that I would like to ask of you “thought leaders,” people who can get the job done, not only in your hospitals but also at the American College of Surgeons and the American College of Emergency Physicians. First, I encourage you to implement protocols for screening and brief intervention as the standard of care. Second, develop protocols for getting BAC levels on drivers involved in serious and fatal crashes when you suspect alcohol to be a factor, and establish blood alcohol drawing as normal business practice for your hospital. Third, work through your public policy arms to ensure that insurance

coverage is provided for people who need it, regardless of their illness.

Thank you very much for your attention. I hope I have convinced you that we are really serious about this problem. Unfortunately, the cycle of change in the political realm can take much longer than it does in the emergency department, where if someone is in pain, you can stop it; or if someone comes in bleeding, you can stop it. The problem of impaired driving in this country is going to take a long time to turn around. The cycle of change will be tremendously long; therefore, we need your help in solving the problem. This and other large-scale problems are not solved in Washington. Rather, they are solved within your communities, within your hospitals—one community and one hospital at a time. Each of you is an agent of change, so I ask each of you to please begin the work today. In your discussions today, I would ask that you reach some consensus on this subject to bring to your peers. You are thought leaders, and your opinions can inform decision makers and bring about desperately needed change. Thank you very much.

Dr. Larry Gentilello: That was a great presentation, Jeff, and I do have a question. You talked about data needs. Currently, there are 36 states that require BAC testing of surviving drivers who are taken to a trauma center. All of these states have insurance provisions that exclude coverage for treatment if patients are alcohol-positive. Thus, if a driver is taken to a hospital and has a positive BAC, the insurance carrier is not required to pay the bill. I don’t know whether the left hand knows what the right hand is doing. Why does a state pass a law requiring testing and then penalize the hospital or set it up to be in a position where it’s in the hospital’s best interest not to know? A lot of the things you spoke about, such as BAC laws of 0.08, and now moving to primary safety belt legislation, have been achieved by tying highway funding to legislative change that is in everyone’s interest. Do you think the NHTSA will bring these insurance practices, along with the BAC testing law, to the attention of the Hill?

Bert Woolard: One light in the tunnel sometimes seems to be the Governor’s Office of Highway Traffic Safety in each state. I’ve always been a little baffled by the process that leads to the priorities of that office, so a comment on this might be helpful for some of us. We may not be aware of federal funding distributed to each state that should help us with these safety problems. We should have some way to tap that and maybe we’d be able to maintain databases or do other work. My understanding is that the priority list comes from Washington for those offices and then somehow that gets translated into local projects. Our Injury Prevention Center has had some help from the Governor’s Office, but how much of that comes from your office in Washington?

Dr. Jeffrey Runge: Dr. Gentilello, that’s a great question. As you can see from the difficulty we are having just in convincing states to pass primary safety belt laws, states do

not like it when the federal government tells them what to do, even if ideas are grounded in the best possible data. I'm pessimistic that legislatures will actually pass needed legislation without large monetary incentives. We have provisions in SAFETEA that tie highway funding incentives to legislative action. For example, we have proposed a \$600 million incentive program for primary safety belt laws, which is a sizable incentive even for the largest states, so the NHTSA does have a role in promoting science-based legislation, and we are doing so.

Bert, we used to exert a lot more influence over how states spent their money than we do now. Congress told us to "lay off" in the mid-1990s and, as a result, there is a lot less prescriptive advice coming from Washington. A study, commissioned by Senator Dorgan of North Dakota, and recently released with some fanfare, criticized the NHTSA for not giving consistent direction to the states about how to spend federal dollars. They want accountability on the one hand, but also want us to leave the states alone on the other. Thus, SAFETEA consolidates those grant programs and institutes uniform accountability measures. There is a formula grant program, which goes out to every state based on its population and vehicle miles traveled. This will not change.

Everything else is consolidated into one of essentially four pots of money. One is an incentive pot, so if a state meets an alcohol-fatality rate of 0.53 per 100 million vehicles miles driven, it gets money. Second, if a state makes progress in safety belt use, it gets money. Third, if a state passes a primary safety belt law or reaches a 90% belt-use rate, it gets

a huge chunk of money. The fourth pot is linked to performance in overall state fatality rate, motorcycles, bicycles, and pedestrian safety.

We also have \$50 million allocated for states with high numbers and rates of alcohol-related fatalities. This money will help those states evaluate what is wrong and enable the states to implement safety programs. We have identified best practices, and we know what states should be doing to curb the problem. For instance, New York has a self-sustaining, wonderful alcohol program that has resulted in the third lowest fatality rate for alcohol injury in the nation. We are going to try to get funding tied to results, so if you have a best practice that you can prove is effective, and you go to your governor's highway safety representative under the new reauthorization, I suspect you'll have a lot easier time obtaining funds. The chances of people in your state agencies turning a deaf ear will certainly be less likely.

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Session 1: The Impact of Alcohol and Other Drug Problems on Trauma Care—Biosketches

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Trauma. Dr. Lucas was the recipient of the 2004/2005 National Safety Council Award from the American College of Surgeons and the American Association for the Surgery of Trauma.

Ernest E. Moore, MD, is Chief of the Department of Surgery and Trauma Services at Denver Health Medical Center and Center Vice Chairman, Department of Surgery, University of Colorado Health Sciences Center. His surgical career spans 29 years and includes research on cellular and molecular mechanisms of post shock multiple organ dysfunction. He is a member of numerous professional societies and has been president of several, including the American Association for the Surgery of Trauma and the International Association for the Surgery of Trauma and Surgical Intensive Care. He has received many awards for his research efforts to improve trauma care and 841 peer-reviewed articles, book chapters, books, and other reviews.

Donald D. Trunkey, MD is an internationally renowned trauma surgeon and is one of the first surgeons to incorporate the concepts of preventable death methods and evidence-based practice in support of trauma systems. Earlier in his career he was Chief of the Burn Center at San Francisco General Hospital, where he also had an extensive interest in elective vascular surgery and noncardiac thoracic surgery. He established a laboratory to study mechanisms of shock at the cellular level with a special interest in myocardial performance following shock, lung injury, and cellular immune mechanisms following injury. In 1978, he became Chief of Surgery at San Francisco General Hospital, and in April 1986 he assumed the Chair at Oregon Health Sciences University (OHSU) Department of Surgery, a position he held until 2001. Dr. Trunkey is an advocate for improved trauma care throughout the United States and remains active on the trauma call schedule of OHSU.

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The Impact of Alcohol and other Drug Problems on Trauma Care

Basil A. Pruitt, Jr., MD, FACS

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It is a privilege to be the moderator for this first session and I look forward to seeing the proceedings of this conference published as a supplement to the *Journal of Trauma*. I have briefly reviewed selected literature published since the first of the year. A study published in *Addiction* points out that worldwide, in the young adult group, 5% of all deaths are alcohol-related.¹ The incidence of alcohol-related deaths shows great geographic variation nationally and globally. For example, in Europe, 25% of all deaths in young men are alcohol-related; in Eastern Europe alone, one-third of all young men die from alcohol-related causes.¹ Not only do these figures raise significant epidemiologic concerns, but they also reflect the fact that alcohol induces perverse physiologic problems and exerts deleterious effects on literally every organ system in the body.

Broadly speaking, everyone knows ingesting alcohol causes acute depression of the central nervous system. But not everyone understands the long-term effects such as reduction of brain white matter and olfactory nerve dysfunction. In the cardiovascular system, vasodilation is the characteristic response to acute alcohol exposure, and cardiomyopathy is a common consequence of chronic ingestion. The endocrine response to alcohol ingestion includes release of catecholamines from the adrenal medulla and the inhibition of antidiuretic hormone which is produced by the

pituitary gland. Those effects make alcohol ingestion the social test of renal function. Alcohol also acutely affects the metabolic system, causing alterations of thermoregulation and fat metabolism ranging from decreased serum leptin levels to an increase in high density lipoproteins. In the hematopoietic system, alcohol affects all cells ranging from the red cell to the $N\kappa$ cell. Alcohol further compromises the already impaired neutrophil function (the first line of immunologic defense) in AIDS patients and thereby complicates their treatment.² In the musculoskeletal system, long-term excessive alcohol intake can induce a generalized myopathy analogous to the previously mentioned cardiomyopathy. In addition to the alcohol-induced diuresis just noted, alcohol may induce teratogenesis in the genitourinary system (exemplified by the fetal alcohol syndrome). These changes not only complicate the diagnosis and assessment of injury severity, but influence treatment of the trauma patient as well. Moreover, these effects combine to magnify the severity of injury. A study appearing in *Alcoholism* earlier this year found alcohol use to increase the observed injury above that predicted by vehicle crash, safety belt use, and age. Alcohol use increased the Injury Severity Score as revised in 1990 (ISS-90) by an average of 30%. If any concentration of alcohol was present in the blood, the adjusted odds ratio for serious injury was 1.59.³

As Dr. Hungerford mentioned, this conference follows an earlier one that addressed alcohol problems among emergency department patients. That conference identified several needs that should be kept in mind as we discuss the problems of alcohol and drug use in trauma patients. These needs include (1) development of a user- and patient-friendly minimum data set for reliable, accurate screening, (2) development of effective interventions acceptable to patients and staff, (3) reliable privacy and security of the data collected, (4) elimination of nonpayment for care, which serves as a disincentive for diagnosing alcohol as a contributing cause of injury, (5) changes in medical practice to increase screening and intervention activity, (6) development of new computer-based techniques for screening and intervention to use when the patient resides in the "therapeutic window" of an emergency room stay, and (7) increased funding for research.⁴

Several screening techniques show promising results for identifying patients at risk for repeated alcohol-related injury.

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In the April 2003 issue of the *Journal of Trauma*, Dr. Gentilello's group published a study identifying both categorical and continuous variables readily assessed by brief patient contact. These variables predicted hazardous drinking in the succeeding year.⁵ Categorical variables were being male, unmarried, or assaulted. Continuous variables were age, blood alcohol concentration, drug use in the month before the injury, and number of days alcohol was used (days on which three or more drinks were consumed or nonprescription drugs were used). These variables were evaluated in 110 patients by face-to-face interviews during admission and phone interviews at 1, 4, and 12 months thereafter. Hazardous drinking was defined as consuming three or more drinks on one or more occasions in the preceding month. Among patients studied during the subsequent year, 39% were designated nonhazardous drinkers and remained such. Thirty-five percent were found to be hazardous drinkers, and they remained in that category. The remission rate for hazardous drinkers who changed their consumption patterns to nonhazardous was only 6%. Disappointingly, more than three times as many patients (20.1%) converted from non-hazardous to hazardous drinking in that year. The most significant clinical predictors of hazardous drinking were a blood alcohol concentration (BAC) of anything over zero at admission, any abuse of nonprescription drugs in the preceding month, and having been the victim of intentional injury. The study demonstrated that, on the basis of a brief and focused interview in the emergency room or surgical ICU, it is possible to identify target groups most apt to engage in hazardous drinking and most likely to benefit from intervention.

Several studies indicate that intervention programs can minimize and prevent alcohol-related recidivism. A review published earlier this year in *Addiction* presented results of the Cochran Collaboration Systematic Review of alcohol prevention programs. These results can only be classified as disappointing.¹ Fifty-six studies were reviewed with ineffectiveness observed in 20 (36%) of them. Regarding short- and medium-term prevention, the review determined that no firm effectiveness conclusions could be made. On the basis of these data, it was impossible for the authors to determine whether such brief interventions did any good or not. The authors interpreted data on the effect of *long-term prevention programs* (more than three years in duration) as showing promise. In contrast, recent reports show that pharmacologic intervention may be useful in patients who are identified to be at risk. After a month of treatment, Topiramate appears to be effective in reducing alcohol consumption in patients. It blocked excessive dopamine transmission by increasing the activity of gamma amino butyric acid and inhibited the ability of glutamate to release dopamine.⁶

There are very important differences between primary prevention programs and brief interventions. Primary prevention programs are usually broad educational programs aimed at the general public and generally focus on preventing excessive drinking or, with youth, drinking at all. In contrast,

brief interventions are often conducted during the immediate post-injury window of opportunity and focus only on patients whose high risk drinking behavior has been identified by screening. Moreover, for high-risk patients, the amount of treatment required to reduce alcohol consumption varies, based on the severity of the drinking problem. Patients who have severe problems, such as true alcohol dependence, probably need some type of long-term care, in addition to a brief intervention. Reported earlier this year in *Addiction*, a study by R. H. Moos and B. S. Moos showed that rapid entry into treatment and the duration of treatment for alcohol-use disorders were more important than the intensity of treatment. Consequently, the authors concluded that treatment programs should be structured to begin promptly and emphasize continuity.⁷ However, patients who receive a brief intervention before showing signs of true addiction appear to be amenable to interventions that require only one treatment session. In another study of intervention effectiveness, A. J. Smith et al. randomized males 16 to 35 years of age who were treated for an alcohol-related facial injury to either usual treatment or usual treatment plus a single brief motivational intervention session. At one year follow up, the proportion drinking at hazardous levels had not decreased significantly in the usual treatment group, but had in the group receiving the brief intervention with the greatest effect in those patients considered to be hazardous drinkers.⁸ These reports suggest that while brief interventions appear to have efficacy, further research should be done on primary prevention strategies.

Our job in this conference is to determine how recommendations from the earlier conference, which were focused on emergency departments, can be refocused on trauma patients to improve screening techniques and develop effective intervention programs to reduce death and disability caused by alcohol- and drug-related injury. To identify and quantify the impact alcohol and other drugs have on trauma care, we have three A-Team speakers to conduct the first workshop: Dr. Eugene Moore will speak on "Alcohol and Trauma—The Perfect Storm"; Dr. Donald D. Trunkey will present "A Rational Approach to Formulating Public Policy on Substance Abuse"; and finally, Dr. Charles E. Lucas will discuss "The Impact of Street Drugs on Trauma Care."

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Alcohol and Trauma: The Perfect Storm

Ernest E Moore, MD

Alcohol misuse, when combined with the right circumstances, culminates in a “Perfect Storm” that has catastrophic results. Alcohol misuse impairs judgment and increases the likelihood of serious injury. Once injured, the intoxicated patient is more likely to be hypotensive and less likely to be able to protect his or her airway. Alcohol also impairs multiple compensatory responses to injury that are critical to survival, thereby increasing the likelihood of serious complications. When complications do occur, they may be more severe for intoxicated patients because

both acute and chronic ethanol use adversely affect immunity. Thus, all phases of trauma care are potentially affected by excessive alcohol use. This paper presents facts about trauma care and the physiologic consequences and clinical implications of alcohol intoxication. Further, it shows how health-care costs increase when evaluating and managing an intoxicated trauma patient. This financial burden further escalates in the surgical ICU because the care of an intoxicated patient falls outside the realm of standard care. Trauma surgeons, perhaps more than other health-

care providers, have a unique opportunity and a responsibility to address potential alcohol misuse with their patients. They witness the Perfect Storm almost daily and are fully aware of the short- and long-term consequences of alcohol misuse. A trauma center visit provides an opportune time and place to incorporate alcohol screening and brief interventions as a part of standard trauma care.

Key Words: Alcohol, Trauma, Injury, Intervention, Trauma center, Trauma systems, Injury prevention.

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INTRODUCTION

Trauma is the leading cause of death for Americans ages 1 to 44. Alcohol consumption contributes to these deaths, increasing the risk of trauma-related injuries.¹ Moreover, acute alcohol intoxication and chronic alcohol abuse compromise the patient’s response to injury, affecting all phases of trauma care. This brief overview highlights basic facts about trauma care; the physiologic consequences and clinical implications of alcohol intoxication; the added costs of care for alcohol-related trauma; and the responsibilities of trauma surgeons in addressing alcohol problems with their patients.

BASIC FACTS ABOUT TRAUMA CARE

Trauma is defined fundamentally as tissue damage caused by a transfer of external energy. Kinetic energy-

induced trauma is classified as either *blunt* (force to the external surface) or *penetrating* (foreign object penetrates the external surface). Trauma is also referred to as *intentional* (e.g. resulting from an assault), or *unintentional* (e.g. occurring in a motor vehicular crash). Trauma care represents a continuum from the scene of the injury (prehospital), to emergency department, operating room, interventional radiology, intensive care unit, or physical therapy (in hospital), through rehabilitation.

Trauma centers are hospitals that have specialized equipment and personnel specifically trained to treat trauma patients. These centers are categorized as Level I, II, III, IV, or V based on the center’s capability to provide a specific level of care. Level I trauma centers provide the most comprehensive patient care and serve as key resources for education and research. Typically, Level I trauma centers admit 3,500 to 5,000 injured patients per year, and should be able to manage more than 650 severely injured patients annually (Injury Severity Score greater than 15) to optimize quality of care and cost-effectiveness.²

Trauma surgeons are general surgeons who have experience in the treatment of trauma patients. Most trauma surgeons in Level I trauma centers have completed fellowships in surgical critical care and trauma research. They are qualified to provide the full range of in-hospital care for the injured patient—from emergency department resuscitation through rehabilitation.³

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ALCOHOL AND TRAUMA

Why Should Trauma Surgeons Care about Alcohol Problems?

Alcohol remains a pervasive public health problem in the United States.⁴ First, alcohol is a widely embraced agent used to facilitate social interaction, and there is convincing evidence that moderate alcohol consumption provides cardiovascular benefits. Consequently, unlike illicit drugs, there is societal acceptance—if not encouragement—of alcohol use. Second, excessive consumption of alcohol has been a traditional “right of passage” for college freshmen; this activity is now prevalent at the high school level. In fact, widespread marketing targets underage consumers, notably in beer advertising or commercials during sports events. Finally, many of the baby boomer generation, now in a position to influence policy, have experienced an extended period of society’s tolerance of alcohol indiscretion.

A recent analysis shows that from 1993 to 2001, binge drinking increased in the United States, and 69% of these episodes occurred in individuals 26 years of age and older.⁴ The annual economic cost of alcohol misuse is estimated to be \$185 million.⁵ Alcohol intoxication is well documented as a major risk factor for injury. In more than 40% of patients admitted to trauma centers, alcohol is the precipitating factor leading to acute injury.^{6,7} It is widely acknowledged that alcohol impairs judgment and motor function in a dose-response fashion, but alcohol also provokes hazardous activity by unmasking aggression.⁸ Without intervention, injury associated with alcohol use tends to recur.¹

How Does Alcohol Affect the Patient’s Response to Trauma?

Alcohol intoxication can adversely affect early physiologic responses to injury.

- Alcohol impairs cardiovascular response to acute blood loss.^{9–14}
- Alcohol exaggerates post-shock myocardial contractility dysfunction.^{10–12}
- Alcohol increases pulmonary vascular resistance.⁹
- Alcohol blunts catecholamine release. The net result is inadequate oxygen delivery to tissue and metabolic uncoupling.^{11,13,14}
- Acute alcohol ingestion reduces the electrical threshold for ventricular arrhythmias and promotes electromechanical dissociation.^{15–17}

Thus, intoxicated patients have a higher risk of dying at the scene following blunt thoracic trauma.

Alcohol consumption can also have profound adverse effects on the outcome of a traumatic brain injury (TBI). In clinical studies, alcohol intoxication is estimated to *double* the severity of TBI.¹⁸ Research has shown alcohol to blunt hypercarbic ventilatory drive and to reduce cerebral blood flow.¹⁹ Although alcohol does not have a direct influence on the coagulation cascade,²⁰ it may indirectly promote bleeding

Table 1 Alcohol Intoxication Magnifies Costs of Trauma Care

Nonintoxicated Patient	Intoxicated Patient*	
Chest x-ray	Chest x-ray	
Abdominal Ultrasound	Abdominal Ultrasound	
CBC count	CBC count	
Urinalysis	Urinalysis	
Physical exam	Physical exam	
	Plus—Spine x-ray	Additional \$4,116.00
	Pelvic x-ray	
	Head CT scan	
	Chest CT scan	
	Abdominal CT scan	

* An initial evaluation of an intoxicated patient who presents to the trauma care center after a moderate-speed motor vehicle crash (showing hemodynamic stability) indicates the need for more tests.

by potentiating the inhibitory effects of aspirin on platelet function.²¹

Acute alcohol exposure is directly immunosuppressive, increasing the risk for post-injury infections, acute respiratory distress syndrome, and multiple organ failure.²² Specific defects in both innate and adaptive immunity are also results of acute alcohol intake.^{23,24} In vitro, clinically relevant levels of alcohol inhibit polymorphonuclear neutrophil (PMN) signaling pathways for phagocytosis, the respiratory burst, and degranulation that are critical for eradicating bacteria.^{25–27} Clinical studies have confirmed a dose-dependent relationship between alcohol consumption and these PMN functional deficiencies.²⁸ Alcohol also inhibits monocyte and macrophage production of key cytokines, including tumor necrosis factor alpha (TNF [acute] α) and interleukin 8 (IL-8).^{29,30} Finally, experimental work demonstrates that alcohol impairs T helper lymphocyte (TH-1) regulated cellular responses, while it enhances the production of TH-2 humoral agents.^{31,32} Of note, in vivo studies suggest the immunomodulatory effects of acute alcohol intake persist for seven days. Part of the mechanism for these protracted changes may be the interaction of alcohol with the bone marrow.³³ Alcohol may also be cytotoxic to functional cells, such as the gut epithelium³⁴ and hepatocyte.³⁵ Collectively, the direct effects of alcohol on the primary cells of the immune system and indirect cytotoxicity to other cells act synergistically to promote global immunosuppression.

How Do Alcohol Problems Magnify the Cost of Trauma Care?

Intoxication increases expenses associated with evaluating and managing a trauma patient. For example, consider a scenario in which there is a car accident. A motor vehicle crash (MVC) is the predominant injury mechanism requiring patient evaluation in a trauma center. The typical seat-belt restrained individual, involved in an MVC with significant vehicular damage, arrives in the emergency department (ED).

The patient is frightened and has an elevated heart rate, but is otherwise alert and cooperative with a normal blood pressure. After a thorough physical examination, literally from head to toe, the routine supplementary evaluation of a nonintoxicated patient consists of a chest x-ray, abdominal ultrasound, a complete blood cell (CBC) count, and urinalysis. Unless there are abnormal findings on the physical examination or tests, the evaluation is complete and the vast majority of these patients are sent home following an eight-hour observation period in the ED.

In contrast, the inebriated patient in the same scenario arrives in the ED belligerent, and often noncompliant. Alcohol intoxication can obscure initial test results and signs of injury during the physical examination. This prompts additional tests. To rule out fractures, spine and pelvic x-rays are required. Similarly, any aberration in mental status mandates a CT scan of the head to exclude TBI, and most trauma surgeons would add chest and abdominal CT scans if there was significant damage to the car. At this point, the extra hospital cost alone readily exceeds \$4,000, and virtually all these patients are admitted to the hospital for at least 23 hours of observation.

Another example of the economic burden of alcohol abuse is, regrettably, a common occurrence in urban trauma centers: a witnessed fall from a six-foot wall associated with a five-minute loss of consciousness would prompt a 911 call and subsequent ambulance transport of the victim to a trauma center. The nonintoxicated patient, despite a normal examination and mental status, is evaluated with a precautionary CT scan of the head. If the scan is normal, the patient is sent home. On the other hand, the severely inebriated patient is presumptively intubated to prevent hypoxic secondary brain injury and undergoes both head and abdominal CT scans, because the physical examination is notoriously insensitive. Despite normal scans, the patient is admitted to the surgical intensive care unit (SICU) for frequent neurologic assessments and airway extubation. Recognizing the exorbitant cost from this course of action, rather than admit the patient, occasionally a “frequent flyer” (recurrent inebriated trauma patient) is delivered to the ED and a well-intentioned physician allows the patient to sober-up in the observation unit. However, this time, the patient fails to improve and a delayed CT scan of the head demonstrates an acute subdural hematoma requiring urgent operative decompression. Unfortunately, the window of opportunity has passed and the patient sustains permanent brain damage.

The financial penalties of alcohol abuse go beyond initial management costs and can be enormous in the SICU. The standard care for patients with significant head injury, identified by CT scanning, is frequent clinical neurologic assessment in the SICU. This mode of care is not feasible for the intoxicated patient and, therefore, invasive monitoring of brain physiology is required (e.g. intracranial pressure monitors). Similarly, the confounding effects of alcohol on the cardiovascular response to blood loss frequently lead to more

invasive monitoring (e.g. pulmonary artery catheter). The well-known immunosuppressive consequences of alcohol ingestion result in presumptive antibiotic therapy to combat the body’s normal response to injury or early invasive infection. Finally, evidence of acute intoxication appropriately raises concern for withdrawal from chronic alcohol abuse and often prompts the excessive use of sedatives. This frequently prolongs mechanical ventilation of the patient, which further augments the risk for pneumonia in the SICU.

What are the Responsibilities of the Trauma Surgeon?

Trauma surgeons, perhaps more than any other health-care provider, have tremendous opportunities to address potential alcohol misuse with their patients. On a daily basis, it is the trauma surgeon who sees the elements of “The Perfect Storm” come together—the young man who thought he could drive home after the graduation party; a family on their way home from vacation who just happened to be in the wrong place, at the wrong time; or perhaps it’s the pedestrian who has had one too many drinks and decides to walk home. The list of scenarios is long and varied, and the trauma associated with alcohol abuse becomes painfully familiar. The trauma surgeon sees first-hand the short- and long-term consequences of alcohol-related injury—the devastating realities of massive head injuries and spinal cord injuries compounded by the overwhelming grief of the patient’s family and friends—a constant reminder that, in a fraction of a second, misjudgment can change many lives forever.

Recently, we sent our youngest son off to college. I sadly reflect on tragedies involving our son’s friends who were killed or permanently disabled near the end of their high school years—a time when infinite opportunities were on the horizon. Trauma surgeons can have a definite impact on reducing and preventing these terrible tragedies. As leaders of trauma teams, we must ensure that alcohol screening, brief intervention, and motivational behavioral modification are an integral part of overall trauma care.^{36,37}

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The Impact of Street Drugs on Trauma Care

Charles E. Lucas, MD, FACS

The use of illicit drugs, specifically heroin and cocaine, complicates trauma patient management and consumes extensive hospital resources. This paper focuses on heroin- and cocaine-related injuries observed by physicians at Detroit Receiving Hospital, a large urban Level I trauma center. The pharmaceutical effects, mode of administration, and the manner in which these drugs affect diagnosis and treatment of injuries are documented and

discussed. Specific drug-related complications associated with overdose, soft-tissue infections, bacterial endocarditis (therapy resistant), vascular thromboses, vascular aneurysms, vasoconstriction, stroke, cardiac arrhythmias, muscle ischemia, and solid-organ abscesses are also analyzed. Illicit drug use significantly complicates initial diagnosis and trauma management and is associated with severe adverse pathophysiologic effects. Currently, pre-

vention efforts, such as interventions in trauma centers, should be considered as the most efficient and feasible way to prevent injury recidivism in this patient population. We also conclude that legislative change may be the answer in reducing or preventing the horrendous problems caused by illicit drugs.

Key Words: Cocaine, Heroin, Trauma center, Street drugs, Street narcotics.

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The use of illicit street narcotics has a major impact on many trauma center programs. Injury is caused by either the pharmaceutical effects or the mode of administration of these drugs. Although many drugs with varying effects are readily available, this treatise focuses on the injurious effects of the prime depressant heroin and the prime stimulant cocaine, as experienced in a large verified Level I inner-city trauma center.^{1–4}

Heroin-Related Injury

Heroin is derived from morphine, which is the principal product of the poppy *Papaver somniferum*. Heroin interacts with endogenous opiate receptors that function as neurotransmitters, neurohormones, and modulators of neurotransmission. Heroin-related injury includes overdose, soft-tissue infections, endocarditis, abscesses, vascular thromboses, vascular aneurysms, and solid-organ abscesses.² When an injured patient is first seen in the trauma center, often family members or friends help identify heroin addiction by volun-

teering the patient's history of drug use. Heroin addiction can also be recognized by physical signs of previous heroin injection (i.e., needle tracks, superficial venous thrombosis, and 'skin pop' scars at the sites of previous subcutaneous injections). Lymphedema with swollen extremities and associated cellulitis caused by lymphatic fibrosis may also be present. Knowledge of the patient's heroin addiction can be particularly useful during an emergency operation. The anesthesiologist may need to administer large quantities of narcotics and muscle relaxants. The anesthesiologist may also encounter problems with oxygenation because of previous pulmonary embolization of talc and other particulates, which for profit motives, are used to dilute heroin before it is injected.

Overdose from Heroin

Users who are ignorant of injectate concentration run the greatest risk of overdosing. They often do not know the extent of heroin dilution unless their street distributors have developed an excellent reputation for consistency. Deaths from opiate overdose are caused by respiratory depression.² Like morphine, heroin induces peripheral vasodilation and decreases systemic vascular resistance (further worsened by concomitant release of histamine). Any presence of alcohol aggravates the consequent hypotension. Reduction or prevention of heroin-related overdose might be possible with adequate knowledge or labeling of heroin concentration.

Infectious Complications of Heroin

Two prime contributors to infectious heroin-related injury are the method of injection and the bacterial contamination of the injectate. Many agents are used to dilute heroin including quinine, strychnine, lidocaine, sugars, talcum, and starch producing a product called 'mixed jive.' The diluents cause superficial venous sclerosis and thrombosis. The added bacterial seeding leads to thrombophlebitis and surrounding

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cellulitis. Once the peripheral lines are obliterated, larger veins or 'main lines' have to be used. When these main lines become thrombosed, the user resorts to subcutaneous injections or skin pops. Cellulitis and abscess frequently occur after skin popping. These infectious complications make it increasingly difficult for the user to successfully self-inject heroin. The user may resort to seeking help from street 'doctors' who make central injections into the internal jugular vein by way of a 'pocket shot.' Although these street doctors exhibit remarkable skill, there are associated complications, which include pneumothorax, tension pneumothorax, empyema, and cervical abscesses.

Abscesses from Heroin Use

During a 12-month interval, the surgeons at Detroit Receiving Hospital drained 421 abscesses associated with surrounding cellulitis caused by heroin or mixed-jive injections.⁵ Most abscesses occurred in the groin or leg, but some were present at all sites. The most common organism cultured from these abscesses was methicillin-resistant *Staphylococcus aureus* followed by beta hemolytic *Streptococcus*. Mixed flora was seen in 25% of patients. The average length of hospital stay was 12.4 days unless there were vascular complications, in which case, the average length of hospital stay increased to 26.3 days. The average hospital cost using 2003 estimates was \$30,000 per patient.

Soft-Tissue Necrosis

A small percentage of these patients have widespread cellulitis and soft-tissue necrosis requiring extensive debridement of skin, subcutaneous tissue, and muscle.^{5,6} When performing extensive debridement, nerves should not be excised because they carry their own blood supply. Occasionally, the extent of rapidly spreading soft-tissue involvement requires four-quarter or hindquarter amputation to prevent rapid torso spread or death.⁶ Temporizing in this setting is fatal. Some patients with rapidly spreading soft-tissue involvement have negative cultures caused by an allergic reaction to foreign substances. For example, products, such as powdered skim milk, may have been injected deep into muscles to treat an overdose on the street.

Bacterial Resistance to Antimicrobials

The injectate often contains antimicrobials obtained from legal prescriptions written for other patients who were discharged after having had an abscess drained.^{2,5} This has resulted in a significant incidence of bacterial resistance to some important antimicrobial agents. Over the past 30 years, Detroit Receiving Hospital has repeatedly reported new antimicrobial resistance in heroin addicts.

Vascular Injuries from Heroin

Sometimes the user inadvertently punctures an artery because the presence of scarification and fibrosis from previous cellulitis makes successful intravenous injections more

difficult.^{1,7} This usually causes a 'pinky' as red blood is withdrawn, requiring the needle to be removed without injection. Unfortunately the user may be incapacitated from associated alcohol or other substance abuse, not recognize the pinky, and inject the heroin intra-arterially. This causes severe burning of the distal part of the extremity because particulates from the injectate occlude the small vessels. Ischemia of fingers and toes or even hands and feet result. Tissues that are obviously necrotic require amputation; any viable adjacent tissues cause extensive pain. Aneurysmectomy occasionally must be followed by synthetic arterial graft replacement; recidivism inevitably leads to graft infection, thrombosis, and a threatened limb. Intra-arterial injection often leads to a perivascular hematoma, which becomes secondarily infected. The resulting abscess communicates through the injection site with the arterial lumen. This entity is called a mycotic aneurysm, a pseudonym for an infected pseudoaneurysm.⁷ During a 20-month interval, surgeons at Detroit Receiving Hospital excised 52 mycotic aneurysms in 50 addicts.

Venous aneurysms also occur in the heroin user.⁸ These are harder to diagnose because no pulse is transmitted, and the surrounding area typically displays cellulitis. The patient's respiratory system is usually compromised because of the embolization of bacteria resulting in bilateral pneumonia. Microabscesses cause respiratory failure and often require ventilatory support. Anticoagulation in these patients has the potential for causing intracerebral bleeding because of unrecognized intracranial mycotic aneurysms.

Bacterial Endocarditis

Bacterial endocarditis is a major heroin-related injury. It resists therapy and consumes extensive hospital resources. Recurrent infection may complicate valvular replacement, which can be fatal. Refractory endocarditis is often associated with intrasplenic abscesses caused by bacterial embolization.⁹ Patients treated only with antibiotics typically develop recurrent infection, leading to death. Patients undergoing valvulotomy without valvular replacement are candidates for splenectomy performed simultaneously or subsequent to cardiac surgery. By removing the abscessed spleen, the likelihood of reinfection decreases.⁹

Infected Solid-Organ Hematomas

Frequently, intraparenchymal hematomas are observed after nonoperative treatment of patients suffering blunt liver and splenic injury.² Heroin users may have bacterial seeding of the hematoma, which can become an abscess and require drainage.

Cocaine-Related Injury

Cocaine is derived from the coca plant *Erythroxylum coca*, which is easily grown in warm climates.³ Nicolas Monardes published the first known scientific paper on cocaine in 1565. The coca leaf used to produce cocaine was

introduced from South America into Europe in 1580, where its cultivation flourished for the next three centuries.³ The United States became involved in the science of cocaine in 1854. A scientific team led by Pizzi established a lab at La Paz, Bolivia, and extracted the cocaine alkaloid. Niemann isolated the alkaloid from coca plant leaves and coined the name 'cocaine.' Cocaine use became popular as a topical anesthetic in the late 19th century when it was used for many minor operations. The lay public used cocaine to treat symptoms of runny nose, hay fever, and fatigue.³ Pemberton, in 1886, mixed the coca leaf extract with the African kola nut making syrup, which was later introduced into the soft drink Coca-Cola. In 1913, widespread use of cocaine in various forms led President Taft to declare cocaine 'public enemy number 1.' Congress then defined cocaine as a narcotic by passage of the Harrison Act in 1914. Cocaine use continued as part of an underground network for the next several decades until the early 1970s when inexpensive crack cocaine became widely available. This led to the current upsurge in cocaine use. Fifty million Americans have tried, or are currently using, cocaine; over half of injured patients presenting to inner-city trauma centers have used, or are using, cocaine.

Physiologic and Pathologic Effects

Physiologic cocaine-related injury is caused by intense vasoconstriction, which may affect both small and large vessels.¹⁰ In patients under 45 years of age, cocaine is the number one cause of stroke, fatal cardiac arrhythmia, and myocardial infarction.^{11,12} Patients with cocaine-related and concomitant injuries experience worse pulmonary insult. Vasoconstriction occurs, causing microscopic pulmonary infarcts. Hemorrhagic shock requiring multiple blood transfusions after an injury often leads to shock-lung syndrome, and respiratory function worsens as the need for ventilation support increases. Cocaine-related injury associated with vasoconstriction also increases renal vascular resistance, causing oliguric or nonoliguric renal failure.^{3,13} This condition is more likely to occur in patients receiving multiple transfusions.

Gastrointestinal Injury

Cocaine-related injury involves the gut. Acute perforation of a duodenal ulcer occurs shortly after cocaine inhalation. This results from focal ischemia in the proximal duodenum.^{3,14} Patients sustaining blunt abdominal injury may develop what appears to be an acute abdomen because of hollow viscous rupture. Laparotomy often reveals a focal peritoneal insult with a walled-off area of the small bowel or colon around a microscopic perforation.^{3,15} Histologic examination identifies the focal necrosis with submucosal inflammation, fibrosis, and small vessel thrombosis from cocaine, not blunt hollow viscous rupture. When seen after a motor vehicle collision or assault, the surgeon cannot distinguish between cocaine-induced ischemic injury and blunt hollow viscous perforation. Consequently, the laparotomy is non-

therapeutic. Focal hepatic necrosis is also seen after cocaine exposure. Hepatocellular enzymes can reach very high levels.³

Compartment Syndrome

Intense vasoconstriction causes muscle ischemia progressing to compartment syndrome with or without associated long bone fractures.³ A cocaine-induced compartment syndrome causes more pain than typically seen after low-limb perfusion without cocaine. The extent of rhabdomyolysis is very high after cocaine-related injury. Compartment syndrome in patients with both hemorrhagic shock and cocaine exposure is likely to cause renal shutdown; the coexistent renal effects of cocaine contribute to renal failure.¹⁵

Vascular Injury

Cocaine-induced vasoconstriction may also cause thrombosis of large arteries.³ Examples include the abdominal aorta and the femoral, popliteal, iliac, and renal arteries.¹⁶ The intense constriction of blood flow in the vasovasorum leads to intimal damage. The point of intimal damage attracts platelets, which adhere to endothelium. Concurrently, cocaine enhances coagulation because it reduces the levels of protein-C and antithrombin-III.^{3,17,18} In turn, the induced platelet activation and aggregation promote fibrin deposition and large vessel thrombosis.

Miscellaneous Injury

Injured patients on cocaine often are paranoid, uncooperative, and difficult to manage during the preoperative and postoperative phases.³ Paranoid ideation and bipolar behavior are typical of recent cocaine exposure. Restraints are often needed. The effects of cocaine on the central nervous system may impede use of the Glasgow Coma Scale score to evaluate the patient. When a patient recovers from the acute injury but unexpectedly dies, one should suspect illicit cocaine exposure and collect blood and urine samples for toxicology.¹⁹ Cocaine exposure also leads to spontaneous abortion, stillbirth, and other complications of pregnancy.³

CASE REPORT

One patient with cocaine-related injury after a motor vehicle collision is presented to highlight the way in which drug use complicates trauma management. A 34-year-old unrestrained man was drag racing on a major thoroughfare when he collided with two other vehicles. Two innocent people were killed, and three were badly injured. He was unconscious at the scene and was resuscitated, splinted, and transferred to the trauma center where he arrived at 12:39 AM. He had stable vital signs and a Glasgow Coma Scale score of 12. Imaging studies showed multiple rib fractures, a midshaft femur fracture, which was splinted, and multiple contusions. A toxicology screen showed a blood alcohol content of 0.78 mg/dL and strong positivity for cocaine. (Alcohol is frequently used with cocaine to both blunt the high and prolong

the euphoria.) He had intramedullary rodding of the femur at 2:00 AM and went to the intensive care unit at 3:30 AM, where he became acidotic and complained of pain in his right calf. Arteriography showed a large aortic thrombus, bilateral renal artery thrombi, and thrombotic occlusion of the right iliac, right profunda femoris, and left popliteal arteries. Immediate transabdominal thrombectomy of the aortic, renal, and iliac vessels was followed by exploration of the popliteal artery and extensive thrombectomy.

Postoperatively, he developed the expected complications of cocaine-related injury. He became confused and obtunded with a Glasgow Coma Scale score of 5. His pulmonary function deteriorated, requiring a tracheostomy and long-term ventilatory support. Then he progressed to renal shutdown—a condition associated with cocaine-induced rhabdomyolysis of several muscle groups (including both legs). Bilateral calf fasciotomies were needed to preserve limbs. He had coronary vasoconstriction with myocardial infarction, gut ischemia with prolonged adynamic ileus, hepatocellular dysfunction, and coagulopathy. Therapy included prolonged ventilation, hemodialysis, intravenous nutrition, and multiple antibiotics for the infectious complications. Gradually, his multiple organ dysfunctions improved. He was discharged to a rehabilitation center 90 days after his injury, showing normal mental and renal functions and assisted ambulation with crutches.

Preventive Measures: Reducing the Burden on Trauma Care

Heroin and cocaine have become readily available throughout the past 30 years. Drug-related injury from street narcotics is generally caused by ignorance of drug concentration or bacterial contamination from unsterile preparation. Often the drug-related injury is combined with another type of injury, such as a motor vehicle collision. This treatise has shown numerous ways in which illicit drug use, specifically heroin and cocaine use, complicates trauma care management and places an additional burden on the trauma center's resources. If the American pharmaceutical industry were to legally prepare and distribute these agents, sterility and accurate labeling of drug concentrations would result. Bribery of our law enforcement agents for protecting an illicit drug industry would cease. The real war on drugs can only be successfully won through tax-funded education and rehabilitation. Generous taxation would support educational and rehabilitative programs.²⁰ Pending such legislative changes, the most efficient way to prevent illicit drug recidivism would be to institute prevention programs in trauma centers. This is where patients who have used street drugs and ingested alcohol are initially treated for concomitant injuries, and this is

where implementing preventive programs will yield the greatest medical consequences.

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A Rational Approach to Formulating Public Policy on Substance Abuse

Donald D. Trunkey, MD, and Carol Bonnono, RN, CEN

Unlike alcohol, which is legal and regulated, current public policy makes drugs such as heroin, cocaine, methamphetamines, and marijuana illegal. This article summarizes the history of drug and alcohol

use in the United States, compares our public policies on alcohol to those on drugs, and shows the direct link between alcohol or drug use and crime, corruption, violence, and health problems in other countries and

in our own. A rational approach to formulating a workable public policy is presented.
Key Words: Substance abuse, Public policy, Alcohol, Cocaine, Heroin.

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We are losing the war on drugs.^{1–3} Unlike alcohol, which is legal and regulated, drugs such as heroin, cocaine, methamphetamines, and marijuana are not. Because our current public policy makes these drugs illegal, we are contributing to crime, corruption, and health problems in other countries and in our own. This article summarizes the history of drug and alcohol use in the United States, compares our public policies on alcohol to those on drugs, shows the direct link between alcohol or drug use and violence, and presents a rational approach to formulating a workable public policy.

Brief History of the Evolution of Alcohol or Drug Use

Psychoactive drugs and alcohol have been used and abused throughout history. From the time of the Revolutionary War, the Lewis and Clark expedition, and when Chinese laborers came here after the Opium Wars, opium use increased dramatically in the United States. To combat the growing problem, San Francisco passed an ordinance in 1875 banning opium dens and other establishments where opium was smoked.^{4,5} Five years later, the United States followed suit banning the smoking of opium by Asians only. However,

then others in our population turned to opium, morphine, heroin, cocaine, and marijuana, all of which had very few restrictions.⁶

Many patented medicines contained laudanum or other opiate derivatives. Vin Mariani and Coca Cola were popular tonics containing cocaine. The American Medical Association actually endorsed heroin when it was introduced by Bayer Laboratories in 1898. At this time, only a small number of the population, 350,000, were addicted to opiates, and some physicians even prescribed opiates to treat alcoholism because it was considered a more serious problem. However, physicians and government officials soon became concerned about psychoactive compounds in patented medicines.

In 1906, Congress passed the first Federal Pure Food and Drug Act. This law required over-the-counter drug producers to disclose the psychoactive ingredients in their products. Despite this action, concern about opiate addiction continued to increase, and additional laws were enacted. Congress passed the Harrison Act in 1914. This law further restricted the use of opiates and required all persons involved in the opium or cocaine trade to register with the Internal Revenue Service. Specifically, the title of the law was, 'An Act to Provide for the Registration of, With Collectors of Internal Revenue, and to Impose a Special Tax upon all Persons Who Produce, Import, Manufacture, Compound, Deal In, Disperse, Sell, Distribute, or Give Away Opium or Coca Leaves, Their Salts, Derivatives, or Properties and for Other Purposes.' Heroin and cocaine could only be obtained with a doctor's prescription. (Marijuana was excluded from the law until 1937). In 1916, the interstate shipping of cocaine and heroin became illegal. Opium could still be imported for medical purposes, but only to 12 U.S. ports.

Alcohol—'Demon Rum,' as it was labeled in the late 1800s—was subjected to intense scrutiny and pressure, particularly by the temperance movement. The medical community considered alcohol and the social consequences of alcoholism a more serious problem than the drug problem. Five years after the Harrison Act, the 18th Amendment to the

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Constitution was ratified to prohibit the sale, manufacture, or drinking of alcoholic beverages of any kind after 1920.

Before Prohibition, ironically, alcohol consumption dramatically fell.⁶ Undoubtedly, this was because of the success of the temperance movement and public education regarding alcohol use. Deaths from cirrhosis were reduced by 50% during the 1920s. Why, then, did Americans repeal Prohibition after 13 years and not repeal the Harrison Act? Nadelmann and Courtwright⁶ contend that the prohibition of alcohol affected tens of millions of Americans of all ages 'including many of society's most powerful members'; drugs threatened far fewer Americans. When Prohibition was repealed, crime, corruption, and the violence associated with that period diminished. Unfortunately, few treatment programs for alcoholism emerged.

We have had four separate wars on drugs: 1909 to 1923, 1951 to 1956, 1971 to 1973, and 1982 to the present, all of which have arguably been lost.⁵ Since 1933, we have had two distinct public policies on alcohol and drugs. Alcohol is legal; drugs are not. We are losing the current war on drugs because the focus is on supply rather than on demand or treatment programs. Consequently, in the last 30 years, violence associated with illegal drug trafficking has escalated.

Rise of Organized Crime in the United States

The early 1800s were marked by criminal activity of ethnic gangs in the United States, including Irish, Jewish, and Italian groups. After the Opium Wars in 1840, Chinese were brought to the United States as laborers, and Chinese gangs became part of this community, almost immediately bringing opium into this country. Although at times these gangs were violent, they were disorganized. In contrast, Sicilian secret societies organized to control the drug trade, particularly in big cities on the East Coast.

One man, Arnold Rothstein, did more to change the way drugs and alcohol were distributed than any other single person or group. He was the son of a pious orthodox Jewish family. According to Jill Jonnes, Rothstein 'permanently transformed American crime from petty larceny into big business.'⁷ He excelled at blackmail through labor racketeering and a stolen-bond business. He personally financed rum smuggling and was one of the first to smuggle rum from Europe during Prohibition. Rothstein's legacy was organizing and bankrolling big time international narcotics trafficking. Not only did Rothstein have the capital to finance this endeavor, but he also gained political clout by bribing Tammany Hall politicians. Through Italian street gangs, he organized a distribution network, bought drugs legally in Germany, and then brought the drugs into the United States. Ironically, he shipped the drugs by U.S. merchant ships. In November 1928, Rothstein was found shot in the Central Park Hotel in New York. He had \$6,500 in cash on him when he was found; clearly, he was not a petty criminal. He lingered 48 hours and died on November 6th. Posthumously, Rothstein won a \$500,000 bet that Herbert Hoover would win

the election. Hoover was elected President 2 days after Rothstein's death. It was ultimately thought that Legs Diamond was his killer. One month later, federal agents, who had confiscated Rothstein's office files, arrested four suspects and seized steamer trunks of drugs worth \$3 million. Rothstein's apprentice, Lucky Luciano, took over the empire and ran it until his death in 1962. During Luciano's reign, the illegal distribution of alcohol and drugs was, at times, very violent. It was only when the Medellin and Cali cartels of Colombia became involved with cocaine distribution that a more profound and random violence took over.

The Golden Triangle

The opium-producing areas in the world are steeped in crime and corruption.⁵ When Mao Tse Tung took control of mainland China in 1949, remnants of the Kuomintang Army fled to Laos, Cambodia, Thailand, and Burma (renamed Myanmar in 1989). With Taiwanese capital, these renegade troops established the Golden Triangle, a premier opium-producing venture. Inevitably, this led to corruption within the Burmese government, and violence became rampant. According to some sources, the Central Intelligence Agency (CIA) supported the Kuomintang army troops and the Shan States, which increased Burma's opium crop during the 1950s.⁵

The Golden Crescent

Another source of opium is the Golden Crescent, which consists of the opium-producing areas of Iran, Pakistan, and Afghanistan. These areas have been a major source of illegal drugs since the late 1970s. Violence and corruption in this part of the world is profound. Again, the CIA has contributed to the problem.⁵ In 1964, the South Vietnamese government was toppled, which increased narcotics trade in the Golden Triangle. Corrupt South Vietnamese government officials and generals used Vietnamese and Laotian planes paid for by the CIA to ship heroin from the Golden Triangle. The same thing happened in Afghanistan and Central America, and in both instances, the drug flow to the United States increased. It is noteworthy that in 2002, opium production in Afghanistan was 20 times what it was in the last year of the Taliban rule (2001).⁸

The French Connection

Illegal distribution of drugs has a major effect on the countries involved, particularly because of the associated crime. For example, in 1952, the Italian government banned the manufacture of heroin in response to pressure from the United States. The Mafia responded by sending raw opium to Marseilles, resulting in the so-called 'French Connection.'⁵ Since 1970, there have been 350 judicial judges assassinated in Columbia. Fifty federal judges (25% of all judges in Columbia) have been threatened. The murder rates in Cali and Medellin are some of the highest in the world. In Mexico, about \$50 million is spent every year just to corrupt officials

Table 1 Prevalence of drug and alcohol abuse in trauma patients

	1989 (%)	1994 (%)
Methamphetamines	7.4	13.4
Cocaine	5.8	6.2
Alcohol	43	35

so that illegal drugs can be transported across the U.S.-Mexican border. Assassinations are rampant. Distribution of illegal drugs corrupts governments, military, and police.⁵

East Coast and Florida

In the United States, money laundering is a huge problem along the East Coast, particularly in Boston and Florida. Many legitimate banks are involved. The Bank of Boston was found to have laundered approximately \$1.12 billion dollars in illegal drug money. This money laundering has now shifted to the Cali cartel, the Yakuza in Japan, and Mexico.⁵

In 1980, the substance-abuse industry was the biggest retail industry in Florida at \$12 billion per year. A \$5 billion surplus in the Miami Federal Reserve Bank indicated it was drug money. There was no other explanation. Homicide in Miami went from 349 murders in 1979 to 621 murders 2 years later. This was the highest murder rate in the United States at the time.⁹ One of the authors, Dr. Trunkey, witnessed a similar trend during his general surgery residency in 1966 at San Francisco General Hospital. Approximately 100 gunshot wounds a year were seen at the beginning of his residency. Five years later, during his chief residency year in 1971, gunshot wounds had increased to three per day. This was at the height of the Haight-Ashbury era. Initially, young people were making LSD in bathtubs, but then the Mafia moved in and took over drug distribution, resulting in an increased incidence of violence-related injury in emergency rooms. Dr. Trunkey suggests that there may be a direct link between money laundering and higher incidence of murder.

Problems Associated with the Current War on Drugs

Since 1931, domestic abuse and violence in the United States have increased 700%.⁵ Victims of this abuse show up in emergency rooms. In addition, HIV infections have increased 35%, and organic brain disease, psychiatric disorders, sudden death syndrome, and overdose result in tremendous costs to society.⁴ Drug and alcohol abuse in trauma patients was well documented by Schermer and Wisner in 1999 (Table 1).¹⁰ Their research showed that methamphetamine use in Sacramento, Calif, nearly doubled in their emergency room. Cocaine use and heroin use remained fairly constant, although alcohol use may have decreased slightly. This certainly mirrors the authors' experience in Oregon; however, methamphetamine use was found in more than 20% of the patients, many of whom also presented with alcohol abuse.

Public Policy

There have been four wars on drugs and one war on alcohol. From a public policy standpoint, Congress recognized that the war on alcohol was not effective; consequently, the Volstead Act was repealed. In contrast, despite four wars on drugs, the lessons learned from the war on alcohol are continually ignored. These lessons should be applied toward developing a rational policy on substance abuse. As stated earlier, we are losing the current war on drugs because we are not focused on demand and treatment strategies for those addicted. Does interdiction of drugs work? Absolutely not. One kilogram of cocaine costs about \$100,000 at the distribution point. A pilot who could smuggle drugs into the United States would demand \$500,000 to fly 250 kilograms of cocaine, which costs \$2,000 per kilo to produce. This is 2% of the retail price to bring it into the United States. Thus, if the pilot and accomplices are at risk of being caught, they simply abandon the airplane and flee. This increases the cost of the cocaine by \$2,000 per kilo at the distribution point. The cost of production, distribution, and street sales shows a dramatic increase of price and, presumably, profit. According to *The Economist*, 1 kilogram of heroin brings \$90 to the farmer, \$80,000 to the wholesaler in the United States, and costs \$290,000 when sold on the street. Similarly, the farmer sells 1 kilogram of coca leaves for \$610, and the street price for cocaine powder jumps to \$110,000/kg.³

Do we stop drugs at our border? Again, the answer is no. U.S. officials check only 4% of all containers that come into the country. Most drugs coming into the United States cross the borders illegally, primarily by airplane. This has not changed since 1990. Further, there is a 3,000-mile border with 30 ports of entry, through which 640,000 pedestrians and 240,000 cars, trucks, and other vehicles pass daily. In 1996, the U.S. government estimated that 70% of the cocaine smuggled into the United States came across the U.S.-Mexican border. According to the Drug Enforcement Administration, in a 5-year period (1990–1995), cocaine seizures remained constant at approximately 20%. More recently, attempts to use herbicides in Columbia have met with some success, but the drug producers have countered this action by shifting production to other countries. The cost of our war on drugs is now over \$18 billion per year.¹¹

Alternative Strategies

There are at least two alternatives to our current strategy:¹ decriminalize drugs² or make drugs legal and subject to regulation. We already have examples of decriminalization in the United States. Drug courts are an effort by the judiciary system to solve some of the terrible social problems within our current system. Mandatory sentences and full jails are simply not the answer. In drug court, miscreants are often given a choice of treatment program and probation, provided a major felony has not been committed. This keeps people out of jail and addresses the problem from a treatment standpoint.

Ironically, it was during the Nixon administration that we had some of our best success with methadone treatment programs, and these alternative strategies did work.¹¹ Legalization is another strategy where possession and sale, like alcohol, becomes legal. From a public health standpoint, this has a number of positive aspects. It reduces demand through treatment programs and regulates and controls the drugs that are used in the treatment program. This reduces the consequences of dirty needles, overdose, and psychiatric disorders. If drugs were legalized, it has been predicted that the prison population could be reduced by perhaps two thirds.¹² Those people who do go to prison for felonies could be put into mandatory treatment programs. In addition to the practical aspects of legalization, the benefits would be significant to the countries where producers reside. Drug trade financiers and powerful gangs that threaten these countries would, in theory, go away. Corruption, bribery, and intimidation would diminish.

There is a down side to legalization. More people might become dependent and more people would experiment with drugs. However, the evidence doesn't necessarily support this, as shown in Europe after the Frankfurt Resolution was initiated in November 1990.¹³ Four cities initiated this resolution, and an additional 11 cities have subsequently signed on. The approach in Europe has been a mixture of decriminalization and legalization, with cannabis being the drug that has been legalized de-facto. The experience is somewhat contradictory. There may have been some minimal increased use of drugs, such as cannabis. However, there was no evidence that decriminalizing cannabis significantly increased use.¹³ There are between 5,000 and 7,000 addicts in Amsterdam (a city of 700,000) compared with 45,000 addicts in Baltimore, Md, which has a similar population. We acknowledge this is comparing apples and oranges because rates may vary and drug policies may differ not only within the various classes of drugs, but also between cities. However, in two separate reports, overwhelming evidence supports the effectiveness of prevention and treatment programs in 1996.^{4,14} Drug sales decreased 78% and physical assaults decreased 77%, shoplifting and arrest rates decreased, respectively, by 81% and 50%, arrest for drug possession decreased 64%, crack use decreased 50%, and heroin use decreased 6%. These results would have a dramatic national impact, assuming there were enough treatment programs.

Other studies show that the annual cost of outpatient treatment programs in the United States is \$2,700 compared with incarceration, which costs \$39,000 per year. Residential treatment costs \$12,000 per year; without treatment, the estimated cost to society is \$43,000 per addict.^{15,16} One of the more striking comparisons, however, comes from the journal *The Lancet*.¹⁴ The authors compare the success rate of treating alcoholism, opiate, cocaine, and nicotine dependence with other chronic medical diseases such as insulin-dependent diabetes mellitus, hypertension, and asthma (Tables 2 and 3). Among addictive disorders, nicotine dependence has

Table 2 Treatment success rates for addictive disorders

Disorder	Success Rate (%)*
Alcoholism	50 (40–70)
Opioid dependence	60 (50–80)
Cocaine dependence	55 (50–60)
Nicotine dependence	30 (20–40)

Data are median (range).

*Follow-up at 6 months.

the worst success rate, but the treatment of alcoholism, opioid dependence, and cocaine dependence are slightly better than the success rates for the three chronic medical conditions. This highlights other problems associated with substance abuse. The patient who has a substance-abuse problem is stigmatized by society and even some health professionals; yet three fourths of patients are gainfully employed. In contrast, alcohol use is socially acceptable, and in some instances, the medical profession encourages moderate consumption of red wine. Treatment of alcohol abuse is more socially acceptable than treatment for illicit drug use. Our public policies reflect this disparity. These policies are unfair and ultimately destructive to our society and to the societies of drug-producing countries as well.

A Rational Solution

There are at least two well-articulated public policies on substance abuse.^{16,17} Table 4 contains a list of the goals of a rational drug policy published in the *American Journal of Public Health*.¹⁷ The actual solutions emphasize that our public policies should focus on providing adequate treatment programs. Reducing demand through treatment programs is not only cost effective, but also, as previously stated, has a

Table 3 Compliance and relapse in selected medical disorders

Disease	Compliance and Relapse (%)
Insulin-dependent diabetes mellitus	
Medication regimen	<50
Diet and foot care	<30
Relapse	30–50
Hypertension	
Medication regimen	<30
Diet	<30
Relapse	50–60
Asthma	
Medication regimen	<30
Relapse	60–80

Table 4 Harm reduction goals

Reduce violence related to drugs
Lower mortality and morbidity
Reduce harm borne by innocent others
Reduce costs stemming from and created by drug control interventions

success rate somewhat better than treatment of other chronic medical diseases.

The Physician Leadership on National Drug Policy has also recommended changes to the current public policy on substance abuse.¹⁶

- Refocusing national drug policy on our investment in the prevention and treatment of harmful drug use.
- Eliminating the stigma associated with the diagnosis and treatment of drug problems.
- Improving training for health professionals to ensure clinical competence in this endeavor.
- Establishing community-based health partnerships to solve these problems. This would include working with drug courts and community leaders.
- Investing in research to better understand the biological and behavioral aspects of drug addiction and research on the outcomes of prevention and treatment programs. This would obviously include cost accountability to the public and Congress.

The nonmedical use of psychoactive drugs is inevitable. In a private environment, the use of such drugs would probably not cause public harm. Like alcohol, driving under the influence of drugs is a major social harm and seems to be increasing. The unregulated use of drugs causes other health problems, including HIV, Hepatitis B, Hepatitis C, and overdoses. The public harm that trauma surgeons see is violence. If we could agree that substance abuse is a public health problem, the obvious choice from a public health standpoint is to treat the disease. The corollary is that we must identify those individuals who use drugs inappropriately and cause harm to the public.

In the early 1990s, one of the authors (C.B.) appeared before our state legislature in an attempt to get a law passed allowing physicians to report alcohol and drug toxicity results to the Department of Health. After two unsuccessful attempts, a law was passed in 1995. The original intent was that this would be a ‘must report’ law. However, the Oregon Medical Association and the Oregon Hospital Association objected to this stating they would not support the bill unless it was a ‘may report’ law. In other words, physicians could do it, but they were not required to. After the law was enacted, some physicians supported it. In fact, about one third of emergency physicians and trauma surgeons did care and thought substance abuse was a public health problem. However, one third of the emergency physicians and surgeons simply did not care and did not report patients who were intoxicated or on drugs. One third of the physicians did not order the tests because they thought they were violating the patients’ civil liberties or they were violating patient trust, despite the fact that, by law, they know they are required to report certain infectious diseases and gunshot wounds. Illinois passed a similar ‘may report’ law in 1998, but after 3 years, they found that this was not working and amended the law to ‘must report.’ Because of HIPAA (Health Insurance Portability and Accountability

Act) regulations, the Oregon Legislature made the Oregon law a ‘must report’ law in 2003.

This experience reinforces the recommendation from the Physician Leadership on National Drug Policy—‘We must educate physicians to treat alcohol and drug addiction as a public health problem, and health professionals should be clinically competent in referring and treating these conditions.’ There are other articles within this supplement reinforcing the fact that brief interventions are effective. Over time, recidivism may occur. Treatment interventions, like treatment for all other chronic diseases, must be ongoing.

Another of the recommendations by the Physician Leadership on National Drug Policy is that we must have community-based health partnerships to solve the alcohol and drug problem. If emergency department physicians can identify this problem in routine screening, many patients could be referred to the appropriate treatment centers. If violence or accidents were involved, an alternative strategy would be drug court. Clearly, if a felony has been committed, such as vehicular manslaughter, drug courts could recommend mandatory treatment in the event a prison term was handed down. Alternatively, for a misdemeanor, it would be more appropriate for society to have the patient treated and remain out of jail, which would reduce costs and increase the chance of rehabilitation.

Trauma surgeons must also help identify patients whose injuries are related to alcohol and substance use and refer these patients for treatment. We have found that work-related accidents and home accidents are often associated with either alcohol or drugs. Most acts of violence involve alcohol and drugs, and, as noted earlier, the underlying pathophysiology of vehicular accidents is alcohol or drugs. Thus, trauma surgeons should be involved in reporting these cases to public health departments to assist in surveillance data collection.

There are some interesting allies in the effort to change our current drug policy. In two conservative publications, *The National Review* and *The Economist*, there is support for a change in public policy by conservatives.^{1,2} One editorial in *The Economist* states, rightly, that nicotine has more addictive power than that of heroin.² The author further argues, ‘The practical case for a liberal approach rests on the harms that spring from drug bans and the benefits that would accompany legislation. At present, the harms fall disproportionately on poor countries and on poor people in rich countries.’ Like the public health advocates who argue for harm reduction, *The Economist* reinforces this. ‘Removing these harms would bring with it another benefit. Precisely because the drugs market is illegal, it cannot be regulated.’ The editorial concludes, ‘A legal market is the best guarantee that drug-taking will be no more dangerous than drinking alcohol or smoking tobacco. And, just as countries rightly tolerate those two vices, so they should tolerate those who sell and take drugs.’ The only two adjuncts we would add are 1) trauma patients should be routinely tested for alcohol and drugs, and

2) patients with alcohol- and substance-abuse problems should be referred to appropriate treatment centers.

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Session 1: Impact of Alcohol and other Drug Problems on Trauma Care—Discussion

J Trauma. 2005;59:S67–S75.

The editors of the proceedings prepared the following summary of participant comments made during the session.

Basil Pruitt

We'll now take questions from the audience. Yes, Dr. Schechter?

Bill Schechter

First, I feel compelled to represent the ethnic minorities situated in the room. Dr. Trunkey should add WASPS to the list of ethnic minorities involved in the heroin trade. Second, I believe that the doctors who were unwilling to voluntarily report drinking problems have a point. The body politic has to make a decision that reporting is mandatory. Otherwise, you have an unfair situation. My wife, as the TB controller for San Francisco, had the power to force drug treatment and even to imprison patients with active tuberculosis if they didn't take their medications because of the danger of spread to the general population. In a similar way, alcohol and drug addiction imperils other members of society for the reasons that we have spoken about this morning, but the body politic has to make this a job *de jure* to the physician, mind you. You can't have the doctor, who is trying to care for the patient, be in a situation where reporting is based on personal judgment, when this is not a mandatory action *de jure*. I think it's a failure of the legislature. Third, with regard to the destruction of the safety net in cities and the relationship of alcoholism and drug use to mental illness, most of the patients that I treat who suffer alcohol- and drug-use injuries are also impoverished, living on the streets. We treat them, and we discharge them to a street corner or to some lousy hotel for five days. Then they're back out on the street. I think the public-health approach to this problem has to go way beyond this. We have

to provide some kind of social structure for the people who can't make it, who are exposed to both drugs and alcohol by people who are making a profit off of them.

Donald Trunkey

The voluntary program I initiated did not work. Some surgeons and emergency physicians did not support it because they do not believe treatment works. I agree that reporting has to be a mandated program just like it is for communicable diseases. Although urban rot is a big problem, I do not agree that it is the main cause of alcohol and drug problems. As I tried to point out in that one slide, I think over 75% of people who abuse alcohol and drugs are employed. It's a far bigger problem than we realize. And, until we do mandatory testing on these people, we won't realize how serious it really is. I can tell you from working with the people at American Airlines, it's a problem in their pilots, and it's a problem in their flight attendants. Physicians—15% of anesthesiologists—abuse drugs. I think it's a far bigger problem than we're willing to acknowledge.

Eugene Moore

The physician has a responsibility to report alcohol problems just like other diseases, not just to help the individual patient, but also to help others who might be harmed. In our city, social programs and programs for mental rehabilitation and for disadvantaged individuals are being dropped daily. This will escalate our problems with drugs and alcohol in our cities.

Charles Lucas

The "alcohol problem" is a problem of societal acceptance and of profit. Our typical conference behavior is to go out to eat and drink, have good Italian wine, and then who drives everyone back to the hotel? Me, and I've had a generous amount of wine. Every surgeon in this room has probably done the same thing. In other countries, this is not permissible, so societal change is needed. Regarding drugs, I don't think the problem is just a problem of poor people or access to treatment. When drugs are illegal, the real problem is the profit motive. We need to address the profit motive.

Carl Soderstrom

It is becoming more acceptable for physicians to report individuals who have conditions like epilepsy, multiple scler-

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rosis, or Alzheimer's to state agencies that regulate the use of motor vehicles. I think we have to change the culture's thinking about the word reporting. On medical wards or surgical wards, we don't report somebody to a neurologist. We don't report somebody to a cardiologist or a pulmonologist. We refer them. And it might be better if we embrace the mindset that when somebody demonstrates severe risk-taking behavior, reporting these individuals is actually "referring them to another agency."

Ronald Stewart

Are we talking about referring to law enforcement agencies or to treatment for the drug problem? I think you would have much less of a problem of getting physicians to report if it was for treatment. We don't *refer* people to the police. That's not something that I commonly do. I would refer someone for treatment, but many physicians may have a problem with treating the patient and then *referring* them to the police.

Donald Trunkey

First, let me clarify my recommendation. There's a paradox. I support reporting if the outcome is medical treatment. These patients have a medical disease. Currently, we're required to report all stab and gunshot wounds to the police. So, there is a difference here.

Ronald Stewart

I agree that hospitals *may* report patients to the police, but suspect that most surgeons do not. Reporting criminal behavior is a stumbling block for most surgeons. However, if you're talking about referring the patient for treatment, you'll find a lot of physicians who will support that.

Donald Trunkey

This has not been my experience. There's still the issue of violating patient trust, civil liberties. At least in the surgical community, we're marked by a lot of conservative individuals who are concerned with the patient's right to privacy.

Ronald Stewart

I don't believe that trauma surgeons and emergency physicians have bought into this notion that treating alcohol problems is like treating diabetes. People are sent home all the time without referral for treatment. There's a reluctance to screen; there's a reluctance to refer people for treatment. Surgeons I know have an underlying cynicism and skepticism about treatment for alcohol and drug problems. How do we go about changing their behavior and their way of looking at this problem?

Charles Lucas

My simple approach is that if the alcoholic harms only himself, we recommend treatment. When the alcoholic crosses the line by breaking the law, reporting is mandatory.

Eugene Moore

That's an excellent point. Bill Schechter has already mentioned that we need societal change in terms of how we deal with many issues—including drug and alcohol. Broad-based education by individuals in this room like Carol Schermer, Larry Gentilello, and Carl Soderstrom has been ongoing for a decade now. Finally, we're paying attention to them. We need to educate that brief intervention is effective, and we need to teach a motivational approach versus a confrontational approach to drug and alcohol problems. I've been part of the problem and so have many of us in trauma surgery. We need a whole different approach, but the way to get there is to educate ourselves about the tools and psychology of this approach. It's a different approach than we've taken in the past decade.

Anthony Meyer

I agree with Dr. Moore that managing patients who abuse alcohol or drugs is difficult, especially in the ICU where there are difficulties weaning patients from mechanical ventilation, or in extubating patients with altered mental status. The inability of these patients to participate in their own care is significant. There is a much higher incidence of tracheostomy for treatment of these patients than for the patient who does not have a substance-abuse problem. Another issue is HIPAA. Nobody really knows how HIPAA will be enforced. For mandated reporting, HIPAA should not be an obstacle, but it's not clear how it will affect other types of reporting—prescribed reporting for example. It just depends on *how* the law is written. The degree of influence we exert on how these laws are written will determine whether any of our measures will be effective. Although patients with substance-use disorders can have a reasonable success rate when they pursue treatment, there are still too few treatment programs and too few patients who pursue treatment.

Basil Pruitt

How should these laws be written?

Donald Trunkey

To me, the Centers for Disease Control and Prevention should be the optimal place to report alcoholism and drug abuse because I believe alcoholism and drug addiction are diseases. And the primary reason for reporting should be to get good epidemiologic data. However, Tony has identified a problem we still have to solve—we don't have enough people interested in treatment.

Charles Lucas

I think the best thing that we could do, the government could do, to initiate a societal change would be to implement the laws that all drivers under the influence of alcohol go to jail and actually implement those laws so that the designated driver, the taxi systems, would become popular in America, and all of us wouldn't be doing what all the surgeons in this

room do all the time. When you go out to dinner and entertain, you drive under the influence of alcohol.

Eugene Moore

I disagree with Charlie. We need to work to change the societal habits of alcohol consumption, and we need to divert sharply from punitive measures. Having boys in college, I've heard many stories about local police being given full access to college campuses where they raid private parties. Underage college students are caught, sentenced to mandatory community service, and their driver's licenses are taken away. My boys and their friends tell me this does not have the intended effect. As with sex education, there should be broad-based educational programs in secondary schools and colleges involving the consequences of both drug and alcohol use—particularly alcohol use.

Susan Nedza

The idea that screening is part of our responsibility I think is growing, and the place that it's growing is in our academic centers. It's in the place where we have people like Larry [Gentilello] or some of the other people that are here in the room who continually say, "Yes, you can treat," and "Yes, people get better."

Part of the problem is our narrow perspective. We see people who are recidivist generally, who never get better. In Chicago, where I practice, the alcoholics who are brought in every weekend to sleep in the emergency department in the winter are the ones we believe to have drinking problems. We need to expand this beyond the alcoholic, to the binge drinker, to the teenage drinker, to those who fall down the stairs and hurt themselves because they are intoxicated. Our shift has been toward prevention of all alcohol-related injuries, and probably one of the biggest challenges is that 99% of those people go home. They don't get admitted to the hospital.

There is a lack of training for social workers, staff, and physicians in alcohol interventions. I recommend that the core curriculums in residencies be changed. Training should occur during hospital rounds and should be expanded beyond the idea of calling the police. Half the time, police show up at the end of your shift. Who wants to stay late when you've already worked 14 hours? In Illinois, we had a permissive law. No one reported, and this actually had a negative effect. Nobody drew alcohol levels; first of all, because nobody was going to pay for them, and second, they didn't want to be involved in court and all the other issues. So the reporting issue isn't "do we or don't we?"—it's to whom do we report? If it's to DMV, there are programs.

With other diseases, we have medicines and treatments. When we screen our patients for drug and alcohol use they say, "Yeah doc, I've got a problem. What can I do?" We respond by calling the local program, which can't enroll them for three months. We get very, very cynical, and stop screening. So as we approach this topic, we have to recognize the

total demolition of the outpatient mental health and substance-abuse programs. We could screen all day long, but if we've got nowhere to refer people to, physicians will stop screening. It's AA or nothing.

Donald Trunkey

I agree with Susan completely. We just don't have the available treatment programs anymore. I've been at Oregon Health Sciences University for almost 17 years, and I've never seen a psychiatrist on our ward—not once. If I ask for a psych consult, I usually get a nurse or a psychiatric aide, never a psychiatrist, and as far as I know, we still have an academic department there.

Paul Cunningham

Our treatment centers are overwhelmed and underfunded. We have been able to refer most of our patients who have been the victims of trauma and substance or alcohol use to a counselor. However, the outcome is blunted by the fact that they either have a delayed appointment or are never seen because the system is truly overwhelmed. The dark side of this business—illicit substances sold on the street—is huge. I really didn't recognize this until we tried to do interventions within a small rural community. Very quickly after beginning those interventions, I was warned that if I didn't mute my attempts, I could find myself at the bottom of the river. Decriminalization of drugs might be helpful.

Charles Lucas

In Detroit, we've had one really good 17-week in-house program, which has a very low rate of recidivism. The problem has been getting individuals to take 17 weeks out of their lives; it has to be mandated by the court. To really have success, our courts must be involved.

Peter Rostenberg

I have a much different background. I worked four years at Harlem Hospital Center in New York City, and I've been in private practice in internal medicine and addiction medicine for the past 25 years. We have a policy in my hospital where surgeons address positive blood-alcohol results as clinically important data. And they are required either to address that on the chart or get a consult. These are normal everyday surgeons who've had the same kind of experiences as many others across the country, in many other community hospitals. They love this policy. It makes sense to them. I think we've had situations in the past where physicians have acted as agents of the state. That hasn't worked out well. Who says the police have better treatment services than anybody else? The recidivists that I see, DWI, go to jail and get no treatment. They come out the way they went in—dangerous.

There are very few clinical situations where somebody with an alcohol problem will be as receptive as someone coming to my office with a sore throat. Injury is one of them, so we should take advantage of the situation. We should

always remember that we work for our patients. Let's start to institute policies and procedures that make every hospital a kind of treatment center for alcohol and drugs. Not places where patients go knowing they're going to be arrested or reported. Very possibly, they would avoid even coming to the hospital for treatment.

On the other hand, I once reported a guy who had an alcohol withdrawal seizure while taking off in a 747 as the co-pilot. I have also reported a public bus driver who did not want to go into treatment. Still, I just find it very difficult as a physician to see myself as an agent of the state when we have so many other wonderful opportunities to deal with this major problem.

Michael Sise

Trauma surgeons are held accountable at a level that no other group of physicians is held accountable in the United States. Are we ready to hold ourselves as trauma directors accountable for working upstream on these issues? Should I know not only the number of my patients who are under the influence of drugs and alcohol when they're injured, but also the rate of binge drinking at San Diego High School? It's clear that as trauma directors we have one of the strongest voices in the community. As trauma directors, we can pick up the telephone and talk to the Chief of Police, the Mayor, the US Attorney, or just about anyone in the press and they will listen. Very few people in the community can do this. We're stuck seeing the downstream effects day after day, night after night, which makes us very, very, very prejudiced when it comes to alcohol and drug problems. Yet the evidence is compelling that screening and brief intervention work. So, I guess we have to answer the question as a group: "What are trauma surgeons willing to answer for?"

Donald Trunkey

I think you're absolutely right. We are held to a higher level of accountability and credibility than any other practitioner in the medical profession. I think that is as it should be because we've been granted a franchise, and accountability was part of the original trauma system plan. I tend to agree with Gene [Moore] that as trauma surgeons we've got to get involved. Number one, we can't practice trauma surgery and not recognize that drugs and alcohol are a terrible problem in our society. Education about drugs and alcohol should be part of our "Think First" and "Safe Kids" programs. We've got to reach the very young. Do we have to personally give lectures? No, but each of us are in a position to convince community leaders to support alcohol and drug education in the secondary schools. It's just part of our civic duty.

I was disappointed to hear that some are no longer testing for alcohol and drug use in the emergency room and ICU. I test primarily to find out what other ravages I'm going to see downstream in that patient's care. Knowing that the patient is under the influence of cocaine or alcohol influences my treatment. If I don't start a program of withdrawal support

and a patient gets DTs, mortality goes up. What should we do with this information if the primary disease is alcohol or drug abuse—not the injury?

Charles Lucas

Mike [Sise], as a trauma director, you know that drug and alcohol screens of all seriously injured patients should be done for the reasons Don [Trunkey] just mentioned. Further, your trauma nurse coordinator should be supervising an injury prevention program, which generally addresses the topic of alcohol use at the high school level. This program should be coordinated with your San Diego County system of prevention. So yes, as a trauma director, you are indirectly responsible for all these activities.

Larry Gentilello

Several speakers mentioned that they did not have a place to send patients who need treatment. We're getting into what has been called "The Preventive Paradox"—a misconception that the person who is severely alcoholic is the one who needs treatment. It turns out that most of society's problems that arise from excessive alcohol use do not come out of the alcoholic population. They come out of the population of people who just drink too much, like the case that Gene Moore talked to us about this morning (the group of high-school students who crashed their car after a party). Those teenagers don't need a 28-day treatment program. Jeff Runge showed the peak age for impaired driving fatalities is 20 to 21 years of age, so these are not people with alcohol dependence. They are problem drinkers, binge drinkers, hazardous drinkers, or maybe alcohol abusers. Therefore, the absence of available treatment beds should not dissuade us, because even the placement criteria for alcohol treatment promulgated by the American Society of Addiction Medicine does not suggest that those people go to a treatment center. The type of interventions appropriate for these individuals are more limited, less intensive, and are totally consistent with the time and the staffing and the financial constraints of your trauma center.

For example, at Harborview, Chris Dunn does brief interventions. Harborview has over 6,000 trauma admissions per year, and he's the only one who performs interventions. You would never send someone home from your trauma center with a fracture without having a physical therapist check to make sure that they're not going to stumble with their crutches on their way out the door. Someone who doesn't earn any more money than a physical therapist can handle the intervention load typical of a very busy urban trauma center—as does Chris. It is only the more severely impaired patient, the chronic alcoholic, and they are only a small minority of patients, who require access to a formal treatment center. We don't necessarily need more treatment beds; we need more interest.

Gene Moore mentioned that we need to focus on education. But, education alone is often not enough. Despite wide-

spread evidence of their effectiveness, and many attempts to educate care providers, beta-blockers are still not typically provided to patients after myocardial infarction. There have been many educational and professional society meetings on alcohol and injury that have discussed the need for interventions, and yet most centers do not provide them. So my question for the panelists, especially those who have helped in the development of our trauma system is, what can the American College of Surgeons do to enhance implementation? What can surgical professional societies do? What can surgical leadership do? I ask this question because I do not believe that education is enough.

Eugene Moore

First of all, Larry, I recognize there's been an abundance of educational opportunities for trauma surgeons; but frankly, after I returned from the stimulating meeting at Jackson Hole with you and Carol [Schermer], I learned that out of six attending trauma surgeons in our trauma center, I was the only one who knew anything about brief intervention. So, I started beating up poor residents, telling them about CAGE and AUDIT. No one in that room of 30 people understood anything I was saying. Now, why is that? I'd suggest that we need to make a better effort at educating our trauma surgeons. As surgeons, we went into our field because we like science. When I go on rounds and start talking about cell signaling and neutrophil activation, I guarantee you every trauma surgeon, every fellow there, is paying attention to me. When I go on rounds and start talking about brief intervention, I can't get anyone to talk to me. So I think we have to recognize that we, as surgeons, don't gravitate toward this part of medical practice. We need to impress upon trauma surgeons that our responsibility to our patients does not end with treatment of the injury and getting them out the back door. It's getting that patient back into society, safe for that individual, safe for society around them. However, we also need to acknowledge the trauma surgeon's innate lack of interest in this area as a hurdle to overcome.

Donald Trunkey

My hospital doesn't have the equivalent of what you have at Harborview, and it's not going to, quite frankly. We have done a lot of pro-bono work. The hospital paid thousands of dollars every year to operate a poison control center. It was axed July 1st. So, we will no longer have a poison control center in Oregon. Why? Because the state has slashed medical school budgets so heavily that we're starting to cut out some of these programs. We may have to discontinue "Think First" and "Safe Kids" because the hospital is losing the trauma nurse coordinator who implements these programs. If I were to tell my hospital administrator that I wanted somebody to see every trauma service patient and provide brief interventions, I would be laughed at. I've tried to provide interventions, but I'm not doing it well, because only one in 20 patients follow up. I'm frustrated, quite

frankly. I try to be a role model for the residents. When they become practicing surgeons, I want them to know how to intervene appropriately. The intervention may be brief, but getting the follow-up is so frustrating, I cannot express it.

Charles Lucas

Clearly, Gene needs to stay at home and send his young trauma surgeons to Jackson Hole! My partner, Anna Ledgerwood, and myself have a brief intervention on every patient that we see on rounds. If that patient is in the hospital a week, there are two brief interventions. It's education for the residents and the students; all trauma surgeons should do it.

Carol Schermer

I want to get back to what Dr. Soderstrom and Dr. Rostenberg said earlier. We need to be wary of placing the physician in the punitive, reporting role. This makes physicians uneasy and can violate some patient trust issues. There are other policy measures to address punitive action for DUI. As we all know, not every injury is related to alcohol. Even if DUI, many patients don't warrant punitive measures. We need to rely on the people in this room and our addiction specialist colleagues. Whether it's the surgeons, the addiction specialist, or the social workers, someone needs to provide some sort of treatment, not just resort to punitive measures. One of the main purposes of this meeting is to get all these really smart people together to figure out how to accomplish things like funding Don Trunkey's Trauma Center or to fund a substance-abuse consultation service.

Donald Trunkey

I agree that reporting or referral should not be repugnant to physicians. On the other hand, it's so frustrating at times. Recently, I had a 37-year-old female patient who shot up heroin, and then at 10:30 in the morning hit three kids in a crosswalk at a school. The cops arrived and did not suspect that she was on drugs. They weren't going to do a blood alcohol test. I had to take the cop aside to say, "She screened positive for heroin," because the test that I do cannot be used in a court of law. I said, "You better damned well get a damned test." I was so angry, and it's inappropriate for a physician to be that angry, but this woman really got to me. Sunday I was on call, when a 2-year-old boy riding his tricycle was run over by a neighbor driving a pickup; the truck had to be lifted off the little boy. When the mother arrived at the hospital, she was on amphetamines. I said to myself, "This kid is a loser. He's going to lose the rest of his life. He's got a mother that doesn't watch over him, doesn't care for him, and I *can't* test the mother." I was so angry at this woman because she had let her child get injured. I think sometimes we have an obligation to report.

Gill Cryer

Recently I met with trauma directors, nurse coordinators, and administrators from the 13 trauma centers in Los Ange-

les. One of the system wide quality improvement protocols that we tried to put in place this year had to do with alcohol testing. It became very clear during the process that the physicians—trauma directors like you on this panel— had no interest in reporting to police or to *any* state agency. What they did agree to do was to place the BAC level in the trauma registry, a confidential registry that doesn't name patients so no one can access the patient's blood alcohol level to be used against him at some later time. The goal was to produce data for epidemiologic studies, to define the problem, and to use with state legislators to say, "Look. We need to do something with these patients."

Despite agreement to build a confidential registry, only about 50% of the hospitals were in agreement to regularly test the BAC on their patients, for a variety of reasons already discussed. I think we need to address the reasons why trauma surgeons are reluctant to measure BAC, because I believe that we are going to be a lot more successful at developing solutions to alcohol problems in trauma centers if we are ultimately able to create a disease-related registry, like the cancer societies do to develop and track the success of treatment of cancer patients. Define it, figure out strategies to do something about it, and then enlist our social or political partners to help implement some sort of strategic change.

Eugene Moore

I still think, Gill, one obvious problem is funding. Unless we can take, for example, the tax on alcohol and direct it specifically toward prevention and treatment programs, it's going to become more difficult in trauma systems and trauma centers throughout the country. We've talked about budget cuts today—whether it's federal, national, local, or at our institutions. The cuts are wide-sweeping, and we literally cannot afford to do any task or make any effort for which there is no compensation. Our administrators constantly look at our daily schedules and figure out second to second what we do; if it's not compensable, we're not allowed to do it. If we aren't supported for research via a grant, we cannot spend time on a grant. That's a microcosm, but fundamentally that's what the health system is all about. Somehow, we've got to figure out how to put money back into the system so we can use these preventive programs to eventually save money. Right now, that money is not there.

Donald Trunkey

Gill, I have problems with the trauma registry approach. Substance- and alcohol-abuse are diseases and should be reported—not only to get good epidemiology, but quite frankly, for intervention. I'm very curious to see what happens at CDC with the current reportable diseases. Is it a violation of HIPAA because you're reporting somebody's data?

Charles Lucas

Every patient with serious injury, and you can define it by ISS, should have an alcohol and a drug screen to know what problems to expect, as Don [Trunkey] mentioned earlier. Screening is needed for patient care. What you do with the data afterward is institutional related.

Ronald Stewart

I agree with Dr. Moore that surgeons are interested in the biology, the operation, and critical care. The psychologist and the psychiatrist are interested in setting up outpatient treatment programs and behavioral interventions. One of the key questions is: How do we set up a collaboration like the one that exists at Harborview? A collaboration between psychologist and surgeon or psychiatrist and surgeon? As Larry [Gentilello] pointed out, we don't perform physical therapy. There's a physical therapist who does this. From my own experience and from listening to these discussions, it's clear we're going to have to build the collaborations ourselves. Funding may be an issue, but if the American College of Surgeons verification program sets criteria for alcohol screening and treatment programs, we'd follow it. Even if there were philosophical objection, or no expertise, the hospital would provide these programs because they would be required to do so. What if the college set these criteria through the verification program? That could make it happen.

Donald Trunkey

I'm not sure it would. If you look at McKenzie's most recent paper in *JAMA*, very few of the Level I and Level II trauma centers are actually verified by the colleges—only about a fourth are, maybe even less.

Ronald Stewart

But a fourth would still be a huge change. In my state, it would be everyone.

Donald Trunkey

I'm not opposed to the college developing these criteria for inclusion in the optimal criteria document. I'm just saying that a lot of hospitals (three-fourths, in fact), don't go the ACS route.

Eugene Moore

The ACS route is the wrong direction to go. This would simply reduce the number of centers that want to be verified by the ACS. I think we have to introduce this or inculcate this as a trauma surgeon's responsibility, as part of our global care. The collaboration issue is very important as you point out. We are not behavioral scientists. Behavioral scientists have to affect what we believe is correct. On the other hand, behavioral scientists don't have real-time access to patients to exercise these changes. I'd like to draw the analogy to basic science. Recently, NIH has had enormous funding. This will

be effective because now translational research is being emphasized. No longer can clinicians work in isolation from basic scientists. We need behavioral scientists working side by side with clinicians to effect the change. How that will happen I don't know, but conceptually, that's what needs to be done—research funding needs to be tied to this collaboration.

Charles Lucas

Ron [Stewart's] idea is excellent. It could be incorporated into the chapter on prevention. The proportion of hospitals verified by ACS is not an impediment because state verification criteria—about 98% to 99%—are almost mirror images of the recommendations developed by the college.

Herman Diesenhaus

I used to be the Director of Program Services for the State of Colorado, Alcohol and Drug Abuse Division. You've talked about reporting and referring. I'd like to introduce a third term: Commitment. Thirty-eight states have a distinct "alcohol commitment statute". We used to get into the same kind of discussions over civil commitment versus criminal commitment. Drug courts use criminal commitment. When we were running our system in Colorado, there was a state-wide coordinator whose job was to work with various emergency rooms and detoxification centers in developing a treatment plan to present to the court. How many of you as trauma surgeons in your state use the alcohol commitment statute? It is a viable vehicle. This statute's goal was to do exactly what you're saying. Is it something we should be revisiting as a group? This is another alternative that may or may not be used.

Donald Trunkey

I don't think commitment works in Oregon because it's not mandatory. I have more faith in the drug courts because judges now recognize that the judicial system is broken and that putting people who possess drugs in jail is absolutely insane. They would rather get them into a mandatory treatment program. From the evidence that I've seen, mandatory treatment programs are just as effective as voluntary programs.

Herman Diesenhaus

Right now, the strongest supporters of expanding treatment are the Attorney Generals Association, prosecuting attorneys, and judges. At the next conference, we should bring surgeons, emergency department staff, and judicial people together to look at how we can develop a system to deal with these issues.

Basil Pruitt

So far, we have focused on reporting and issues of commitment. This afternoon we are going to discuss screening and intervention. Is everyone happy with Dr. Gentilello's paper? That we can screen and that the predictor of hazardous

drinking is any alcohol level on admission? Is this the most sensitive and specific screen we have? And is this acceptable to all of us?

Eugene Moore

Recently, Carol Schermer and others produced cogent evidence that even though the trauma center is an opportunity to screen patients at risk for alcohol abuse, blood alcohol level is not the most sensitive marker. The most sensitive marker is injury. Everyone who is admitted to a hospital with an injury should undergo brief intervention.

Basil Pruitt

Is this cost effective? I mean, screening every admission to the trauma service?

Eugene Moore

We can't keep imposing costly services on trauma centers and expect them to survive. And I would argue the more we demand services that are not reimbursed, the more likely it is that trauma centers are going to back out of the system, and our trauma system will break.

Basil Pruitt

But I thought you just said that everyone admitted to a trauma center with an injury should be screened.

Eugene Moore

There is compelling data that all injured patients should be screened. The fact that a patient is hospitalized for an injury is an indicator that alcohol may be a problem in that patient's life. Broad-based screening should be done. It is likely that we can capture the patients who are going to be compliant with the program. What we're now seeing in our centers are impaired drivers—a group with a higher risk for recidivism.

Basil Pruitt

But even in Eastern Europe, only one-third of young male deaths are alcohol related—the other two-thirds are needlessly screened. Right?

Eugene Moore

I don't think mortality should be our only barometer. It's global disability, as well as deaths, that we're trying to address today.

Ronald Stewart

How expensive is this program? How many employees would be needed? One or a half full-time employee?

Charles Lucas

It doesn't cost anything, Ron. Dr. Trunkey is paid as a full professor at his university to teach students and residents. In the process, he has brief interventions with his patients. It

doesn't cost a damn thing, and we should all be doing what he does.

Basil Pruitt

About those interventions. The professor approaches a patient with an assembled throng and says, "How do you feel about getting your sorry ass in this fix from drinking?" Boy, is that a great intervention!

Charles Lucas

If that isn't a military approach to intervention, I don't know what is. Donald [Trunkey] is a very tender, sensitive, loving person, and his patients like it when he grills his students and residents about alcohol and drugs.

Robert Woolard

At Brown University, we conducted an alcohol intervention program, a randomized controlled trial of over 500 patients. Results showed that brief interventions can reduce injuries followed out to one year. We collected data on other drugs as well, and learned that 47% of the patients we studied were also using marijuana.

I appreciate the vignette from Dr. Moore about friends of his children. When my own children attend parties, marijuana and alcohol are always available—and sometimes other drugs. They hear lots of myths about the use of marijuana. The most common one is that it's safe to drive after using marijuana, and that most of the data show that marijuana does not affect reflexes. Another myth is that it's probably not as hazardous to drive after using marijuana as it is to drive after drinking alcohol. But, put the two together and there is an additive effect. We see a lot of patients who, unless we screen, will continue to use marijuana and alcohol in combination. Counseling should address both.

Susan Nedza

We need to support these proposed changes in practice. There's little for the hospital to gain if interventions decrease the number of trauma center admissions, but society has much to gain. Therefore, the case for diminishing alcohol-related illnesses has to be initiated in our communities and has to capture some of the data related to the cost of incarceration. Although the criminal justice system is a proponent for intervention treatment via drug courts, that system is also affected by budget cuts. This is one of the groups we need to partner with.

Regarding interventions, we can take a hint from what we've done in violence prevention screening, where someone asks the patient specifically whether violence is part of their history. It then becomes a history issue, and that triggers everything. Effective screening can consist of as few as one or two simple questions, and only screen-positive patients will need an intervention.

Gordon Smith

We should broaden the focus from criteria for trauma center accreditation to the definition of quality care for the hospital. Just as Larry [Gentilello] mentioned, if a physical therapist wasn't available to advise on the use of and the appropriate height of crutches, this would be viewed as bad medical practice. If the hospital were to close its physical therapy department to save costs, the hospital would probably fail accreditation. Compulsory referral to police is probably not the answer either, because they're going to be overwhelmed, and they have no treatment services. States often require hospitals to provide prevention services. Would the American Hospital Association or the state require a certain number of full-time employees per a specified number of beds to begin brief intervention programs? I would like to see a discussion on how we could accomplish this.

Basil Pruitt

Dr. Lucas, would you speak to that as Chair of the Verification Committee?

Charles Lucas

Interventions could be introduced in the form of a recommendation, and then over a period of time the results of visits by the college would identify the number of institutions who have put such things into place. Any problems with such programs could be fed back to the college and to other participating institutions.

Donald Trunkey

I support mandatory referral or mandatory reporting because it works. Every November, I go to Sweden and teach a one-week trauma course. Sweden has some of the most draconian alcohol laws in existence—zero tolerance for driving under the influence.

Basil Pruitt

As someone else has already mentioned, in states with mandatory reporting laws, insurance companies are allowed to deny payment for medical care when alcohol or drug use is involved. Why would we support mandatory reporting? This would be like shooting yourself in the foot.

Donald Trunkey

Well, wait a minute. I don't support insurance companies getting off the hook here one iota, nor do I support the police not arresting these people.

Basil Pruitt

Are we going to change the law so the insurance companies have to pay?

Donald Trunkey

Dr. Runge showed you this morning the costs to society are absolutely staggering. I would like to see us reduce those costs by half and put that into education or health care.

Basil Pruitt

But that takes a legislative action, doesn't it?

Charles Lucas

The system is so illogical. Thoracic surgeons don't have to report people who smoke to the insurance company when they're taking their lungs out for lung cancer. The whole thing is illogical.

Basil Pruitt

But Charlie, who said life is logical?

Charles Lucas

We have to point out to them the illogic of it all. We have to give them other parallel examples.

Basil Pruitt

So then we're going to mount a legislative campaign to change the laws in 38 states? Is that right, Larry? That's a perfectly reasonable goal if you think we can achieve that.

Eugene Moore

The reason that only 25% of Level I centers are verified by the ACS is because in those states they have decided that the ACS criteria are too onerous. That's why Washington state doesn't verify by the ACS—because Ron Maier doesn't believe what the ACS requires is logical. For example, ACS mandates that a trauma surgeon be in an emergency department for every intubated patient. So the more rules you impose that the trauma surgeon doesn't believe in, the less compliance and the less credibility that document is going to have. Injury prevention programs mandated by the Committee on Trauma (COT) is not the way to go. Trauma surgeons must believe this is part of our responsibility as physicians. Don't force them, educate them.

Charles Lucas

The word is "recommend," Gene. Nobody said mandate. The Verification Review Committee of the COT does not mandate that every trauma surgeon be present whenever there's an intubation in the emergency department. Without getting into the details of why Washington or other states don't use the college program, I re-emphasize that 99% of the state's criteria is the same as the college's criteria. The college has been the leader in the development of criteria that nearly all states use to verify or designate their trauma centers.

Donna Johnson

I'm probably the minority in the room. I'm a substance-abuse director for a rural community just north of Atlanta. In addition to outpatient services, for the past 15 or 16 years I've directed an emergency receiving facility for individuals with substance abuse and psychiatric disorders. Our success with referrals from hospitals over this period of time has not been very good because the hospitals referred patients who did not meet the admission criteria for our programs. To address this situation, we met with staff in hospitals and began sending counselors to the hospitals for consults, evaluations, and recommendations for placement. We came to realize that the people showing up in trauma centers and hospitals were at high-risk, and we gave them priority status so they could get into our facilities much quicker. So I've seen collaboration work. Unfortunately, on July 1, our program will be ending because of funding cuts. I would love to see the trauma world and the treatment world work together and come up with new protocols.

Donald Trunkey

We've covered a lot of issues. I don't see a lot of solutions. We need to work on identifying solutions during the next two days.

Basil Pruitt

I want to thank the audience and our speakers for a good discussion. The meeting is now adjourned for lunch.