



TOXTALK

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AUSTIN 2006 - CONTINUED SUCCESS!

By Vickie W. Watts, SOFT Meeting Coordinator

The S.O.F.T. 2006 Annual Meeting in Austin, Texas was successfully conducted having a record attendance of 798 registrants. Rod McCutcheon served as Meeting Host and Laurel Farrell as Meeting Treasurer. The attendance breakdown included 338 SOFT members, 198 nonmembers, 192 exhibitors, 7 students and 29 accompanying persons.

Through the efforts of Workshop Chair, Jeri Roper-Miller, the program included ten focus-oriented workshops with an outstanding attendance of 1150 registrations. Special thanks goes out to the various Workshop Chairs for their contributions towards the excellent quality programs offered: Wayne Jeffrey, Chip Walls, Ann Marie Gordon, Rebecca Jufer-Phipps, Marc LeBeau, Daniel Anderson, Dwain Fuller, William Anderson, Richard Hilderbrand, Larry Bowers, Leland McClure, Craig Sutherland, Steven Wong, Ruth Winecker, Randal Schneider, Jayne Clarkson, Michael Schaffer, and Alphonse Poklis.

The Scientific Chair, Fiona Couper, prepared a program that included 120 abstracts that were presented as 38 platform and 82 poster presentations. The meeting was supported by 78 exhibitor booth registrations. Through the hard work of our Exhibit Coordinator, Lisa O'Dell, the exhibitor sponsorship came in at a total of \$160,818 which allowed for the SOFT member registration fee of only \$195 for the outstanding week of events and



receptions. In addition to the weeklong excellent scientific sessions, the attendees toured the Texas State History Museum and enjoyed dancing the Texas Two Step. Heartfelt thanks are sent to the 2006 Meeting Host, Rod McCutcheon and his delightful wife, Susie, for their endless efforts and attention to detail that made this meeting particularly enjoyable and successful for the S.O.F.T. group. A special thanks also goes out to S. Tinsley Preston III of Preston Publications for the continued support of the S.O.F.T. annual meeting in providing the JAT Special Issue to all the attendees. Many of the pictures in this issue of ToxTalk are courtesy of Mr. Preston.

S.O.F.T. continues to take its members to different parts of our country to experience distinctive cities. Be sure to mark your calendars for next year's annual meeting in Raleigh, North Carolina, October 15-19, 2007.

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THANKS TO THE MONFORTES!



For eighteen years Joe and Pat Monforte have skillfully and dutifully prepared and distributed the quarterly SOFT ToxTalk newsletter to its membership. Well, all good things must come to an end. The Monforte's have opted to explore new adventures and enjoy new opportunities, and regretfully resigned this post. Colossal thanks are sent to the Monforte's for their tireless contributions on behalf of S.O.F.T. over the years. They will forever have the gratitude, appreciation, and recognition from their S.O.F.T. membership family.

PRESIDENT'S MESSAGE

BY TIMOTHY P. ROHRIG, PH.D., DABFT

It has been an honor and a privilege to serve as the 2006 President of the Society of Forensic Toxicologists. I would like to thank the Board of Directors, the various committee chairs and most importantly the membership for their support, suggestions and guidance.

As I was writing this message for the last issue of our 30th Anniversary celebration of ToxTalk, I took a moment to reflect on the growth and necessary changes of SOFT over these years. SOFT was founded as an organization based upon camaraderie and teamwork. We have grown from a semi-formal group of professionals, to an internationally recognized professional organization that attracts forensic toxicologists from all parts of the world to our annual meetings. We now have attendance numbers routinely exceeding 750 toxicologists. In order to maintain and improve upon the professional quality of our meetings, Dr. Graham Jones [SOFT President 2005] created the position of SOFT Meeting Coordinator. Ms. Vickie Watts, along with Ms. Lisa O'Dell [Vendor Liaison] have and will continue to ensure continuity of quality in our annual

meetings. Thank you Vickie and Lisa! However, this daunting task cannot be accomplished alone. Rod McCutcheon [2006 Meeting Host] and his staff put on an exceptional scientific meeting in Austin. Thank you Rod for a great meeting and good fun in Austin!

In response to the significant growth that SOFT has experience over the last several years, the Board approved increasing the numbers of hours that our Administrative Assistant Ms. Bonnie Fulmer works. As I announced previously, SOFT now has a "real" home. Please note the new office address, toll-free number and email addresses published elsewhere in the newsletter. I trust that these enhancements will serve the organization and membership well.

Along with growth comes change. I recently received the resignations of two valued members of our organization, Dr. Joe Monforte and Ms. Pat Mohn-Monforte as ToxTalk Editor and Publisher, respectively. As we recall from our recent business meeting in Austin, the Monforte's have provided many years of dedicated

service to SOFT. I am confident, that although they are pulling back on some service to the organization, they BOTH will continue to be active members of SOFT. Joe and Pat, thank you for your years of service in the publication of ToxTalk. To fill this void, I have appointed Dr. Yale Caplan as the Interim Editor of ToxTalk, to work with our capable Associate Editors, and continue the publication of ToxTalk.

I would be remiss if I did not acknowledge the significant contributions that Ms. Bonnie Fulmer has provided for the "business" aspects of our organization. I hope many of you that came to our last meeting in Austin, took the opportunity to have met Ms. Fulmer as she worked the registration desk. Thank you Bonnie and I look forward to seeing you at all of our meetings in the future.

Finally a word of thanks to the membership – it has truly been a gratifying experience to serve as your President.

Wishing all a happy and safe holiday.



AUSTIN 2006 ROCKED

BY J. ROD MCCUTCHEON



A big thank you to all who attended and participated in the 2006 SOFT Annual Meeting held in Austin, Texas. Drs. Fiona Couper and Jeri Roper-Miller organized and coordinated ten workshops and over 100 platform and poster presentations. There was plenty of science to challenge even the most inquiring minds. Hopefully, everyone also had an opportunity to enjoy some of the sights and sounds of Austin and maybe even try a little "two-step" on the dance floor.

Many individuals contributed to the planning and execution of the meeting. Vickie Watts, Meeting Coordinator, Laurel Farrell, Meeting Treasurer, Dr. Peter Stout, IT Coordinator, and Bonnie Fulmer, SOFT Administrative Assistant, know how to make a meeting happen and keep the meeting host on the right track. Another group that makes contribution each year is what I will call the SOFT "volunteer team". These folks, too many to name individually, can be seen every year helping with registration, assembling workshop materials, and many other behind the scene duties. Having willing volunteers and a hall full of exhibitors (79 booths this year, thank you to Lisa O'Dell, Exhibitor Coordinator) allowed us to have all of that good food



and beverage at a reasonable price.

Thank you again to all who participated and see you next year in North Carolina.

Pictured above:

2006 Meeting Host, J. Rod McCutcheon, Susie McCutcheon, Julie Canfield, and 2006 S.O.F.T. President, Timothy P. Rohrig, Ph.D.



LIVE ALCOHOL DRINKING LABORATORY FOR FST WORKSHOP IN AUSTIN-SOFT REPEATS ITSELF WITH ANOTHER SUCCESSFUL CONTROLLED STUDY

Submitted by Vickie W. Watts, Live Study Coordinator

Introduction:

Alcohol consumed in a relaxed social environment over an extended period of time is usually the situation encountered by the forensic toxicologist in providing interpretive expert testimony. A typical example would be a retrograde extrapolation for a subject arrested after an evening of drinking at a party or in a bar. Interpretive expert testimony in alcohol (ethanol) related cases generally involves three types of calculations: retrograde extrapolation, where a known breath alcohol concentration (BrAC) test result is used to predict the blood alcohol concentration at an earlier time period; the estimation of a minimum number of drinks to achieve the measured alcohol concentration; and the estimation of a theoretical maximum alcohol concentration obtained from a known drinking pattern. On a day-to-day basis, calculations of retrograde extrapolation and estimation of minimum number of drinks or theoretical maximum BrAC are made in courtrooms across the country in answer to the demands of the medicolegal system.

These types of calculations involve multiple assumptions such as the subject's drinking history, elimination rate, and volume of distribution (Widmark ratio) for alcohol. The accuracy of the calculation depends upon the available data in the literature upon which these assumptions are based.

Live Drinking Laboratory Study Design:

The live drinking laboratory was conducted for purposes of training provided at the workshop entitled "Standardized Field Sobriety Tests—Principles and Practice". This workshop was conducted on October 3, 2006 during the annual meeting of the Society of Forensic Toxicologists in Austin, Texas.

Volunteer subjects (4 females and 5 males), 24 to 50 years of age, were interviewed for weight, type and time of recent food consumed, then pretested for initial BrAC. Subjects consumed light carbohydrates during the initial phase of drinking and were allowed a sandwich halfway through the drinking period. Drinking commenced at 12:00 p.m. after establishing a 0.00% breath alcohol concentration using the Intoxilyzer Model 5000. All alcohol was administered in 15 and 30 gram doses and BrAC results graphed in real time using an interactive, real time, BrAC graphing Excel program. Subjects were administered doses of ethanol in preparation for evaluation of BrAC using standardized field sobriety testing administered by officers from the Texas Dept. of Public Safety. All alcohol was distributed, time intervals for drinks determined and results tabulated by Vickie W. Watts, the

Live Study Coordinator. Two Intoxilyzer Model 5000 breath testing instruments were utilized throughout the experiment to record BrAC. This instrument utilizes a 2100:1 blood:breath ratio, therefore results are reported in g/210 L (10). The calibration of the instruments was checked using a 0.080 g/210L simulated breath alcohol solution. The breath testing instruments were operated by 4 chem-



ists from the Texas Department of Public Safety under the supervision of Mack Cowen.

The rate of drinking was not predetermined, but designed to reflect a normal social rate of alcohol consumption. Subjects consumed known quantities of alcohol as often as they requested, with each drink consisting of 50 or 100 mL of 40% alcohol, straight or combined with mixer. The drinking time interval, time drinking stopped, total amount, and type of alcohol consumed were recorded for each subject. After completion of each drink, subjects underwent a ten minute deprivation period to allow for the dissipation of mouth alcohol. The BrAC was then monitored by duplicate testing with the Intoxilyzer 5000 prior to administering the next drink. Subjects drank in small groups in the relaxed social environment of a hospitality suite. Five volunteer non-drinking 'watchers' were each assigned 1-2 drinking subjects. The watchers observed and monitored alcohol consumption time, deprivation periods, stop drinking time, and post-absorption testing periods.

The alcohol consumption phase was completed in approximately 3-4 hours. Subject's were then monitored by duplicate breath testing and participated as live study subjects for the standardized field sobriety testing portion of the scientific workshop. At the completion of their participation in the workshop they were monitored at 10-15 minute intervals for the next 2-3 hours to record the post-

References:

1. Widmark, E.M.P. *Principles and Applications of Medicolegal Alcohol Determination. Biomedical Publications, Davis, Calif., 1981. Translated from German by Scitrans Inc., Santa Barbara, Calif., 1932.*
2. Schwar, T.G. *Alcohol, Drugs, and RoadTraffic (W.E. Cooper, T.G. Schwar, and L.S. Smith, eds.), Juta & Co., Capetown, 1979.*

absorptive phase for elimination rate.

The resulting data was evaluated as follows:

- 1) Rate of drinking in a social setting; Drinks are administered at the subject's request.
- 2) Length of plateau periods at maximum BrAC.
- 3) Post-absorptive elimination rate of alcohol.
- 4) Estimation of Vd (Widmark ratios).

Results and Discussion:

The nine subjects consumed alcohol in 15 or 30 grams doses per drink simulating *singles* or *doubles*. The mean time interval between drink requests was found to be 33 minutes, with a range of 20 to 60 minutes. This time interval included the 10 minute deprivation period prior to each breath test. The subject was required to give a duplicate breath test before the next drink was administered. Table I shows the measured drink time intervals where singles or doubles were ordered along with the average and range.

Table I. Rate of Drinking in a Social Setting

Subjects	Intervals	Avg. (min.)	Range (min.)
#1	3	32	25-45
#2	3	50	45-60
#3	3	27	20-35
#4	3	33	30-40
#5	3	32	30-35
#6	2	25	24-26
#7	2	52	45-60
#8	2	45	45-45
#9	2	55	50-60
Mean		33	20-60

Absorption-Distribution Phase:

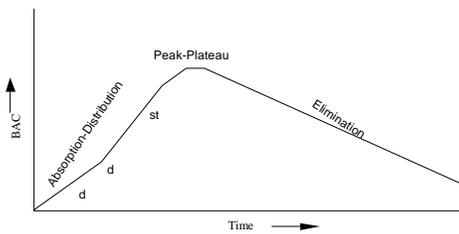
The BrAC shows a steady rise with time as the amount of alcohol absorbed into the bloodstream exceeds the amount that is being eliminated. In a social drinking pattern where alcohol is continually being ingested over many hours, this phase may actually consist of a series of progressive rises and plateaus. As shown in Figure 1, a theoretical blood alcohol curve would have three phases: absorption-distribution, peak-plateau, and elimination. The time that each drink was administered is designated with a (d) and the time the last drink was completed with no more alcohol being ingested by (st).

Excel BrAC Program Design by David Watts

<u>Drinking Volunteers:</u>	<u>Observers:</u>
Javier Velasco	Robert Zettl
Michael Wagner	Jeri Roper-Miller
David Watts	Peter Stout
Frank Esposito	Debbie Denson
Dale Hart	Tracy Brugger
Nicole McCleary	
Erin Boone	<u>Study Coordinators:</u>
Denise Teem	Vickie Watts
Erin Hepler	Mack Cowen

LIVE ALCOHOL DRINKING LABORATORY - (CONTINUED)

Fig. 1. Phases of the Blood Alcohol Curve



BrAC measurements were plotted versus time for each subject, with both the values of each duplicate pair of breath test results used in the graphing of the BrAC. The data for all 9 of the laboratory subjects is presented in Excel diagrams on the insert page to this article. Each Excel plot shows the drinking history, BrAC curve, and regression line elimination data for each subject.

Complete tri-phasic BrAC curves with clearly defined peak-plateau at the maximum BrAC and complete regression line elimination rates were obtained for subjects #1, #6, #7, and #9. Partial bi-phasic curves with an absorption phase and clearly defined maximum BrAC and plateau marked by the beginning of an elimination phase were obtained from subjects #2, #3, #4, #5, and #8.

Peak - Plateau Phase:

After the subject stops ingesting alcohol the BrAC will eventually cease to rise. When this maximum blood alcohol concentration is reached, the subject has entered into the peak phase of the blood alcohol curve. The time period for this phase may range from a sharp peak to a broad plateau. If the peak BrAC remains constant over time, this phase is designated as the plateau interval time for each subject. Table II shows the plateau interval times for six of the subjects in the study.

Table II. Plateau Interval Times

Subject	Plateau Intervals
#2	121 min.
#3	94 min.
#4	63 min.
#5	154 min.
#6	161 min.
#8	52 min.

Elimination Phase:

When the BrAC shows a steady decline over time, more alcohol is being eliminated from the bloodstream than is being absorbed. The resulting decline in the BrAC measurements is the elimination phase of the blood alcohol curve. Linear regression lines were plotted from the elimination data using both results of the duplicated breath test measurements. The slope of the regression line was used to determine the elimination rate for each subject. Given the equation of the regression line ($y = mx + b$), the slope (m) represents the elimination rate in grams of alcohol per 210

liters (g/210 L) per minute. Recalculation ($\times 60$) of the data gives the elimination rate in grams of alcohol per 210 liters (g/210 L) per hour. As shown in Table III, the mean elimination rate was found to be 0.0136 (g/210 L) per hour with a range of 0.0111 to 0.0188 (g/210 L) per hour.

Table III. Elimination Rates Obtained From Regression Data

Subject	Elimination Rate g/210 L/hour
#1	0.0178
#2	0.0155
#3	0.0140
#4	0.0119
#5	0.0111 mean 0.0136 g/210 L/hr
#6	0.0188
#7	0.0178
#8	0.0156
#9	0.0150

Estimation of the Widmark Factor:

Widmark¹ expressed the volume of distribution (Vd) of alcohol in the body as the quotient between the mean alcohol concentration of the whole body and that of the blood. This quotient, known as the Widmark factor (r), can be estimated if one knows the total grams of alcohol administered to the body (A), and the grams of body mass (p) by using the value of the predicted theoretical maximum blood alcohol concentration (C_o), through the equation:

$$r = \frac{[\text{body}]}{[\text{blood}]} \quad r = \frac{A}{(C_o)(p)}$$

or $A = (C_o)(p)(r)$

This equation is valid if the total dose is absorbed instantaneously and the measured blood alcohol concentration (Ct) is equal to the predicted theoretical maximum blood alcohol concentration (C_o). In reality though, the process of absorption requires time during which a portion of the alcohol will be eliminated and the measured Ct will be lower than the C_o maximum. The point where the extended regression line intersects the y-axis represents the theoretical maximum BrAC that would be present if the entire amount of alcohol had been absorbed without any loss due to elimination (Fig. 2). By using the equation of the regression line established from the post-absorption data, the theoretical C_o can be obtained by setting the time (x) to zero by which the concentration (C_o) will be equal to the y-intercept:

$$y = mx + b \quad y = m(0) + b \quad y = b$$

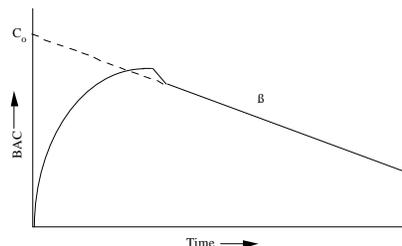


Fig. 2 Theoretical Max. Blood Alcohol C_o

An alternative method to determine the theoretical maximum alcohol concentration for use in calculating the Widmark factor (r) is to add the amount of alcohol eliminated, calculated from the elimination rate (β), to the amount of alcohol still in the blood, measured by the BrAC. The estimation of the Widmark ratio is represented by the same formula whether the curve is for single dose administration or a cumulative curve from intermittent ingestion of alcohol. The measured BrAC at time (t) is represented by Ct and the amount of alcohol eliminated represented by (β)(t):

$$A = p r (Ct + \beta t) \quad r = \frac{A}{p (Ct + \beta t)}$$

Both methods were used to estimate Widmark factors for the four subjects that exhibited complete regression line data in the post-absorption phase. The results are tabulated in Table IV. The theoretical maximum BrACs showed good agreement between the y-intercepts (C_o) of the regression line data, and the summation of measured BrAC and eliminated alcohol (C_s). The subsequent calculated Widmark factors (r_o and r_s) also agreed well. The Widmark factors ranged from 0.58 to 0.66 for the three female and 0.63 for the single male subjects. The above values were in agreement with the range of 0.5 to 0.9 as reported by Schwarz². It should be noted that typically, the subjects used in determining Widmark factors are normally in a fasting state, have reached a higher BrAC, and are in their early twenties. The body weights of each subject used in the calculations were independently confirmed prior to the start of the drinking laboratory.

Table IV. Theoretical Max. BrAC, C_o , C_s and Estimated Widmark Factors r_o , r_s

Subject	C_o	r_o	C_s	r_s
#1 M	0.223	0.63	0.222	0.63
#6 F	0.219	0.58	0.217	0.58
#7 F	0.126	0.66	0.125	0.66
#9 F	0.087	0.59	0.087	0.59

C_o , r_o - Theoretical maximum BrAC and Widmark factors obtained from the y-intercept of the regression line.

C_s , r_s - Theoretical maximum BrAC obtained through summation of measured Ct and (β)(t).

Conclusion:

The social drinking pattern is the real-world scenario usually faced by the forensic toxicologist when testifying as an expert witness. This study has demonstrated that during social drinking the subjects chose to drink at an average of 33 minute interval. The calculated elimination rates ranged from 0.011 to 0.188 g/210 L per hour. For the four subjects with complete tri-phasic BrAC curves, the estimated theoretical maximum blood alcohol concentration (C_o), and Widmark factors (r_o) estimated from the extension of the regression line through the y-intercept were in good agreement with the theoretical values (C_s) and (r_s) calculated from the summation of the measured BrAC and the amount of alcohol eliminated (β)(t).

SUNSHINE / RIEDERS SILENT AUCTION A HUGE SUCCESS



Irving Sunshine, Ph.D., DABFT

Two of the great founders and illustrious leaders of forensic toxicology passed away this year: Dr. Fredric Rieders and Dr. Irving Sunshine. In honor of these very beloved individuals, Bunnie Gallagher of Shamrock Glass initiated a benefit, and with the help of Lisa O'Dell and many others, the Sunshine/Rieders Silent Auction was held at this year's SOFT meeting. Our ever generous exhibitors donated a wide variety of spectacular items which included custom made jewelry, iPods, a car GPS unit, DVD players, a SONY Playstation, an Xbox 360, wine, chocolate, SOFT merchandise, kitchen items, kid's toys, gift cards and many other items. The hugely successful event was very emotional and well received. In fact, \$5110 was raised!

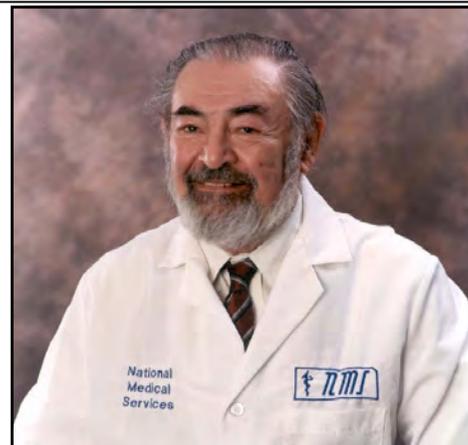
Fifty percent of the proceeds allocated on behalf of Dr. Sunshine have been placed into SOFT's Educational Research Award (ERA) fund specifically in Dr. Sunshine's name. They will be used along with existing funds for recognition of worthy students and researchers involved in academic training and research in areas related to forensic toxicology. These annual awards are used to assist awardees with

travel and expenses to attend the annual SOFT meeting for the purpose of making a platform presentation of their research findings.

The other half of the proceeds allocated on behalf of Dr. Fredric Rieders will go to Fredric Rieders Family Renaissance Foundation. The Foundation was established by Dr. Rieders in 1994 as a non-profit organization dedicated to fostering the love for science and art in students young and old. The Foundation focuses on teaching through research, academic instruction and supporting scientific and humanistic endeavors. The operational facility provides an academic milieu and an experimental laboratory that is overseen by experts in various fields. Extramural activities supported by the Foundation include: grants for research projects at local universities, funding the publication of books, sponsoring colloquia and monthly seminars, development of scientific software and participation in a program which provides high school students with an opportunity to work in a laboratory setting on a research project. Michael Rieders has indicated that he hopes to see the Silent Auction funds utilized to fund Foundation students at SOFT meetings. To learn more about the important missions and goals of the Fredric Rieders Family Renaissance Foundation, go to www.frfoundation.org.

In addition, SOFT would like to recognize the generous contributions to the Silent Auction by:

Acro Biotech
Agilent Technologies
American Solutions for Business
Andwin Scientific
Axiom Diagnostics
Biochemical Diagnostics
Branan Medical Corporation
Capitol Vial
Cerilliant Corporation
ChemWare, Inc.
Common Cents System
Full Spectrum Analytics
GRACE Davison Discovery Sciences



Fredric Rieders, Ph.D., DABFT

International Diagnostic Systems
Journal of Analytical Toxicology

Lisa O'Dell & Bart Stites

Microgenics Corporation

Neogen Corporation

NMS Labs

Orochem Technologies

Orasure Technologies

Ray & Kay O'Dell

Restek Corporation

Roche Diagnostics Corporation

SGE, Inc.

Shamrock Glass Company

Shimadzu Scientific Instruments

Thermo Electron

United Chemical Technologies, Inc.

UTAK Labs, Inc.

Varian, Inc.

Venture Labs, Inc.

Waters Corporation

Our deepest thanks go out to these openhearted companies.

These extraordinary gentlemen will long be remembered for their contributions to the field of forensic toxicology.

S.O.F.T. 2006 FUN RUN/WALK

Submitted by

Vickie W. Watts, Fun Run Coordinator

The Fun Run/Walk was an adventure to remember as the group of 60 walked or ran along the Austin Town Lake Trail in the early dawn hours on the morning of October 5th right under the Congress Street Bridge as the estimated 1.5 million bats returned from their nightly patrol. All participants received the 2006 classic Run/Walk shirt and, for the first time, a classy SOFT logo pedometer. Sponsorship for the Fun Run/Walk was received by Cerilliant Corporation, OraSure Technologies, Quality Assurance Service, Shamrock Glass Company and Agilent Technologies. The 1st place runner this year was Mark Roberts from Waters Corp. who received a digital heart monitor, which was graciously supplied by Agilent Technologies in support of the Fun Run/Walk. Our hats go off to the dedicated participants and to the generous sponsors of this highly coveted event.



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AUSTIN MEETING EXHIBITORS & SPONSORS

Submitted by Lisa O'Dell, S.O.F.T. Exhibit Coordinator

A total of 66 different companies exhibited at and sponsored the SOFT Annual Meeting in Austin. Many thanks are extended to the companies as well as to the attendees for welcoming them with such warmth and friendship. The superior quality of SOFT meetings continues to be the biggest draw for exhibitors. In fact, many say our meeting is the best one they attend during the year.

This remarkable list of companies supported SOFT at this year's meeting by exhibiting, sponsoring and advertising. As you know, their financial assistance is vital to the continued success of our annual meetings. Please take a moment to recognize the many companies for their support of our organization through their enduring commitment year after year. Truly, it is an extraordinary list.

Acro Biotech
Agilent Technologies
Alternative Biomedical Solutions
American Solutions for Business
Andwin Scientific
Applied Biosystems
Axiom Diagnostics
Biochemical Diagnostics
BioMed Resource
Biotage
Branan Medical Corporation
Campbell Science Corporation
Capitol Vial, Inc.
Cerilliant Corporation
ChemWare

CMI
Common Cents Systems
Dade Behring
Data Unlimited International
domnick hunter
Dynex Technologies
Eccotrax
Excalibur Lab Specialists
Express Diagnostics International
Forensic Magazine
Full Spectrum Analytics
GBF
GERSTEL
GRACE Davison Discovery Sciences
Humana Press
Immunalysis Corporation
International Diagnostic Systems
JEOL USA
Journal of Analytical Toxicology
Lin-Zhi International
Lipomed
Lynn Peavey Company
Microgenics Corporation
MicroLiter Analytical Supplies
Neogen Corporation
NMS Labs
OraSure Technologies
Orochem Technologies
Perkin Elmer Life and Analytical Sciences
Quality Assurance Service
Randox Laboratories
Regis Technologies
Restek Corporation
Roche Diagnostics
Rudolph Research Analytical
Sciteck Diagnostics
Shamrock Glass Company
Shimadzu Scientific Instruments
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Teledyne Tekmar
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Venture Labs
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WELCOME TO THE SOFT 2007 ANNUAL MEETING RALEIGH / DURHAM / CHAPEL HILL, NC

October 15-19, 2007

Welcome back to the Raleigh-Durham-Chapel Hill area, the venue of the first SOFT meeting after official incorporation in 1974 when membership was approximately fifty members strong. Since then, much development has occurred, both in the field of forensic toxicology and geographically. In 2006, this area received accolades from Money and Forbes magazines, among others, to include "Best Place for Business and Careers", "Most Wired City", and "Best Places to Live". The meeting will be held during the week of October 15-19, 2007 at the Sheraton Imperial Hotel,

which is only a 3-point shot away from RDU International Airport. The area has much to offer by way of history and academia since it was once home to the tobacco industry and is still home to the esteemed Duke University, University of North Carolina, and North Carolina State University. Our meeting location is right in the center of Research Triangle Park, an almost 3600 acre public/private, planned research park established in 1959 by leaders from business, academia and industry. We are also located within three hours of the beautiful Blue Ridge Mountains, and the wonderful Outer Banks coastal area where the Wright

Brothers did something important. The hotel will provide shuttles to nearby areas, including shopping malls and downtown Durham where you will find marvelous restaurants and more. The meeting will include a welcome reception, a night at the historic tobacco district where you will be entertained with live music and a chance to dance, plus a formal dinner with a unique after-dinner show for your amusement. Of course, the reason you are all coming—a fantastic scientific program.

HOTEL ACCOMMODATIONS

The 2007 meeting will be held at the **Sheraton Imperial Hotel & Convention Center** where the group rate is \$115 per night. The hotel is located at 4700 Emperor Blvd., Durham, NC 27703. The Sheraton Imperial provides complimentary scheduled shuttle service to and from the airport which is 4 miles from the hotel.

Attendees can access the hotel using the following website for additional meeting information, to book, modify, or cancel reservations:

<http://www.starwoodmeeting.com/StarGroupsWeb/res?id=0610275106&key=91838>



Sheraton Imperial Hotel / Convention Center
4700 Emperor Blvd., Durham, NC 27703
Tele: 919-941-5050
Max. Temp. = 72° F / 22° C
Min. Temp. = 48° F / 8° C

Alternate accommodations can also be made at two other nearby hotels at the same group rate (\$115):

Comfort Inn Suites 919-314-1200
Springhill Suites by Marriott 919-998-9500

EXPLORE THE TRIANGLE

Golf - There are over 20 local spectacular golf courses to select from. For more information visit these informative websites:

<http://www.triangleteetimes.com/> or
<http://www.sheratonrtp.com/golf.html>

NC State Fair - You want what deep fried? You name it and chances are you'll find it deep fried at the NC State Fair. Located just 10 minutes away from the hotel. For more info see the website:

<http://www.ncstatefair.org/2006/>

Wildlife & Nature - Do you want to see a Bald Eagle? Maybe you just want to take a hike and see the beautiful changing colors of the leaves. Then Jordan Lake is the place you'll want to be. Located just 35 minutes from the hotel, you are also welcome to wet a line there. For more info see the website:

<http://ils.unc.edu/parkproject/visit/jord/home.html>

The Sarah P. Duke Gardens, on Duke University Campus, offers 55 acres of landscaped and woodland gardens with more than 2,000 kinds of plants and 5 miles of beautiful pathways. For more information, visit the website:

http://www.durham-nc.com/things/nature_places.php

There is also Duke Lemur Center, home to 250 prosimian primates (<http://lemur.duke.edu/>), the Carnivore Preservation Trust, a wildlife sanctuary (<http://www.cptigers.org/default.asp>), and the North Carolina Zoo (<http://www.nczoo.org/>).

Nightlife - Franklin Street, Ninth Street, Downtown Raleigh. If nightlife is your thing, then head to one of the cities that form the Triangle and enjoy!

Education & the Arts - The Triangle area has many museums in which you can while away the time. The North Carolina Museum of Natural Sciences, the North Carolina Museum of Art, Exploris, the North Carolina Museum of Life and Science, the North Carolina Museum of History, and the Morehead Planetarium and Science Center.

Historic - North Carolina is rich in history. Depending on your travel schedule you can visit renowned university campuses of Duke, UNC, and NC State; see what it was like to live and work in past times by visiting Old Winston-Salem, Biltmore Estates, or the unique American Tobacco Historic District. In addition, the State Capitol of Raleigh can be toured by trolley or by foot, both guided and unguided. If you tend to like the road less traveled, you may wish to see the Galloway cows grazing at Fearington Village, find the historic mill town of Bynum (home of folk artist Clyde Jones), visit Seagrove for its Carolina pottery, or visit the heart of North Carolina wine country in Yadkin Valley. All are a refreshing "must see" on any visit to the Triangle.

Airport - Raleigh Durham International Airport is approximately 4 miles from the hotel. The Sheraton Imperial Hotel provides complimentary scheduled shuttle service to and from the airport.



SOFT 2007 ANNUAL MEETING RALEIGH-DURHAM-CHAPEL HILL

October 15 – 19, 2007

Co-Hosts: Jeri Roper-Miller / Ruth Winecker
Site: Sheraton Imperial Hotel, Durham, North Carolina



PRELIMINARY PROGRAM

Sunday, October 14, 2007

- Satellite Organization Meetings
- Registration Opens (2:00 pm—6:00 pm)
- NLCP Inspector Training (2:00 pm—6:00 pm)

Monday, October 15, 2007

- Continental Breakfast (7:00 am—8:30 am)
- Registration (7:00 am—6:00 pm)
- Workshops (8:00 am—5:00 pm)
- SOFT Student Enrichment Program (8:00 am—5:00 pm)
- Board Meetings, Committee Meetings, Exams
- Dinner—on your own



Tuesday, October 16, 2007

- Continental Breakfast (7:00 am—8:30 am)
- Registration (7:00 am—6:00 pm)
- Workshops (8:00 am—5:00 pm)
- Board Meetings, Committee Meetings, Exams
- Exhibits Set-up (12:00 noon—5:00 pm)
- Exhibits Open (6:30 pm—8:00 pm)
- Welcoming Reception in Exhibit Hall (6:30 pm—8:00 pm)
- Elmer Gordon Forum (8:00 pm—10:00 pm)
- Nite Owl Reception (10:30 pm—12:30 am)

Wednesday, October 17, 2007

- Continental Breakfast (7:00 am—8:30 am)
- Registration (7:30 am—5:30 pm)
- Exhibits Open (9:30 am—3:30 pm)
- Scientific Session (8:30 am—10:00 am)
- Poster Session 10:30 am—12:00 noon
- Lunch w/ Exhibitors (12:00 noon—1:30 pm)
- Scientific Session (1:30 pm—3:00 pm)
- SOFT Business Meeting (3:30 pm—5:00 pm)
- Exhibitor's Happy Hour (5:00 pm—6:30 pm)
- Historic Tobacco Evening Dinner and Dance (6:30 pm—10:30 pm)

Thursday, October 18, 2007

- SOFT Fun Run/Walk (6:30 am—8:00 am)
- Continental Breakfast (7:00 am—8:30 am)
- Registration (7:00 am—5:00 pm)
- Exhibitor Feedback Mtg. (8:00 am—9:30 am)
- Exhibits Open (9:30 am—1:30 pm)
- Scientific Session (8:30 am—10:00 am)
- Poster Session (10:30 am—12:00 noon)
- Lunch w/ Exhibitors (12:00 noon—1:30 pm)
- Exhibits Breakdown (1:30 pm—3:30 pm)
- Scientific Session (1:30 pm—3:00 pm)
- Poster Session (3:30 pm—5:00 pm)
- President's Reception (6:30 pm—10:30 pm)

Friday, October 19, 2007

- Continental Breakfast (7:30 am—9:00 am)
- Closing Scientific Session (9:00 am—11:00 am)
- NSC Executive Board (11:30 am—1:30 pm)

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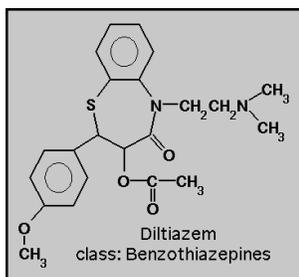
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CASE NOTES: #1

POST MORTEM DETECTION OF DILTIAZEM (CARDIZEM®) IN INDIVIDUALS ABUSING COCAINE

Timothy Hahn, B.S., Joseph Avella, M.S., FTS-ABFT, Michael Lehrer, Ph.D., Department of Forensic Toxicology, Division of Medical-Legal and Forensic Investigations, Suffolk County, NY (timothy.hahn@suffolkcountyny.gov)

Diltiazem (Cardizem®, Biovail Corporation) is intended for the treatment of angina and hypertension through a calcium channel blocking activity in cardiac and smooth muscle. In the past six months, our laboratory has encountered four post-mortem cases in which diltiazem was detected in individuals with no clinical history or evidence suggesting the use of this cardiac-related drug. The decedents ranged between 18 - 45 years of age; the cause of death in 3 of the 4 cases was blunt force trauma related to a motor vehicle accident. The fourth individual's death was drug related excluding the diltiazem. A common factor associated with these cases was the detection of either cocaine or the metabolite benzoylecgonine in autopsy specimens. A literature search led to the discovery of



two *DEA Microgram Bulletins* dated August 2004 and January 2005 describing the association of cocaine with diltiazem and a possible relationship to these four cases. The DEA Cocaine Signature Program at the Special Testing and Research Laboratory detected the presence of diltiazem hydrochloride in cocaine shipments seized upon entry into the United States (1, 2). The shipments seized contained between 8 - 20 percent diltiazem in relation to the cocaine base. We believe that our detection of diltiazem in the cases outlined below is directly related to the use of the drug as a cutting agent during the cocaine manufacturing process, as evident by the DEA cocaine seizures.

The following cases were examined for this possible relationship between the detection of diltiazem and cocaine use:

Case 1. An 18-y-o female passenger was pronounced dead following her ejection during a single vehicle motor vehicle acci-

dent. The cause of death was blunt force trauma including alanto-occipital disarticulation and internal hemorrhaging. She had a history of mild depression and was being treated with Wellbutrin. The family describes a history of smoking and social ethanol use. The motor vehicle operator was charged with DWI.

Case 2. A 41-y-o male was found dead in a locked bedroom following a lengthy domestic abuse situation. He had a history of bipolar disorder with alcohol, prescription drug and crack cocaine abuse. Previous medications included Paxil and Oxycodone. Findings at autopsy showed slight decompositional changes with no gross pathologic abnormalities. The cause of death is pending full toxicology results.

Case 3. A 23-y-o male passenger was pronounced dead following a single motor vehicle accident with a telephone pole during a police pursuit. The cause of death was attributed to blunt force trauma including skull fractures and brain lacerations. No previous clinical or social history was available. The driver was charged with DWI.

Case 4. A 43-y-o male was discovered dead in the passenger seat of a motor vehicle that collided with a light pole. The driver was not present at the scene. The

cause of death was determined to be blunt force trauma including multiple organ lacerations and cervical dislocation. This individual had a clinical history of non-insulin dependent diabetes mellitus with non-compliance of treatment and abuse of tobacco and ethanol. The driver was charged with leaving the scene and DWI.

For each case, a drugs of abuse immunoassay screen of blood or urine specimens was positive for benzoylecgonine. A basic drug screen of liver specimens, utilizing a liquid/liquid extraction with GC/MS analysis, showed the presence of cocaine and/or co-caethylene. An additional peak was identified in each case as diltiazem via a mass spectral library match. Further quantitation of cocaine and benzoylecgonine by GC/MS confirmed the use of cocaine by each individual, as shown in the table below. To confirm the presence of diltiazem in each case, drug levels were quantitated in blood and/or urine specimens utilizing GC/MS analysis in the single ion-monitoring mode. The results for all four cases are listed below:

**Send your Case Notes to Section Editor,
Matthew Barnhill, Ph.D. at
mbarnhilljr@worldnet.att.net**

Case	Cocaine (mg/L)		Benzoylecgonine (mg/L)		Diltiazem (mg/L)	
	Sample	Concentration	Sample	Concentration	Sample	Concentration
1	Chest Blood	ND	Chest Blood	1.4	Chest Blood	<0.1
	Urine	1.6	Urine	19.5	Urine	0.6
					Liver	Detected
2	Heart Blood	ND	Heart Blood	1.5	Heart Blood	ND
					Liver	Detected
3	Femoral Blood	0.08	Femoral Blood	0.3	Femoral Blood	<0.1
	Urine	21.9	Urine	23.3	Urine	1.7
					Liver	Detected
4	Femoral Blood	<0.05	Femoral Blood	<0.1	Femoral Blood	<0.1
	Urine	2.3	Urine	1.5	Urine	0.3
					Liver	Detected

CASE NOTES: #1 (CONTINUED)

In the cases described above, the presence of diltiazem in each individual did not contribute to the cause of death. Baselt noted that following a 120 mg dose of diltiazem, blood levels ranged between 98-304 µg/L (3). At the sub-therapeutic levels we obtained in the blood, it can be assumed that no harmful pharmacological effect was delivered by the drug. However, with a large dosage of cocaine adulterated with diltiazem, the levels attained and effects are unknown given the variability in the illicit cocaine production process. In a controlled study involving the administration of diltiazem to healthy individuals (4), no specific physiological effects were noted. With a co-administration of cocaine and diltiazem,

the stimulatory response from cocaine use (hypertension, tachycardia, pupil dilation) was unchanged, while skin temperature did not rise as rapidly. An additional study investigating the effects of diltiazem in cocaine-sensitized rats demonstrated a blocking of the psycho stimulatory response via the inhibition of a calcium channel dependent dopamine release mechanism in the brain (5). In rats not sensitized to cocaine there was no appreciable response with the injection of diltiazem.

Although the diltiazem in these cases exhibited no detrimental toxicological effect, it is unknown what consequences this drug mixture would produce in a cardiac compromised individual or in those individuals addicted to cocaine. Adverse drug interactions due to the combination of therapeutic drugs and illicit compounds largely have not been investigated and have the potential to be extremely life threatening. This has been demonstrated by recent reports of heroin being combined with fentanyl, resulting in the sharp rise of overdoses related to this combination (6). These cases demonstrate the vigilance in drug detection and thorough case investigations that toxicology laboratories must maintain in an ever-changing environment.

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1. **DEA Microgram Bulletin.** Intelligence Alert. *Diltiazem, Hydroxyzine and Methylephedrine Identified In Separate Shipments of Cocaine.* August 2004. Vol. XXXVII, No. 8.
2. **DEA Microgram Bulletin.** Intelligence Alert. *Cocaine Containing Diltiazem on the West Coast.* January 2005. Vol. XXXVIII, No. 1.
3. R.C. Baselt. **Disposition of Toxic Drugs and Chemicals in Man**, 5th ed. Biomedical Publications, Foster City, CA, 2002, pp 523-527.
4. Rowbotham MC, Hooker WD, Mendelson J, Jones RT. *Cocaine-Calcium Channel Antagonist Interactions. Psychopharmacology.* 1987; 93(2):152-4.
5. Pierce RC, Quick E, Reeder D, Morgan Z, Kalivas P. *Calcium-Mediated Second Messengers Modulate the Expression of Behavioral Response to Cocaine. Journal of Pharmacology & Experimental Therapeutics.* 1998; 286(3): 1171-76.
6. Associated Press. *A Deadly Heroin Mixture Is Claiming Dozens of Lives. New York Times.* 28 May 2006, late ed.: 27.

CASE NOTES: #2

OXYCONTIN “GHOST PILL” IN A HOSPITAL FATALITY

Douglas E. Rohde, M.S., Lake County Crime Laboratory, Painesville, OH 44077

Case History: The decedent was a 53-y-o female admitted to the hospital ICU after being found at home alone and comatose. She expired two days later. It was thought she might have suffered a cardiac event or a seizure, or possibly a drug overdose. She had a history of seizures and chronic pain. Known medications included morphine sulfate, Oxycontin (oxycodone), Vicodin (hydrocodone) and phenobarbital. She used a morphine pump into the spinal canal (1.5 mg/day), but the pump had been discontinued earlier in the week.

Analytical: Postmortem and antemortem blood samples, along with CSF and gastric contents were submitted for toxicological analysis. Results were as follows:

Antemortem Blood

Oxycodone, 0.11 mg/L
Hydrocodone, 49 mg/L

Postmortem Blood

Dihydrocodeine, positive
Phenobarbital, 6.7 mg/L

CSF

Dihydrocodeine, 21 ng/ml



Two intact tablets were found in the stomach during autopsy that were identified by logo as oxycontin; however, analysis by GC/MS failed to detect any oxycodone in the tablets. The concept of a “ghost pill” was described by Dan Anderson in *JAT*, Vol 26, No 7, October 2002.

The coroner ruled the death natural/seizure disorder.

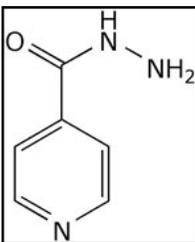
CASE NOTES: #3

ISONIAZID FINDING IN A POSTMORTEM CASE

*George F. Jackson, S. Diaconescu,
E.H.A. Institute of Forensic Science, State Toxicology Laboratory, Newark, NJ*



Isoniazid is an isonicotinic acid derivative used in the treatment of mycobacterial and latent tuberculosis infections. It is readily absorbed and widely distributed into body tissues and fluids. Isoniazid mechanism of action is concentration dependent. Gastrointestinal disturbances, CNS depression, sei-



zures and coma have been reported following over dosage with Isoniazid. We present a case of an 18 year old female who was prescribed isoniazid for treatment of tuberculosis. Autopsy did not reveal any anatomical cause of death. No active disease process of lung, liver or heart was noted at autopsy and cause of death was exclusive of any disease. All specimens submitted to the laboratory from the medical examiners office were subject to standard analytical screening

and confirmation protocols. Based on the scene investigation of the case, isoniazid analysis was performed on all submitted tissues. Isoniazid was extracted, derivatized and quantitated by gas chromatography – mass spectrometry. The results of the analysis were as follows: femoral blood – 53.4 mg/L, liver – 26.8 mg/Kg, urine – 170 mg/L, and kidney – 10.4 mg/Kg. No other therapeutic drugs were detected in the analysis.

CASE NOTES: #4

Accidental Deaths in a Cannabinoid Positive Driver and Passenger

Robert D. Williams, Ph.D., College of Medicine and School of Public Health, The Ohio State University, Columbus, Ohio

Introduction: Delta 9-tetrahydrocannabinol (THC) is a potent psychoactive ingredient within the cannabinoid family of compounds found in the plant *Cannabis sativa* more commonly referred to as marijuana. THC interacts with endogenous systems that are teleologically traceable over millions of years (1). After administration, differential distribution in the brain includes concentrations reaching the limbic, sensory, and motor areas (2). THC binds to specific brain receptors causing impairment of psychomotor functioning. G-protein coupled cannabinoid CB₁ receptors are ubiquitous in the central nervous system and are also found in some peripheral tissues. CB₁ receptors affect multiple signal transduction pathways (3). THC modulates neurotransmission through CB₁ receptors by inhibiting adenylate cyclase, inhibiting calcium channels, activating protein kinase, and stimulating potassium channels.



Case History: A 19-year-old male driver accompanied by his 22 year-old wife were traveling on a dry 2-lane asphalt roadway en route to their home about two blocks away during a clear sunny day. The driver stopped at an intersection marked by stop and railroad crossing signs, then turned right and proceeded almost immediately onto the tracks, although flashers were engaged warning of an oncoming train. Prior to approaching the intersection, the train's engineer rang the bell, blew the whistle, and observed the vehicle hesitate on the tracks. He proceeded to put the train into an emergency stop. Witnesses in vehicles at the scene yielding the right-of-way confirmed hearing the whistle before the train approached the intersection, observed the train lights, and felt the rumble of the tracks. The train consisting of 2 locomotives with 72 cars estimated at a weight of 3000 tons and length of approximately 3600 feet collided with the vehicle at 38 mph. The collision led to the driver and passenger's demise from associated injuries.

the Franklin County Ohio Coroner's Office to comprehensive analysis. The presence of THC at a concentration of 2.2 ng/ml was discovered. The blood was negative for ethanol and other analytes. The General Assembly of the State of Ohio recently enacted legislation of a per se level for operating a vehicle while under the influence of marijuana at ≥ 2.0 ng/ml in whole blood, blood serum or plasma.

References:

1. De Petrocellis L, Melck D, Bisogno T, et al. Finding of the endocannabinoid signaling system in Hydra, a very primitive organism: possible role in the feeding response. *Neuroscience* 1999; 92 (1): 377-87.
2. Pertwee R. In vivo interactions between psychotropic cannabinoids and other drugs involving central and peripheral neurochemical mediators. In: Myrphy L, Bartke A, editors. *Marijuana/cannabinoids: neurobiology and neurophysiology*. Boca Raton (FL):CRC Press, 1992:165-218.
3. Ameri A. The effects of cannabinoids on the brain. *Progress in Neurobiology* 1999; 58: 315-348.

Send your Case Notes to Section Editor, Matthew Barnhill, Ph.D. at mbarnhilljr@worldnet.att.net

Results and Discussion: The Forensic Toxicology Division subjected blood obtained from the driver at autopsy within

CASE NOTES: #5

A DUI Case Involving Alcohol, Triazolam (Halcion®), and Bupropion (Wellbutrin®)

A. Gallegos, J. Musselman, Phoenix Police Department Laboratory Services Bureau, 620 W. Washington, Phoenix, AZ 85003.

At 1530 hours an officer contacted a confused driver who was initially reported to the Phoenix Police Department by an alarmed citizen who witnessed a driver striking a curb and continuing to drive on a flat front tire in a dirt lot. Upon contact, the 59 year-old male suspect told the officer that he had gotten lost on the way home from getting something to eat and ended up stuck in the dirt lot. The driver admitted to drinking approximately 5 beers from 1000 to 1400 hours, taking 25mg Halcion the night before at 2100 hours, and taking 100mg Wellbutrin that morning at 0500 hours. The driver was confused about the date and day of the week, responding that it was 5/24 rather than 5/30 and that it was Friday rather than Tuesday. After administering field sobriety tests the officer concluded that the suspect displayed signs and symptoms of impairment and subsequently performed a breath test on an Intoxilyzer 5000 with results of 0.026 and

0.025 g/210L breath at 1710 and 1717 hours. A DRE was called to evaluate the driver since his breath alcohol concentration did not correspond to the level of impairment that he exhibited.

The DRE made the following observations and remarks in his report: Upon contact the driver was slumped over, had poor coordination, flushed face, bloodshot/watery eyes, and slow/slurred speech. During the *Rhomberg Modified* the subject exhibited a heavy circular sway, eyelid tremors, and estimated 85 seconds as 30. The Walk and Turn, One Leg Stand, and Finger to Nose were all not administered for safety of the subject. The suspect also exhibited 6 cues of HGN with an angle of onset at 30 degrees, and his pupils were slow to react to light. The suspect also told the DRE that he was partially paralyzed on the right side and was taking Halcion as a sleeping pill every night at 2100 hours. It was the opinion of the

DRE that the suspect was under the influence of CNS Depressants and a urine sample was collected for analysis.

The initial urine drug screen by EMIT was positive for benzodiazepines and a Toxi-A screen indicated the presence of hydroxybupropion; a general liquid/liquid extraction confirmed the presence of hydroxybupropion. A GC/MS SIM method was used to determine the benzodiazepines that were present in the urine sample. The result of this confirmation method was alpha-hydroxytriazolam (690 ng/mL). Triazolam has been deemed safe by the FDA when used at lower doses, but it has been banned in the UK since 1991. The benzodiazepine method used at the time of the analysis included 3 deuterated internal standards and 14 benzodiazepines as shown in *Table 1* below. *Table 1* includes data from all urine cases from 2003 to present where benzodiazepines were confirmed.

Table 1

BENZODIAZEPINES	# of CASES	RANGE (ng/mL)	AVERAGE (ng/mL)
<i>d5-Oxazepam</i>			
Desalkylflurazepam	1	370	370
Nordiazepam	58	47-1900	500
Oxazepam	107	45-39000	2300
Diazepam	2	55-65	60
Lorazepam	30	33-120000	1400
N-Desmethylflunitrazepam	0	n/a	n/a
Temazepam	96	19-120000	3600
2-Hydroxyethylflurazepam	0	n/a	n/a
<i>d4-Aminoclonazepam</i>			
7-Aminoclonazepam	51	39-12000	1500
7-Aminoflunitrazepam	0	n/a	n/a
<i>d5-Alpha-Hydroxyalprazolam</i>			
Alpha-Hydroxymidazolam	20	72-5500	920
Alprazolam	45	50-2000	100
Alpha-Hydroxyalprazolam	73	26-2500	420
Alpha-Hydroxytriazolam	1	690	690



*Since the analysis in this case was performed, *d4-Desmethylflunitrazepam* has been added as an additional internal standard.

DRUGS IN THE NEWS

BY DWAIN FULLER, B.S., D-FTCB, TC-NRCC

Buprenorphine Making Inroads in Opiate Addiction Therapy

Buprenorphine is being heralded by the media as a great new weapon in the treatment of opiate addicts.¹ The popularity of buprenorphine as an alternative to conventional methadone treatment for opiate addiction is being driven by a number of factors, not the least of which is an astounding increase in the number of methadone related deaths being reported as methadone has found increased use as a pain management drug.

Data from MedWatch – the FDA’s Safety Information and Adverse Event Reporting Program – indicate that, from 1970 through 2002, 1,114 cases of methadone-associated deaths were reported. Remarkably, a greater number of methadone-associated deaths were reported in 2001 alone than during the entire period from 1990 through 1999. This number doubled again in 2002. In North Carolina, the number of deaths associated with methadone increased five-fold from 1997 through May 2001.² It is quite possible that those using the drug for pain management as well as novice abusers, may be increasing their dosing much more rapidly than they are developing tolerance to the drug. This is exacerbated by a build-up of drug in their system due to methadone’s long half-life, reported to be 15-55 hrs.³



Proponents of buprenorphine as an opiate replacement drug cite evidence of the low abuse potential of the drug. Buprenorphine is derived from thebaine as is oxycodone. Buprenorphine is a partial agonist and therefore can produce the euphoria, analgesia, and sedation associated with opiates. However, while buprenorphine stimulates the same brain receptors as full opiate agonists such as heroin and morphine, buprenorphine produces a lesser degree of sedation and respiratory depression than those drugs and causes no significant impairment of cognitive or motor skills. Buprenorphine is also reported to have a “ceiling effect” whereby increased doses of the drug do not produce increased effects after a certain point, or ceiling. In fact, high doses of the drug can actually precipitate with-

drawal symptoms in opiate addicted individuals. As a result, buprenorphine is not as effective as methadone in treating severely opiate-addicted individuals who require larger doses of opiates in order to maintain treatment therapy.

There are further advantages of buprenorphine in opiate addiction therapy. Unlike methadone, it can be prescribed by a local doctor and obtained from a local pharmacy, providing patients easy access to treatment. Because patients can visit their local doctors, buprenorphine therapy is far more discreet, making it preferable for many patients who must deal with the stigma attached to making daily trips to a methadone clinic. This treatment option also is more convenient than methadone therapy for many abusers who would otherwise have to drive long distances each day to obtain methadone. Further, buprenorphine therapy can provide treatment in rural areas with inadequate access to treatment and in areas where methadone clinics have reached full capacity.⁴

Because buprenorphine use can produce euphoric effects it is not, however, without potential for abuse. Buprenorphine was first introduced to Ireland in 1980 and the first case of its abuse presented to the National Drug Advisory and Treatment Centre in February 1986. Buprenorphine is now established as a major drug of abuse among Dublin’s opiate addicts and its abuse is becoming increasingly common. It should be noted, however, that buprenorphine is rarely the preferred drug of opiate abusers. It is often used to prevent withdrawal symptoms when heroin is unavailable.⁵ Of course one may wish to view this last piece of information as a resounding endorsement of buprenorphine in addiction treatment. Addicts report a less intense euphoriant effect with buprenorphine as compared with heroin, however addicts are reportedly enhancing the euphoric effects by potentiating buprenorphine with cyclizine.⁵

As a deterrent for diversion and abuse, buprenorphine is available in a

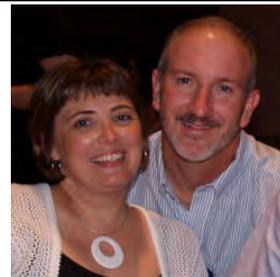
compound known as Suboxone™. Suboxone contains both buprenorphine and naloxone, an opiate antagonist.

Suboxone was designed specifically to meet FDA requirements for a more diversion-proof drug for use in opiate addiction therapy and is available only in the United States. The naloxone contained in Suboxone guards against abuse--if an abuser crushes and injects or snorts the Suboxone tablet, the naloxone in it precipitates withdrawal symptoms.⁴ When used properly, that is sublingually, however, the naloxone in Suboxone is minimally absorbed compared to the buprenorphine and has little effect on the efficacy of the drug.

Buprenorphine appears to show a great deal of promise in the treatment of opiate addiction due to its increased availability over methadone, low abuse potential, and concomitant increase in safety, especially for the naloxone-containing formulation known as Suboxone. However, as forensic toxicologists, we have heard these promises before. Only time will tell if this drug will be beneficial or simply become another abuse problem. On paper, however, buprenorphine seems to have a lot going for it.

References:

1. *Baltimore has new way to treat addicts.* Donna Leinwand, *USA Today*, 10-4-06
2. *Methadone-Associated Mortality: Report of a National Assessment.* U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Substance Abuse Treatment, Division of Pharmacological Therapies.
3. *Disposition of Toxic Drugs and Chemicals in Man*, Seventh Edition, Randall C. Baselt
4. *Intelligence Bulletin: Buprenorphine: Potential for Abuse.* National Drug Intelligence Center, Department of Justice, 2004-L0424-013, September 2004
5. J.J. O’Connor, E. Moloney, R. Travers, A. Campbell, *Buprenorphine Abuse Among Opiate Addicts*, *British Journal of Addiction*, (1988) 83, 1085-1087



2007 TIAFT/ICADTS Joint Conference, August 26-30, 2007

Plans are well under way for the 2007 TIAFT/ICADTS joint conference, T2007, to be held in Seattle, Washington, USA. The dates of the conference are August 26th-30th, 2007. This meeting will provide a spotlight on the toxicology of alcohol, drugs and traffic safety, while retaining all the normal topic areas for TIAFT and ICADTS meetings. It is also a great opportunity for North American Toxicologists to attend a TIAFT meeting in your own backyard. There likely won't be another one in the US for a few years.

The conference is being held in the Seattle Sheraton Hotel and Conference Center, a newly renovated world class meeting space. Hotel reservations at the conference rate must be booked through the T2007 web site, on the "hotel" tab at www.T2007.org. As usual, the conference is structured with a strong scientific program, supported by a strong social program for relaxation and networking that is typical of TIAFT meetings. It features receptions at the Seattle Art Museum with an extensive collection of Native American and Pacific Rim art and culture, and the Museum of Flight, one of the world's top collections showing the history

and development of human flight. The meeting will be capped off with the annual awards banquet. There will be a choice of several tours on Tuesday afternoon to satisfy the curiosity of ICADTS members about the sights and sounds of the Pacific Northwest. Preliminary information on the tour options and the rest of the program is available at www.T2007.org, and the web site will go live for online registration and online abstract submission on December 1st, 2006.

The scientific organizing committee, co-chaired by Dr. Dan Isenschmid, is soliciting papers in the subject areas of forensic toxicology, impaired driving, human performance toxicology, analytical methodology, interpretive toxicology, clinical and environmental forensic toxicology, alternative matrices, approaches to detecting drugged drivers, oral fluid technology, detection limits and device



performance, demographics of drunk and drugged drivers, roadside surveys of alcohol and drug use, and other related topics. Abstracts are due March 31st, 2007 and must be submitted online. The cut-off for the early registration rate is June 30th, 2007. So make your plans now for T2007, and visit the web site for regular updates! More information is available from T2007@wsp.wa.gov.

Exhibitors and vendors should contact Lisa O'Dell at nomadlee9@aol.com.

ABFT NEWS

Submitted by Yale Caplan, Ph.D., DABFT, President, American Board of Forensic Toxicology

FEE WAIVER PROGRAM

The application fee waiver program for new applicants for Diplomate and Forensic Toxicology Specialist will end on December 31, 2006. The response has been exceptional with over 30 new applications received.

NEW CERTIFICANTS:

Rebecca Jufer Phipps, Ph.D., DABFT
Robert W. Romberg, Ph.D., DABFT
Amy Lais, B.S., FTS-ABFT

CERTIFICATION NOW OPEN INTERNATIONALLY

ABFT certification, originally limited to the United States and Canada, has been extended internationally. This is in response to the many requests for certification from non-U.S. citizens around the world. The only restrictions are that the examination must be taken in English and taken in the United States at our designated examination sites.

14TH ANNUAL CERTIFICANT RECEPTION

The annual meeting, reception, and Certificant ceremony was held in October at the SOFT meeting in Austin. Presentations were made by Board members regarding certification and accreditation programs and comments were received from the Certificants.



Yale H. Caplan, President of the American Board of Forensic Toxicology and newly appointed Editor of ToxTalk

Article layout, digital mechanics, grammatical editing, and graphic assistance for ToxTalk provided by volunteer ASU students David Watts and Kayla Fulmer.

CALL FOR PAPERS

SOFT SPECIAL ISSUE OF JAT

By Sarah Kerrigan, Ph.D., Guest Editor

It is an honor to serve as the Guest Editor of the 27th annual SOFT Special Issue of the *Journal of Analytical Toxicology* (JAT). With each year, this job is a harder act to follow. I am hoping that with your help we can continue to make it a great success.

Manuscripts are reviewed in terms of originality, value to the field, technical content, and clarity. Complete author guidelines can be found at the JAT website (www.jatoc.com) or from their editorial office at 847-647-2900 x1302

All manuscript submissions are handled electronically through the JAT website. There will be an option in a dropdown menu for submission to the "Special Issue", so please make sure to select that option when submitting your manuscript.

The timeline for the 2007 Special Issue of JAT is as follows:

- March 5, 2007: Title and Abstract Submission Due by Email to sarah.kerrigan@earthlink.net
- March 12, 2007: Completed Manuscripts Due to Guest Editor via the JAT website
- April—May 2007: Review of Manuscripts for Acceptance / Revisions by Authors

Thank you in advance for making this a great Special Issue.

Society of Forensic Toxicologists, Inc.

S.O.F.T. Administrative Office
One Macdonald Center
1 N. Macdonald St., Suite 15
Mesa, AZ 85201

Phone: 888-866-SOFT (7638)
Fax: 480-839-9106

**E-mail: ToxTalk@soft-tox.org
Office@soft-tox.org**

ToxTalk Deadlines for Contributions:

February 1 for March Issue

May 1 for June Issue

August 1 for September Issue

November 1 for December Issue

ToxTalk is the official publication of the Society of Forensic Toxicologists, Inc., mailed quarterly (bulk mail) to its members. It is each member's responsibility to report changes of address to the SOFT Administrative Office. Non-members may receive ToxTalk for \$15 per calendar year. Checks payable to SOFT may be mailed to the SOFT Administrative Office. To submit articles or address ToxTalk issues please email to ToxTalk@soft-tox.org.

Future S.O.F.T. Meeting Info

- 2007:** Chapel Hill, NC.....Oct. 15-19, 2007..... Jeri Roper-Miller, Ruth Winecker
- 2008:** Phoenix, AZ.....Oct. 27-31, 2008.....Vickie Watts, Norman Wade
- 2009:** Oklahoma City, OK.....Oct. 18-23, 2009.....Phil Kemp
- 2010:** Richmond, VA.....Michelle Peace
- 2011:** San Francisco, CA.....Nikolas Lemos
- 2012:** Boston, MA.....Michael Wagner

2008 PHOENIX MEETING UPSIZED

The meeting location of the 2008 conference to be held in Phoenix, Arizona has been changed to accommodate our ever-expanding membership numbers. The larger venue selected is The Pointe South Mountain Resort, a luxury resort located in a desert oasis nestled at the



base of South Mountain Preserve in Arizona. The Four-Diamond Pointe South Mountain Resort welcomes guests as the premier travel destination and largest all-suite resort in Arizona (**640 spacious 2-room suites for everyone**). Pointe South Mountain Resort features some of the best amenities of any Phoenix resort including an 18-hole championship golf course, the Phantom Horse Athletic Club & Spa,

lighted tennis courts, over 60 miles of biking and horseback riding, and dining at six unique onsite restaurants. When most people see water in the desert, they are seeing a mirage, but in Phoenix when you see water, you are seeing The



Oasis Water Park at Pointe South Mountain Resort voted in the Top 10 by the Travel Channel. The SOFT-2008 attendees will soon realize this isn't your typical Phoenix hotel.

Pointe South Mountain Resort also has 117,000 sq. ft. of indoor and outdoor meeting and event space. The 20,000 sq ft Grand Ballroom exhibit hall can accommodate over 100 exhibit booths with each

booth having a spacious 10ft by 10ft set up. The 8,000 sq. ft. South Mountain Ballroom has double ceiling to floor projection screens and will accommodate the SOFT scientific sessions.



Pointe South Mountain Resort is the only Phoenix hotel to receive the **Best Guest Relations Award** from *The American Hotel & Lodging Association* for **SURGE**, a program created to ensure a "Super Ultimate Resort Guest Experience."

We're on the Web!
www.soft-tox.org

2007 S.O.F.T. OFFICERS & COMMITTEE CHAIRS

President - Diana Wilkins, Ph.D.

V. President - Christine Moore, Ph.D., DABCC

Secretary - Anthony Costantino, Ph.D., DABFT

Treasurer - Bradford Hepler, Ph.D., DABFT

Directors -

Philip Kemp, Ph.D., DABFT

Barry Logan, Ph.D. DABFT

Ashraf Mozayani, Ph.D. DABFT

Marc LeBeau, Ph.D.

Sarah Kerrigan, Ph.D.

Any S.O.F.T. member interested in serving on a committee should contact the S.O.F.T. President or the Committee Chair.

Committee

- Nominating.....Timothy Rohrig, Ph.D., DABFT
- Membership.....Anthony Costantino, Ph.D., DABFT
- Budget, Finance, and Audit.....Robert Turk, Ph.D., DABFT
- ToxTalk Editor.....Yale Caplan, Ph.D., DABFT
- ByLaws.....Yale Caplan, Ph.D., DABFT
- Publications (JAT Special Issue)Sarah Kerrigan, Ph.D.
- Awards.....Philip Kemp, Ph.D., DABFT
- Drugs & Driving.....Sarah Kerrigan, Ph.D.
- Meeting Resource.....Christine Moore, Ph.D., DABCC
- Laboratory Guidelines.....W. Lee Hearn, Ph.D.
- Policy and Procedure.....William Anderson, Ph.D.
- SOFT Internet Web-Site.....Bruce Goldberger, Ph.D., DABFT
- Continuing Education.....Ann Marie Gordon, M.S.
- Ethics.....Aaron Jacobs, Ph.D.
- Drug Facilitated Rape & Sexual Assault.....Marc LeBeau, Ph.D.
- MS/MS GuidelinesJohn Cody, Ph.D.

Committee Chair

- Timothy Rohrig, Ph.D., DABFT
- Anthony Costantino, Ph.D., DABFT
- Robert Turk, Ph.D., DABFT
- Yale Caplan, Ph.D., DABFT
- Yale Caplan, Ph.D., DABFT
- Sarah Kerrigan, Ph.D.
- Philip Kemp, Ph.D., DABFT
- Sarah Kerrigan, Ph.D.
- Christine Moore, Ph.D., DABCC
- W. Lee Hearn, Ph.D.
- William Anderson, Ph.D.
- Bruce Goldberger, Ph.D., DABFT
- Ann Marie Gordon, M.S.
- Aaron Jacobs, Ph.D.
- Marc LeBeau, Ph.D.
- John Cody, Ph.D.

