

West Virginia

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West Virginia State Medical Association

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President's Message



Money & Medicine

by Hoyt J. Burdick, MD
WVSMA President
2012-2013

What do you watch on Wednesday evenings after the national news? Somewhere between *Entertainment Tonight* and *Inside Edition*, I came across the public television program "*Money and Medicine*" on WPBY-Huntington (produced by Roger Weisberg, aired Sept. 25, 2012).¹ Since I'm keenly interested in both of those topics, for very different reasons, I never made it back to my mindless television shows. The program director's statement began:

As rising health care costs threaten to bankrupt the country, MONEY & MEDICINE investigates the dangers patients face from over-diagnosis and over-treatment. In addition to illuminating the so-called waste and overtreatment that pervade our medical system, MONEY & MEDICINE explores promising ways to reduce health care expenditures and improve the overall quality of medical care.

While I braced myself for an accusatory bashing of physicians and our ordering patterns, incomes, or morals, I was pleasantly surprised by an insightful documentary that included frank conversations with physicians and their patients at UCLA Medical Center in California and Intermountain Health System in Utah. The topics spanned from pre-term induction of labor at the beginning of life to excessive futile interventions near the end of life. As I listened, the

issues seemed equally relevant for West Virginia physicians and patients.

Dr. Brent James, Chief Quality Officer at Intermountain Health Care, presented some staggering numbers that you have probably heard in the past. Up to 30% (\$800 billion per year) of U.S. Healthcare Spending is unnecessary, redundant or just not helpful. There are multiple reasons and payment and tort systems may be more to blame than individuals. Dr. James explained (paraphrased):

One person's waste is nearly always another person's income. Income turns into strong political defenses in areas that are classic wastes – waste that actually hurts patients. Treatments that are powerful enough to heal can also harm. Everything we do in Medicine is innately dangerous. We're not just talking about withholding unnecessary care, we're talking about withholding possible, unnecessary injuries. Defensive medicine doesn't justify bad medicine. Those dollars can be put to better use. Rising healthcare costs are creating a financial crisis of sufficient size to destroy the United States of America. We have no choice. We will solve the problem.

Next, Dr. Elliot Fisher, from The Dartmouth Institute, began by comparing the care and outcomes for similar patients from UCLA and Intermountain. The California patients had 60% more hospital days, 75% more office visits,

more specialists, more tests and more procedures. The California patients had similar outcomes to their counterparts in Utah. This drives home the Dartmouth Atlas conclusions that because of widespread variations in availability and use of healthcare services, "geography is destiny" when it comes to how a specific medical problem is evaluated and treated.

Dr. Fisher is also one of the nation's foremost experts on new models of healthcare delivery and payment reform, including Accountable Care Organizations. On a more positive note, Dr. Fisher explained that physicians at Intermountain Health Systems have shown by designing into care the very best science; it is possible to improve care and reduce overall costs.

I've worked with the WVSMA staff and others since the airing of "*Money and Medicine*", to understand the large scale changes occurring in healthcare financing and delivery across America. Although there are many private sector reforms and the Medicare ACO experiment, the biggest changes consist of Medicaid reform experiments in states like Maine, Oregon and Colorado. I've asked a few of the respective state societies how those changes are affecting their physicians and the care of patients. The changes

are happening real time, and the reviews have been mixed. Hopefully we can continue to learn from reform efforts in other states.

Reducing waste and wisely managing scarce medical resources was also a national topic at the most recent AMA meeting. After considerable debate, the House of Delegates adopted a Council on Ethical and Judicial Affairs (CEJA) ethics policy that included the following:

*Physicians have an obligation to recommend the less expensive option when the available medical alternatives offer a "similar likelihood" of patient benefit. Physicians should be prudent stewards of the shared societal resources with which they are entrusted. However, individual physicians alone cannot and should not be expected to address the systemic challenges of wisely managing health care resources.*²

Some physicians objected that this approach could wrongly limit physicians' ability to advocate for the interests of individual patients when those interests conflict with the need to constrain healthcare costs. Dr. Alan M. Mindlin, a Michigan ophthalmologist, commented: "I started out as a physician-healer, then I became a provider, and now I'm a steward?"²

To get the focus back on "physician-healer" and still reduce overuse of treatments that aren't always medically necessary, the AMA convened a national summit featuring the Physician Consortium for Performance Improvement (PCPI) and The Joint Commission, along with physician organizations, medical specialties, government agencies, research institutions, health care organizations and patient groups. After examining the evidence and utilization patterns, the five most common procedures with the potential for overuse were: antibiotics for the common cold, ear tubes for brief periods of fluid behind the ear

drum, blood transfusions, coronary artery stents and early scheduled births without medical need.³

After this intriguing documentary, the questions that kept me awake were:

- What do the issues described in "*Money and Medicine*" mean for West Virginia physicians?
- What unnecessary or overused treatments can we eliminate from our own practices?
- Should we wait and react to the proposed changes in healthcare payment, or seek to participate in the discussions and policy-making?
- Should we leave it up to hospitals or insurers to decide the best practice models?
- Should we defend the status quo or help direct change?
- What is the role and message of WVSMA as the voice of medicine?

By the time of my next message, we will have elected a President and Congress will have fixed, delayed or imposed the Sustainable Growth Rate formula for physician payment (Medicare). If you didn't vote, you shouldn't complain!

As your President, I look forward to my visits to your county societies and having the chance to talk with each of you about these changes and how they are affecting your practice.

In the meantime, I think I'll go back to watching *Entertainment Tonight* on Wednesday evenings after the national news.

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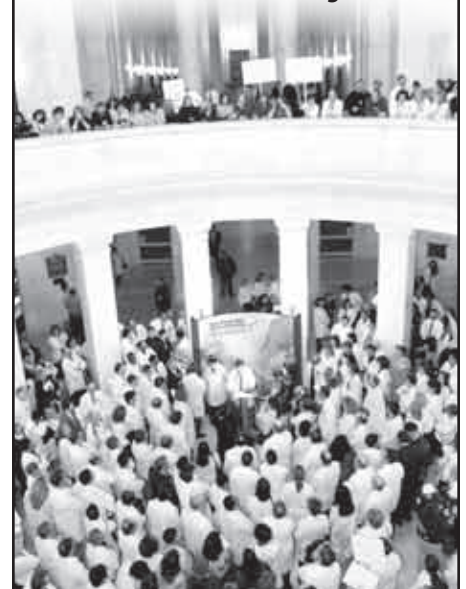
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Thoracolumbar Burst Fractures Treated with the Verte-Span Titanium Cage

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Disclaimer

None of the authors have a financial interest in Verte-Span or Medtronic Sofamor-Danek.

Introduction

Approximately 50,000 spinal fractures occur in the United States each year with 10%-20% resulting in burst fractures from T9 to L5.¹⁻³ Axial forces exerted anteriorly with varying degrees of flexion/rotational forces in the thoracolumbar region produce burst fractures (Figure 1) that create kyphotic deformity, loss of vertebral height, and retropulsed fragments of bone protruding into the spinal canal frequently causing neurologic deficit.^{4,5} These complex fractures can involve unilateral or bilateral posterior element fractures, anterior wedge deformity, and anterior and posterior longitudinal ligament

injury. The Denis classification of thoracolumbar trauma evaluates the stability of spine fractures relative to the disruption of three anatomic spine column elements: anterior, middle and posterior. It classifies these fractures as two column injuries which are considered unstable.^{2,4}

Patients treated with a non-operative strategy of bed rest, thoracolumbosacral orthosis and observation have up to a 20% incidence of increasing neurological deficit.² Operative treatment is recommended if there is increasing neurological deficit, increased kyphosis, or the fracture appears unstable.² Fractures are considered unstable when there is vertebral height loss of over 50%, presence of translational components, fractures of posterior elements, increased interpedicular distance or greater than 30° of kyphosis.^{2,4} Operative treatment with vertebral body replacement includes implantation of spinal instrumentation and supplemental support.^{3,5-14} Over many years, several different types of spinal implants have been used including allogeneous, xenogeneous (sea coral) or autogeneous structural bone graft, ceramics, ceramic glass, and carbon fiber.^{11,13,15}

Currently, the titanium mesh cage is a common option for vertebral body replacement hardware after anterior decompression and corpectomy. However, studies have shown post-operative complications such as subsidence, erosion of adjacent endplates, telescoping of the cage into adjacent vertebrae, stress shielding, and implant failure.^{7,11,16} Currently, there is an increased production of expandable cages to be

used for vertebral body replacement that have several advantages over the similar titanium mesh cage.^{14,17} Expandable cages offer in situ distraction that allows smaller surgical exposure and firm contact between the cage and the vertebral endplates thereby increasing bone fusion and reducing hardware migration.^{14,17} Some expandable cages such as the Synex (Synthes, Bochum, Germany) and VBR (Ulrich, Ulm, Germany) offer optional angled endplates to help restore natural spine curvature.^{15,17} Recent studies have shown favorable results with the use of expandable cages for spinal tumor resection,^{13,18,19} and treatment of destructive osteomyelitis.¹⁰

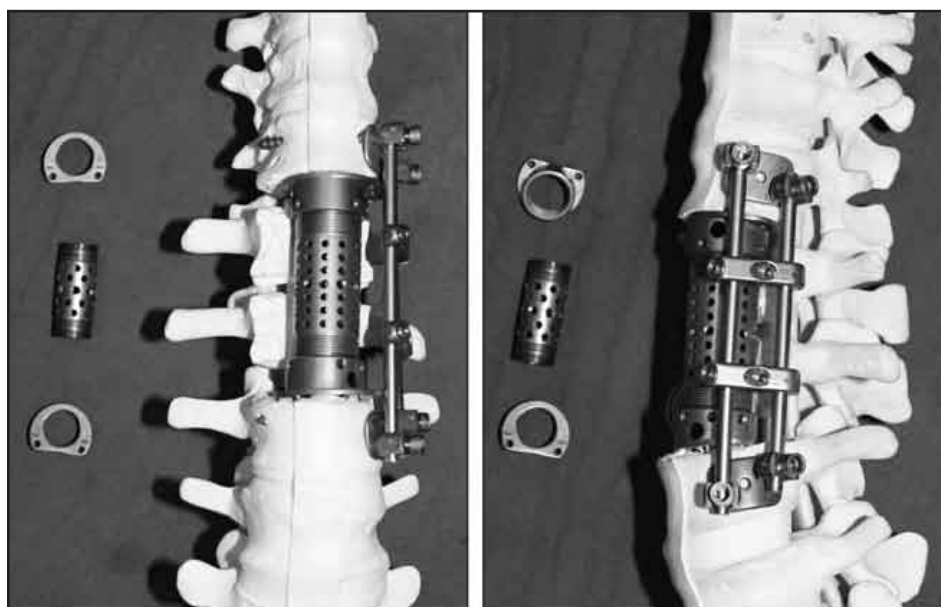
In this study, we describe radiographically and clinically the largest series of patients treated with the Verte-Span (Medtronic Sofamor-Danek, Memphis, TN) expandable cage for thoracolumbar vertebral body replacement for single level

Figure 1.

Burst fracture showing loss of vertebral height, canal compromise, and kyphotic deformity.



Figure 2.
Verte-Span device and supporting instrumentation.



burst fractures. The Verte-Span device consists of a cylindrical cage available in different sizes combined with spiked endplates with variable degrees of angulation (Figure 2). The Verte-Span is not a stand-alone system and requires supplemental anterolateral and/or posterior instrumentation such as screw-rod constructs.¹⁵

Materials and Methods

This study gained approval through the institutional review board located at the Charleston Area Medical Center in WV. A retrospective review of hospital charts, office reports, and radiographs were examined for 28 patients diagnosed with an acute thoracolumbar burst fracture who had corpectomy surgery with the Verte-Span expandable cage

implanted from February 2002 to May 2007. A general surgeon and a spine team headed by one of five spine surgeons performed all surgeries.

Patient Population

The study consisted of 17 men (61%) and 11 women (39%) who ranged in age from 19 to 68 years (mean 43 years) of whom 9 were smokers and 19 were non-smokers. All patients presented with one level burst fractures in the thoracolumbar spine resulting from motor vehicle accidents, being struck by a falling object, and a sledding accident. On presentation to the trauma care unit the injury severity score of the 28 patients ranged from 4 to 43 (mean 16.5). Twenty-seven (27) patients were assigned American Spinal Injury Association (ASIA) severity of injury scores from A to E measuring

sensory and motor function (A = complete impairment of motor and sensory function below S4-S5, E = normal motor and sensory function). One patient was sedated on presentation and was not assigned an ASIA score. Of the 27 patients scored, 12 received an E, seven a D, five a C, one a B and two an A on consultation.

A pre-operative radiographic analysis of 26 patients (Table 1) showed a sagittal 2.6° to 38.2° (mean 11.2°) segmental kyphosis at the fractured vertebrae level by measuring the Cobb’s angle of the of the superior and inferior vertebrae.* Loss of vertebrae height ranging from 5.9% to 60% (mean 26%) was found for 26 patients by measuring the fractured vertebrae height and dividing that by the average height of the inferior and superior vertebrae. Further, 27 patients had 7% to 74% (mean 52%) maximum canal compromise as calculated according to the method of Fehlings et al.²⁰

Surgical Procedure

All patients underwent corpectomy with implantation of the Verte-Span expandable cage (Figure 3). Patients were positioned in the lateral decubitus position. Exposure was made to the lateral thoracolumbar vertebral complex through an anterior lateral approach. Discectomy of the adjacent superior and inferior discs with corpectomy of the fractured vertebrae was performed. A variety of high-speed drills and bone rongeurs were used followed by removal of cartilaginous endplates and the posterior longitudinal ligament. A Verte-Span cage size was chosen based on the measured corpectomy site and the desired ultimate replacement cage height. It was prepared with endplates of 0° or 5° degrees of angulation. The cage was packed with autograft and a combination of

Table 1. Pre-operative Radiographic Measurements

	Kyphotic Deformity	Maximum Canal Compromise	Loss of Vertebral Height
Mean	11.2°	52%	26%
Range	2.6°-38.2°	7%-74%	5.9%-60%

*To measure the sagittal angle of a fractured L1, the angle of the inferior endplate of T12 and the superior endplate of L2 is measured.

Figure 3.

Verte-Span device and lateral supporting screw-rod construct in situ following corpectomy.



allograft and/or bone matrix protein sponge. The cage was then positioned into the corpectomy site and expanded to maintain firm contact to the superior and inferior vertebral bodies until the desired height was obtained. Supplemental anterolateral instrumentation was then placed across the corpectomy site while posterior instrumentation when chosen required a separate surgery. The surgical procedures averaged 6.9 hours (range 4.1-12.1 hours).

Post Operative Care

Twenty-seven (27) patients appeared for follow-up visits where ASIA scores were assigned and radiographs were analyzed according to their most recent office visit. Image studies pre-operatively and post-operatively were used to compare kyphosis correction and restoration of vertebral height. Kyphosis was

measured by comparing the Cobb's angle of the bony endplates. Vertebral height restoration was based on comparison of the average vertebrae and interdiscal height of the superior and inferior vertebrae and the height of the Verte-Span cage (Figure 4). Subsidence and evidence of hardware failure were assessed.

Statistical Analysis

Data analysis was performed using SAS 8.02. Basic descriptive statistics, such as means and standard deviations for continuous variables and proportions and frequencies for categorical variables, were used to analyze the data. Comparisons of categorical variables were performed using contingency table analysis with a Chi-square test to determine statistically significant differences. Comparisons of continuous variables were performed using t-tests. Pearson correlations were used to determine if relationships existed between two continuous variables. An alpha level of ≤ 0.05 was used to determine statistical significance.

Results

Patients had a mean follow up period of 8.1 months (range 0-35 months). All patients underwent a one level corpectomy with Verte-Span instrumentation. Five patients underwent posterior fusion with pedicle rods and screws while 23 underwent anterior fusion with rods and screws or an anterior plate.

Clinical Results

Thirteen patients improved by one ASIA score post operatively, 14 patients were unchanged, and one patient decreased by one ASIA score. The mean patient score

improvement was 0.54 (Table 2). The patient with a decreased ASIA score from E to D experienced an acute exacerbation while working prior to follow-up that caused weakness due to pain. Post-operative examination of x-rays demonstrated excellent alignment and fixation of the Verte-Span and screws. Larger pre-operative maximum canal compromise significantly affected the change in ASIA score by half a point ($p = 0.0142$). Post-operative pain was the most common symptom at follow-up by 13 patients, 10 patients complained of weakness, 7 patients had paresthesias, and five patients had a full recovery without pain or neurological deficit. There were no significant findings between ASIA score and age, the use of angled endplates, or subsidence.

Radiographic Results

Mean post-operative kyphosis of 27 patients at the latest follow up was 5.0° with a mean difference of 6.2° from average pre-operative kyphosis of 26 patients ($p = 0.0027$) (Table 3). There was an increasing trend of the number of 5° endplates used (0, 1, 2) and post-operative mean kyphosis of 2.7° , 6.7° , and 7.8° respectively. Mean subsidence of 27 patients was $2.4 \text{ mm} \pm 4.5 \text{ mm}$. Mean final height of the expanded cage was $49 \text{ mm} \pm 6.7 \text{ mm}$ with a difference in the restoration of the fractured vertebral height of $2.8 \text{ mm} \pm 7.4 \text{ mm}$. There were no statistically significant findings with post-operative kyphosis and subsidence with age, smoking, sex, size of cage used, bone graft, or location of supplemental instrumentation.

Surgery-Related Complications

Pseudoarthrosis, hardware failure, or subsequent fracture was not seen in any patient. Slight flange protrusion was noted in two patients that was not associated with neurological deficit and did

Table 2. American Spinal Injury Association (ASIA) Scores (N=27)

ASIA Score	A	B	C	D	E
Pre-Operative	2	1	5	7	12
Post-Operative	1	0	3	5	18

Figure 4.

Technique for calculating vertebral height restoration: $[(X+Y)/2] - Z$.

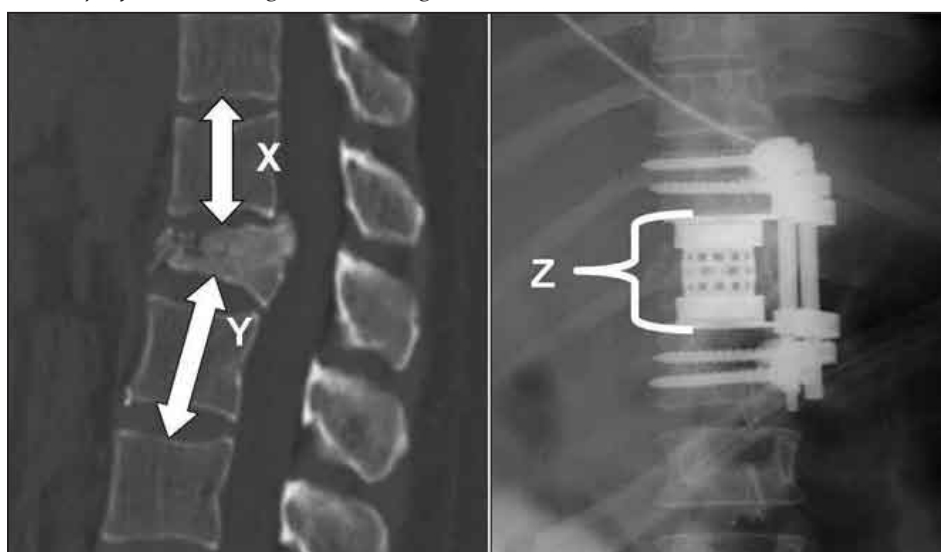


Table 3. Post Operative Radiographic Measurements

	Kyphotic Deformity	Subsidence	Restoration of Vertebral Height*
Mean	5.0°	2.4mm	2.8mm
Range	0.9°-22.0°	0.0mm-19.0mm	-14.5mm- 9.0mm

* Restoration of vertebral height is calculated as the difference between the final height of the Verte-Span cage and the calculated pre-operative vertebral height as demonstrated in figure 4.

not require subsequent surgery. One patient had an intraoperative CSF leak that was repaired using fibrin glue and absorbable gelatin. One patient had a superficial wound infection with dehiscence that required subsequent debridement.

Discussion

The management of thoracolumbar burst fractures is continually changing with advances in technology. As the production and use of expandable cages increases, more studies will be necessary to evaluate their efficacy. Several studies have addressed the biomechanics¹⁷ of expandable cages and their use in vertebral body replacement.^{6, 10, 13, 14}

In our study, patient ASIA scores improved from pre-operative to

post-operative assessment, possibly due to anterior decompression and restoration of anatomic spinal dimensions. Patients had an improved or identical ASIA score post-operatively; one had a decreased ASIA score due to trauma experienced prior to the last follow up.

Pflugmacher, et al.¹⁷ did not find a significant difference between the biomechanics of three different expandable cages, the Synex, VBR, and X-tenz (DePuy AcroMed, Sulzbach, Germany) when compared to the titanium mesh cage in an in vitro study.¹⁷ Conversely, studies by Dvorak¹⁶ and Grob, et al.²¹ have shown a titanium mesh cage failure in the thoracolumbar spine while a review of four studies^{6,10,13,14} that included a total of 81 patients treated with expandable cages did not report

a single cage failure. Similarly, in our study of 28 patients, we did not experience cage failure. This may be due to the stronger construct and the use of supplemental anterolateral and/or posterior reinforcement supporting the cage.

Subsidence among vertebral replacement hardware has remained a complication for vertebral body replacement with the titanium mesh cage.^{7, 16, 21-23} A review of studies examining expandable cages and subsidence differ by the types of expandable cage implanted. Liljenqvist¹⁰ found a lack of subsidence in cases with an expandable titanium ring. Thongtrangan¹³ reported very little subsidence by using the VBR and Woiciechowsky¹⁴ reported one case of subsidence in a patient with osteoporosis who was treated with the Anterior Distraction Device (ADD) (Ulrich, Ulm, Germany). Auguste et al.⁶ found quantifiable cage subsidence ranging from 2.3 ± 3.7 mm for one level corpectomy to 6.5 ± 7.9mm for three level corpectomy using the Synex expandable cage. The Verte-Span device has allowed minimal average subsidence in our study. This may be due to the enlarged Verte-Span footplates that more easily reach the weight bearing apophyseal ring of the vertebral body.

Changes in kyphosis in our series proved statistically significant from pre-operative to post-operative measurements possibly resulting from the use of optional angled endplates. The VBR and Synex expandable cages have the option of angled endplates and studies involving these cages have shown improvement in kyphotic angle.^{6,13} Through the use of endplate angulations, restoration of natural spine curvature is possible and may help lead to better patient outcomes.

This study did not evaluate the fusion in patients treated due to difficulty in assessing inner cage fusion and its lack of relevance to

functional outcome as demonstrated by Eck, et al.⁷ Other studies involving expandable cages have reported 100% fusion as demonstrated by Auguste, et al.⁶ in 22 cervical cases, Liljenqvist, et al.¹⁰ in 20 degenerative osteomyelitis cases, and Woiciechowsky¹⁴ in 20 cervical cases. High fusion rates may result from the ability of expandable cages to create firm contact against the adjacent vertebrae allowing for minimal migration and a better bone-to-bone interface.

Conclusion

In treating burst fractures of the thoracolumbar spine, the Verte-Span expandable cage avoids complications associated with bone grafts, device failure, and subsidence as seen with the titanium mesh cage, while offering the advantage of an adjustable height mechanism that allows firm implantation, vertebral height alignment and restoration, and ease of insertion. The Verte-Span also offers large spiked endplates with optional angulations to reduce subsidence and cage migration. The data presented in this study show favorable results in patient outcome, subsidence, device support, vertebral height restoration, and kyphosis correction.

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Tabletop Scenarios for Realism in Bioterrorism and Threat Preparedness

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Abstract

Five realistic tabletop scenarios were designed to facilitate threat preparedness training of Medical, Public Health, Nursing, Emergency Services, Mental Health, Allied Health, and Pharmacy personnel. Training scenarios were (1) student contaminates lettuce (Act) in a state university with *Shigella sonnei* (Agent), (2) dismissed athlete contaminates ice (Act) at the basketball tournament with *Escherichia coli* (Agent), (3) workers fail to report abandoned backpacks (Act) at a state fair that contain smallpox virus (Agent), (4) terrorists expose county residents (Act) to Pneumonic plague bacterium (Agent), and (5) infected birds expose field-trip participants (Act) to Avian influenza virus (Agent). Evaluation of the tabletops yielded positive ratings of educational outcomes in these domains: well-structured, organized, plausible, realistic,

engaging, on-target, useful, and multidisciplinary. Attendees with previous blended-learning courses on bioterrorism and threat preparedness enhanced performance in the tabletop exercises. Evaluative data indicated a new level of competence and self-confidence about being part of a coordinated, local-level, interdisciplinary response.

Introduction

The main purpose of this article is to provide a succinct descriptive synopsis of the potential realism of tabletop scenarios in bioterrorism and threat preparedness. Public health organizations prepare for threats involving disasters, including intentional chemical, biological, radiological, nuclear, and explosive events, and more common threats ranging from infectious diseases to natural disasters. Partners for planning and response to disasters include (but are not limited to) mental health, clinical and emergency medical services, fire service, law enforcement, emergency management, and homeland security agencies. Tabletop exercises are one way to create realistic, practical dialogs that foster joint problem solving among constituents.

The U.S. Senate's Committee on Governmental Affairs held a "Hearing on Public Health Preparedness for Terrorism" following the 2001 anthrax outbreak. Milne testifying on behalf of the National Association of County and City Health Officials,⁵ proposed that planning for preparedness should bring together people from public health, emergency response, law enforcement, local hospitals, and others to deal with potential hazards in realistic scenarios. Subsequent publications also comment on the potential effectiveness of practical

drills⁴, especially in cross-disciplinary emergency response training.¹¹

A coordinated tabletop exercise should stimulate pragmatic engagement of appropriate people/groups (e.g., public health personnel and their external partners). A written scenario is created by an interdisciplinary leadership group. The scenario may be accompanied by a video sequence and is often introduced by the overall exercise facilitator. Working groups devoted to specific problems within the scenarios also have facilitators. Sometimes groupings segregate disciplines (e.g., nurses at one table, EMTs at another table, and so on). A more intuitive approach is a planned mix of discussants (e.g., a nurse, an EMT, a public health worker, and a fire fighter). Group results are usually shared with the entire gathering, discussed, and critiqued. Later, the "after-action report" pulls together the deliberations, findings, and recommendations.

Several predecessor models exist. Ohio local health districts built a tabletop exercise around a bioterrorist smallpox simulation.¹ Participants dealt with planning, communications, public information, bioterrorism training, medical treatment capacity, pharmaceuticals, quarantine and isolation, interim housing, personal protective equipment, surveillance, and mass vaccination. A finding from that exercise was that bioterrorism tabletop exercises must be accompanied by expert advice from health professionals knowledgeable in epidemiologic characteristics of biological agents.

Tabletop exercises in Texas,⁷ in Arkansas,⁹ and in South Carolina⁸ developed interdisciplinary community-based themes

with stakeholders from public health, emergency response, law enforcement, local hospitals, and others. The need for practical scenarios in job-relevant settings was also emphasized.⁹ Substantial interdisciplinary and interagency benefits can occur through the initial step of designing a tabletop exercise.³

The context of preparedness training is needed for planning in public health emergencies. The American Academy of Family Physicians and the Agency for Healthcare Research and Quality stated that healthcare providers in general, have low levels of preparational competency to deal with bioterrorism or natural disasters.² Similarly, Shadel, et al. 2004 cited research indicating “evident weaknesses in the U.S. public health system that may prevent an effective response to a bioterrorism incident” (p. 282).¹⁰

Methods

Development of realistic preparedness tabletops for rural health professionals was supported through a HRSA grant, “Bioterrorism Training and Curriculum Development Program,” for the development of three continuing-education courses and five tabletop exercises with associated outcome measures. The study was conducted in accordance with institutional IRB ethical practices.

The first tabletop scenario was “Valley Thunder.” In this tabletop scenario, three student anarchists contaminate all lettuce delivered from a greenhouse vendor to a university, area schools, nursing homes, and others, with *Shigella sonnei*. Three modules addressed (1) the initial contamination, (2) activation of the county Emergency Operations Center, and (3) results from the extended restoration time and fear

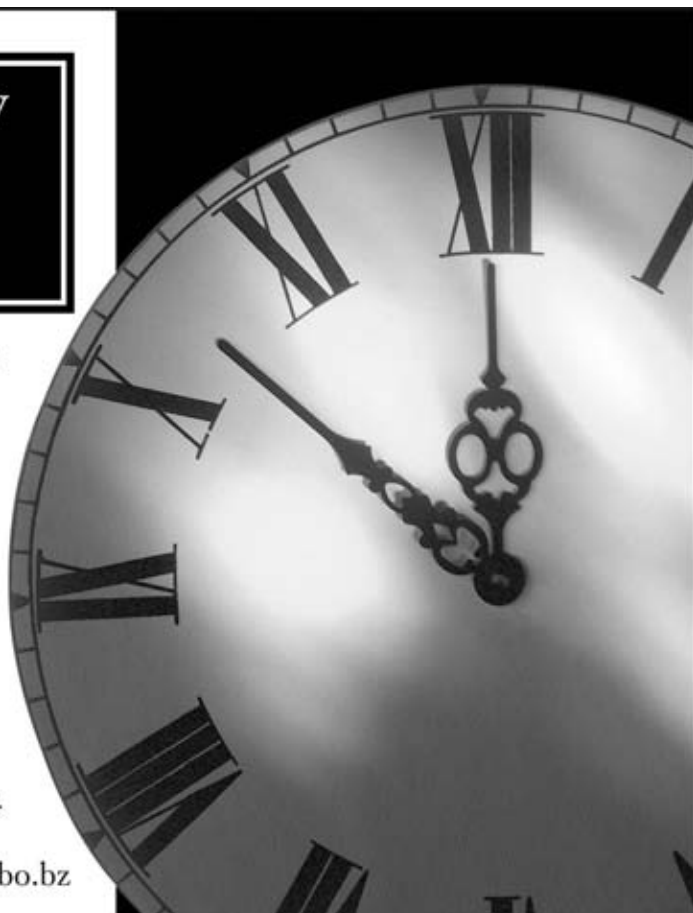
of another outbreak. The second tabletop scenario was “Capitol Offense” in which a student athlete dismissed from his team enlists a fellow student to retaliate during the regional basketball tournament by contaminating ice at one of the food stands with *Escherichia coli*. Five days after contamination, numerous patients presented with diarrhea and abdominal cramps, which also resulted in mental health treatment of victims and families (particularly parents). The third tabletop scenario addressed “A Fair to Remember” in which cleaning staff found backpacks behind toilets at the state fairgrounds, of which no reports were submitted to the supervisors. Two weeks later, the CDC confirms smallpox and notifies the State Bureau for Public Health, the FBI, the U.S. Department of Homeland Security, and other relevant Federal Agencies. The fourth tabletop scenario was “Eastern

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Harbor” which addressed a global network of terrorists with intentions of attacking the U.S. with weapons of mass destruction. The Pentagon gave a specific alert for the possibility of plague bacterium. Patients were diagnosed with pneumonic plague. Hundreds of worried people from this region and out of state presented at emergency departments, and there were 36 confirmed deaths from this outbreak of pneumonic plague. The fifth tabletop scenario was “A Field Trip Gone Fowl” during which an Animal Science Farm was hosting their annual Kiddie Days, where students from elementary schools and child-care centers toured the farm. The CDC confirmed avian influenza after an employee at the farm is found to be infected with H5N1 avian influenza virus. Antiviral medications and respiratory equipment were requested in accordance with the state Strategic National Stockpile plan.

Participant recruitment for the tabletop exercises included contacting hospitals, local health departments, and emergency services organizations. There were 641 players (including males and females) who participated in the five tabletop exercises. The primary disciplines for these players, in order from most to least, were: (1) Other, n=284, (e.g., EMS, Fire, Hazmat, Public Safety), (2) Public Health Practitioners, n=135, (3) Nurses, n= 95, (4) Physicians, n=64, (5) Social Workers, Counselors, PAs, PTs, OTs, n=32, (6) Health Administrators, n=24, (7) Pharmacists, n=5, and (8) Dentists, n=2. They represented Public Health Command, Public Health Operations, Hospitals, Education, Agriculture, Response Agencies, and Support Agencies. Participants also included players who were observers, facilitators, or evaluators. Observers supported the participants in the group as they developed responses, but they were invited primarily to observe the exercise as a learning experience. Facilitators provided

situational updates, moderated group discussions, and supplied additional information as required. Evaluators observed and recorded discussions during the exercise, participated in the data analysis, and assisted with drafting the After-Action Report. Based on their observations, the tabletop exercises were reaching the intended target population.

Personnel who created the practical tabletop exercises were (a) the WV Area Health Education Centers (WV AHECs), (b) the contractor for operating the tabletop exercises, and (c) university personnel. Nationally, AHECs work to improve the distribution of primary care providers in underserved rural communities. They assist in providing continuing education, assessments, evaluations, and budgeting, and they serve as liaisons between government agencies and rural primary care providers.⁶ The geographic location and regional mission of different AHECs provided some context (e.g., near national capitol, or site of the state fair). Ideas for the tabletop scenarios came from descriptions of news events, existing literature, and brainstorming.

The practical tabletop training goals and objectives included: (1) assess plans/policies/procedures, and (2) facilitate understanding of strengths and weaknesses of threat preparedness in a rural yet industrial region. The realistic tabletops were no-fault exercises with objectives for group problem solving and interagency cooperation.

To build realistic scenarios, each tabletop exercise was preceded by (1) development of concept-objectives to identify structure, organization, interdisciplinary utility, and plausible realism, (2) creation of the scenario, including “Act” and “Agent,” and (3) finalization of the events of the tabletop in a concluding planning conference. The authentic scenarios were designed to avoid overwhelming conditions

that would discourage players and truncate the discussion, and were reviewed to assure consonance with and relevance to the tabletop exercise players. These practical tabletop exercises were multimedia-driven (e.g., video tapes, graphics, live description of the modules, and player situation manual). Each exercise was presented sequentially in three distinct phases (three modules, each congruent to one of the goal phases) representing significant periods of response in the exercise. Following each module in the storyline, participants were expected to consider a series of questions to highlight pertinent issues for consideration. These questions were supplied as a catalyst for the group discussions, and participants were neither required to answer every question nor limited to those topics.

As noted previously, there were five pragmatic tabletop exercises conducted that would facilitate reasonable threat preparedness. The titles of the exercises were (1) Valley Thunder, (2) Capitol Offense, (3) A Fair to Remember, (4) Eastern Harbor, and (5) A Field Trip Gone Fowl. While the funding vehicle specifically required a bioterrorism focus, the funders and program designers also encouraged an “all-hazards” approach.

Each of these five tabletop exercises was evaluated using forms filled out by those attending. There were 13 categories rated by the participants in the range of poor to excellent. These categories were (a) well structured & organized, (b) scenario was plausible & realistic, (c) players were engaged, (d) exercise stayed on target, (e) materials were useful, (f) participation was appropriate for position, (g) appropriate level & mix of disciplines, (h) exercises tested training course knowledge, (i) training course(s) enhanced performance, (j) can recognize a bioterrorism event, (k) can assist communication &

response development, (l) can evaluate response plans, (m) can alert the public health system. Participants also provided comments (positive and/or negative) about the experience of participating, and the overall value for personal learning and organizational benefit. (More information regarding the tabletop scenarios is available from the corresponding author).

Results

The participants in the five tabletop scenarios were from the disciplines of Public Health Nursing, Medicine, Emergency Services, Mental Health, Allied Health, and Pharmacy. After each tabletop exercise, those attending filled out an evaluation form. The numbers of evaluation forms submitted for the five tabletop exercises were: (a) 45 for Valley Thunder, (b) 82 for Capital Offense, (c) 90 for A Fair to Remember, (d) 69 for Eastern Harbor, and (e) 70 for A Field Trip Gone Fowl. To allow standard, unbiased assessment of the rated categories, 20 evaluation forms filled out by respondents were randomly selected for each of the five tabletop exercises. For the five tabletop exercises, the means from these 100 respondents (20 + 20 + 20 + 20) are summarized in Figure 1. Eight of the categories were rated in the "Good" (4) to "Excellent" (5) range. These eight high-ranking categories (Figure 1) were (a) well structured & organized, (b) scenario was plausible & realistic, (c) players were engaged, (d) exercise stayed on target, (e) materials were useful, (f) participation was appropriate for position, (g) appropriate level & mix of disciplines, and (h) exercises tested training course knowledge. Tabletop participants, who previously had taken blended-learning courses concerning threat and disaster preparedness, indicated that (a) the tabletop "exercises tested training course knowledge" (Mean=4.1), and (b) "training

course(s) enhanced performance" in the tabletops (Mean=3.8).

The After-Action Reports summarized key strengths and major recommendations from the five realistic Tabletop Exercises. A summary of these strengths and recommendations can be viewed in Table 1. An after-action report generated to be used by the players and their agencies to improve emergency response plans and procedures, provided the following recommendations: (a) establish relationships with those community resources associated with special-needs populations, (b) collaborate surge capacity planning and management of displaced individuals, and (c) establish formal plans and relationships for surveillance, notification, and reporting. Key strengths were noted in these after-action reports, including: (1) interagency relationships were fostered, including specific willingness to establish Memorandums of Understanding between agencies, (2) local support agencies have important resources they can provide to responders, and (3) there is excellent public health communication within and between counties. A possible limitation to the Tabletop Exercises could be the low numbers of pharmacists who participated in the scenarios. Given the significant role of Pharmacists in threat preparedness and disaster response, it would be highly recommended that they be included as key players in Tabletop Exercises to improve emergency response plans and procedures.

Discussion

The premise of this project was to provide preliminary data concerning how and whether healthcare professionals and affiliated organizations benefit from engagement in simulated, practical scenarios on bioterrorism and threat preparedness. The tabletop exercises addressed: (1) Terrorism Recognition

and Reporting, (2) Multidisciplinary Coordinated Response, and (3) Acute Care of Patients, in accordance with the proposal support from the Health Resources and Services Administration (HRSA). Rationales for conducting tabletop exercises are: (1) to test a plan, and (2) networking in a partially realistic event simulation, with tasks focused on collaborations among traditionally unrelated disciplines related to disaster response. This report describes the latter setting, which is tested less frequently.

The major limitation of such tabletop scenarios research is that it is difficult to demonstrate the real-life effectiveness of having participated in the scenario. The simulation is typically built to replicate an historical disaster. After participants complete the training, an actual test of its effectiveness could occur only

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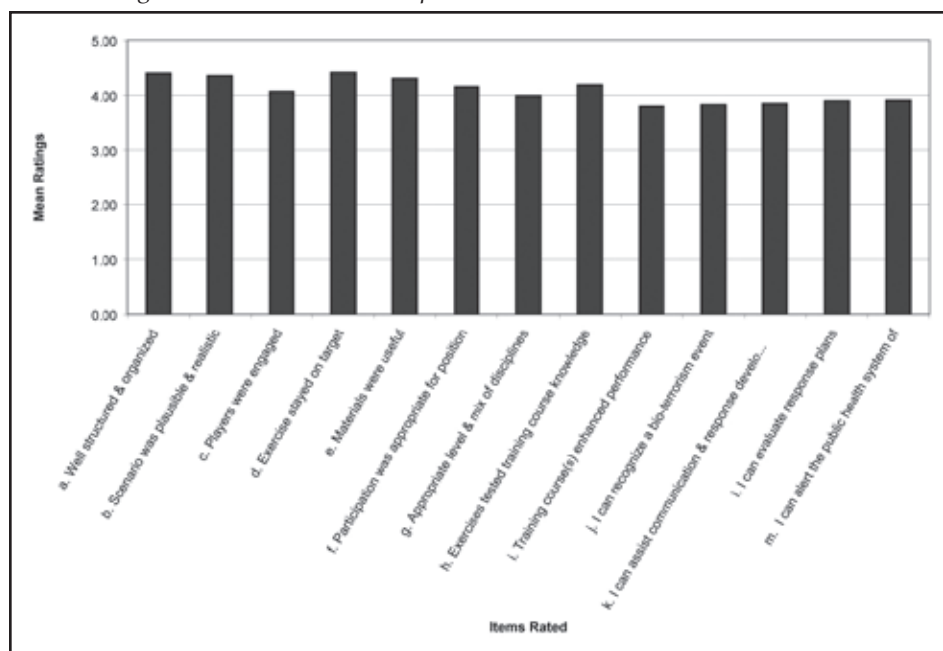
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Table 1. Recommendations and Key Strengths of the Tabletop Exercises

Tabletop Exercise	Recommendations	Key Strengths
1. Valley Thunder	<ul style="list-style-type: none"> * Establish a contingency plan for current communication and notification methods. * Create a public information plan. * Develop procedures and policies to provide long-term mental health care, including memorandums of understanding (MOUs) with psychiatrists, psychologists, and social workers who specialize in stress-related illness. * Plan for when and how to activate a joint information center. * Establish a plan for the education system to appropriately address a WMD incident. * Establish regional or multiple volunteer Medical Reserve Corps units. 	<ul style="list-style-type: none"> * Interagency relationships fostered a willingness to establish MOUs. * Program planning stimulated participants to identify gaps in their plans. * Existing emergency plans were adapted, where practical, for a weapons of mass destruction (WMD) incident.
2. Capitol Offense	<ul style="list-style-type: none"> * Establish a policy between public health and the first responder community regarding pre-incident information sharing. * Update emergency plans for educational institutions. * Use the wealth of resources of local support agencies by establishing agreements. * Develop MOUs between smaller hospitals and private security companies to provide security support during emergencies. 	<ul style="list-style-type: none"> * Interagency relationships were fostered, and there was willingness to establish memorandums of understanding (MOUs) with one another. * Federal and local law enforcement representatives expressed favorable relationships. * One-region health department facilitates a coordinated public health response. * Current public health plans adequately address food-borne illnesses, and staff are appropriately trained on response procedures. * Hospitals are well prepared to handle food-borne illnesses.
3. A Fair to Remember	<ul style="list-style-type: none"> * Develop a database of vaccinated personnel. * Develop some type of formal disaster plan for all medical facilities. * Conduct multi-agency emergency preparedness training and exercises across jurisdictions. * Develop memorandums of understanding (MOUs) with local support agencies. * Educate the public (in general) and staff of local support agencies (in specific) regarding identification/recognition of bioterrorism agents. 	<ul style="list-style-type: none"> * Interagency relationships were fostered, and there was willingness to establish MOUs with one another. * There is open communication between education and public health. * The education system is well prepared to meet the acute care needs of students. * A plan to activate and notify support agencies of an occurrence is already in place. * Support agencies are able to provide a wealth of local resources. * Law enforcement is willing to improve relationships with public health.
4. Eastern Harbor	<ul style="list-style-type: none"> * Develop memorandums of understanding (MOUs) with local support agencies. * Provide education regarding identification/recognition of bioterrorism agents. * Establish relationships with those community resources that are associated with special needs populations. * Plan for extended confinement in facilities and management of a surge of displaced individuals. * Conduct multi-agency emergency preparedness training and exercises across jurisdictions. * Establish warning thresholds for those agencies that may be first to notice an outbreak, and implement formal notification and reporting plans. 	<ul style="list-style-type: none"> * Interagency relationships were fostered, and there was willingness to establish MOUs with one another. * Public health and schools developed an excellent relationship. * Hospitals are knowledgeable and vigilant toward identifying biological indicators. * The affected county is working actively to improve planning efforts and has made commendable progress. * Local support agencies have a wealth of resources they can provide to responders.
5. A Field Trip Gone Fowl	<ul style="list-style-type: none"> * Establish formal relationships for surveillance and notification in Public Health Department. * Develop county mass casualty plans, including a mass casualty plan for the public health and medical community. * Collaborate county and regional surge capacity planning between public health and hospitals. * Establish a public health warning threshold for sick children in schools. * Share emergency response plans between relevant county agencies. * Establish relationships among those community resources that are associated with special needs populations. * Designate a representative at the EOC for each support agency. 	<ul style="list-style-type: none"> * Interagency relationships were fostered, and there was willingness to establish MOUs with one another. * Local support agencies have a wealth of resources they can provide to responders. * There is excellent public health communication, both within a county and between counties. * Public health acknowledged that coordination is difficult between jurisdictions, and regional planning efforts currently are underway.

Figure 1.
Mean Ratings Across All Five Tabletop Exercises



if that same (or similar) disaster happened again. The genuine scenarios in the current research (a) involved hands-on experience with disaster planning and response scenarios, (b) while providing continuing education to healthcare professionals, first responders, and social-service providers. These practical scenarios were a logical culmination of the theoretical model, starting with pre-existing initial blended-learning courses, and adding a hands-on exercise with testing.

The need for well-trained healthcare, social service, and emergency response personnel has been recognized as a priority for improving the preparedness level in emergency response nationwide.³ U.S. goals for homeland security call for training of first and emergency responders to catastrophic events.⁴ Competence and confidence for coordinated decision making are tangible benefits of cooperative problem solving with tabletop scenarios. Such realistic, engaging, on-target, and multidisciplinary educational opportunities are

critical for empowering emergency-response competencies of first responders, healthcare professionals, and social service providers.

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Stroke in Children: Need for Increased Awareness

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Abstract

An 11-year old pediatric patient, who suffered a stroke is presented. She experienced a new-onset, severe, and persistent headache. Despite identification of a subacute ischemic lesion on CT scan, a delay in transfer to specialized care occurred. Laboratory investigations revealed hypercoagulability, which prompted treatment initiation. Stroke in children is a rare but significant cause of death and long-term disability. With increased understanding, improved guidelines, and emerging treatment options for children's stroke, increased awareness about this disease is necessary for prompt identification and treatment in this population.

Introduction

Despite being rare, stroke in children is one of the leading causes of severe long term disabilities in this age group. Fifty to 80% of children surviving stroke will have permanent neurological deficit, more frequently hemiparesis or hemiplegia, but also sensory, visual and cognitive impairment, and seizures.¹ Additionally, stroke is one of the top 10 causes of death in children. Stroke in children is rare, with a reported incidence of 1.3 to 13.0 cases /100,000.² Stroke poses a significant toll for the patients and their families.

Clinical presentation can involve non-focal neurological signs, such as headache, altered mental status, seizures, or a transient neurological deficit. Absence of focal signs results in delayed diagnosis with increased recurrence, mortality and complications. Delay in diagnosis of stroke up to 72 hours has been reported in children, with significant fraction of this time occurring in hospitals.³

In this paper we present a pediatric patient with stroke with non focal presentation.

Case presentation

A previously healthy 11 year-old female experienced the new onset of severe headaches for one week. The pain occurred multiple times during the day, lasting less than one hour. She went to the local ER where a brain CT demonstrated a sub-acute ischemic lesion in the right caudate nucleus (figure 1, A). She was discharged home and referred to child neurology clinic. When she was seen five days later, her symptoms had not changed, and her exam remained non focal. In order to investigate underlying causes of her CT finding, she was admitted. General laboratory investigations including CBC and metabolic panel were normal. A hypercoagulable workup (protein C, protein S, factor II mutation, antithrombin III level, lupus anticoagulant, MTHFR mutation, cryoglobulin, homocystine, cardiolipin antibody, lipoprotein (a), beta-2 glycoprotein) showed abnormality of Factor V Leiden with heterozygosity for R506Q polymorphism. MTHFR showed homozygosity for C667T. Homocystine was within normal limits. TTE was unremarkable. Intra- and extra-cranial Magnetic Resonance Angiography (MRA) was normal. MRI of the brain demonstrated region of restricted diffusion in the head of right caudate nucleus (figure 1, B).

During her hospital stay she became asymptomatic. She was started on aspirin and folic acid, and was discharged home. She is doing well 18 months later.

Discussion

Approximately 55% of children's strokes are ischemic in nature,

and 45% are hemorrhagic.⁴ Congenital heart disease and sickle cell disease (SCD) are the most common predisposing factors for arterial ischemic stroke in children. Children's stroke recurs in up to 25% of cases; mortality is higher after recurrence.⁵ Children with hypercoagulability or vascular causes (vasculopathies and cerebral arteriopathies) are at increased risk of recurrence.⁶

Our patient was discharged home despite the identification of a subacute ischemic lesion on brain CT. The incomplete workup prior to discharge hindered early recognition of treatable risk factors and put her at risk of recurrence.

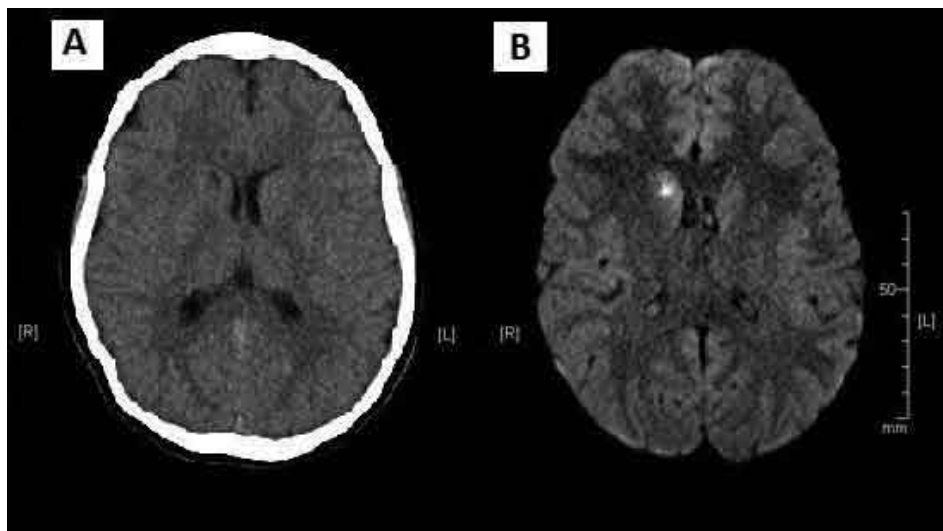
In order to minimize the risk of recurrence, a comprehensive evaluation of a child with stroke should at least exclude vascular and cardiac causes (by MRA or CTA and cardiac echo), and include a complete hypercoagulability work-up.

Recommendations for management of stroke in infants and children have recently been published.⁴ Specific treatment is suggested for different etiologies including aspirin or anticoagulation for prothrombotic conditions, anticoagulation for arterial dissection, and exchange transfusion for SCD. Safety of anticoagulation has been demonstrated in neonates with CVST.⁷ Although tPA is not currently recommended in children, a multicentric clinical trial to evaluate safety of this drug is under way.

With treatment options becoming available in children, it is critical to consider stroke in the differential diagnosis for every child presenting with new onset of acute neurological deficit, severe headache, altered mental status, or seizures, and to obtain urgent and complete

Figure 1:

Brain CT (A) showing subacute lesion in the right caudate nucleus. Brain MRI (B) with restriction on DWI sequences in the same location confirms the subacute nature of the lesion.



evaluation in the emergency room including a brain MRI. The same holds true for any infant experiencing seizures after cardiac surgery, or following prolonged or complicated delivery.⁸ Referral to pediatric neurology for thorough evaluation of possible risk factors, including cardiac, vascular, infectious and hyper-coagulable factors for accurate diagnosis and correct management in this age group is strongly suggested.

Despite improved availability of rapid, non-invasive diagnostic techniques for diagnosing stroke, rapid access to care and transfer to specialized service are often delayed particularly in remote, underserved areas of the state.

Conclusion

Increased awareness is needed among primary care and ER physicians, as well as among the general public, about occurrence of stroke in children. A high index of suspicion is necessary in this age group, as accurate and timely diagnosis and treatment, and age-appropriate rehabilitation can minimize death and disability.

Acknowledgments

We thank Dr. Laurie Gutmann for her inputs and suggestions and for her final review of this paper.

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Marijuana Induced Hyperemesis: A Case Report

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Abstract

Marijuana induced hyperemesis is a syndrome manifested by intractable nausea, vomiting and abdominal pain in someone who chronically uses marijuana with relief obtained from excessive bathing. This case report documents the exhaustive and costly work-up that has been performed in the case of one patient presenting to our facility with these complaints. It will also discuss marijuana induced hyperemesis syndrome in an effort to increase awareness of this under-diagnosed condition allowing for a more thorough history-taking and reduce unnecessary testing and radiologic examinations.

Introduction

Marijuana is the most widely used illegal drug in the United States according to the National Institute of Drug Abuse.¹ Marijuana is used medically in controlling nausea and vomiting, especially in cancer patients.^{2,3} In 2004, Allen et al. reported the detrimental effects seen in a series of patients presenting with intractable abdominal pain, nausea and vomiting who had a history of chronic marijuana use.⁴ This group of 10 patients not only had the same symptoms, but nine of them reported temporary relief from excessive showers/bathing. The first retrospective analysis done in the United States describing this syndrome was by Soriano-Co et al.⁵ who found that the average patient presenting with this cluster of symptoms (nausea, vomiting and

abdominal pain) was 34.4 years old with a 19-year history of chronic marijuana use prior to initial onset. All patients obtained relief by bathing on average five times per day for 30 – 45 minutes. In both articles, when the patients ceased marijuana use all symptoms resolved. When marijuana was reinitiated, symptoms returned within weeks to months.^{4,5}

Case presentation

A 42-year-old Caucasian female, who has routinely been seen at our institution for nausea, vomiting and abdominal pain since 2003, presented with the complaint of nausea, vomiting and abdominal pain. She stated that the symptoms occurred this time after eating four bites of ice cream. She denied any hematochezia, melena, hematemesis, constipation, diarrhea or fever. She felt her symptoms were the same as those in previous episodes. Her past medical and surgical history was significant for chronic abdominal pain, iron deficiency anemia secondary to menorrhagia, poly-substance abuse, post-traumatic stress disorder with major depressive disorder, and cholecystectomy. Social history was significant for current chronic marijuana abuse with a history of cocaine use. Her medication list included quetiapine, venlafaxine ER, diazepam, lansoprazole, sucralfate, metoclopramide, polyethylene glycol, ondansetron, MS contin, hydrocodone and gabapentin.

Her physical exam was normal except for some mild epigastric tenderness which she attributed to her excessive vomiting. Laboratory studies including a comprehensive metabolic panel, amylase, lipase, and complete blood count were

normal except for anemia, which had improved since her last admission. Urine studies, including urinalysis, were normal with a urine drug screen positive for delta-9-tetrahydrocannabinol (THC), benzodiazepines and opiates. Abdominal and chest x-rays were normal.

During the course of her admission, further investigation into her history revealed chronic marijuana use. She reported that long hot showers provided the only relief for her pain and nausea. She claimed that she took so many showers that her bathroom was growing excessive amounts of mold and mildew. Research into her medical records revealed an even more disturbing fact: excessive radiation exposure and medical cost. In total, she has had in excess of 97 abdominal x-rays, eight abdominal CT scans, two abdominal MRIs, an abdominal MRA, small bowel follow-through, three gastric emptying studies, four esophagogastroduodenoscopies (EGD), and three colonoscopies. Since 2003 these tests produced two abnormal findings: (1) the two most recent gastric emptying studies at 224 and 180 minutes (gastroparesis) and (2) gastritis/duodenitis on EGD. Throughout her complete seven-year work-up, celiac sprue, peptic ulcer disease, Barrett's esophagus, porphyrias, ischemic bowel disease, appendicitis, ulcerative colitis, Crohn's disease and *H. pylori* infection have been excluded. The patient's medical record indicated that since 2005 she has had 97 emergency room visits. Additionally, since 2007 she has had 42 admissions.

As was the case in her previous admissions, the patient was hydrated with intravenous fluids, diet was

slowly initiated and abstinence from marijuana was encouraged. She was counseled on her new diagnosis of Cannabinoid Hyperemesis Syndrome (CHS) and the importance of abstinence. She voiced understanding and was discharged. Unfortunately, she continues to return to the hospital with the same complaint and positive urine drug screens for marijuana.

Discussion

Marijuana contains more than 60 cannabinoids with delta-9-tetrahydrocannabinol being the one most studied.^{4,6,7} Research has identified at least two G-protein-coupled receptors in the body for THC, labeled as cannabinoid receptor type 1 (CB-1) and cannabinoid receptor type 2 (CB-2).^{4,6,7} CB-2 receptors are predominantly located in immunologic tissue and are thought to have immunomodulatory effects, which have yet to be defined.⁷ CB-1 receptors located in

neurons of the brain, spinal cord and peripheral nervous system produce neuromodulatory effect.^{4,6,7} Central CB-1 receptors in the area postrema and dorsal vagal column offer the positive side effects of cannabis used in medical marijuana.^{6,7} In the myenteric and submucosal plexus, CB-1 receptor activation decreases gastric acid secretion, slows gastric emptying and slows intestinal motility.^{4,6,7} The exact mechanism by which these actions occur is not completely understood, but CB-1 receptors are commonly found in conjunction with acetylcholine transferase which marks cholinergic neurons supporting the theory of CB-1 receptors in the regulation of intestinal motility.⁷

The theories behind the mechanism for the phenomenon of an antiemetic producing a pro-emetic reaction are debated. The first theory is one of toxic accumulation. THC is metabolized in the liver through the

cytochrome P450 system, specifically enzymes CYP2C9, CYP2C19 and CYP3A4.^{1,3,4} Certain populations may have a genetic alteration in these pathways or enzymes leading to a toxic accumulation of cannabinoid metabolites. Furthermore, because THC and its metabolites are so lipophilic, the toxic accumulation occurs in the brain leading those more sensitive to higher levels to develop hyperemesis.^{2,3,4}

Another theory presented considers the imbalance between the antiemetic effects of the central nervous system and the pro-emetic effects of the peripheral nervous system.^{2,3,4,5,6} Initially, the central antiemetic effects targeted by medicine dominate the system. The pro-emetic effects, including gastric emptying and intestinal motility slowing, overpower the central effects with excessive use. An average of nineteen years of abuse was documented in one study.^{2,3,4,5,6}

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Moreover, research has found that CB-1 receptors increase in number as more cannabinoids are introduced into the system, thereby potentiating the effects in the GI tract.⁴

The most recent theory underlying excessive showering is predicated on the premise that CB-1 receptors are the most prevalent G-coupled-protein receptors located throughout the brain. These receptors have been identified throughout the hypothalamic-pituitary-adrenal (HPA) axis,⁵ and scientists propose that overstimulation of these receptors may alter the thermoregulatory homeostasis. The exact mechanism remains unknown.

Conclusion

It is important that physicians be aware of Cannabinoid Hyperemesis Syndrome (CHS) (See Table 1) as lack of identification could result in costly work-ups and unnecessary radiation exposure. CHS should be a diagnosis of exclusion, and specific and adequate history-taking can lead to heightened sensitivity to this possibility. Physicians should include drug abuse history, including the duration of the abuse, keeping in mind the average time of presentation was 19 years of continued marijuana abuse.⁵

Table 1: Diagnosis of Cannabinoid Hyperemesis Syndrome (CHS)

Necessary for diagnosis	History of chronic marijuana use for years
Clinical signs of syndrome	Severe nausea and vomiting Vomiting that recurs in cyclic pattern over months Resolution of symptoms after stopping marijuana use
Supportive signs	Compulsive bathing for symptom relief Abdominal pain No evidence of gall bladder or pancreatic inflammation

Furthermore, when a patient presents with chronic abdominal pain, nausea and vomiting with marijuana use, the information should trigger a urine drug screen (UDS) and questioning about bathing history, including whether this provides relief.

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Idiopathic Non-Traumatic Spontaneous Renal Hemorrhage/Laceration: A Case Report and Review of the Literature

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Lopa Pandya, MS-III

Michael Chehval, MD

Abstract

Introduction: The majority of patients presenting with renal and/ or peri-renal hemorrhage are diagnosed with an underlying etiology. Non-traumatic spontaneous idiopathic renal hemorrhage is an infrequently reported entity. Management of these patients is critical; diagnosis is established only once any surgically correctable etiology is excluded.

Case Presentation: A 57 year old Caucasian female with no significant past medical history presented to an outside emergency department with a one day history of right lower back pain and fatigue. An abdominal and pelvic computed tomography (CT) at the time revealed a grade IV right renal laceration. We present this unusual case of a previously healthy woman with a low probability for a spontaneous idiopathic non traumatic grade IV renal laceration with perirenal hemorrhage.

Conclusion: Though most renal and perirenal hemorrhages are associated with an underlying etiology, in rare circumstances idiopathic non traumatic spontaneous renal laceration manifests with insignificant symptomatology. It is critical for clinicians in the Emergency Department to be aware of this entity to avoid diagnostic error. Prior to categorizing an injury as idiopathic, appropriate evaluation to rule out rare etiologic basis is crucial.

Introduction

Though uncommon, non-traumatic spontaneous renal hemorrhage is well reported in the literature. Nearly all isolated case reports and case series including metanalysis; report renal neoplasm as the most common etiology for the spontaneous renal /perirenal hemorrhage.^{1,2} Both benign and malignant renal neoplasms are included as a source

of bleeding with the majority being either angiomyolipomas or renal cell carcinomas respectively. Meta-analysis of these case series with renal hemorrhage infrequently report patients with an unknown idiopathic etiology (2.6 to 6.7%).^{1,2}

We report a case of a previously healthy middle aged female with spontaneous idiopathic non traumatic renal laceration with renal and perirenal hemorrhage and review of literature.

Case presentation

A 57 year old female was referred to us via an outside Emergency Department following the finding of a renal laceration with perirenal hematoma detected on CT scan. On further evaluation, the patient was in otherwise good health and only felt unwell one day prior to presentation. Symptoms included persistent back pain, fatigue and associated with nausea. The patient denied history of fever. On further evaluation in the form of abdomino-pelvic CT scan with and without contrast, the patient was determined to have a grade IV renal laceration involving the inferior pole of the right kidney with a large perirenal hematoma (Figure 1). Detailed review of the radiologic images revealed a normal left kidney with no evidence of any incidental masses on either side.

The patient denied any recent or remote history of any obvious or trivial trauma in any form. The patient denied any medical comorbidities in the form of diabetes, hypertension, systemic vascular disorder or any vasculopathies. On presentation the patient denied any long term use of steroids or blood thinning medications.

On presentation to our emergency department; the patient was admitted to the intensive care unit with serial hemoglobin and hematocrit monitoring. Throughout the hospital course the patient remained stable and was reimaged with a CT angiogram (in 48 hrs) to delineate the renal anatomy and to identify the source of bleeding. The CT angiogram confirmed a grade IV laceration of the right renal midzone and inferior pole. A normal single renal artery was demonstrated bilaterally and the right side demonstrated a non-perfused inferior pole without any evidence of masses (Figure 2). The patient was managed conservatively and was discharged home.

Discussion

Non-traumatic spontaneous renal hemorrhage is a distinct entity described in the literature.² It presents in the absence of any obvious renal trauma, either external or iatrogenic. A majority of these cases are attributed to renal neoplasms, both benign and malignant.² A large meta-analysis (47 published manuscripts) revealed that the vast majority of patients (85%) were adults and presented with acute flank pain. Of these 165 patients 61.5% were reported to have benign (31.5%) and malignant (29.7%) etiology. Angiomyolipoma and renal cell carcinoma were the most common etiology, respectively, with size ranging from 1-20 cm. A majority of patients (68.4%) were treated with nephrectomy, whereas about 10% patients were treated conservatively.

Diverse etiological factors such as infection, nephritis, blood dyscrasias, coumadin anticoagulation, calculus disease, and dialysis have

been attributed to spontaneous non-traumatic renal hemorrhage.¹⁻³

Idiopathic non-traumatic spontaneous renal bleeding is extremely rare. Only two published meta-analysis mention it being factored as the etiology for non traumatic spontaneous renal bleeding. The first largest meta-analysis of spontaneous renal parenchymal rupture was reported in 1975 by McDougal et al. The cohort had 78 patients with the majority (58%) of renal ruptures being secondary to renal neoplasms. The author also reported two patients for whom the source of the bleeding was undetermined.¹

Recently, another meta-analysis with a large cohort of patients reported almost identical results. Of these 165 reported patients, 154 had determined etiology, whereas 11 (6.7%) had no etiological basis for bleeding.²

Based on these two well documented large meta-analyses

and our literature search, only 13 cases have been reported where the etiological basis of the spontaneous renal hemorrhage remained undetermined.

Though it is well recognized that most cases of spontaneous renal hemorrhage are secondary to renal mass, in incidental cases where the source of bleeding is nonexistent, idiopathic, and non traumatic, etiologies should be taken into account. Due to the ease of availability and minimal time required for CT scanning almost all patients with abdominal pain presenting to the emergency department are imaged on presentation. It is at this point that many patients with retroperitoneal and or perirenal bleeding can be identified and classified based on the etiology. A careful evaluation of the radiological images with a radiologist is of utmost importance to discover a possible source of bleeding.

If no cause is determined the patient can be managed conservatively. In our patient, after discussing the initial imaging with the radiologist we elected to manage the patient in this manner. We further evaluated the source of bleeding with a CT angiogram which confirmed the initial finding of normal renal anatomy.

Conclusion

Non-traumatic idiopathic spontaneous renal hemorrhage with renal laceration is a rare entity. Though very few cases are reported, a significant number of cases may be unreported. Occasional patients may present with insignificant symptoms, a high index of suspicion is vital to avoid misdiagnosis. This case emphasizes that a thorough evaluation of patients presenting to the Emergency Department is of paramount importance.

Diagnosis is confirmed after careful evaluation with selective



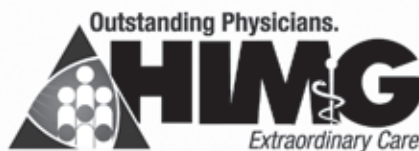
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angiographic imaging. Most patients should be managed conservatively unless life threatening hemorrhage is the initial presentation.

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Figure 1.

CT scan abdomen reveals a grade IV renal laceration involving inferior pole of the right kidney with a large perinephric hematoma.

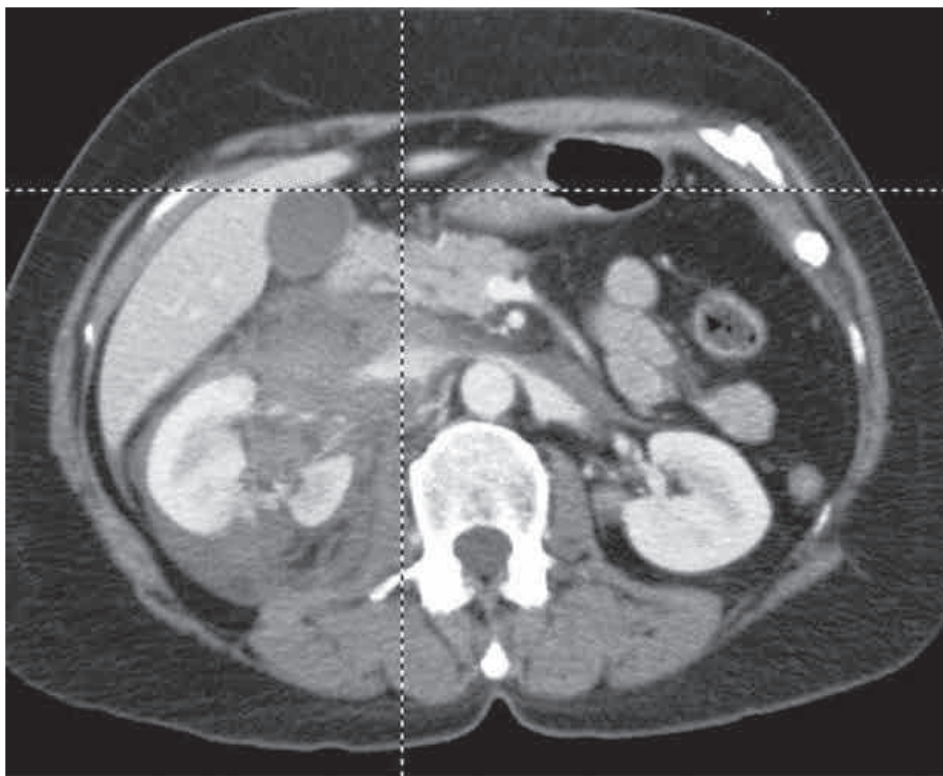
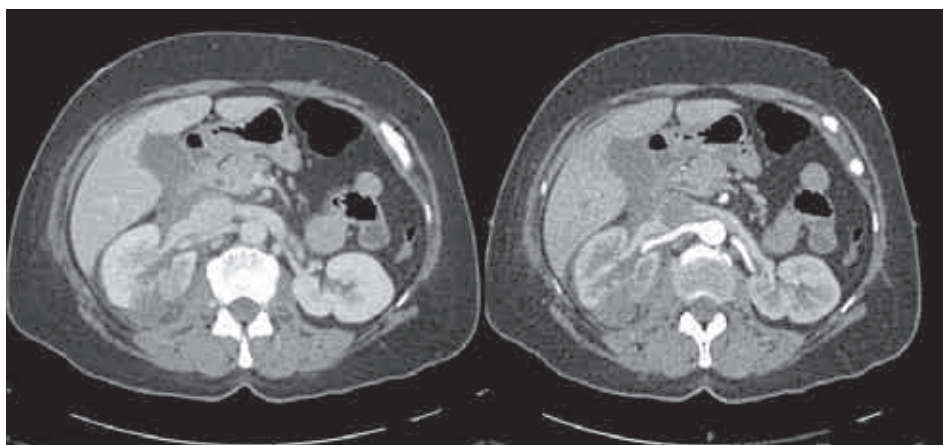


Figure 2.

CT angiogram revealed a grade IV laceration of right renal midzone and inferior pole with normal single renal artery (bilaterally) with a non perfused inferior pole on the right side with no any evidence of any renal mass.



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Chronic Pulmonary Dysfunction Following Acute Inhalation of Butyl Acrylate

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Abstract

Butyl Acrylate (BA) (2-propionic acid; $\text{CH}_2=\text{CHCOOC}_4\text{H}_9$) is a colorless liquid commonly used in impregnation agents and adhesives. Dermal contact with BA has previously been reported to cause moderate skin irritation with skin sensitizing potential in humans. Health effects of inhalation of BA have not been previously reported. Accordingly, we document the health conditions of a bystander, first responder and landfill worker exposed to butyl acrylate (BA) released to the atmosphere following a collision and roadside spill in October 1998. Retrospective data were collected via chart review and analyzed for exposure, symptoms, physical findings and radiological, laboratory and spirometry results over a ten-year period. All three patients had similar respiratory symptoms including a dramatic hacking cough and dyspnea. Findings included abnormal pulmonary function tests and breath sounds. These data underscore the potential hazards of BA inhalational exposure and the need to wear additional protective equipment.

Introduction

Butyl Acrylate (BA), also known as 2-propionic acid ($\text{CH}_2=\text{CHCOOC}_4\text{H}_9$) is a colorless liquid used in

impregnation agents and adhesives for the production of inks, paint, adhesives, sealants, emulsifiers, textiles, plastics, elastomers and solvent coatings. BA is a flammable substance with a pungent odor. It is often shipped as a liquid in tanker trucks¹ and handled in closed environments after being mixed with stabilizers to prevent polymerization. The U.S. produced 581,000 tons of BA in 2000.²

There is little published information regarding the potential adverse human health effects of acute or subacute topical exposure to BA. BA is a moderate skin irritant with skin sensitizing potential in humans.³ Nine of 22 people exposed to BA through a patch had a sensitization reaction.⁴ BA has been shown to cause contact dermatitis from eyeglass frames.⁵ A patient developed eczema under the nose pads of eye glasses after being sensitized to the plastic backs of earrings.⁶ Case reports of dermal effects from topical BA exposure include xerosis, hyperkeratosis, fissuring and onycholysis in a carpenter who often used paints and glues containing BA and a mechanic whose hands were unprotected.⁷ This case series reports on three individuals exposed to BA via inhalation following a roadside spill in October 1998. They were initially examined at the Institute of Occupational and Environmental Health (IOEH) at West Virginia University in 1998-99.

Exposure Incident

At approximately 8:45AM on October 24, 1998 a tanker truck carrying nearly 45,000 pounds of BA collided with a logging truck

on U.S. Rte 50 in a rural area near Salem, WV. The vehicles exploded on impact and both drivers died instantly.⁸⁻⁹ The debris spread nearly 200 feet, including a nearby stream where a subsequent fish-kill was attributed to the chemical. The fire from the explosion charred the four-lane roadway and prevented firefighters from accessing the vehicular remains for about three hours. Meteorological reports in the spill area between October 24 - 30 included no significant precipitation, temperatures ranging from 35 - 60°F, and winds generally less than 6 MPH.

At least 23 people were treated for exposure to the chemical spill. Six people were admitted to the hospital, including one firefighter. Nearby residents complained of respiratory irritation. Those within a half-mile of the wreckage were evacuated to shelters immediately following the incident because of the potential toxicity. The debris and contaminated soil were moved to a landfill and buried. The contaminated section of the road was removed and disposed of at an old water treatment plant in Salem.¹⁰

Materials and Methods

Patient clinical and laboratory data were abstracted from West Virginia University (WVU) medical records following approval of the WVU IRB. A chart review instrument was developed to assemble information regarding exposure, symptoms, physical examination and radiological, laboratory and spirometry results. No formal dose response assessment was performed at the scene by accident investigators. Based on

patient medical histories, the size of the load, and the well reported on-scene destruction documented in news articles and photos, we believe that two of our patients had substantial exposures.

Case Presentation

Patient 1

A female college student was seen at WVU two weeks after exposure complaining of dyspnea, persistent cough, and hoarseness. She reported being exposed to BA vapors while her car was idling with other vehicles just behind the accident site. She left her vehicle and retreated a short distance; but remained near the crash site for 20-25 minutes before being assessed by emergency responders. She experienced sore throat, burning/itching skin and conjunctival irritation. She sought treatment at a local emergency center and was prescribed both triamcinolone and beclomethasone oral inhalers. She was referred to WVU due to continued facial swelling, chronic cough and nasal symptoms. She had no prior history of pulmonary disease apart from mild asthma in childhood. She was not prescribed any medications prior to the time of the BA exposure. She coughed continuously throughout the evaluation. Lung auscultation revealed diminished air entry with marked end-inspiratory wheezes in all lung fields. Airway hyper responsiveness was documented by a positive methacholine challenge test. Findings included airflow obstruction and cough due to upper and lower airway irritation resulting from the toxic exposure. Otherwise, the physical examination was unremarkable.

Patient 2

A male landfill worker experienced cough, hoarseness, dyspnea, headache and generalized

weakness shortly after incident site materials arrived at the landfill. He was exposed over the course of several days to BA vapors from contaminated soil and associated debris as a heavy equipment operator. His symptoms started within a few hours of the arrival of the contaminated materials and worsened with continued contact. He developed a headache and became light-headed. He noted progressive sore throat, chest pain, cough and dyspnea. He required several visits to regional emergency departments and was admitted to the hospital over the next several weeks. His symptoms persisted despite treatment with fluticasone, salbutamol and terazosin. He was referred to WVU for evaluation after three weeks. His past medical history included mild childhood asthma. This continued into adulthood; but had not been recently symptomatic. He was diagnosed with acute and chronic bronchitis from chemical irritant exposure, with probable tracheitis and laryngitis.

Patient 3

A male first responder who had evacuated residents and domestic animals on the day of the spill was referred to WVU by Worker's Compensation for an independent medical evaluation following seven months of respiratory complaints. He was a former smoker with a previous diagnosis of chronic bronchitis. He was taking no medications at the time of the spill. His symptoms started immediately upon exposure to the BA vapors and included eye irritation, lacrimation, rhinorrhea, nausea and vomiting. He experienced increasingly severe symptoms of dyspnea and cough accompanied by a headache over the course of several days. His respiratory symptoms did not resolve despite treatment with salmeterol, salbutamol and fluticasone propionate nasal spray.

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Lisa L. Lilly, Responsible Attorney

A chest radiographic examination 18 weeks post exposure revealed a lung abscess that was treated successfully with antibiotics. Spirometry (see Figure 1) showed a mild restrictive pattern of impairment and airway hyperresponsiveness documented by a positive methacholine challenge test. He also complained of persistent muscle weakness and pain and an inability to concentrate or focus. Findings included pre-existing bronchitis, with the subsequent development of reactive airway dysfunction. The patient continued to require treatment for bronchospasm more than 10 years after the exposure.

Summary Data

Clinical profile of the patients including acute symptoms and radiological findings are presented in Table 1. Follow up symptoms and pulmonary function test results are shown in Table 2 and Figure 1 respectively. All three patients experienced persistent upper and lower respiratory symptoms including prominent cough, nasal congestion, sore throat, dyspnea and wheezing. They also all had abnormal spirometry results. One patient had a previous history of bronchitis and developed a lung abscess which may have been related to the exposure. All three patients continued to report intermittent dyspnea and used inhalation medications to control their respiratory disease approximately three years after the initial exposure. The patient with preexisting bronchitis had symptomatic asthma and evidence of declining pulmonary function at 10 year follow-up. He left full-time employment due to respiratory disability. The other two patients had left the area and were unreachable.

Discussion

This is the first case series documenting health consequences of an acute unprotected and

Table 1: Clinical profile including acute symptoms and radiological findings of patients exposed to butyl acrylate

	Patient 1	Patient 2	Patient 3
Clinical profile			
Age	20-30	31-40	41-50
Gender	F	M	M
Occupation	Bystander	Landfill worker	First Responder
Nature of exposure	Spill site	Landfill	Evacuating nearby residents
Tobacco	No	No	Quit in 1995
Prior pulmonary etiology	No	No	COPD
Onset of respiratory symptoms	Immediate	1-2 weeks	Immediate
Acute Symptoms			
Cough	Present	Present	Present
Nasal Congestion	Present	Present	Present
Sore throat	Present	Present	Present
Lacrimation	Present	Absent	Absent
↓ night vision	Present	Absent	Absent
Wheeze	Present	Present	Present
Crackles	Absent	Absent	Absent
Lacrimation	Present	Absent	Absent
Redness of eyes	Present	Absent	Absent
Facial Swelling	Present	Absent	Absent
Hand Swelling	Present	Absent	Absent
Radiological Findings			
X-ray Chest	Normal	Normal	Rt. Lung mass
CT Chest	Normal	Normal	3 cm abscess-right side
CT Sinuses	Mucosal thickening	Normal	Normal

Table 2: Clinical findings during follow-up visits

	Patient 1	Patient 2	Patient 3
Dyspnea	Present	Present	Present
Cough	Present	Present	Present
Nasal Congestion	Present	Present	Present
Sore Throat	Present	Absent	Absent
Headache	Present	Absent	Absent
Wheeze	Present	Present	Present
Intolerance to strong odor	Present	Present	Present

uncontrolled exposure to BA vapors. Few published references were found documenting human toxicity of BA.¹ The consistency of the clinical findings in these cases supports several inferences. First, smell alone provides insufficient warning protection for exposures to BA despite its sharp and easily perceived odor. All three exposed individuals were able to remain exposed and tolerate vapor inhalation for many minutes. Second, the levels of BA vapors encountered during the spill and the handling and transportation of contaminated soil were associated with both acute and chronic effects of the upper and lower respiratory tracts. Two of the cases also reported non-specific symptoms including headache and loss of ability to concentrate.

Although states do not have a ways to proactively measure the amount of toxic product passing

through each state, nor a means to control the distribution of the myriad hazardous products that pass routinely through every state, there is an active state surveillance program for hazardous spills. This program is conducted by the state health departments in some seven states. The National Toxic Substance Incident program is a cooperative program with a public data base, funded by the Agency for Toxic Substances and Disease Registry (a part of the Centers for Disease Control) and the U.S. Department of Transportation. The intent of the program is to provide a clearer picture of why and where incidents are occurring, and what happens when incidents do occur. West Virginia is not one of the funded cooperating states. However, each state can request assistance from the ATSDR when needed. Information

about the program can be found at www.atsdr.cdc.gov/ntsip/.

These cases illustrate important lessons about worker and bystander protection. Highway bystanders at the site of potentially toxic incidents must be instructed to promptly evacuate the scene. All emergency responders, including animal control officers, must be trained and provided with adequate personal protection before entering toxic spill areas. Finally, sanitary landfills may need to strengthen their occupational health procedures for the handling and disposal of toxic materials. Particular caution may be necessary for those otherwise healthy individuals with a history of even minor previous pulmonary disease.

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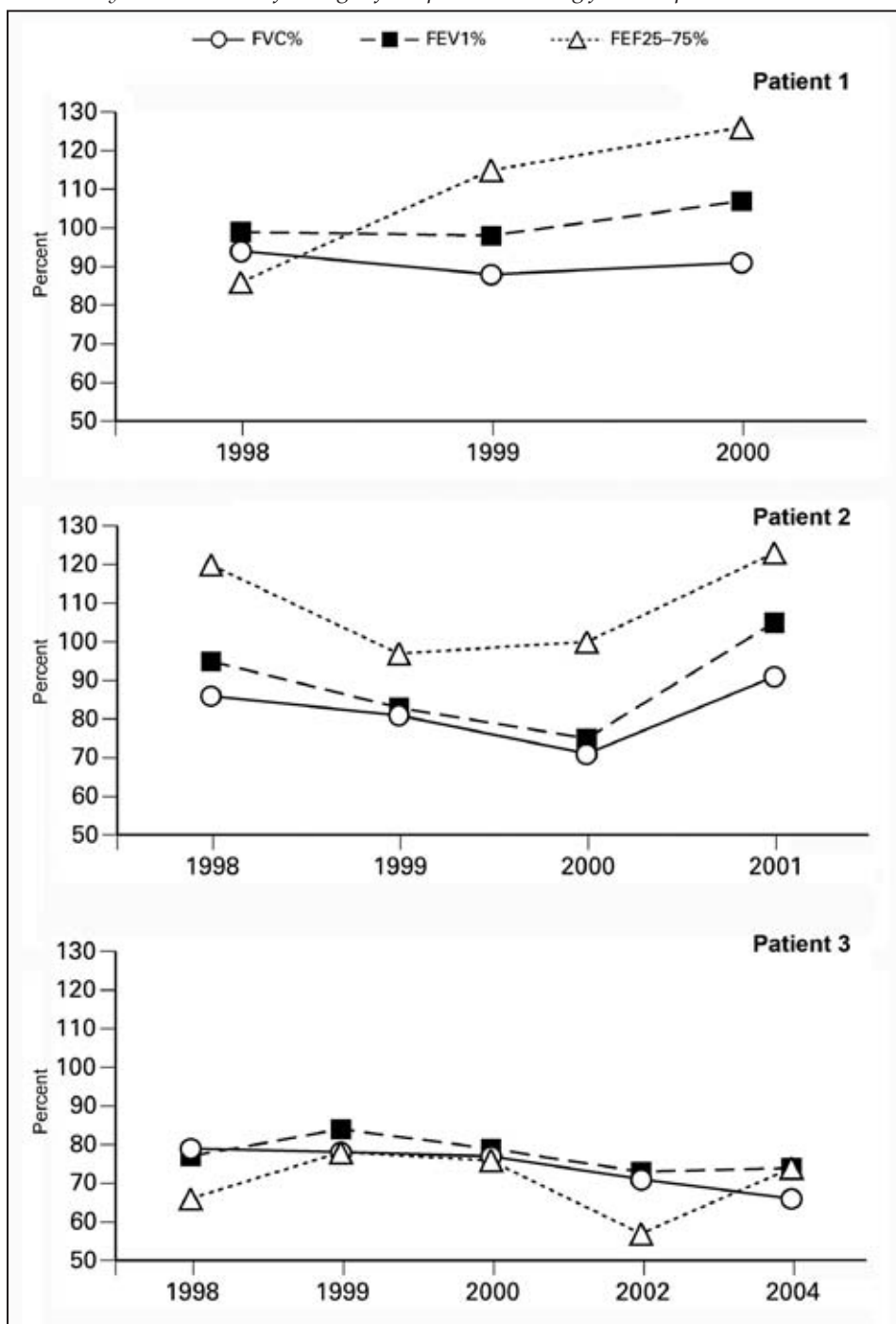
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Figure 1.
Pulmonary Function Test findings of the patients during follow-up.





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Charleston Town Center Marriott
Charleston, WV

20th Annual WV Rural Health Conference

Wednesday through Saturday, Nov. 14-16
The Resort at Glade Springs
Daniels, WV

West Virginia Public Health Symposium

Thursday and Friday, Nov. 15-16
Charleston Marriott Town Center
Charleston, WV

CORE (Center for Organ Recovery and Education) Conference

Tuesday, Dec. 4
WVU Health Sciences Center
Charleston, WV

32nd Cardiovascular Conference at Snowshoe

Friday through Sunday, Jan. 25-27, 2013
Mountain Lodge Conference Center
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West Virginia Trauma Symposium

Wednesday through Friday, Feb. 6-8, 2013
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CALL FOR PAPERS – 2013

Theme: Rural Healthcare Disparities: Challenges & Solutions

WEST VIRGINIA is considered one of the most rural states in the nation according to the U.S. Census Bureau. Our citizens are statistically older, less educated, have lower incomes, and contend with chronic medical conditions more than their national counterparts. In addition to these statistical barriers, access to healthcare is often limited by a scarcity of local providers. This special edition of the *West Virginia Medical Journal* will focus on the challenges these disparities create and will strive to offer solutions for the betterment of healthcare delivery to our citizens.

The *West Virginia Medical Journal* is soliciting articles for this special CME edition to address issues such as:

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Strengthening West Virginia's healthcare infrastructure 2. Special populations (particularly the elderly, children, pregnant women, disabled, handicapped, and mentally ill) specific challenges and solutions to healthcare access 3. Innovative methods to effectively communicate with rural populations 4. The future of small rural practices 5. Chronic illness management in rural populations (particularly diabetes, obesity, kidney and heart disease) 6. Effective recruitment and retention of healthcare providers | <ol style="list-style-type: none"> 7. Use of technology to aid rural healthcare settings 8. Barriers to trauma care and improving access 9. Rural clinic and hospital support and development 10. Current programs designed to reduce barriers to healthcare access (physical, social, educational and/or economic), including an analysis of the cost-benefit and cost-effectiveness of the program(s) 11. Substance abuse — effective tools and resources to aid the rural practice 12. Improving collection and analysis of healthcare workforce data |
|--|---|

Submissions requirements

- | | |
|---|---|
| <ol style="list-style-type: none"> 1) cover letter (include corresponding author's email address) 2) manuscript (double-spaced) 3) short biography <i>for each author</i> 4) three questions and answers pertaining to the manuscript (for CME Post-test Questions) 5) a paragraph stating the objectives of the paper 6) All figures and photos must be submitted separately as black and white or grayscale .jpg, or .tif files. | <ol style="list-style-type: none"> 7) Word count limit is 2,500 with a limit of 5 visuals (i.e., 3 tables and 2 figures). Actual figure and table size is left to the discretion of the managing editor, as space is available. 8) Reference format follows the same style as JAMA. 9) Editorial/commentary submissions are limited to 700 words. <p>Scientific articles should be prepared in accordance with the "Uniform Requirements for Submission of Manuscripts to Biomedical Journals." Please go to www.icmje.org for complete details. For additional requirements, please refer to <i>Manuscript Guidelines</i> at www.wvsma.org/journal.</p> |
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For more information or questions about submissions, please contact Angie Lanham, Managing Editor.
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DEADLINES:

Manuscript submission:	February 1, 2013
Reviews returned by:	April 1, 2013
Resubmissions:	May 1, 2013
Printing:	July/August 2013 issue

Each month, the WV SMA tracks the number of MPLA suits filed in each county throughout West Virginia. Below is a chart summarizing the case filings from 2005 through July 2012. Please note the annual total for 2005 was significantly impacted by the large number of suits brought in Putnam County that year, most of which related to one physician. Year-end total filings 2005 through July, 2012 were 273, 154, 174, 178, 205, 170, 372, and 148 respectively.

COUNTY	2005	2006	2007	2008	2009	2010	2011	2012 thru July	TOTALS 2005 - 07/2012
Barbour	1	0	0	1	0	0	0	0	2
Berkeley	4	3	3	2	2	2	5	9	30
Boone	0	1	1	0	1	1	0	4	8
Braxton	1	1	0	0	0	1	0	0	3
Brooke	4	0	2	3	2	1	4	1	17
Cabell	7	14	14	13	27	17	18	12	123
Calhoun	0	0	0	0	0	0	0	0	0
Clay	0	0	0	0	0	0	0	0	0
Doddridge	0	0	1	0	0	0	0	0	1
Fayette	1	5	3	2	5	0	9	1	26
Gilmer	0	0	0	0	0	0	0	0	0
Grant	0	1	1	1	0	0	0	0	3
Greenbrier	4	3	5	5	6	5	4	3	35
Hampshire	1	0	1	0	0	0	0	0	2
Hancock	0	1	0	1	0	0	0	0	2
Hardy	0	0	0	0	0	0	0	0	0
Harrison	8	5	9	6	5	7	6	5	51
Jackson	1	3	4	1	4	1	1	1	16
Jefferson	1	0	2	3	2	1	2	1	12
Kanawha	37	47	46	49	53	56	84	57	429
Lewis	1	1	1	0	0	0	0	0	3
Lincoln	0	1	0	0	0	0	0	0	1
Logan	9	2	4	6	7	9	6	3	46
Marion	2	1	0	4	4	2	3	4	20
Marshall	2	2	2	0	0	0	1	1	8
Mason	3	1	2	5	3	2	3	0	19
McDowell	0	1	1	3	4	0	1	1	11
Mercer	4	8	9	8	15	5	11	6	66
Mineral	3	0	0	0	1	1	1	0	6
Mingo	5	3	3	2	4	3	5	4	29
Monongalia	10	15	15	14	17	15	16	12	114
Monroe	1	0	1	0	0	0	0	0	2
Morgan	0	0	0	0	1	0	1	0	2
Nicholas	2	1	2	1	5	0	3	3	17
Ohio	10	5	6	5	4	11	9	6	56
Pendelton	0	0	0	0	0	0	0	0	0
Pleasants	0	0	0	0	0	0	0	0	0
Pocahontas	1	0	0	0	0	0	0	0	1
Preston	0	2	0	0	0	0	1	1	4
Putnam	126	4	5	7	6	5	15	1	169
Raleigh	10	7	14	18	11	6	135	4	187
Randolph	4	2	5	3	4	4	2	1	25
Ritchie	0	0	1	0	0	0	0	0	1
Roane	1	0	1	1	0	0	1	0	4
Summers	0	0	1	0	1	0	2	0	4
Taylor	0	2	0	1	0	0	0	0	3
Tucker	0	0	1	0	0	0	0	0	1
Tyler	0	0	0	0	0	0	1	0	1
Upshur	1	3	1	1	0	4	3	2	15
Wayne	0	0	0	0	0	0	0	0	0
Webster	0	0	0	0	1	0	1	0	2
Wetzel	2	1	0	1	1	1	1	1	8
Wirt	0	1	0	0	0	0	0	0	1
Wood	6	5	6	11	8	9	15	4	64
Wyoming	0	2	1	0	1	0	2	0	6
TOTALS (BY INDIVIDUAL YEAR)	273	154	174	178	205	170	372	148	1675



Mullett named Loyal West Virginia Physician WVU faculty pediatrician led effort to reduce infant mortality in state



Dr. Mullett

Martha D. Mullett, M.D., a 1972 graduate of the West Virginia University School of Medicine, has been named this year's recipient of the Loyal West Virginia

Physician Award in recognition of her significant contributions to the health care of state citizens. The school's alumni association honored Dr. Mullett at an event on Sunday, September 30.

As a WVU pediatrics professor and clinician, Mullett's leadership during the formation of WVU's neonatal intensive care unit (NICU) and the development of perinatal care services around West Virginia helped lead to a tremendous drop in infant mortality in the state.

In 1978, Mullett became the NICU director at what is now West Virginia University Children's Hospital, a

position she held until 1998. Mullett also led the West Virginia Birthscore Project, which identifies infants at high risk for infant morbidity and mortality and refers them for follow-up and needed medical consultation.

Mullett retired from clinical practice and the WVU School of Medicine faculty in June of this year.

Mullett has served WVU as a member of the WVU Medical Corporation Board of Directors; the West Virginia University Faculty Senate; as chair of the School of Medicine's Committee on Women's Issues; and as president of the WVU School of Medicine Alumni Association. She has also served as president of the West Virginia Perinatal Association.

At the national level, Mullett is the only West Virginia physician to be appointed by the Secretary of Defense and approved by the White House

to serve as a member of the Defense Advisory Committee on Women in the Services (DACOWITS), providing senior Pentagon officials with independent advice regarding women in the armed forces. As vice-chair of the group for two years in the 1990s, Mullett served for a total of six years.

In addition to her medical degree, Mullett also completed her baccalaureate at WVU in 1968, and earned a Master's in Public Health from Harvard University. She went on to complete her pediatric residency and a fellowship in neonatal perinatal medicine at WVU in 1976.

The Loyal West Virginia Physician Award was established in 2010 by the WVU School of Medicine Alumni Association to recognize West Virginians for compassionate delivery of healthcare, for outstanding community service and for dedication to the WVU School of Medicine.

Dr. Charles L. Rosen named chair of the WVU Department of Neurosurgery



Dr. Rosen

Charles L. Rosen, M.D., Ph.D., has been named chair of the West Virginia University Department of Neurosurgery. Arthur Ross, III, M.D.,

M.B.A., dean of the WVU School of Medicine, announced the appointment in September.

"Following a comprehensive search process, which provided us with the privilege to carefully consider some of this nation's very finest academic neurosurgeons, we have concluded that the best candidate for this important job was right here at WVU School of Medicine," Dr. Ross said. "Charles Rosen is an outstanding clinician, a gifted teacher and a well-

funded clinical translational scientist. It is increasingly rare to find someone so accomplished in each of these mission-critical areas. I am pleased and delighted that Dr. Rosen has accepted this exciting challenge and look forward to the many things that this great department will achieve with him at the helm."

Dr. Rosen has been serving as interim chair of the department since September 2011. He joined the faculty at WVU in 2001 and has held various positions in the department since that time.

Outside of the department, Rosen has served on numerous committees within the School of Medicine. He is also involved with various professional organizations and societies, including the American College of Surgeons, Congress of Neurological Surgeons,

American Association of Neurological Surgeons, and the North American and European Skull Base societies. He has also served as president of the Neurological Society of the Virginias.

In addition, he is currently the medical director for neurosurgery at United Hospital Center, Ohio Valley Medical Center and Wheeling Hospital.

Rosen completed his undergraduate degree at Washington University in St. Louis, his master's and doctorate degrees at the New York University Graduate School of Arts and Sciences, and his medical degree at the New York University School of Medicine. He completed advanced training at the George Washington University Medical Center in Washington, D.C. He is board certified in neurological surgery.

Joan C. Edwards School of Medicine students and faculty inducted into national honor society

Twelve 4th-year medical students at the Marshall University Joan C. Edwards School of Medicine were inducted into the Gold Humanism Honor Society (GHHS) during a September ceremony.

The society, established in 2002, is an association of individuals and medical school chapters whose members are selected as exemplars of empathy, compassion, altruism, integrity and service in working with patients, their families and others in the field of medicine.

The GHHS is an initiative of the Arnold P. Gold Foundation which was created in 1988 by Dr. Arnold P. Gold and his wife Dr. Sandra Gold in an effort to nurture and preserve the tradition of the caring physician.

Dr. Joseph I. Shapiro, dean of the School of Medicine, was honored in 2002 with the Arnold P. Gold-Healthcare Foundation of New Jersey Humanism in Medicine Award.

“The GHHS honors that aspect of being a health care provider which I think is most admirable. Of the different distinctions that I’ve been fortunate enough to receive, being selected as an honoree from the GHHS in 2002 is probably the one I’m proudest of,” Shapiro said.

Shapiro went on to say he’s extremely proud of the Marshall students and Marshall faculty who have demonstrated outstanding commitment to excellence and compassion in patient care and are now being inducted.

The following students were inducted into the honorary: Brian Abadir, Proctorville, Ohio; Matthew Q. Christiansen, Gandeenville, W.Va.; Matthew B. Curry, Huntington, W.Va.; John B. Epling, Summersville, W.Va.; Joshua A. Hess, Hurricane, W.Va.; Caleb R. Huff, Glenwood, W.Va.

Jacob T. Kilgore, Kenova, W.Va.; P. Gordon McLemore, Murray, Utah; Bi Mo, Philadelphia, Pa.; Kathleen H. Richardson, Long Valley, N.J.; Melissa A. Rowe, Huntington, W.Va.; Adam T. Short, South Charleston, W.Va.

Several faculty members were also inducted into the society and recognized as recipients of The Leonard Tow Humanism in Medicine Award. They include: Dr. Renee S. Domanico, associate professor, pediatrics; Dr. Shirley M. Neitch, professor, internal medicine; and Dr. Gerard J. Oakley, professor, obstetrics & gynecology. Dr. Darshana T. Shah, professor, pathology and associate dean of faculty affairs & professional development was also inducted and will serve as chapter advisor.

Alumni celebrate ‘Milestones and Memories’ homecoming

Joan C. Edwards School of Medicine alumni gathered in Huntington in September for the 26th annual alumni weekend.

Sen. Ron Stollings, M.D., Class of 1982, was recognized as the 2012 Distinguished Alumnus. Stollings is board-certified in internal medicine

and has a private practice in Madison. He has served West Virginians as a state senator in the West Virginia Legislature since 2006 and is chairman of the Senate Health and Human Resources committee. He is a former member of the Higher Education Policy Commission

and past president of the West Virginia Medical Association.

Classes celebrating with reunions this year are the Class of 1982, Class of 1987, Class of 1992, Class of 1997, Class of 2002 and the Class of 2007.

Joan C. Edwards School of Medicine features dual-degree program with emphasis on research

Dr. Joseph I. Shapiro, dean of the Joan C. Edwards School of Medicine at Marshall University, has announced revitalization of a research-focused dual-degree program at the School of Medicine.

The M.D./Ph.D. program has existed at Marshall since 1992, but operated on an ad hoc basis as students expressed interest. The revised M.D./Ph.D. program is a

seven-year commitment that allows students to graduate with both degrees, preparing them for careers in patient care and medical research.

Dr. Richard Niles, senior associate dean for research and graduate education, says most of the students interested in the dual-degree program are interested in careers in academic medicine. Niles says students interested in pursuing the

combined degree will check off the corresponding box on their American Medical College Application Service (AMCAS) application. When Marshall receives the applications, they will be flagged for review by a subcommittee consisting of members of the medical school admission committee and the graduate studies committee which, in turn, will make admissions recommendations.



Congratulations 2012 Certified Medical Compliance Officer (CMCO) Class!

by Barbara Good, CMC, CMOM
Physician Practice Advocate, WVSMA

This fall, WVSMA became the first State Medical Association to be chosen to host the Certified Medical Compliance Officer Course. The intense five day course provided instruction by D.K. Everitt, BBA, CMCO, and Robert Liles, JD, MBA, MHA.

This special initiative offered West Virginia medical practices the opportunity to obtain compliance training from the experts in a live setting. The Practice Management Institute (PMI) nationally recognized training program helps to ensure that medical practices are prepared to meet all compliance guidelines.

Members of the Inaugural Certified Medical Compliance Officer (CMCO) class included:

Certified Medical Compliance Officer Course Fall 2012

Amy Callihan
Kathy Carper
Melissa Cox
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Barbara Good
Cherie Hanna
Lou Ann Hodges
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The WVSMA remembers our esteemed colleagues...

Galal Zakaria Galal, MD

After bravely battling many illnesses for over nine years, Dr. Galal Zakaria Galal passed away on July 10, 2011.

He was born in Cairo, Egypt, on November 12, 1949. He attended medical school at Ain Shams University in Cairo, and then followed with a Radiation Oncology residence at Boston University. He was also an instructor at the University of Massachusetts medical Center before moving to Beckley. From then on, he practiced Radiation Oncology at the Raleigh Regional Cancer Center from 1993 - 2002.

Dr. Galal is survived by his wife, Sawsan, daughter Salwa and two sisters Wafaa and Fatma. His sisters still reside in Cairo.

Arrangements by Melton Mortuary, Inc., Beckley. request that donations of sympathy be made to Brio Integrated Theatre, an organization for those with special needs, in his memory. Donations may be made online at briotheatre.org, or may be sent to Brio Integrated Theatre, P.O. Box 29, Winchester, MA 01890.

Lawrance S. Miller, MD

Dr. Lawrance S. Miller, 90 of Kingwood, WV, passed away on Wednesday, July 27, 2011 at Ruby Memorial Hospital. He was born May 11, 1921, in Bridgewater, VA.

Dr. Miller attended the Medical School of the University of Virginia

where he graduated with a M.D. degree in 1945. After internship at the Medical College of Virginia in Richmond he returned to active duty in the U.S. Army Medical Corps until 1948, having served four years in the Army during and following World War II. He then spent one year in a general surgery residency at the Johnston-Willis Hospital in Richmond, VA and then three more years in Orthopedic Surgery Residency at the Medical College of Virginia and Crippled Children's Hospital in Richmond, VA.

He returned to Morgantown in 1952 to practice with Justus C. Pickett in orthopedic surgery.

He was married to Carmen (Christian) Miller for 63 years, and they celebrated their 60th wedding anniversary in 2008. In addition to his wife Carmen, he is survived by three sons and spouses, Judge Lawrance S. Miller, Jr. and Susan of Kingwood, Orthopedic Surgeon Dr. Steven C. Miller and Carolyn of Morgantown, and Attorney Timothy M. Miller and Anne of Charleston; nine grandchildren and spouses, Paige (Miller) and John Hayes of Leesburg, VA, Jessica Miller of Kingwood, Jennifer (Miller) and Adam Jury of Columbus, OR, Benjamin and Lisa Miller of Brooklyn, NY, Allison Miller and fiancée, Luke Arno of Portland, OR, Timothy Jr. and Elizabeth Miller, of Arlington, VA, Katherine (Miller) and Pascal LeSeac'h of Brooklyn, NY,

Laura Miller of Morgantown, Thomas Miller of Charleston, two sisters, Kathryn Roche of Bridgewater, VA and Mrs. Mary Ellen Phibbs of Glendale, CA; two brothers, Rev. Myron S. Miller of Richmond, VA and Charles E. Miller of Bridgewater, VA; and special caregivers, Betty Bolyard and Rosalee Johnson.

Raul H. Tamayo, MD

Raul H. Tamayo, MD, passed away on March 22, 2012, at the age of 71.

Dr. Raul Tamayo was a dedicated son, cherished brother, devoted husband and adoring father. Furthermore, he was a well-respected Emergency Room physician for over 35 years in Beckley, WV. Raul proudly served his country as a Medical Physician in the U.S. Army Reserves and volunteered in various medical care locations.

Those left to cherish his memory include his loving wife of 44 years, Teresita I. Tamayo of Palmetto, FL; children: Maria Theresa Tamayo-Coffey, BSN, RN, CNN, and husband Paul of San Francisco, CA, Raoul Tamayo, MD, and wife Marilou Tamayo, MD, of Las Vegas, NV, Jonathan Tamayo, PTA, CPhT, and wife Gretchie of Palmetto, FL, and Joseph Tamayo, MD, and wife Rochelle Tamayo, BSN, RN, of Palmetto, FL; grandchildren: Gabrielle Coffey, Mackenzie Coffey, Benjamin Tamayo and Tristan Tamayo; several brothers, sisters, nieces, nephews and extended family along with a host of friends.

AMPAC Federation Meeting

On October 4-5 AMPAC, the political action committee of the AMA, held a federation meeting in Washington, DC with representatives of the state medical association PACs from around the country. WESPAC Director/Treasurer Amy Tolliver and WESPAC Board Member Dr. Lisa Costello participated in this meeting. As part of the trip, Tolliver and Costello met with staff members of West Virginia's congressional delegation (all our members of Congress were back in WV campaigning for re-election!). The two visited the offices of Senator Joe Manchin, Congresswoman Shelley Moore Capito and Congressman David McKinley. AMA lobbyist Jason Marino attended the meetings, as well.

Top on the list of critical issues discussed at these meetings was finding a permanent repeal to the Medicare

SGR formula. The discussions centered on the AMA's transition principles for developing a high performing Medicare program. The WVSMA is a signatory, along with nearly all the state medical associations and national specialty societies, to an October 15 letter issued by the AMA to Congress calling for an elimination of the SGR by implementing new federal policy on payment models. The policy focuses on physician-led, patient-centered payment models that can offer physicians opportunities and allow them to lead changes in care delivery while being rewarded for improving the quality of patient care and lowering the rate of growth in costs. For more information on this letter, please visit wvsma.org and click on the advocacy page.



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KEYSER, WV 26726 EXPERIENCE

by Steve Brown, Agency Manager



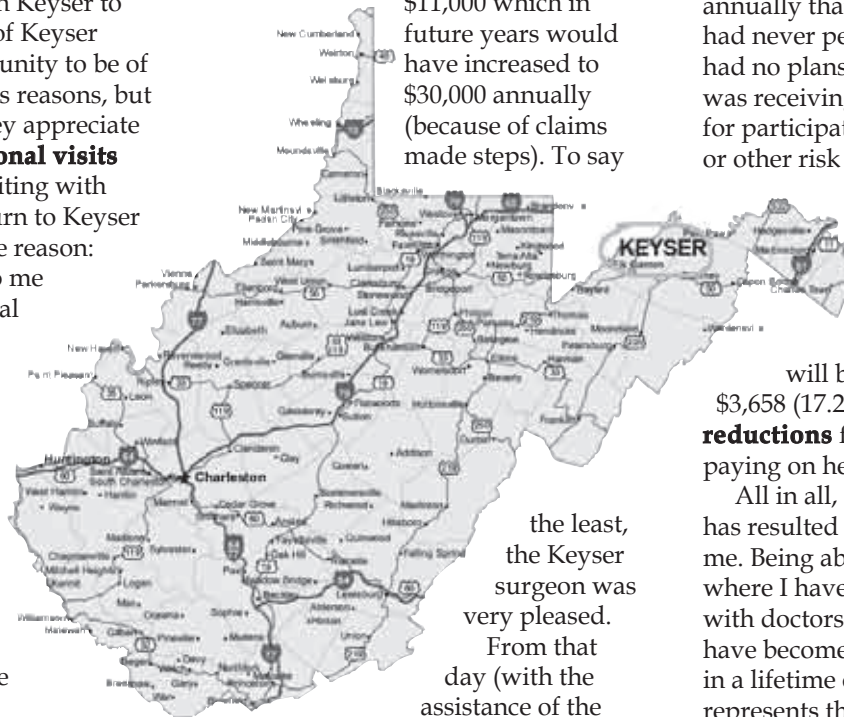
During my college days, I was a resident of Keyser, WV 26726 while I attended Potomac State College located on a hill overlooking downtown Keyser and the beautiful Potomac River. Never did I dream then that one day I would relish the opportunity to re-visit Keyser and Potomac State College the way I do now.

Since I have managed the West Virginia Medical Insurance Agency (started in 2004), I have expanded the number of clients I have in Keyser to a total of 10. The doctors of Keyser have given me the opportunity to be of service to them for various reasons, but one reason stands out: they appreciate the frequency of my **personal visits** to their offices. I enjoy visiting with them in Keyser, and I return to Keyser 3 or 4 times each year. The reason: It's a little bit like home to me and I have taken a personal interest in their practices.

In 2004 on my first visit to Keyser as Agency Manager, I met with 4 or 5 doctors at a Potomac Valley Medical Society meeting. I was asked "why are you here?" Having not been announced or introduced, I was able to talk about the insurance agency I had just recently started on behalf of the West Virginia State Medical Association (WVMSA) and that I would like for the local doctors to do business with the agency and me. A local surgeon asked me what I could do for him. I never over promise about providing better coverage or cheaper premiums, but I could certainly guarantee him that he would see me frequently and I

would help him all I could. He asked me to be more specific; so I requested a copy of his policy and his most recent application (which he later provided me by mail). Well the result is history; I determined that this surgeon had been allowed by his then current agent to be misclassified, which caused his premium to be \$11,000 more than it should have been. When proof of this was provided to his insurance company, he was mailed a check for

\$11,000 which in future years would have increased to \$30,000 annually (because of claims made steps). To say



the least, the Keyser surgeon was very pleased.

From that day (with the assistance of the general surgeon) I have been able to increase my business in Keyser and I enjoy my frequent return visits.

Because of the number of clients I have in Keyser, I have been able to **influence** the West Virginia Mutual Insurance Company to bring their CARE program presentations and CME Loss Control workshops to Keyser (which have

been held at Potomac State College) as opposed to having these local doctors drive to Morgantown, Martinsburg, or Elkins. This also makes it more convenient to doctors residing throughout the region including Romney, Petersburg or Moorefield.

In 2012, we added two new clients in Keyser. One became our client for two reasons: (1) she also was being misclassified by her carrier because her agent mailed a pre-typed application annually that included procedures she had never performed and currently had no plans to perform and (2) she was receiving zero premium credits for participation in Mutual CARE or other risk management premium

credit programs. With the classification savings (\$2,851) and the potential premium credits savings (\$1,807), she

will be eligible to receive \$3,658 (17.2%) in **premium reductions** from what she was paying on her August 2012 renewal.

All in all, coming to Keyser in 2004 has resulted in a labor of love for me. Being able to visit a community where I have some roots and work with doctors who over the years have become family to me is a once in a lifetime opportunity. Plus, it also represents the Agency's **commitment** to provide quality service to doctors anywhere in the State of West Virginia. (Keyser is 4 hours driving time from our offices in Charleston.)

The Agency currently represents over 350 doctors in 44 counties of West Virginia; we would welcome the opportunity to replicate the "**Keyser, WV 26726 Experience**" anywhere in the State; call us 1-800-257-4747, ext. 22.

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- Appalachian Cardiovascular Research Network** – *Identification of Genes Contributing to Cardiovascular Disease in Overweight and Obese Individuals from West Virginia* **Jan/Feb 23**
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- Berg**, Sven T., MD, MPH, CPE; Charles P. Schade, MD, MPH; Mary T. Blizotes, RN, MPH; Patricia B. Ruddick, RN, MSN – *Using Health Information Technology to Advance Preventive Care in West Virginia* **May/June 48**
- Bergental**, John, MD; Stephen M. Davis, MPA, MSW; Rosanna Sikora, MD, FACEP, FAAP; Debra Paulson, MD, FACEP, FAAEM; Charles Whiteman, MD, FACEP – *Pediatric Bicycle Injury Prevention and the Effect of Helmet Use: The West Virginia Experience* **May/June 78**
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- Blum**, Frederick, MD, FACEP, FAAP, FIFEM; Charles Whiteman, MD, FACEP, Danielle Davidov, PhD; Allison Tadros, MD, FACEP; John D'Angelo, MD – *Falls and Dilemmas in Injury Prevention in Older West Virginians* **May/June 14**
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- Davidov**, Danielle, PhD; Miryam Miller, MD; Roger Tillotson, MD, FACEP; Charles Whiteman, MD, FACEP; Thomas Marshall, MD; Owen Lander, MD, FACEP – *Injury Prevention and Recreational All-Terrain Vehicle Use: The Impact of Helmet Use in West Virginia* **May/June 96**
- Davis**, Stephen M., MPA, MSW; John Bergental, MD; Rosanna Sikora, MD, FACEP, FAAP, Debra Paulson, MD, FACEP, FAAEM; Charles Whiteman, MD, FACEP – *Pediatric Bicycle Injury Prevention and the Effect of Helmet Use: The West Virginia Experience* **May/June 78**
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- Gyure**, Kymberly, MD; Cara L. Sedney, MD; Todd Harshbarger, MD – *An Unusual Form of Listerial CNS Infection* **July/Aug 12**
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- Jain**, Abnash C., MD; Ravindra Bhardwaj, MD, MPH, Puneet Sharma, MD; Mitchell S. Finkel, MD; Sumesh Jain, MD; Ahmad Arham, MD; Tooba Kazmi, MD; Robert J. Beto, MD; Wissam Gharib, MD; Bradford E. Warden, MD – *Gender and Geographic Differences in CAD Risk Factors and CHADS₂ Scores in Atrial Fibrillation Patients* **Jan/Feb 18**
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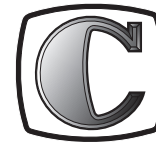
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Instructions for authors submitting CASE REPORTS

1. The WVMJ will consider case reports that will remind readers of important clinical lessons, shed light on the possible pathogenesis of a disease, prevent errors, describe unusual presentations, do away with misconceptions, present a rare disease or problem in context, describe a novel procedure or treatment, describe unusual associations of symptoms or diseases, describe unexpected outcomes, or present information that make a clear point useful to the readership.
2. A cover letter to the editor must accompany the manuscript, listing
 - a. How this report will advance the understanding of a disease, drug or medical problem in general.
 - b. Is this of interest to a particular specialty or to a broader clinical audience?
3. Case reports must be designed as follows:
 - a. **Abstract (100-120 words):** listing what is being reported, the outcome and the lesson(s) learned.
 - b. **Introduction (180-220 words):** a brief background leading to a statement of the paper's purpose. All the elaboration regarding the disease or clinical situation must not be presented in this section, and should instead be part of the discussion.
 - c. **Case presentation (400 words):** orderly narrative (symptoms, signs, relevant exam, diagnosis, etc) with stated and clearly presented rationale for the course(s) of action taken
 - d. **Discussion (350-600 words):** relevant information about the disease or problem being presented, putting the case in context. A comparison with similar cases in the literature must be included, with such information presented—if possible—in table form.
 - e. **Conclusion (50 words):** clearly state the main conclusions derived from this experience.
 - f. **References:** No more than 20 references will be published. WVMJ will print a notation to the reader to contact the author for additional references.
4. Figures must depict valid information and have markers pointing to the area of interest. Submit only high quality photos and tables, which are large enough to fill a 2-3/8 inch space at 100%.

Refer to the Manuscript Guidelines at wvsma.org for specific instructions concerning reference formatting and file requirements.



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WEST VIRGINIA RESPONDER EMERGENCY DEPLOYMENT INFORMATION SYSTEM REDI



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