Observations of Pre-operative Teamwork and Communication During the Implementation of a City-Wide Surgical Safety Checklist

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Abstract

Background. Use of the World Health Organization's (WHO) perioperative safety checklist has been shown in prior studies to reduce morbidity and mortality. In 2009, the Medical Society of Sedgwick County, Kansas, developed a modified version of the WHO checklist for city-wide implementation. This study evaluated how the checklist was used at a Wichita hospital.

Methods. An observational tool was developed to evaluate time-outs at the beginning of surgical procedures. A convenience sample of cases was evaluated across surgical specialties and procedures. Observations included: 1) when the time-out was done, 2) who led the time-out, 3) which items on the checklist were addressed, 4) how much time was spent, and 5) whether problems were identified or adverse events prevented.

Results. Data were collected from 121 observations. Only one of the surgical teams was observed to refer directly to the checklist posted in the OR to conduct their time out. The time-out was done before induction (3%), drape (19%), incision (77%), and after incision (1%). The process was led by the circulating nurse (92%), surgeon (7%), and circulating nurse and surgeon together (1%). The percent of completed checklist items was: patient identity (96%), procedure (96%), antibiotics (87%), site (80%), allergies (75%), position (70%), equipment (60%), DVT prevention (50%), images (40%), surgeon concerns (36%), and anesthesia provider concerns (34%). On average, seven (SD = 2.5) of 11 items on the checklist were addressed. Time spent ranged from less than one minute to five minutes; 78% took one minute or less. Problems were identified in 7% of cases. In one case, a wrong site surgery was prevented.

Conclusions. Despite the intention to implement a city-wide surgical safety checklist, the checklist rarely was used in its entirety to conduct the observed time-outs in the subject hospital. Although the checklist was under-utilized, safety benefits were observed from the time-out process. These would likely be enhanced and extended by consistent use of a checklist.

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Introduction

Safety checklists have proven to be a valid and inexpensive cognitive aid to reduce human error and improve teamwork and communication.[1] High reliability organizations such as the aviation industry, nuclear power industry, and military have long used checklists as a means of safety management. The exceptional safety record of the aviation industry owes much of its credit not to superior pilot skill, but to

reducing a complex process into a simplified series of checklists to ensure no steps are overlooked. For example, the early form of the pilot's checklist accounted for the four key steps of flying an aircraft: 1) takeoff, 2) flight, 3) before landing, and 4) after the landing.[2] This simple checklist reduced risks of operator error and minimized the impact of factors related to stress, fatigue, and memory in performing a complex task.[3]

The safety checklist intervention is supported by human factors science and the systems-based approach.[4] The systems approach emphasizes the importance of team functioning over individual operators. In the systems approach, the operator is not blamed for adverse events; rather the system is analyzed to determine the root cause of errors. After determining the events that led up to an error, defenses are built into the system to prevent recurrence of the previous error as well as future adverse events.[5] Such an approach has the possibility of elucidating methods that could place the surgical profession on a performance trajectory that could achieve higher goals than may have been possible with the existing model.

In 2008, the World Health Organization (WHO) published guidelines identifying multiple recommended practices to ensure the safety of surgical patients worldwide.[4] Key among those recommendations was the promotion of a surgical safety checklist. This checklist, evaluated by Haynes et al.[6], concluded the WHO 19-item surgical safety checklist (see Figure 1; which includes "sign-in", "time-out" and "sign-out" sections) decreased post-surgical complications, deaths, and surgical site infections for non-cardiac patients. The inpatient complication rate was 11% at baseline and fell to 7% after implementation ($p < 0.001$).[6] At baseline, the rate of death was 1.5% and fell to 0.8% afterward ($p = 0.003$). Approximately 20 million surgeries are performed in the US each year. Applying the mortality reduction observed in the WHO study to this figure, the total deaths related to surgical procedures could fall from about 300,000 to 160,000. This translates into possibly 140,000 lives saved in the US yearly from the appropriate use of the checklist. This approximation is comparable to estimates presented in other studies.

For many in the healthcare community, the checklist was heralded as a means to ensure a basic minimum safety standard. The surgical safety checklist process implies that every participant of the surgical team has a right and responsibility to communicate if they foresee or notice any errors or problems. Patients who are treated by teams that exhibit less communication are likely to have poorer outcomes.[8] Properly used, the checklist ensures that critical tasks are carried out and the team is prepared adequately for the operation.[9]

Vats and colleagues[8] found variability in the way the checklist was implemented noting the informal nature of its execution, unfamiliarity with the checklist among operating room (OR) staff, and uneven support from surgeons and anesthesiologists. Einav et al.[10] suggested the use of large posters in the OR to guide team members in conducting the checklist. Posters also would serve a secondary purpose of reminding OR staff of commitment to the surgical safety process. Additionally, the checklist has been critiqued for not asking questions early enough to enable corrective action to be taken.[10] Moreover, some OR teams used the checklist as a tool to ensure completion of a safety process whereas others treated it as a "tick box" exercise.[9] Further critiques of the surgical safety checklist center on its inapplicability to all surgical specialties. For example, the checklist omitted many

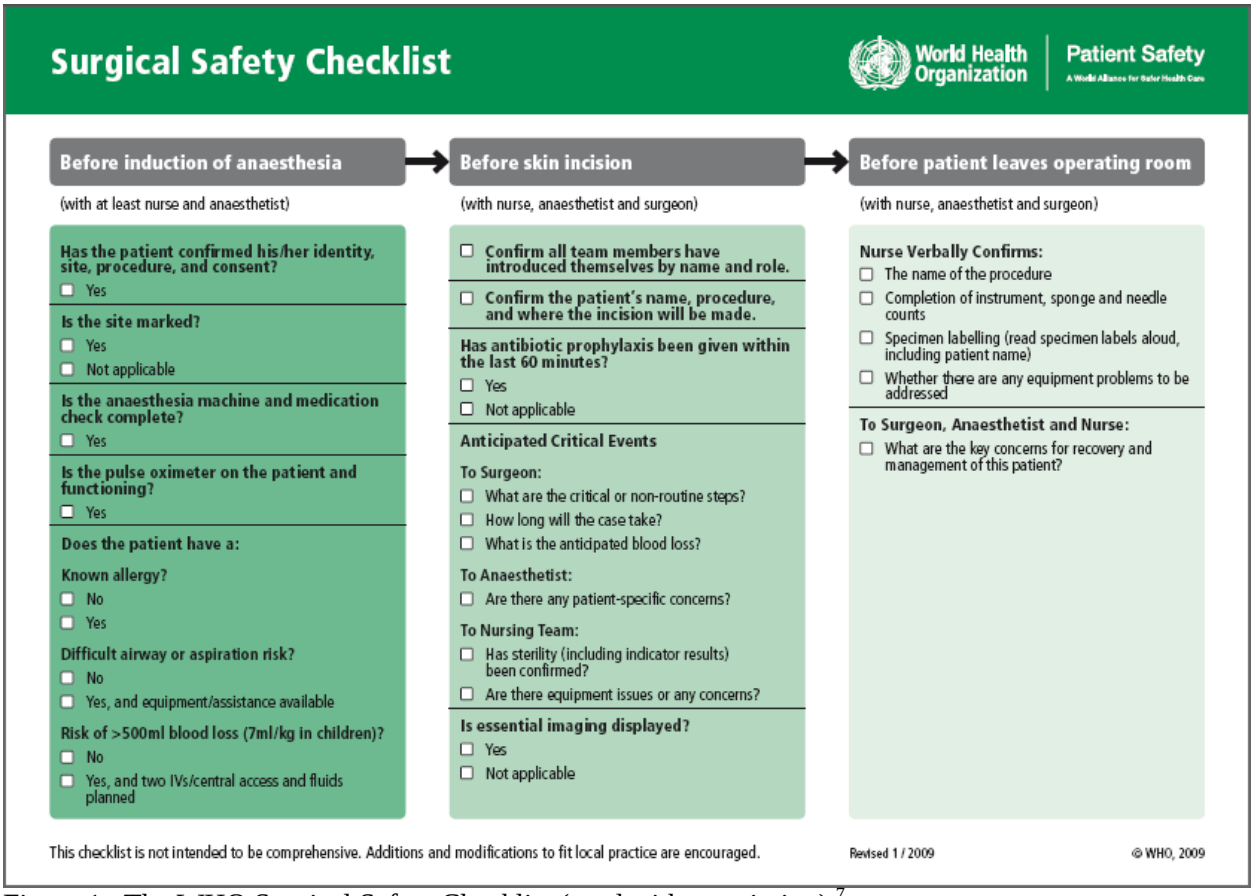

Figure 1. The WHO Surgical Safety Checklist (used with permission).[7]

important safety checks crucial to the safe conduct of cardiac operations such as checks on perfusion equipment and preparation for postoperative intensive care.[11] Lastly, for all of its safety benefits, the checklist cannot identify and account for competency gaps.[12]

Another factor that influences proper execution of the checklist is teamwork. When teamwork was optimized, the quantity and quality of preoperative briefings and team oriented behaviors increased.[8] Finally, differences in outlook between clinicians and hospital administrators seemed to hinder attempts to introduce safety-related changes.[13] The disparity in attitudes regarding safety between OR staff and administration propagates downstream to influence breakdown at the surgical level.[14] If adherence to the checklist is to be improved, it must be workable and acceptable to all staff. Creating a context where clinicians and managers work together is seen to lead to more success.[13] The surgical safety checklist, when backed up by good communication and training, results in a flexible yet resilient organization.[15]

The WHO study[6] evoked a wave of sentiment promoting the surgical safety checklist as a necessary component in the operating room. The Joint Commission (JC), the major accrediting body in the US, followed suit with the WHO and amended its own standards for a perioperative checklist. On July 1, 2004, the JC published, "The Joint Commission Universal Protocol for Preventing Wrong Site, Wrong Procedure and Wrong Person Surgery".[16] According to the Joint Commission's Universal Protocol requirements for time-out, the team members must confirm the correct patient identity, correct procedure,

and the correct operation site if applicable. The JC Universal Protocol checklist addressed and augmented many of the areas covered by the first two stages of the WHO checklist (check-in and time-out). The Joint Commission supported the use of the WHO Surgical Safety Checklist, yet the current WHO checklist did not address the standards set forth in the Universal Protocol fully.[17]

Due to impending further regulation from the JC, many surgical centers in the US adopted the use of some form of a surgical safety checklist. The Medical Society of Sedgwick County (MSSC) formed The Wichita Quality Healthcare Collaborative (TWQHC) in 2005 and began discussions on creating its own version of the WHO surgical safety checklist. The MSSC is a 1210 member physician group in Wichita, Kansas, the largest metropolitan area in the state of Kansas. MSSC efforts to create a checklist also were hastened by impending Joint Commission (JC) regulations requiring a surgical safety checklist in the OR.

TWQHC held several meetings at the MSSC which were attended by administrators and OR staff members representing the area's major surgical centers. In March 2009, TWQHC introduced a 9-point consensus checklist to be used within OR time-outs at surgical centers in the greater Wichita area. Their consensus checklist is nearly identical to the WHO's version of the checklist depicted in Figure 1. They concluded that the consensus checklist should be posted in each operating room and referred to by the OR team to conduct their pre-operative briefing.

The surgical teams were advised to refer to the posted checklist each time and respond to the prompts with information read directly from the patient chart. In addition to the JC's requirement to verify patient, procedure, and operation site, TWQHC's checklist also complied with the JC's intent to "ensure that all relevant documents are available and have been reviewed, as well as ensuring blood products, implants, and special equipment are available prior to the start of the procedure and accurately matched to the patient."[18] The observers in this study were tasked with evaluating the manner and consistency with which the pre-procedure safety verification process was performed and inclusive of the required components.

The primary objectives of this study were to: 1) provide observational data regarding OR time-outs while executing the perioperative checklist approved by the Wichita Quality Health Collaborative, 2) discuss the behaviors exhibited by the observed surgical team members and the possible impact on safety outcomes, 3) suggest that the perioperative checklist represents a cultural paradigm shift that may redefine the roles of team members regarding surgical safety.

It was hypothesized that the implementation of the checklist might fail to elicit complete compliance across the observed surgical teams. The full utilization of the surgical safety checklist will require a shift in cultural paradigms; one that replaces the physician-centric culture with a systems-based, collaborative approach.

Methods

Intervention. The MSSC began forming The Wichita Quality Healthcare Collaborative in 2005 shortly after The Joint Commission's "Universal Protocol for Preventing Wrong Site, Wrong Procedure and Wrong Person Surgery" became effective on July 1, 2004. During a series of conferences at the MSSC, a committee made up of surgical staff and administrators developed a consensus form of a pre-operative checklist. TWQHC officially recommended their checklist for use in operating rooms in the Wichita area in

March, 2009. It was presented and promoted in the months prior at the subject facility, during OR staff meetings and hospital quality improvement meetings. The data collection process began in April, 2009. All time-outs that were observed in this study occurred weeks after the checklist had been officially implemented at the subject facility.

The TWQHC consensus checklist addresses nine discrete items. One of these items was "special concerns" referring to the whole team. This item was expanded in our observation tool to record role-specific concerns from the surgeon, nurses, and anesthetist. Expanding this item resulted in the 11 measured checklist items referred to in the sections below.

Subjects. One hundred and twenty one observations were conducted at one major medical center in Sedgwick County, Kansas. A random sample of cases was evaluated, between April 2009 and March 2010, across surgical specialties and procedures. This study received scientific review and was approved by the Institutional Review Board.

Procedures. Study personnel arrived prior to the posted surgical start to be in place and capture, by audio recording, the entirety of the event being observed, specifically, the surgical time-out which includes the pre-operative safety checklist (see Appendix). During the observational period, the study personnel collected data on the observation tool.

The observer captured, by audio recording, the entirety of the time-out process and pre-operative safety briefing. During data analysis, the study personnel played back the recorded audio to clarify what was verbalized within the pre-operative briefing. Upon completion of the observation tool, the audio recording was erased from the device's memory per approved study protocol. No attempt was made to mark or save any audio recordings. Data elements included a table for OR staff presence and participation, the checklist items, when and how the time-out was conducted, and space for open-ended comments (e.g., concerns being verbalized, "problem solving" responses, and dissenting opinions section on the consensus checklist). Four fourth-year medical students were trained to use the data collection tool. Initially, they trained with video-recorded pre-operative briefings that used a safety checklist (found at www.scoap.org and www.safesurg.org). Then, two study personnel would attend live observations of pre-operative briefings together until their inter-rater reliability exceeded kappa ≥ 0.8.

Results

A total of 123 surgical briefings were attended during the course of this study. However, two of the briefings began before induction of anesthesia, therefore, the data could not be applied due to IRB protocol restrictions. Additionally, 25 observations were conducted using the wrong version of the data collection tool and only partial data was retained for analysis.

Observations were conducted at all times throughout the day. However, the most convenient and predictable time was during the first round of operations in a given day. The surgical time-out began when the initiator, typically the circulator nurse, asked the team if they were ready to start the briefing. The circulator typically read the patient's name first, followed by the intended procedure, and continued with some combination of the remaining safety checklist items. Most observations lasted less than five minutes, but observers typically were present in the operating room several minutes before the time-out was initiated.

In one of the 121 eligible evaluations, the checklist posted in the room was referred to specifically during the pre-operative time-out. The other 120 teams did not read from

nor verbally acknowledge the checklist posted in the OR during the briefing. The items on the checklist were addressed in their entirety in 12 out of 121 (10.0%) time-outs. In two instances (1.7%), a safety time out was not done at all, violating the Joint Commission's standard.

The average number of items completed on the observation tool checklist was 6.6 of 11 (Std Dev 2.4). The percentage for the number of items completed on the checklists is shown in Figure 2. The completion percentage of each item on the 11 point checklist is shown in Figure 3.

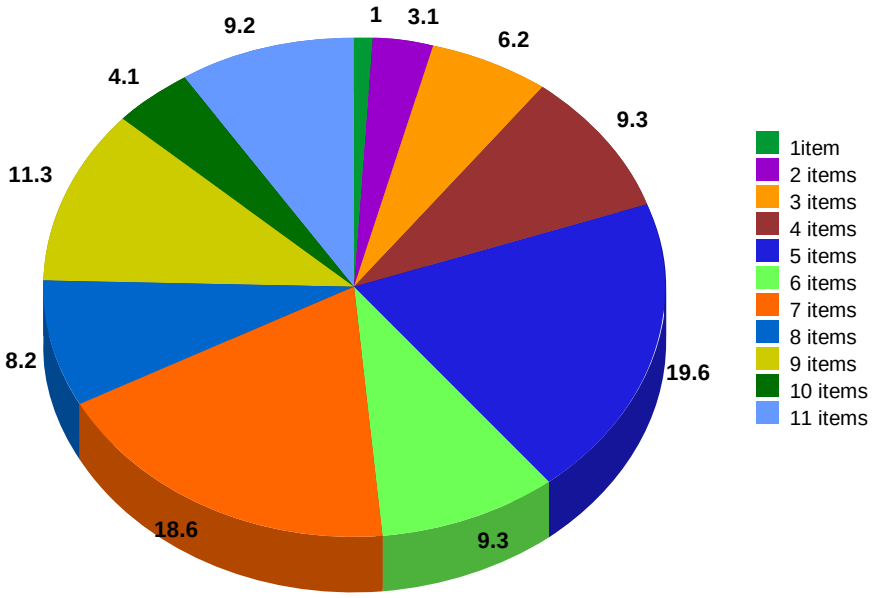

Figure 2. The percentage for the number of items completed on the checklists.

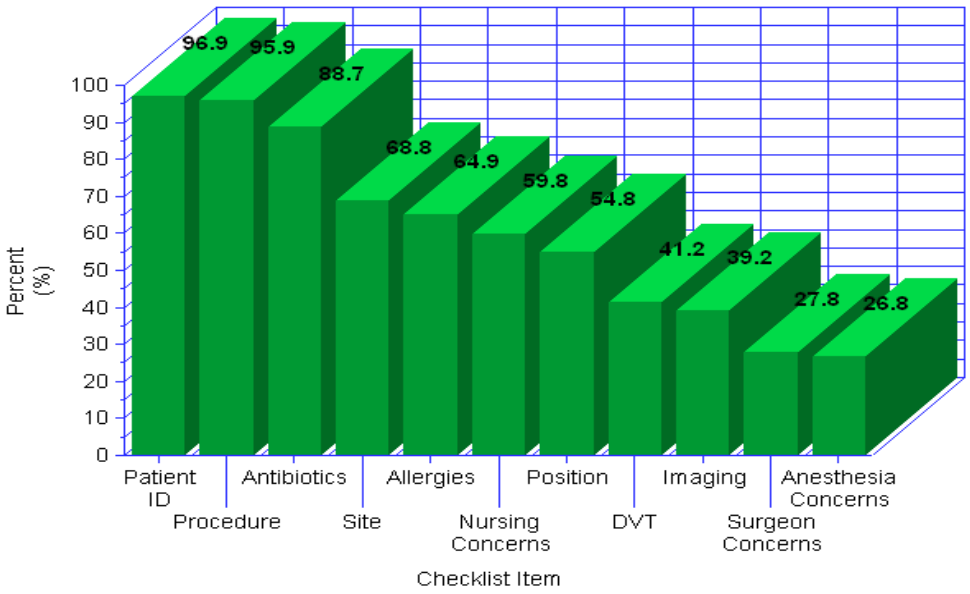

Figure 3. Percentage of checklist items performed.

Timing of time-out and checklist performance by percentage is shown in Figure 4. The circulating nurse performed the checklist 92.5% of the time, and the lead surgeon 7.5% of the time. Eighty-four percent (83.5%) of the time the time-out was performed in less than 3 minutes, and in 69.4% of the cases, it was one minute or less. In 20 observations (16.5%), the checklist took longer than five minutes to complete. Attendance and introduction during the time-out were variable: circulating nurse (attended 100%, introduced 0%), attending surgeon (attended 97.5%, introduced 4.2%), scrub nurse (attended 97.5%, introduced 0%), certified registered nurse anesthetists (attended 90.1%, introduced 0%), and the anesthesiologist (attended 35.5%, introduced 0%). The observations of verbal responses by team members are in Table 1.

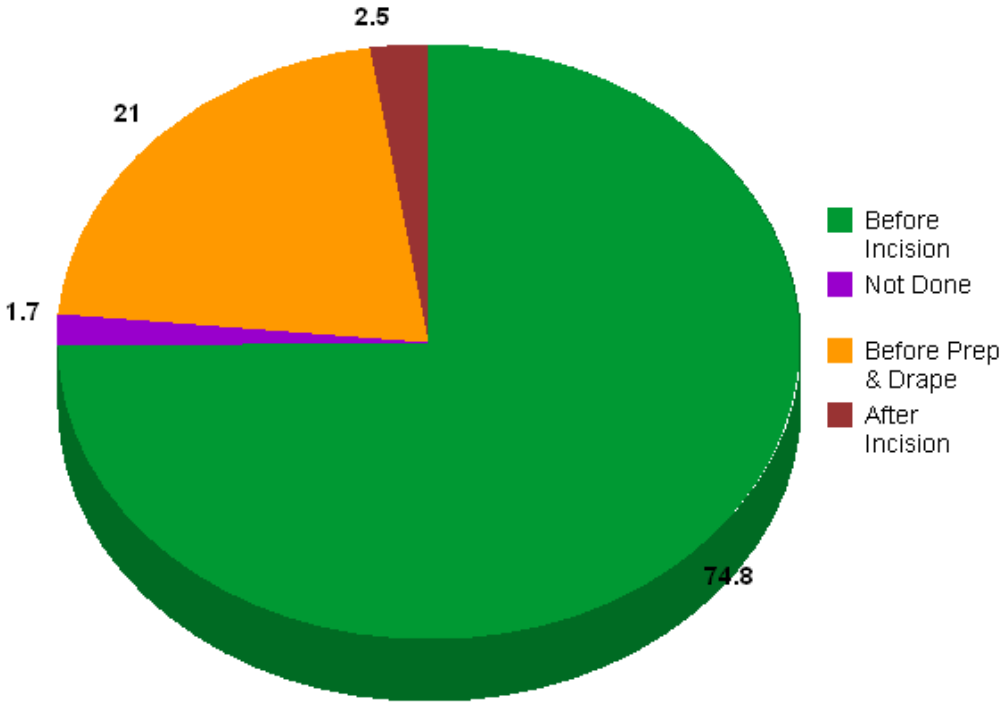

Figure 4. Timing of time-out and checklist performance by percentage.

During the time-out, the leader failed to engage the operating staff members directly in 33.3% of cases. "Alternatives to the standard procedure," and "problems" were identified in 2.5% and 6.6% of cases respectively, but in one case the "problem" identified was that a wrong-sided body part was marked. In one case (0.8%), the surgeon verbalized that the operative room was a "safe environment" to voice concerns during the procedure.

Discussion

The data showed that despite recommendations from the hospital administration, the checklist as a whole was utilized rarely during the pre-operative briefing. The eleven items that we evaluated were addressed fully in only 10% of the pre-operative briefings. In all but one case, the surgical team failed to utilize the posted checklist in the OR and confirm each of the nine items listed there. The tasks completed

Table 1. Summary of verbal observations.

Observation Topic	Team Comments (as noted by observers)
Problems identified.	1. Clarification/uncertainty of a medicine allergy. 2. Identification of a missing item needed for the procedure. 3. Confusion by anesthesia over whether or not heparin was given. 4. Noted the patient as hypothyroid. 5. Additional antibiotic requested. 6. Noted by circular nurse that the patient was unsure about their allergies. 7. Noted that the surgeon asked for patient to be given more cefotetan (antibiotic). 8. Operative procedure reviewed.
Changes made to technology or approach.	1. Wrong side of patient initially marked for surgery. 2. Cell saver requested by surgeon. 3. Hemavac and nylon suture requested by surgeon. 4. Decision made about mesh.
Action taken on missing items.	1. Missing item was located and brought to surgery. 2. Placed sequential compression devise. 3. Missing port kit needed for surgery. 4. Placed Foley catheter.
Clarifications requested on specific items.	1. Circulator nurse asked the surgeon, "Do you want the large or small size attachment?" It was verbally resolved by the surgeon. 2. Anesthesiologist asked the surgeon, "Do you want another dose of antibiotics?" It was verbally resolved. 3. Circulator asked the surgeon for clarification of the procedure. The surgeon responded verbally. 4. Surgeon asked OR staff, "What could have been done better in our time out process?" Time out was repeated. 5. CRNA asked the anesthesiologist, "Shall I replace the scopolamine path." The answer was, "Yes replace it." 6. Circulator nurse asked surgeon for procedure clarification. The surgeon clarified the procedure. 7. Surgeon asked CRNA, "Were antibiotics given?" CRNA replied "Yes." 8. Surgeon asked CRNA, "Do you want Ancef or cefotetan?" and replied, "Cefotetan." 9. Surgeon asked circular nurse, "Do we have a Foley in?" Circulator nurse replied, "Will put Foley in." 10. Scrub nurse asked circulator nurse, "Can you get disposable graspers?" Circulator nurse answered, "OK." 11. Surgeon asked CRNA, "Were antibiotics given?" CRNA answered, "Ancef given at 1449." 12. Surgeon asked scrub nurse, "Do we have a port 2 access site kit?" Scrub nurse went to retrieve.

	13. Circulator nurse asked CRNA, "Were antibiotics given?" CRNA answered, "Yes, 2 g of Ancef were given at 0748." 14. Surgeon asked circulator nurse, "Do we have a cell saver?" Nurse obtained cell saver. 15. Circulator nurse asked CRNA, "Did you give Amp and Gent? What time?" CRNA answered, "Amp given at 0718. Gent given now." 16. Circulator nurse asked CRNA, "Were antibiotics given?" CRNA answered, "Yes, 2 g of Ancef were given." 17. Surgeon asked anesthesiologist, "Were antibiotics given?" Answered, "Yes, vancomycin was given." 18. Surgeon asked CRNA, "Were antibiotics given?" CRNA answered, "Ancef was given." 19. Surgeon asked circulator nurse, "Did you get her pics (images) up?" Circulator nurse replied, "I will put them up." 20. Circulator nurse asked anesthesiologist, "Were antibiotics given?" Answered, "1 g of cefotetan at 1351." 21. Surgeon asked CRNA, "Do you want antibiotics?" CRNA answered, "She's probably on orals on the floor." 22. Surgeon asked circulator nurse, "Does she have a Foley?" CRNA responded, "No. I will insert Foley." 23. Surgeon asked CRNA, "Did she get antibiotics?" "Yes, 1 g of cefotetan." 24. Surgeon asked circulator nurse, "Does she have SCDS or DVT prophylaxis?" Circulator nurse replied, "Yes, SCDS." 25. CRNA asked surgeon, "Do you want antibiotics?" Surgeon said, "Give Ancef." 26. CRNA asked surgeon, "What antibiotics do you want?" Surgeon answered, "Giving 2 g Ancef at 0735." 27. Circulator nurse asked surgeon, "What do you want the tourniquet set on?" Surgeon replied, "Set at 300." 28. Scrub nurse asked circulator nurse, "Does he like to use this reciprocator?" Circulator nurse answered, "Yes, that one is what he uses." 29. Surgeon asked CRNA, "Were antibiotics given?" Answered, "Yes." 30. Circulator nurse asked the anesthesiologist, "Were antibiotics given?" Answered, "Yes. Antibiotics were given." 31. Circulator nurse asked surgeon for clarification of procedure terminology. It was clarified by the surgeon.

with the most consistency were confirmation of patient identity and procedure. One possible explanation is that OR teams were generally quite familiar with these particular tasks due to the JC's mandate (prompting verification the correct patient, procedure, and operating site), effective July 1, 2004,[18] nearly five years prior to the implementation of TWQHC's checklist. While surgical teams were advised to refer directly to the posted checklist, this behavior was noted in only one case out of 121. The low completion rate of the safety checklist (10%) showed that the teams' execution of the checklist did not meet the standards set by their peers and administrators at the medical society meetings.

The JC recommended that, when possible, the patient should be involved in the verification process.[19] The patient was sedated fully during each of 121 valid time-out observations. Two of the original 123 observations were invalidated by an IRB condition that the patient be unaware of the observer. From a human factors perspective, including the patient in the verification process tends to add to the reliability of the safety briefing. In 73.6% of cases, the time-out was before incision. This means the patient had been sedated deeply, prepped, and draped. Completing the time-out at that particular juncture bypasses some critical points where errors can occur. For instance, it is possible that the wrong patient could be present or the incorrect side may have been prepped, and the team may not become aware of this until just before incision. Although we were not able to evaluate the briefings in which the patient was included, doing so diminishes the risk of patient misidentification.

Benefits of the safety checklists may include: 1) reducing human error, 2) prompting human interaction, and 3) developing team identity.[20] Surgical teams navigate many layers of complexity on a daily basis. A systems approach is advocated to deal with this high level of complexity and ultimately curb the effect of human error on patient outcomes.[5] The safety checklist, if used as intended, clearly falls within the systems approach.

Less clear is what type of human interaction is stimulated by the use of the safety checklist. Our study found that in 33.6% of the observations the initiator/ leader of the briefing, typically the circulating nurse, did not direct verbal prompts toward any particular staff member. In other words, they did not demand or maintain the full attention of any one particular staff member. A study by Mazzocco et al.[8] found that lack of communication and team functioning placed patients at a higher risk for death or complications, even after adjusting for the American Society of Anesthesiologists risk category. The time-out checklist, in its intended use, causes the entire team to stop their individual activities and focus together on the primary collective task, verifying a safe and appropriate surgical environment.

The complexity of safety concerns surrounding any one operation are worthy of the undivided attention of all surgical team members. In "The Universal Protocol for Preventing Wrong Site, Wrong Procedure, and Wrong Person Surgery", the Joint Commission stated that during the performance of a time-out "all relevant members of the procedure team [should] actively communicate during the time-out".[19] Surgical staff may need to employ communication skills, distinct from their technical expertise, to ensure that this behavior occurs reliably.[21,22]

In this study, the anesthesiologist was absent for most of the time-outs. Given that they were ultimately responsible for critical elements that dictate patient vitality (e.g., airway, breathing, and circulation), their presence at the patient safety briefing is

important. A failure to appreciate expressed concerns regarding patient safety issues discussed during a time-out may delay or impede proper action in emergency situations. The observed surgical department's policy requires that all nurse anesthetists (CRNAs) be supervised by a physician anesthetist. Anesthesiologists are not required to attend time-out briefings explicitly for cases staffed by CRNAs. However, we recommend that they do so, for the very reason that they are required to supervise at all, to ensure that the patient receives the highest quality care possible. In fairness, a single anesthesiologist may be responsible for supervising up to three cases at once, which makes it challenging to avail them at each briefing. Safety measures can be implemented and supported by actions at various levels of administration. Ensuring that the anesthesiologist is present at each briefing may require action on the part of the administrators who determine how each case is scheduled and staffed.

Often in medical practice, time limitations are an issue. This fact may be a source of resistance to the implementation of any safety checklist measures that increase the time commitments of an already overburdened staff. However, the safety checklist has a minimal time commitment; 83.5% of the briefings took three minutes or less. Within that relatively short time, several critical items can be clarified. Some issues discussed in the safety checklist, if not addressed properly, can cause significant harm to patients. For example, the issue of deep venous thrombosis (DVT) is a considerable risk in the surgical population. In one study, the incidence of DVTs was 3.7% of all adverse events, and 18% of those were preventable.[23] Our study showed that DVT prophylaxis was confirmed in only 41.4% of briefings. Additionally, site infections are a major contributor to patient morbidity and mortality. The effectiveness of antibiotic administration shortly before skin incision to prevent surgical site infections has been established since the 1960's and has been applied widely in surgical operations.[24] Our study observed that antibiotic prophylaxis was confirmed in only 86.9% of pre-operative briefings.

Although the checklist was under-utilized, safety benefits were observed from the time-out process. In one observed case, the use of the checklist exposed that the wrong site had been marked prior to the time-out. Had this error persisted, a sentinel event may have occurred in the form of a wrong-site surgery. Other problems identified during time-out discussions, were uncertainty about patient's allergies, missing equipment, and the discovery that additional antibiotics were necessary. Failure to detect and address the aforementioned issues could have resulted in needless harm to patients.

Study limitations. The study was conducted at one Wichita area hospital. Results might have been different had other sites where the MSSC checklist was in use were added. The procedures were selected by convenience and many of the observations were conducted early in the morning when start times were more predictable. Perhaps, some services were under-represented if they were scheduled routinely for afternoon start times.

The observations were completed over a relatively short period. Therefore, a shift in behavior over time could not be measured reliably. Two observers went off protocol and did not use a recording device consistently. However, the briefings were relatively short and predictable and there was little effect on the validity of the observations. Furthermore, the majority of the items registered by the observers were purely objective.

More subjective data from individuals who use the checklist would provide further insight into the behavioral factors that

dictate its use. To include patient participation, signed informed consent would have been required prior to observing the briefing. We concluded prior to the study that the patient consent process itself would have signaled our observation to the OR staff in a manner that causes them to consciously change their behavior. This change in behavior would have exacerbated the Hawthorne effect (i.e., when participants alter their behavior as a result of being part of an experiment or study), which we reasoned was substantial in this study. As a result, the utilization of the surgical safety checklist may have been, in reality, lower than observed.

Conclusions

Based on the observed resistance to the safety checklist, a culture change or paradigm shift is necessary to realize the highest possibilities for patient safety. The existing paradigm is one that Atul Gawande refers to as the "Master Builder/Master Physician" model.[24] Dating back to medieval times, buildings were constructed by a master builder who designed, engineered, and oversaw construction of every aspect of the project from start to finish. Gawande likened this to the existing culture in healthcare which is traditionally physician-centric, generally regarding other providers as ancillary. Full utilization of the safety checklist requires a shift to a systems-based model rooted in human factors science.

Paradigm shifts are healthy in science because they challenge us to develop and implement models that better deal with reality. Thomas Kuhn, a well-known scientific historian, stated that the new model must seem to resolve some outstanding and generally recognized problem that can be met in no other way.[25] It also must solve more problems than its predecessor while preserving "a relatively large part of the concrete problem solving activity that has accrued to science through its predecessors." The systems-based model fits Kuhn's description of a revolutionary paradigm. It addresses the global concern about improving patient safety. It better addresses the problems of morbidity and mortality in surgical practice through the use of the safety checklist.[6] Finally, it preserves our evidence-based clinical methods and confirms that our clinical acumen is applied fully in the care of each patient.

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Keywords: patient safety, preoperative period, surgery, interdisciplinary communication, patient care team

Appendix

The Pre-Operative Briefing Observation Tool

Date: _____ Observer Name: _____

Position	Circulating Nurse	Surgeon	Assistant Surgeon or PA/RNFA	Anesthesiologist	CRNA	Scrub Nurse	Assistant Scrub Nurse	Patient	Other Personnel
Attendance @ time-out: P = Present, L = Late, A = Absent, or N/A									
Introduction @ time-out I = Introduced S = Self-identified N = Not Identified N/A = Not Available									
L = Lead during briefing N/A = Did not lead									
Person verbalized an unusual/ unpredictable concern or event (N/A if not applicable)									
Person gives a "problem solving" response (N/A if not applicable)									
Person expressed dissenting opinion or frustration w/ checklist (N/A if not applicable)									

Surgical Checklist for Time-Out:	**Circle if observer heard these words**
Confirm the patient's: **Y N Identity Y N Procedure Y N Surgical site Y N Position**	We
Y N Confirms that all essential imaging results for the correct patient are displayed in the operating room	Us
	Our
Y N Confirms that prophylactic antibiotics have been administered ≤ 60 min before incision is made or that antibiotics are not indicated	Team
Y N Surgeon reviews critical and unexpected steps, operative duration, and anticipated blood loss	Together
Y N Anesthesia staff review concerns specific to patient	
Y N Nursing staff review confirmation of sterility, equipment availability, and other concerns	
Y N Patient allergies read from chart	
Y N Verbally considered DVT prophylaxis	

I. During Time-out Briefing: **Start Time:** _____ **End time:** _____.

1. Checklist was done ☐Before Induction of Anesthesia ☐Before Prep and Drape ☐Before Incision ☐After Incision ☐Not Done
2. To whom did the leader direct the checklist questioning? ☐Patient ☐OR Staff Member ☐Not Centered/Directed
3. Did the team address every point of the checklist? ☐ NO ☐YES (See checklist)
4. Did anyone **add** some points to the list? ☐ NO ☐YES, please explain:

5. Were any problems identified due directly to a prompt from the checklist? ☐ NA (if checklist not done) ☐ NO ☐YES, please explain:

6. Were any last minute changes made to technology or approach from using the checklist? ☐ NA (if checklist not done)
☐ NO ☐YES, please explain:

7. Was action taken on any missing items? ☐ NA ☐ NO ☐YES, please explain:

8. Did a discussion of alternatives to the standard procedure arise because of the checklist? ☐ NA (if checklist not done)
☐ NO ☐YES, please explain:

9. Was a planned technician switch-out verbalized during time-out? ☐ NO ☐YES

10. Who is invoked for clarification of a specific matter?

Question	To	From	Resolution

11. Is anyone who verbalizes a problem discouraged or reprimanded? ☐ NA

☐ NO ☐YES	Proponent::	Resistor:	Explain:
☐ NO ☐YES	Proponent::	Resistor:	Explain:
☐ NO ☐YES	Proponent::	Resistor:	Explain:

12. Was it ever verbalized that the environment is safe for alternate constructive opinions? ☐ NO ☐YES, please explain:

Driving Habits of Older Adults: A Look at Rural vs. Urban Drivers in Kansas

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Abstract

Background. The older adult population is the fastest growing cohort in Kansas, resulting in a growing number of older drivers. With age, changes in the ability to drive can compromise safety. Although it is challenging for health care providers to identify unsafe older drivers, it would be helpful to know what common driving habits they share. This exploratory study evaluated differences in the self-reported driving behaviors of older drivers in urban and rural settings of Kansas.

Methods. A one-page, 19-item survey was administered to patients over age 65 in the waiting rooms of two physician medical offices in urban Kansas City and rural Junction City, Kansas.

Results. A total of 105 surveys were completed. Rural drivers reported they were involved in approximately 9% more accidents than the urban drivers ($p = 0.166$). Rural drivers were more likely to drive in poor weather conditions, such as snow, ice, fog, and rain ($p = 0.032$). Eyeglasses were worn by 10% of the rural cohort compared to 37.8% of the urban cohort ($p = 0.0044$). More urban drivers reported they did not want to make changes to their current driving habits (71% vs 40%; $p = 0.004$). Urban drivers drove a longer distance to reach their destinations. Drivers from both environments avoided unfamiliar roads and did not use cell phones or global positioning system (GPS) devices while driving.

Conclusions. By understanding the habits of older drivers, healthcare providers can tailor safe driving messages to support safe driving and enhance patient safety. Physicians could benefit from knowing that older rural drivers wore their glasses less frequently, trended towards having more accidents, and were more prone to drive during inclement weather. Urban Kansas drivers drove further to get to their destinations than their rural Kansas counterparts. Understanding these driving habits and tailoring their prevention messages accordingly may help health care providers in Kansas improve older patient's safe driving behaviors.

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Introduction

The older adult population, those over 65 years of age, is the fastest growing cohort in Kansas and in the US. Further, Kansas is expected to show slightly more growth than the US in the 85 and older age group.[1] Safe driving amongst older adults has become a growing public health and road safety issue. The older adult population experiences the same accidents per mile driven as 20-24 year olds and the accident-related mortality rate of older drivers over 80 years old is second only to teen drivers.[2,3]

By the year 2030, 23% of the population will be over 65.[4] Drivers 65 years of age and older make up 15% of the total drivers on the road. The proportion of older drivers will increase since there are more young drivers than two to three decades ago.[5] From 2005 to 2025, the number of licensed drivers ages 65 and older is expected to double.[6]

Over three-fourths of all older adults live in suburban and rural areas.[7] Overall, older drivers (60 years and older) have among the highest rates of motor vehicle collisions per mile driven of all the age groups and are exceeded only by drivers in the under 24 age range.[11] In 2006, women over age 65 accounted for 13.6% of all women, but represented 20.8% of all female crash fatalities, the highest proportion of fatalities for any population group.[7]

Aging alone does not imply poor driving. However, as we age, many physical changes impact the ability to drive, such as reflexes[8-9], vision[9-11], memory[12], attention[12], and decision-making ability[12]. Many factors contribute to the driving behaviors of older adults. For example, they tend to avoid bad weather, drive with more people in the car to help with navigation, frequently drive to their pharmacy or grocery store, drive with glasses, have decreased ability to make left hand turns with oncoming traffic, and avoid high traffic and unfamiliar areas.[8-12] Yet, many older drivers do not feel the need to restrict their driving.[11] In fact, older drivers would like to prolong their independence, even after they perceive a potential driving hazard. With the increasing life expectancy and growth among this cohort, the promotion of safe driving behaviors and ensuring the availability of resources to provide adequate driving alternatives is a public health priority.

For physicians, addressing this issue and tailoring safe driving messages to older adults can be especially challenging. No specific guidelines exist for physicians to remove an unsafe older driver.[7] Tools to tailor a safe driving message based on urban or rural landscapes are not available. In addition to communicating safe driving habits to older drivers, reinforcing driving evaluations to health care providers, and encouraging transportation alternatives to older drivers and caregivers are essential to address this issue. With this in mind, this study compared differences in the driving habits of drivers over age 65 in urban Kansas City, Kansas and rural Junction City, Kansas. By examining these differences, accident prevention messages can be tailored in clinical settings based on urban or rural residence to improve patient safety and awareness.

Methods

Kansas City and Junction City were chosen as representative urban and rural sites where our institution maintains clinical activities. According to the 2008 census, Kansas City had a population of 597,572 with an area of 438 square miles.[13] Junction City had a population of 20,671 within 7.7 square miles and is 66.4 miles from the closest urban city. One outpatient clinic at each site was selected for the study. The office in Junction City was an internal medicine clinic affiliated with the local hospital and had a geriatric population (over age 65) of approximately 85%. The office in Kansas City was a geriatric clinic exclusively seeing patients over age 60, therefore, over 90% of the patients were over age 65. Both clinics were affiliated with the University of Kansas Medical Center.

The investigators developed a one-page, double-sided survey containing Likert scale, yes/no, and open-ended questions regarding driving habits and accident history (see Appendix). Questions included whether they held a driver's license, their typical driving distances, destinations, frequency, accident history, and accident type. In addition, self-reported psychosocial questions were asked including driving changes they felt they needed to make, driving limitations they have adopted, and types of community support they felt would enable them to be safer drivers.

To maintain anonymity, personal identifiers were not requested, except for age. It was communicated clearly that motor vehicle agencies would not be notified and their medical care would not be compromised in any way. After receiving Institutional Review Board approval, the survey was given to a convenience sample of patients walking into either clinic over a four-month period. The clinic staff distributed the survey at the check-in desk to anyone over age 65, with or without a current driver's license. The patients were asked to complete the voluntary survey while in either the waiting or examination room. The surveys were returned to the clinic staff at the end of the patient visit and ultimately to the investigators.

A two-tailed Student t-test was performed on continuous data. Since these were random, unrelated, convenience samples, the investigators assumed that these were two samples with unequal variance.

Results

Fifty-five surveys were collected from the urban site and 50 from the rural site. Statistically significant findings were found in three domains. Rural drivers were more likely to drive in poor weather conditions, such as snow, ice, fog, and rain ($p = 0.032$; see Table 1). Eyeglasses were worn by 10% of the rural cohort compared to 37.8% of the urban cohort ($p = 0.0044$). More urban drivers reported they did not want to make changes to their current driving habits (71% vs 40%; $p = 0.004$).

Although not statistically significant ($p = 0.166$), the rural cohort was involved in approximately 9% more accidents than the urban cohort, 15.4% vs. 5.6%. Interestingly, the average number of miles for a one-way trip was lower in the rural cohort (6.4 miles) than in the urban cohort (24.2 miles). Further, the range was larger for the urban cohort (1-50 miles) than the rural cohort (0.5-20 miles).

Table 1. Percent of older drivers avoiding certain weather conditions.

Weather Condition	**Rural Cohort N = 40**	**Urban Cohort N = 22**
Rain	0.0	9.0
Snow	7.5	13.6
Ice	7.5	18.0
Fog	2.5	18.0

Many similarities were noted between the driving habits of rural and urban participants in terms of valid driver's licenses, driving age, and driving frequency (Table 2). Use of global positioning systems (GPS) and cell phones while driving in this population was limited. Less than five percent of both cohorts had attended a driver's education course aimed specifically at older drivers, yet approximately 10% from each cohort expressed a desire to receive a driver's refresher course.

Table 2. Similarities between the rural and urban Kansas driver cohorts.

	Rural Cohort N = 50	**Urban Cohort N = 55**
Valid Driver's License	87%	85%
Average Age	76	75
Drove daily	50%	48.7%
Drove 3 times per week	37.5%	35.9%
Cell phone or GPS use while driving	1%	1%

The two groups reported several similarities when asked how the communities they lived in could help to improve their driving. Some reported recommendations included slowing down other drivers, avoiding tailgating, obeying traffic signals more diligently, and driving courteously. Participants also noted changes they wanted to make in the next year. Rural participants included slowing down while they drove (n = 1), reducing the number of trips they made weekly (n = 2), and limiting their driving to daytime only (n = 6). One urban participant expressed a desired change to not drive in snow and another planned to stop driving over the next year.

Discussion

Rural and urban drivers are frequent drivers. Urban drivers generally drive longer distances to get to their destinations than their rural counterparts. Fewer than five percent of both cohorts used GPS navigation devices. In recent driving safety research,[14] GPS systems can be an effective means to provide older driver education. In the study, they compared 54 participants, 70-89 years of age, with traditional instructor and dual-brake vehicle training versus a GPS feedback training system. They found that those with the GPS feedback training reduced their driving errors by 25% ($p < 0.05$).[14] Based on this study, instituting an automated voice system in the vehicle reminding older adult drivers that they are driving above or below the basic speed law and informing them of the distance to the next car may be helpful.

Due to the frequency of older adults driving, physicians should inquire about driving habits and changes as an important part of a visit with an older patient. During office visits, it may be helpful for the physician routinely to discuss if their older patients drive, if they need help driving, and how confident they feel when they drive. Considering their medical comorbidities, physicians should assess what driving limitations could or should be imposed. Based on this study, all patients over the age of 65 should be asked when their last eye exam was, if they consistently wear their glasses when driving, when their last accident was, and if they are driving in bad weather conditions where their visual acuity may be compromised.

A large percentage of older adults did not feel inclined to make any changes to their driving habits. With physician guidance, older Kansans may be more willing to make changes to improve their driving safety. Safe driving messages can be targeted to account for differences in older urban and rural drivers. Rural physicians should be aware that rural older drivers wear their glasses less frequently, have more accidents, and are more prone to drive during inclement weather than their urban neighbors. Rural drivers specifically can be given driving messages to wear their glasses and to avoid inclement weather. Both groups displayed an interest in a driver's refresher course, therefore, this strategy also can be discussed with patients.

This study had a number of limitations that might have biased the results. First, only English literate drivers could complete the survey. Older adults that could not read English could not participate in the study. Second, participants may not have wanted to disclose true information regarding the number of accidents, the types of accidents they were involved in, and past driving habits. Despite the reassurance that local authorities would not be notified, participants could have been afraid to disclose driving behaviors for fear of legal consequences. Third, this convenience sample only captured ambulatory, community dwelling older adults visiting their doctor's office. This did not capture drivers that were too ill to drive to their doctor's

office or who rarely saw a doctor. Fourth, the Junction City clinic was only 66.4 miles from the closest urban city. Therefore, the rural results may not have been as authentic when compared to a more isolated rural community. Fifth, this was a small sample size, therefore, the generalizability of this study to the main population was limited. Lastly, participants were able to leave any question unanswered. For example, only 40 of the rural and 22 of the urban cohort chose to answer the question about driving in dangerous weather conditions.

Driving is a symbol of independence for older adults. It should not be deprived from anyone unduly. Further studies are needed to determine the most appropriate physician strategies to improve older patient driving safety. Once more studies are completed, policy decisions can be made about sustaining the safety of older drivers in a fair and equitable manner. Maintaining an older adult's independence and quality of life is important and should be the responsibility of the whole community. This includes encouraging safe driving practices for older adults and providing transportation alternatives for those no longer able to drive. These decisions are difficult and often can start in the physician's office.

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Keywords: automobile driving, aged, rural population, urban population, accident prevention

Driving Habit Questionnaire

You are being invited to participate in a research study conducted by Dr. Shelley Bhattacharya and Dr. Kristina Diaz through the University of Kansas Medical Center. If you choose to participate you will be asked to complete a short 2-page survey. You are not required to complete this survey and it will not affect your medical care today. None of this information will be reported to any governmental agency, it is purely for a research study comparing driving habits of urban vs. rural older drivers in Kansas. If you choose to complete this study, please return it to the front desk or mail it to the address found at the end of the survey. Thank you for your time!

Date: ___________	Age: _________	Year of Vehicle:__________

1. Do you have a valid driver's license? Yes_________ No________
2. Do you drive? Yes_________ No________
3. If you DON'T drive, why did you stop driving?

Didn't feel safe License Expired Don't have a car Family didn't want me to drive
Other: ____

Stop here if you do not drive.

- -

If you DO drive, please continue….

4. In an average **week,** how many days per week do you normally drive?
   Every day 3 days a week 1 day a week Less than 1 day a week Only for emergencies

5. How often is there a person who accompanies you when you drive your car?
   Always Quite often Sometimes Never

6. How often do you drive on unfamiliar routes?
   Quite often Sometimes When there is a helper (person or GPS) Never

7. How often do you wear a seatbelt?
   Always Quite often Sometimes Never

8. Do you drive in the…

a) Rain?	Quite often	Sometimes	When there is a helper (person)	Never
b) Snow?	Quite often	Sometimes	When there is a helper (person)	Never
c) Ice?	Quite often	Sometimes	When there is a helper (person)	Never
d) Fog?	Quite often	Sometimes	When there is a helper (person)	Never

9. How often do you use a cell phone while driving?
   Sometimes → how often?________ Not at all

10. Do you wear glasses when you drive?
    Yes___________ No_________________

11. What kinds of problems do you have when you drive (check those that apply)?
    __Other drivers __Traffic __Not knowing directions __Fear/Anxiety
    __Reflexes slower __Trouble seeing pedestrians __Difficulty seeing signs/signals

    Other (please comment):____

12. How comfortable are you at making left hand turns with oncoming traffic?
    Very Comfortable Moderately Comfortable Slightly Comfortable Not Comfortable at All

13. Have your family members or anyone else suggested you limit your driving?
    Yes No What did they want you to do? _____

14. In the **past week**, where did you drive?

Place	How many times?	Approximately how many miles from home (1 way)?
Store		
Church		
Work		
Relative/Friend's house		
Restaurant		
Dr. appointments		
Pharmacy		
Other:		

15. In the **past 3 months**, have you driven at night - when it's dark?
    Quite often Sometimes When there is a helper (person or GPS) Never

16. Within the **last year** have you had any car accidents where you were the driver?
    Yes _____ How many?_____ No_____

    Types of accidents: a) Hit another car b) Got hit by another car
    c) Hit an object that wasn't moving (pole, tree, etc) d) Hit while making a turn
    e) Other: _____

17. Within the **last year** have you had any "close call" car accidents where you almost could have had an accident while you were the driver?
    Yes_____ How many?_____ No_____

    Can you describe the accidents?

---

18. Within the past **two years** have you changed your driving habits?
    Yes Not that I'm aware of No

    If yes, what kind of changes (check those that apply):
    __Drive less frequently __Drive only during the day __Drive only when necessary
    __Drive only in familiar places __Drive only with someone to help me

    Other changes you've already made (please write)? _____

19. Are you thinking about making any changes to your driving habits in the **near future**?
    Yes I'm thinking I probably do Not really

    If yes, what kinds of changes (check those that apply)?
    __Stop driving __Reduce length of trips __Have someone else drive

    Other changes you are thinking of making (please write)? _____

20. Have you ever taken a driver's education class for older drivers?
    Yes No

21. What kinds of things would you like your doctor or community to provide that would help you be a safer driver?

    _____

Knowledge and Attitudes of Physicians in Kansas Regarding Domestic Minor Sex Trafficking

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Abstract

Introduction. Domestic minor sex trafficking (DMST) has been reported increasingly in the news as a problem in Kansas. It is essential that healthcare providers are educated about the topic and feel confident in their ability to identify and report a victim. The purpose of this study was to explore Kansas physicians' knowledge, attitude, and training regarding DMST.

Methodology. A 20-question survey was e-mailed to 1,668 physicians registered with the Kansas Board of Healing Arts in the specialties: family medicine, pediatrics, obstetrics/ gynecology, and emergency medicine.

Results. Of those emailed, 69 (4%) responded to the survey. Those that responded agreed that DMST was a problem in the US (86%; n = 59) and Kansas (80%; n = 55). Of the respondents, only 12% (n = 8) felt confident in identifying a victim and only 11% (n = 8) screened patients for DMST. Over half (61%; n = 42) reported encountering possible signs of DMST in patients, however, only few suspected DMST.

Conclusion. Physicians reported encountering victims of DMST in their practices, which indicated the existence of DMST in Kansas. Survey respondents were lacking in knowledge regarding DMST. Further, their suspicion of DMST victimization (based on presentation), was rarely followed through with reporting. Training, for symptom recognition, victim identification, and proper reporting, is necessary for Kansas physicians as they are often the only professional to come in contact with DMST victims.

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Introduction

Background. Sex trafficking refers to those who have been coerced or forced into providing commercial sex acts.[1,2] Sex trafficking is different from prostitution, which is a conscious decision to provide commercial sex acts and the freedom to stop. Victims of sex trafficking do not have the ability to quit whenever they choose,[3] but rather are manipulated by means such as debt bondage, isolation from public/family/ friends, control of victims' money, or sedation with drugs.[4]

Sex trafficking that involves the commercial sexual exploitation of minors against their will within a national border formally is titled domestic minor sex trafficking (DMST).[5] Minors are the most vulnerable population to be victimized and DMST has been identified as a growing problem in the US.[6] The US Department of Justice estimated that there are up to 293,000 American youths at risk of becoming victims of DMST.[7] Street children constitute the largest victim group. These children are commonly runaways or throwaways who have been abandoned by their parents.[8] Females are at highest risk with the average age of entry being between

11 and 14, but some are as young as 5 years of age.[6]

Sex trafficking is just as much of a local problem as a national problem. A 2009 article of *The Wichita Eagle*[9] stated that a national FBI initiative had rescued 900 children and led to 510 convictions of traffickers and their associates. A Wichita Police Captain stated to *The Hutchinson News* that the Midwest has become a hub for domestic sex trafficking.[10] Approximately 2,300 children become victims to commercial sexual exploitation each year.[11] *KWCH* news quoted experts who said Wichita is ranked among the top 5 cities where traffickers come to take girls.[12]

The US Department of Health and Human Services identified primary care, urgent care, obstetrics and gynecology, mental health, and inpatient care as the most likely settings where healthcare providers may encounter a victim.[13] Victims of DMST present with a variety of health concerns including sexually transmitted infections, infectious diseases, pelvic inflammatory disease, pregnancy, food deprivation, poor nutrition, headaches, head and neck traumas, dental or oral problems, respiratory illnesses, gastrointestinal problems, memory loss, broken bones, and chronic pain.[13] However, they are less likely to receive immediate treatment and are at high risk for chronic conditions.

Healthcare providers have a unique role when interacting with DMST victims and may be the only professional contact during their captivity.[4] A European study of trafficked women revealed that at least 28% of those questioned had been evaluated by a healthcare professional during their exploitation.[1] Therefore, healthcare providers may have the unique opportunity to identify and report victims providing a means of escape from a life-threatening situation. Moreover, reporting of DMST is mandatory by law.[14]

Many victims are difficult to identify because they often deny being a victim and consequently are not identified by the untrained provider.[4] Healthcare providers should seek training on how to identify and report these victims. It is essential that healthcare providers realize that DMST victims are in potentially life-threatening situations. The Rescue and Restore Campaign and the National Human Trafficking Resource Center provide training resources as well as phone consultation for healthcare professionals. In addition, the Christian Medical and Dental Association has developed a continuing medical education (CME) online tutorial that educates healthcare providers about the issue.[13]

Research regarding DMST is scarce due to the underground nature of the problem. Thus, the level of knowledge of healthcare providers regarding DMST is not well documented. A survey with 110 respondents including physicians, mid-level providers, and nurses conducted in two US emergency departments revealed that 76% of emergency room healthcare providers knew what human trafficking was, but only 13% felt either confident or very confident that they could identify a trafficked victim.[15] The specific aim of this study was to determine Kansas physicians' current level of DMST knowledge, attitudes regarding DMST, and self-perceived level of competence regarding the identification of DMST victims.

Methods

Study design and study population. This descriptive, cross-sectional study utilized a 20-question survey emailed to Kansas physicians registered with the Kansas Board of Healing Arts in the specialties of family medicine, pediatrics, obstetrics/gynecology, and emergency medicine. Highly specialized physicians were less likely to encounter

DMST victims and were excluded. Recipients included physicians practicing in both rural and urban settings. The list provided by the Kansas Board of Healing Arts contained addresses outside of Kansas. These addresses were excluded with the exception of those in the greater Kansas City area. There were 1,668 physicians that fit the inclusion criteria. A link to an online survey was sent electronically in November 2011 and re-sent to non-respondents after four- and eight-week intervals.

The survey, designed specifically for this study, included questions on belief, knowledge, experience, training, and current practice regarding DMST,[5] as well as demographics. Questions consisted of multiple choice (1 item), yes/no (3 items), true/false (1 item), Likert scale (1 item), multiple choice-multiple answer (4 items), and fill in the blank (4 items). Prior to distributing the survey to physicians, it was administered to three individuals, testing for content and clarity. Responding to the survey implied consent. Descriptive statistics were used to analyze survey results. This study was approved by the Wichita State University Institutional Review Board.

Results

Of the 1,668 email addresses provided, 69 physicians responded to the survey for a response rate of 4%. Of those, there were 42 (60.9%) females and 27 (39.1%) males with a mean age of 47 years. The mean number of years in practice was 17.1 (SD = 11) with a range of 2 to 47 years. Over half (55.1%; n = 38) of respondents practiced in a city with a population greater than 300,000. The primary clinical settings most reported were private practice (43.5%; n = 30) and emergency department (23.2%; n = 16). The predominant specialties reported were family practice (49.2%; n = 32) and pediatrics (30.8%; n = 20; Table 1). Five of the 69 survey respondents reported encountering a victim in their practice. These five physicians encountered a total of 24 cases, yet only 22 cases were reported. While more than 65% (n = 45) of respondents indicated that they had not encountered a victim, 28% (n = 19) stated that they did not know whether they had encountered a victim or not (Table 2).

Table 3 illustrates respondents' answers to questions assessing their beliefs about DMST. The majority of respondents reported believing that DMST is a problem in the United States (85.5%; n = 59) and in Kansas (79.7%; n = 55). Most (76.8%; n = 53) reported not feeling comfortable in identifying a victim in their practice. Over half of the respondents agreed that DMST is a problem that should receive state funding for treatment of victims (68.1%; n = 47) and for public education (69.6%; n = 48). Respondents agreed young female patients should be educated about DMST (81.2%; n = 56) and 63.8% (n = 44) agreed they should be educated by physicians at annual physicals.

Table 4 highlights respondents' answers to factual questions about DMST. Knowledge responses were varied: over half (60.9%; n = 42) responded that DMST occurs in small towns and was associated with a shorter life expectancy (73.9%; n = 51). Fewer associated DMST with starvation (46.4%; n = 32). Most (78.3%; n = 54) correctly answered that even if a trafficked girl is compensated (e.g., food, shelter, drugs, money), it is still considered DMST. Over half (63.8%; n = 44) knew that it is mandatory for a physician to report anyone he/she suspects to be a victim of DMST. Respondents recognition of potential DMST indications were low: controlling boyfriend (5.8%; n = 4), branding (tattoo/jewelry; 1.4%; n = 1), lying about age (1.4%; n = 1), lack of community knowledge (1.4%; n = 1), avoiding eye contact (4.8%; n = 4),

revealing/short/tight clothing (4.3%; n = 3), chronic drug use (2.9%; n = 2), or defensive/rude/ evasive/aggressive behavior (1.4%; n = 1). (See Figure 1.)

Table 1. Respondent demographics.

	Total (N = 69)
Age, years (mean, SD)	47.1 (11.1)
Years in practice (mean, SD)	17.1 (11.1)
Age	
0 – 29	1 (1.4)
30 – 59	55 (79.7)
60 and over	9 (13.0)
Gender	
Male	27 (39.1)
Female	42 (60.9)
Specialty	
Family Practice	32 (49.2)
Pediatrics	20 (30.8)
Obstetrics/Gynecology	4 (6.2)
Emergency/Trauma	9 (13.8)
Other	8 (11.6)
Years in Practice	
0 - 19	41 (59.4)
20 and greater	27 (39.1)
Primary Clinical Setting*	
Private Practice	30 (43.5)
Hospital Inpatient	9 (13.0)
Emergency Department	16 (23.2)
Urgent Care	4 (5.8)
Community Health Center/Low Income Clinic	10 (14.5)
Population	
Less than 10,000	9 (13.0)
10,000 - 49,999 (not close to metro area)	4 (5.8)
10,000 - 49,999 (close to metro area)	4 (5.8)
50,000 - 99,999	2 (2.9)
100,000 - 299,999	12 (17.4)
Greater than 300,000	38 (55.1)

*Primary Clinical Setting defined as location of most clinical hours.
Note: Percentages may not equal 100 due to missing data. Data reported as *f* (*%*), unless otherwise noted.

Table 2. DMST victim encounters and reporting.

	Total (N=69)	Private Practice 30 (43.5)	Hospital Inpatient 9 (13.0)	Emergency Department 16 (23.2)	Urgent Care 4 (5.8)	Community Health/Low Income Clinic 10 (14.5)	*p**
DMST Victims Encountered							0.520
0	45 (65.2)	21 (70.0)	7 (77.8)	9 (56.2)	1 (25.0)	7 (70.0)	
1	2 (2.9)	2 (6.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
2	1 (1.4)	1 (3.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
5	1 (1.4)	1 (3.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
15	1 (1.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.4)	
Unknown	19 (27.5)	5 (16.7)	2 (22.2)	7 (43.8)	3 (75.0)	2 (20.0)	
Reported DMST Cases (based off of encounters)							0.598
0	60 (95.2)	26 (96.3)	9 (100.0)	13 (92.9)	3 (100.0)	9 (14.3)	
2	1 (1.6)	0 (0.0)	0 (0.0)	1 (7.1)	0 (0.0)	0 (0.0)	
5	1 (1.6)	1 (1.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
15	1 (1.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (10.0)	

Note: Percentages may not equal 100 due to missing data. Data reported as *f* (%), unless otherwise noted.
*Chi-square test.

Table 3. Domestic Minor Sex Trafficking: Beliefs (N = 69).

	Agree	Disagree
DMST is a problem in USA	59 (85.5)	0 (0.0)
DMST is a problem in Kansas	55 (79.7)	5 (7.2)
DMST should receive state funding for treatment of victims	47 (68.1)	6 (8.7)
DMST should receive state funding for public education	48 (69.6)	10 (14.5)
Most victims are not US citizens	19 (27.5)	36 (52.2)
Prostitute is appropriate term for trafficked girls	7 (10.1)	57 (82.6)
Prostitution is a crime in KS, therefore these girls are criminals	2 (2.9)	59 (85.5)
Confident in ability to identifying victims of DMST in practice	8 (11.6)	53 (76.8)
Young female patients should be educated about DMST	56 (81.2)	4 (5.8)
Who should educate young females?		
Media	56 (81.2)	
Physicians at annual physicals	44 (63.8)	
School program	55 (79.7)	
Clergy	29 (42.0)	
Law Enforcement	39 (56.5)	
Public Awareness Campaign	62 (89.9)	
Other	8 (11.6)	

Note: Percentages may not equal 100 due to missing data. Data reported as *f* (*%*), unless otherwise noted.

DMST in Kansas. Out of 69 respondents, 7.2% (n = 5) reported an encounter with at least one victim and 27.5% (n = 19) reported a possible encounter with a victim. Barriers to reporting included not being sure the patient was a victim (73.9%; n = 51), not knowing how to report (30.4%; n = 21), the victim not acting like she needed help (4.3%; n = 3), and not having time (2.9%; n = 2; Figure 2 and Table 5). Some (18.8%; n = 13) were aware of agencies in their area that assist victims of DMST, but only 11.6% (n = 8) reported familiarity with the National Human Trafficking Resource Center (1-888-373-7888).

Kansas physician training on DMST. A few respondents (5.8%; n = 4) had received general training on DMST. Some (10.1%; n = 7 and 13%; n = 9, respectively) have received training on how to identify a victim and how to report a victim. More than half (66.7%; n = 46) of respondents stated they would take part in some type of training. Respondents were most interested in participating in the following forms of training: continuing medical education (CME) presentations, online tutorials, and seminars/conferences (Table 6).

Discussion

Even though there was a very low response rate, five respondents reported encountering a victim(s) in their practice. Further, more respondents indicated they might have treated a victim but were uncertain. These findings indicate that DMST is a valid concern in Kansas, but

Table 4. Domestic Minor Sex Trafficking: Knowledge (N = 69).

Number of Victims of DMST in USA*			
0 - 49,999	10 (14.5)		
50,000 - 99,999	28 (40.6)		
100,000 - 149,999	18 (26.1)		
150,000 - 200,000	13 (18.8)		
Average Age of DMST victim's entry into sexual exploitations†			
6-8	4 (5.8)		
9-11	26 (37.7)		
12-14	38 (55.1)		
15-18	1 (1.4)		
	True	False	I Don't Know
DMST occurs in small towns. (true)	42 (60.9)	2 (2.9)	13 (18.8)
DMST is frequently associated with poor oral health. (true)	33 (47.8)	2 (2.9)	17 (24.6)
DMST is frequently associated with poor vision. (true)	13 (18.8)	9 (13.0)	33 (47.8)
DMST is frequently associated with starvation. (true)	32 (46.4)	3 (4.3)	20 (29.0)
Trafficked girls have shorter life expectancies than general population. (true)	51 (73.9)	0 (0.0)	5 (7.2)
Trafficked girls can walk away from trafficker whenever she chooses. (false)	0 (0.0)	57 (82.6)	1 (1.4)
A trafficked girl is paid for her work. (false)	4 (5.8)	38 (55.1)	11 (15.9)
A trafficked girl is compensated (e.g., food, shelter, drugs, money). (false)	2 (2.9)	54 (78.3)	2 (2.9)
It is common for relatives to be the trafficker/pimp. (true)	33 (47.8)	7 (10.1)	19 (27.5)
It is mandatory for a physician to report suspected DMST. (true)	44 (63.8)	3 (4.3)	14 (20.3)

*US Department of Justice estimation, 2006.

†US Department of Justice, 2009.

Note: Percentages may not equal 100 due to missing data. Data reported as *f* (%), unless otherwise noted.

suggests that physicians are not trained to identify victims. The medical settings in which victims were encountered included emergency medicine, private practice, and a community health/low income clinic. Certain practices/specialties may be more likely to encounter victims and/or recognize them.[13] Practices such as primary care, urgent care, obstetrics/gynecology, mental health, and inpatient care offer a safe, private environment for a victim and is the entry point into the health care system. Urgent care or emergency departments are more likely to see victims due to the prevalence of violence and injuries that may be inflicted on a DMST victim. Although, the majority of respondents for this study were from urban settings (populations

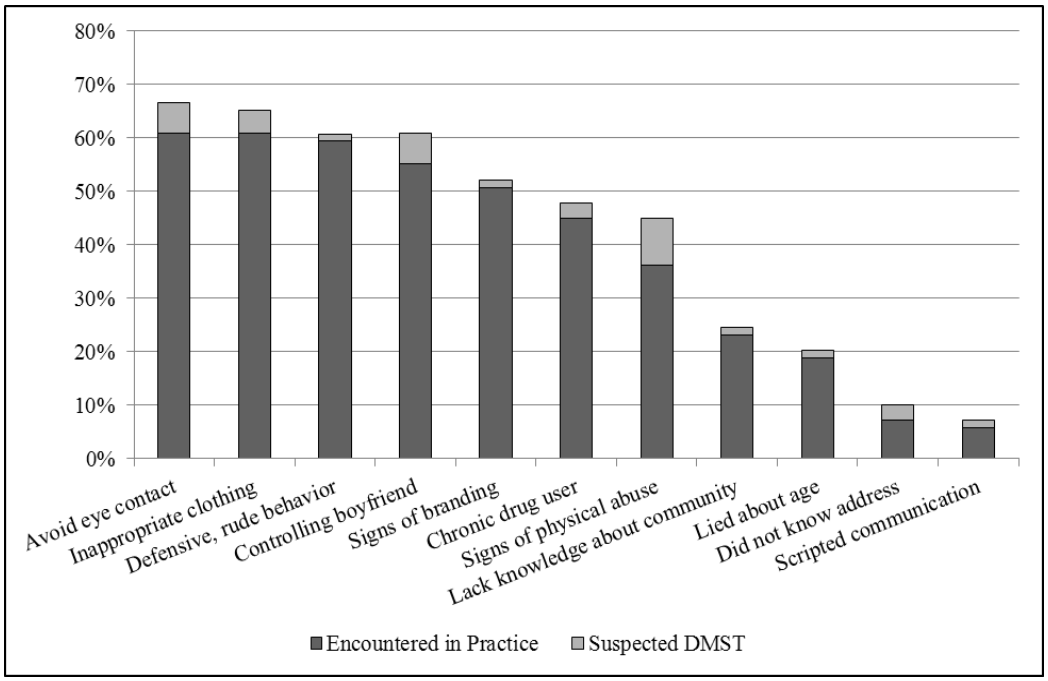

Figure 1. Signs of Domestic Minor Sex Trafficking.

Table 5. Domestic Minor Sex Trafficking: Encounters (N = 69).

DMST Victim Encounters	
0	45 (65.2)
1-10	4 (5.8)
10+	1 (1.4)
Unknown	19 (27.5)
DMST Cases Reported	
0	60 (87.0)
1-10	2 (2.9)
10+	1 (1.4)
Inhibits Reporting DMST	
Did not know to report	21 (30.4)
Did not have time	2 (2.9)
Wasn't sure patient was a victim	51 (73.9)
Victim didn't act like they needed help	3 (4.3)
Other	38 (55.1)
Where Encounters of DMST Patients Occur	
Private Practice	28 (40.6)
Emergency Department	22 (31.9)
Inpatient Hospital	12 (17.4)
Community Health/Low Income Clinic	18 (26.1)
Other	32 (46.4)

Note: Percentages may not equal 100 due to missing data. Data reported as *f* (%), unless otherwise noted.

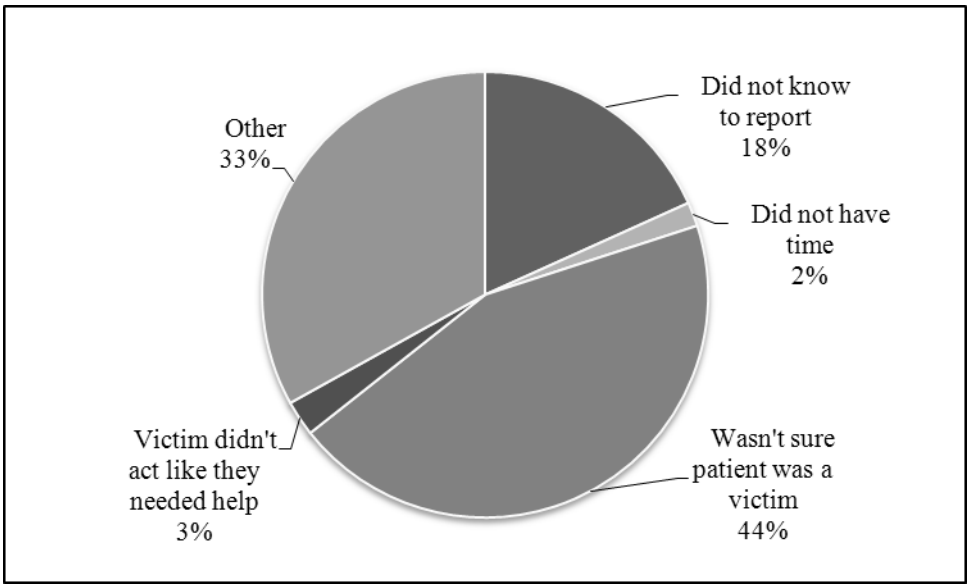

Figure 2. Reasons physicians did not report suspected DMST.

Table 6. Domestic Minor Sex Trafficking: Training (N = 69).

	Training	No Training
Participation in training		
DMST in general	4 (5.8)	54 (78.3)
Victim identification	7 (10.1)	46 (66.7)
Report victim	9 (13.0)	42 (60.9)
Appropriate interaction with victim	6 (8.7)	43 (62.3)
Additional/future training		
Feel healthcare workers should receive more	57 (82.6)	5 (7.2)
Willing to take part in additional DMST training	46 (66.7)	9 (13.0)
Employment should require DMST training	3 (4.3)	50 (72.5)
	Received Training	Interested in Type of Training
Training Preference		
Medical School Curriculum	1 (1.4)	15 (21.7)
CME Presentation	5 (7.2)	54 (78.3)
Seminar/Conference	3 (4.3)	34 (49.3)
Online Tutorial	2 (2.9)	49 (71.0)
Professional Journals	3 (4.3)	27 (39.1)
Newspaper/magazines	2 (2.9)	14 (20.3)
Webinar/Video Conference	1 (1.4)	21 (30.4)
Other	3 (4.3)	2 (2.9)

Note: Percentages may not equal 100 due to missing data. Data reported as *f (%)*, unless otherwise noted.

greater than 300,000); DMST is currently not limited to metropolitan areas. Thus, DMST education and provider training should be prioritized to emergency or urgent care providers in any community setting.

Physicians may not have the tools to identify DMST victims in their practice. Respondents were not aware of signs that identify a DMST victim and acknowledged their lack of confidence to do so. Although respondents reported being aware of the problem in the US and Kansas, they did not have comprehensive knowledge of the topic. Over 85% of respondents had seen patients who displayed possible DMST signs (e.g., not knowing address, scripted communication, or signs of physical abuse).

Many respondents could not identify health hazards associated with DMST correctly, nor were they aware it is mandatory to report suspected DMST victims. Few respondents were aware that the National Human Trafficking Resource Center at 1-888-373-7888 is available to assist callers in determining if a person is a victim and providing local resources to help.[1] These deficits are most likely due to the lack of formal training on DMST and indicated a need for further education for physicians to fulfill their key role of identifying and reporting victims.

Respondents reported that the greatest barrier to reporting was being unsure whether or not the individual was actually a victim and not knowing how to report. Educating physicians about the national human trafficking resource center and its services likely would help overcome some of these barriers. Education should emphasize to physicians that their job is to report suspected cases, not necessarily to investigate. Furthermore, recognition training may result in the reporting of a greater number of cases. While most believed healthcare workers should receive more training, only 6% of respondents had received training on DMST. Over half stated a willingness to take part in some sort of training event. CME presentations, online tutorials, and seminar/conferences were the preferred avenue of training.

Only a small percentage (11.6%) of physicians reported actually screening young female patients for involvement in DMST. Equally few educated their patients about the risk of DMST. Respondents believed that young female patients should receive education about DMST, and over half agreed that this education should be provided by physicians during annual physicals. Physicians believed this to be an important topic to address with their patients and that they were willing to create awareness but also advised other strategies (e.g., media, public awareness campaigns, and school programs).

The results of this study closely mirrored a study performed in US emergency departments, which found only 13% of emergency department providers felt confident identifying a DMST victim.[16] This finding is remarkably similar to the low number (12%) of Kansas physicians who felt confident. These results demonstrated that healthcare providers in Kansas and even nationally may lack the training and tools to identify victims effectively.

Study limitations. Survey results should be interpreted with caution due to several limitations. The first is the response rate of 4%, which is very low. Clinical survey response rates have demonstrated a decline in the past two decades and in 2002 averaged 68% in one study conducted by the American Academy of Pediatrics.[15] While the results of this survey reflect only a small percentage of Kansas physicians and findings are not generalizable to larger populations, it is a first step in gauging the awareness and beliefs for healthcare interaction for DMST victims. Further, the study may have been affected by response

bias, as physicians who are aware of the issues may have been more likely to respond than those unaware and uninterested in DMST. Future research should explore attitudes and knowledge of all disciplines of healthcare professionals in Kansas and nationwide as well as the impact of screening and recognition training for DMST.

Conclusions

Domestic minor sex trafficking has made local headline news as a problem in Kansas. In this study, a few Kansas physicians reported having treated victims of DMST in their clinical practice. Further, other physicians reported possibly treating DMST, but were uncertain. Respondents were interested in the topic yet were lacking factual knowledge. This lack of knowledge and self-reported low confidence in recognition suggested a need for clinical training in DMST. Survey respondents, while representing a small percentage of Kansas physicians, agreed this is a problem and advocate training for recognition, interaction, and reporting. With healthcare workers in such a prime position to identify and report victims, it is important they have the knowledge and skills to do so.

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Keywords: sex offenses, sexual behavior, minors, health knowledge, attitudes, practice, physicians, Kansas

A Survey of Resident Attitudes on Billing and Coding Education: An Assessment by Pediatric Training Year and Career Plans

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Abstract

Introduction. Billing and coding (B&C) are important aspects of medical practice that many feel are taught inadequately during residency. In addressing this deficiency, residency programs must determine when and how to teach B&C. Some programs teach through informal methods or direct their education only towards senior residents and/or certain career paths. Is this approach ideal? This study evaluated pediatric resident attitudes towards formal B&C education, by post graduate year (PGY), and career plans.

Methods. A survey was distributed to residents before and after implementation of a novel, formal curriculum teaching B&C. General linear models were calculated to look at differences over time of all residents and by PGY levels and future career plans.

Results. Among all residents, there was no change in the highly positive attitudes towards Learning is Important, Valuable Use of Time, or Want a Formal Curriculum. Perceived Knowledge increased significantly and Need to Know More decreased significantly. There were no differences between PGY levels or career plans with all years valuing and wanting education. PGY-3s scored higher than PGY-1s and PGY-2s with Perceived Knowledge.

Conclusion. This study demonstrated a strong, equal amount of interest in the formal education of B&C across all residents, regardless of training year and/or career plans. Pediatric residencies should consider implementing formal education on B&C to all residents. Pediatric resident attitudes towards billing and coding education can be used to guide the curriculum.

KS J Med 2012; 5(4):154-159.

Introduction

Billing and coding is a complicated, but essential aspect of medical practice that affects the ability of every provider and institution to deliver care within legal, financial, and ethical bounds. First established in 1992, then heavily revised in 1995 and again in 1997/1998, the Physicians' Current Procedural and Terminology billing and coding rules established by the American Medical Association are confusing, unintuitive, often changing, and open for interpretation.[1-5] Many physicians have difficulty mastering this critical skill possibly due to inadequate education during residency training.[6] The Pediatric Residency Review Committee (RRC) understands the need to educate and has made Practice Management, under which B&C is classified, a requirement in training programs since 1999.[7] However, the specifications are not defined clearly and training varies from program to program.

A review of the literature showed a desire and need from residents to learn more about B&C across multiple specialties.[8-14] These studies, mostly surveys, highlighted the lack of training in their respective programs while underscoring the desire for a

more involved curriculum. Among the studies that assessed satisfaction with B&C education, only two assessed their residents' or graduates' competencies.[15,16] Complicating the issue, there was a disagreement among Graduate Medical Education administrators centering on whether residencies should dedicate precious time towards a B&C curriculum or whether there were more valuable aspects of medicine to learn, especially within the restrictions of an 80-hour work week.[17,18] Moreover, does B&C education need to be completed through formal didactics, or can informal teaching points be adequate? Because the RRC mandates practice management education in some form, some programs direct their B&C education only towards senior residents and/or certain career paths. But is this practice progressive or detrimental, and is it in accordance with what residents want?

To answer these questions about whether B&C should be taught to all residents, regardless of training year or career plan, and how it should be taught, the study purpose was to assess the attitudes towards B&C of pediatric residents by their post graduate year (PGY) and their career plans, in the setting of a new, formal B&C curriculum. We hypothesized that the majority of our residents possessed a favorable attitude towards the education of B&C, with PGY-3s and those going into private practice being most interested.

Methods

This study was approved by the hospital's Institutional Review Board. A waiver of documentation of consent was obtained. All pediatric residents were informed verbally, and in writing, that their participation within the study was voluntary. Assurance was given that their performance evaluations would not be affected by this study in any way.

The study was conducted during the academic year of July 2009 - June 2010. Residents completed an attitudes survey pre- and post-implementation of a new curriculum teaching the basics of B&C. The curriculum was given during resident clinics as a five-lecture series. The first two lectures, covering the basic skills of assigning the proper Physicians' Current Procedural Terminology Evaluation and Management code, were given in September. The curriculum included the provision of a simplified reference sheet, created by an investigator and approved by the institution's auditors, highlighting the basic principles of B&C. The last three lectures, given monthly in January, February, and March, focused on case examples and reinforcement of what was taught initially in September.

The survey (sample questions in Table 1) was designed to assess resident attitudes in four general areas: the importance of B&C, their perceived current knowledge of it, their desire to learn more, and their desire for a formal curriculum. The questions were scored on a 5-point Likert scale from strongly disagree (1) to strongly agree (5). Written at a 6th grade level, the questions were created by general pediatric faculty from the suggestions of former residents. Three attending physicians piloted the survey to assess readability and clarity before its distribution. The survey also requested the participant's PGY and future career plans immediately post-graduation: Academic Medicine (plans to join the teaching faculty of a medical school), Fellowship (plans to pursue subspecialty training), Private Practice, and Unknown.

Statistical analysis was performed using SAS (version 9.2 March 2008, SAS Institute Inc, Cary, NC). Means for each question were reported. General Linear Models were constructed to examine differences in the

means for each question pre- and post-curriculum by all residents, each PGY level, and each career plan group. Pair-wise comparisons of the least square means were used to examine the averaged pre- and post-results between each PGY level and career plan groups. Statistical significance was set at 0.05. Data were analyzed on an aggregate basis because of the interest in attitudes by PGY and career plans, rather than on an individual basis. Furthermore, because data were analyzed in this method, it was not necessary to ensure that the same residents completed both pre- and post-surveys.

Table 1. Sample questions on the Attitude and Perceived Knowledge survey.

Sample Questions	Label for Figures
Learning to properly code and bill is important in my career.	Learning is Important
Learning to code and bill is a valuable use of my time.	Valuable Use of Time
I have a good sense on how to properly code and bill.	Perceived Knowledge
I need to learn more on how to properly code and bill.	Need to Know More
The residency program should have a formal curriculum on coding and billing.	Want a Formal Curriculum

Results

Sixty-five residents were eligible to participate in the study. Forty residents completed the pre-curriculum survey (61% completion rate) and 45 completed the post curriculum survey (69% completion rate). Because some residents were on night float, vacation, or rotated to an outside continuity clinic, not all residents could complete both surveys and/or attend all five lectures. The average lecture completion rate was 3.2 lectures (+/- 1.2 lectures). There were no significant differences among the composition of PGY level or career plan groups (Table 2).

Table 2. Characteristics of resident participants.

	Pre-Survey (n = 40)	**Post-Survey** (n = 41)	**p Value**
Post Graduate Year (PGY)			
PGY-1	12 (30%)	14 (34%)	0.854
PGY-2	16 (40%)	14 (34%)	
PGY-3	12 (30%)	13 (32%)	
Future Plans			
Academic	6 (15%)	5 (12%)	0.565
Fellowship	14 (35%)	17 (42%)	
Private Practice	12 (30%)	15 (37%)	
Undecided	8 (20%)	4 (10%)	

Aggregate analysis of all residents demonstrated no significant change over time in the values seen for the questions of Learning is Important, 4.8 to 4.9 (p = .367), Valuable Use of Time, 4.7 to 4.7 (p = .606), or Want a Formal Curriculum, 4.5 to 4.5 (p

= .596). A significant increase was demonstrated in Perceived Knowledge from a mean of 2.1 to 3.3 ($p < .001$) and a significant decrease was seen in Need to Know More from a mean of 4.9 to 4.6 ($p < .003$).

Analysis by each PGY demonstrated no significant differences for Learning is Important, Valuable Use of Time, Want a Formal Curriculum, or Need to Know More. However for Perceived Knowledge, a significant increase was seen over time in the means for PGY-1: from 1.7 to 3 ($p < .001$); PGY-2: from 2.2 to 3 ($p < 0.001$); and PGY-3: from 2.4 to 3.9 ($p < .001$; Figure 1).

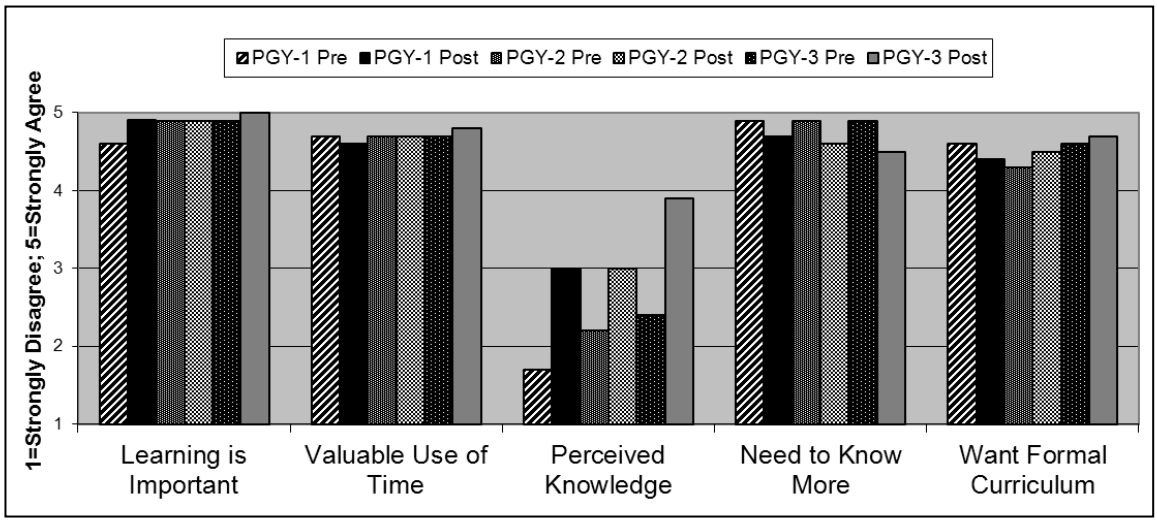

Figure 1. Survey results by post graduate year (PGY). Perceived Knowledge showed significant change.

A significant difference was found for Perceived Knowledge when comparing between PGY ($p < .001$). Using pair-wise comparisons of the least square means, the averaged pre- and post-results of each year showed PGY-3 scored significantly higher than PGY-1 and PGY-2 ($p < .001$ and $p = .005$, respectively). However, PGY-1 and PGY-2 were not significantly different from each other. The remaining questions showed no significant differences between PGY.

Analysis by each career plan demonstrated similar results with no significant differences found for Learning is Important, Valuable Use of Time, Want a Formal Curriculum, or Need to Know More. Perceived Knowledge showed significant increases over time for those entering Fellowship: from 2.3 to 3.5 ($p < .001$); Private Practice: from 1.8 to 3.1 ($p < .001$); and Undecided: from 2 to 2.8 ($p = .04$). Academic Medicine did not increase significantly over time: from 2.5 to 3.4 ($p = .12$; Figure 2).

A significant difference was found for Perceived Knowledge when comparing between career plans ($p = .034$). Pair-wise comparisons of the least squared means showed that residents planning on entering Academic Medicine and those planning on Fellowship reported significantly higher values than those entering Private Practice ($p = .042$ and $p = .018$, respectively). No other questions showed significant differences between career plan groups.

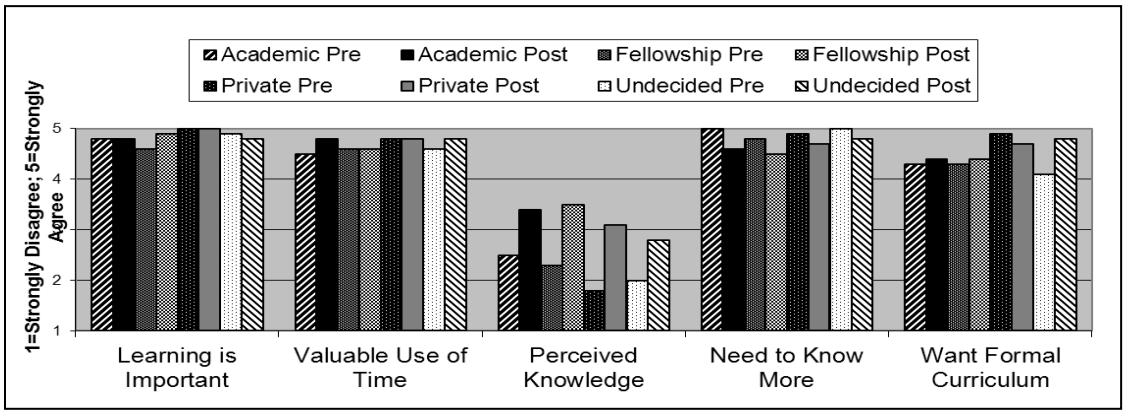

Figure 2. Survey results by career plans. Only Academic Medicine showed no significant change in Perceived Knowledge.

Discussion

This study demonstrated a strong, equal amount of interest in the formal education of B&C across residents, regardless of training year and/or career plans. These findings are contrary to our initial hypothesis that PGY-3s and those residents entering private practice would be most interested. Additionally, the results answered the debate about whether residency is an optimal time to teach B&C by demonstrating that all residents regard B&C as an important, valuable skill to learn. Residents' strong preferences for a formal curriculum suggested the answer of how to teach.

The pre- and post-surveys had a significant time interval between them, possibly leading to the confounding factor of resident attitudes improving because of work experience and not just from our curriculum. However, we believed time did not contribute to the measured change because residents did not receive any other training in B&C or submit their own bills.

Despite our curriculum's success with significant increases among all residents in Perceived Knowledge and significant decreases in Need to Know More, post-curriculum results were still low with Perceived Knowledge and high with Need to Know More. These results underscored a desire and understanding that there is more to learn beyond the basics provided. This study can influence curriculum development by directing education to all residents, not just to those nearing graduation or planning for private practice.

Limitations to this study included its small sample size, which may have contributed to the statistical change seen when the question Need to Know More was analyzed by all residents, but not seen when analyzed by PGY or career plans. Also, the study was institution-specific, involved only pediatric residents, and spanned only one year. Lastly, some researchers may have preferred a pre- and post-paired response approach over the aggregate analysis we performed. Despite these limitations, we recommend that pediatric residencies institute a formal curriculum teaching proper B&C to all residents, regardless of PGY or career plans.

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Keywords: internship and residency, attitude of health personnel, healthcare common procedure coding system

Use of an External Ventricular Drain to Manage Cerebral Edema in Bacterial Meningitis

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Introduction

Bacterial Meningitis affects approximately 1.2 million people worldwide annually with 135,000 deaths.[1] In those who survive, neurologic sequelae are common. Cerebral edema is an occasional complication of this disease and heralds a more severe course. Although antibiotics are the mainstay of treatment, when cerebral edema is present more aggressive therapeutic measures directed specifically at this problem should be considered.

Case Report

A twenty-four-year old female was brought to the emergency department (ED) by EMS after being found unresponsive in her home by her boyfriend. Initial findings included altered mental status as well as leukocytosis with left shift. She was found with bottles of oxycodone/acetaminophen and hydrocodone/acetaminophen at her home. Of note, the patient had a splenectomy several years earlier as treatment for Idiopathic Thrombocytopenic Purpura, putting her at increased risk for encapsulated pathogens.

Serum acetaminophen level was elevated in the ED. She initially was treated for acetaminophen overdose with N-acetylcystine. Several hours after admission during the first night, the patient developed a high fever, up to 105^{o}F. However, there were no call parameters ordered, and a physician was not contacted.

The next morning, the fever was discovered and bacterial meningitis was suspected. Due to her altered mental status and concern for elevated intracranial pressure (ICP), the patient was sent for computed tomography (CT) of the head prior to lumbar puncture. CT revealed cerebral edema (Figure 1) and the patient was started on empiric treatment for bacterial meningitis including ampicillin, ceftriaxone, vancomycin, and dexamethasone.

Figure 1. CT of the head on admission showing poor gray-white differentiation and effacement of the sulci.

At the time of treatment, the patient continued to have altered mental status and she was intubated due to concern that she could not protect her airway. Due to the severity of her illness, an infectious disease specialist recommended aggressive treatment of the cerebral edema. Her initial ICP was 34 mmHg. An external ventricular drain was placed in the right lateral ventricle to maintain ICP in target range. CSF revealed *Streptococcus pneumoniae*. In addition to the ventricular drain, hypertonic saline and mannitol were used to aid in decreasing ICP.

The patient improved clinically over the next several days. Antibiotics were tapered to penicillin alone based on sensitivities. She was extubated on day 6 and the ventricular drain was removed on day 8. A subsequent CT scan showed resolution of the cerebral edema (Figure 2). The patient suffered from sensorineural hearing loss, but otherwise had no other neurologic sequelae and was discharged on day 14, after receiving the proper immunizations.

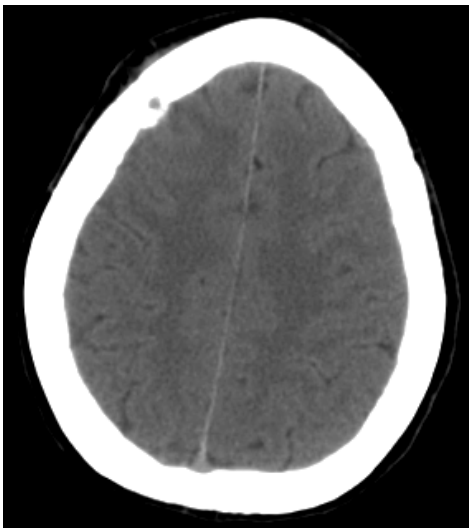

Figure 2. CT of the head on day 8 showing improvement of prior findings as well as right frontal burr hole.

Discussion

Cerebral edema is an occasional complication of bacterial meningitis. Multiple mechanisms of development include: (1) vasogenic due to increased permeability of the blood brain barrier, (2) cytotoxic due to toxic factors from neutrophils, and (3) interstitial due to obstruction of flow of CSF.[2] Several factors placed this patient at increased risk for cerebral edema. There was a delay in treatment that was multifactorial in nature, including delays in diagnosis, discovering the patient's fever, and sending the patient for CT before starting empiric antibiotics. Additionally, the responsible bacteria, *Streptococcus pneumoniae*, are particularly pathogenic due to the severity of immune response it stimulates and the persistence of biologic activity of the debris of killed bacteria.[3] Further, this patient was immunosuppressed due to prior splenectomy, decreasing her ability to fight infection.

There were no known clinical trials, but several case reports described using surgical means[4,5] and medical therapy[2,6] to treat elevated ICP and cerebral edema in bacterial meningitis. Given our patient's severe clinical state at the time of diagnosis, the decision was made to pursue aggressive measures to treat her cerebral edema and elevated ICP. The outcome of this case, while not perfect given the residual hearing loss, generally, was considered reasonable given the severity of her illness.

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*Keywords***:** bacterial meningitis, brain edema, intracranial pressure, neurologic disorder

Mycobacterium Bovis BCG Strain Osteomyelitis Masquerading as Spinal Metastasis from Bladder Cancer

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Introduction

Mycobacterium Bovis, Bacillus Calmette-Guérin (BCG) strain, osteomyelitis is a rare complication of intravesical BCG treatment of bladder cancer.[1] It is clinically and radiologically indistinguishable from Mycobacterium tuberculosis. M. bovis is the main cause of tuberculosis in cattle. Human infections occur in the setting of animal domestication, infected cow's milk products, BCG vaccination, or intravesical BCG instillation for bladder cancer treatment. Approximately 1-2 percent of human tuberculosis cases are attributable to M. bovis. Among patients diagnosed with tuberculosis, the possibility of M. bovis should be considered in the setting of foreign born individuals, Hispanic ethnicity, age less than 15 years, immunosuppression, HIV infection, extra pulmonary disease, history of intravesical BCG, and non-responsiveness to standard TB treatment.[1]

Case Report

An 80-year-old man was admitted from an outside hospital for further work-up of low back pain, bilateral lower extremity weakness, and gait instability of six-month duration. He also reported unintentional weight loss of 40 pounds and fatigue over past 5-6 months. He had no fever or night sweats. He was diagnosed three years earlier with bladder cancer and had cystoscopy with tumor removal. He subsequently had 15 instillations of BCG therapy. At the end of BCG therapy, he was declared as being in remission from bladder cancer. His other past medical history included hypertension and supraventricular tachycardia.

On exam, the patient was lethargic and had severe lower extremity weakness. Labs showed an erythrocyte sedimentation rate of 81 mm/hr, C-reactive protein of 11.73 mg/L, thrombocytopenia with platelets of 67,000, and anemia with hemoglobin of 9.4 gm/dL and hematocrit of 28.3%.

At the outside hospital, computed tomography (CT) of the spine showed a T10 mass (Figures 1 and 2). CT of the chest, abdomen, and pelvis did not show any abnormality. Positron emission tomography showed increased uptake at T10. A CT-guided needle biopsy showed non-specific inflammation and fibrosis but no cancer. Due to his worsening lower extremity weakness and low back pain, a documented spinal mass, and history of bladder cancer, it was presumed that patient had a recurrence of bladder cancer and he received ten radiation therapy treatments to the T10 area. The last treatment was a week prior to the admission to our hospital. As he did not improve with radiation treatment, he was referred for spinal surgery at our hospital.

The patient underwent a T9-T10 thoracic laminectomy and decompression with T6-L1 posterior fusion with associated tissue

Figure 1. CT scan showing T10 osteomyelitis, sagittal plane.

Figure 2. CT scan showing T10 osteomyelitis, transverse plane.

biopsy of the T10 vertebral body, which showed no evidence of malignancy. After surgery, he had some improvement in his left extremity weakness.

The patient was transferred to a long-term acute care facility to be followed by a neurosurgeon. Three weeks later, the acid-fast bacilli culture of the T10 tissue taken from the back surgery was positive for mycobacterium bovis. This organism was sensitive to isoniazid, ethambutol, and rifampin, but resistant to pyrazinamide.

The patient was readmitted with a diagnosis of BCG strain osteomyelitis three years after he received BCG treatment for his bladder cancer. A chest x-ray was without evidence for pulmonary tuberculosis. An HIV test was negative. Further exploration of spine to look for any residual infection and debridement was deferred due to moderate malnutrition and poor functional status (due to his recent spine surgery from which he was still recovering and had ongoing weakness).

The patient's spine infection was managed medically. He was started on isoniazid, ethambutol, and rifampin and transferred to a long-term acute care facility. He completed two months of isoniazid, ethambutol, and rifampin followed by seven months of isoniazid and rifampin. With treatment, his strength and low back pain improved and he was discharged home.

Discussion

BCG is an attenuated derivative of the virulent strain of M. bovis. Intravesical instillation of BCG was first introduced by Morales and associates[2] and is an effective agent for therapy and prophylaxis of superficial transitional cell carcinoma of the urinary bladder. It has been used to treat existing or residual tumors, prevent tumor recurrence, prevent disease progression, and prolong survival.[3] Common complications of BCG immunotherapy include cystitis (up to 90%), hematuria (up to 34%), and fever (3%).[4,5] Severe complications, including sepsis and systemic infections, are rare (less than 1%). Severe systemic disease also can present with disseminated intravascular coagulopathy, respiratory failure, jaundice,

and leukopenia.[4] Late organ-specific manifestations (pneumonitis, hepatitis, pyelonephritis, osteomyelitis, and bone marrow infection) are due to a reactivation of BCG infection.

Risk factors for complications from BCG instillation include traumatic catheterization, urethral injury during BCG instillation, bladder biopsy, hematuria, active infection, immunosuppression, bladder outlet obstruction, radiation cystitis, and transurethral resection of the prostate and deep bladder tumor within two weeks of instillation.[6-11] BCG organisms have been documented in the bladder up to 16.5 months after completion of BCG intravesical instillation therapy.[6] Long lasting and persistent BCG DNA in the bladder wall after intravesical BCG therapy may account for long-term immune-activation and immune anticancer effects, and may explain why patients are still at risk of disseminated infection for months and even years after BCG therapy.

M. bovis can manifest with primary and reactivation forms. Involvement may be pulmonary, extra pulmonary, or dissem-inated and is indistinguishable from tuberculosis. The prognosis for disease is worse than M. tuberculosis.

Susceptibility testing of a mycobacterial isolate with resistance to pyrazinamide or individuals known to have contact with M. bovis often leads to identification of M. bovis.[12] Staining for acid-fast bacilli, PPD skin test, mycobacterial culture, and the interferon gamma release assay are capable of detecting Mycobacterium infections, but cannot identify M. bovis versus M. tuberculous. Differentiation of M. bovis from M. tuberculosis includes colony morphology, biochemical assays (M. bovis has negative niacin production and negative nitrate reduction tests), susceptibility tests (e.g., resistance to pyrazinamide), and PCR genomic analysis. Based on colony morphology, M. bovis BCG strain can be distinguished from M. bovis wild strain. M. bovis BCG strains are eugonic and grow more rapidly (3-4 weeks to grow on Löwenstein-Jensen medium), have a rough, buff-colored appearance, and in some cases, accumulate niacin. M. bovis wild strains, on the other hand, have a very slow growth rate, produces dysgonic-appearing colonies on Löwenstein-Jensen medium, and frequently require 6 to 8 weeks to become observable.

One should consider M. bovis BCG strain when a nucleic acid probe is positive, but the organism is characterized by negative nitrate reduction, negative niacin production, susceptibility to inhibition by thiophene-2-carboxylic acid hydrazide (TCH), and resistance to pyrazinamide, especially in a patient with a history of intravesical BCG therapy for bladder cancer.[13] For conclusive identification of M. bovis, the isolate should be sent to the state public health laboratory or a mycobacteria reference laboratory, which was done in our case. The duration of therapy for pulmonary and extra pulmonary disease should be nine months; genetic resistance of M. bovis to pyrazinamide precludes use of a short-course (6-month) regimen. The regimen consists of isoniazid, rifampin, and ethambutol for the first two months, followed by isoniazid and rifampin for seven months and for meningitis up to a total of twelve months.

At least fifteen cases of M. bovis BCG strain osteomyelitis have been reported following intravesical therapy.[13-27] The range for presentation post instillation varies between two weeks and 12 years. In one report, 1.5 years after diagnosis and surgical and anti-tuberculous treatment, the patient was pain-free with no functional limitations or clinical and imaging findings of recurrent infection.[24] Notably, 8 of 15 patients with vertebral osteomyelitis required surgical

intervention with debridement and spinal stabilization similar to our case.[13,15,16,19-21,24,27] One patient received a presumptive diagnosis of metastatic lung cancer and underwent empiric radiation therapy to the back and chest similar to our case. Another case developed pancytopenia from bone marrow infection with BCG two years after intravesical instillation of BCG for bladder cancer.[22] Mycobacterium bovis osteomyelitis involving a hip arthroplasty[17] and infected aortic aneurysm along with vertebral osteomyelitis also has been reported.[26]

Although the systemic complications are known from the use of intravesical BCG, osteomyelitis is a rare complication and recognition of this syndrome is critical to institution of appropriate therapy and prevention of long-term complications in patients treated with intravesical BCG. Timely diagnosis is important, because chemotherapy, when initiated early in the disease, can preclude the necessity for surgical intervention.

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Keywords: mycobacterium bovis, osteomyelitis, bladder cancer, case report

Midwifery in Kansas

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Introduction

"A midwife is a person who has successfully completed a midwifery education programme that is duly recognized in the country where it is located and that is based on the ICM Essential Competencies for Basic Midwifery Practice and the framework of the ICM Global Standards for Midwifery Education; who has acquired the requisite qualifications to be registered and/or legally licensed to practice midwifery and use the title "midwife;" and who demonstrates competency in the practice of midwifery.

Scope of Practice

The term "midwife" means "with woman"[1] and reflects the midwife's role as the responsible and accountable professional who works in partnership with women to give the necessary support, care and advice during pregnancy, labour and the postpartum period, to conduct births on the midwife's own responsibility and to provide care for the newborn and the infant. This care includes preventative measures, the promotion of normal birth, the detection of complications in mother and child, the accessing of medical care or other appropriate assistance and the carrying out of emergency measures. The midwife has an important task in health counselling and education, not only for the woman, but also within the family and the community. This work should involve antenatal education and preparation for parenthood and may extend to women's health, sexual or reproductive health and child care. A midwife may practise in any setting including the home, community, hospitals, clinics or health units."[2]

Introduction

Birth is a natural part of life. For the majority of women, it is not associated with a medical condition or disease.[3-11] Thus, for a well population, birth needs to take place in a context that humanizes care, is safe and comfortable, minimizes interruptions, and promotes the bonding, touch, and grooming that occur naturally between a mother and her infant. Such a context facilitates breastfeeding and has the potential to empower mothers and increase their confidence in their new role. For many women, the optimal context for birth is the home. A planned home birth with skilled midwifery care for women experiencing low-risk pregnancies focuses on vigilant assessment, shared decision-making and timely referrals, when needed.

Low-risk pregnancies are those that are considered to be problem-free, based on a detailed assessment of a woman's past medical, gynecological, and obstetric history, and planned home birth by women with low-risk pregnancies is making a comeback in the United States.[8,11-15] In two recent reports, MacDorman and colleagues[14,15] noted that the slow but steady decline seen in home births in the United States from 1989 to 2009 has been reversed. Although the majority of women continue to receive care from obstetrician-gynecologists

or family practice physicians,[16] data from 2004 to 2009 document a substantial 29% increase in home births. In 2009, of 4.2 million U.S. births, 29,650 occurred at home. White women led the increase, with 1 in 90 having babies at home, compared to 1 in 357 Black women and 1 in 500 Hispanic women. Twenty-seven states had statistically significant increases in the percentage of home births from 2004 to 2008; only four states had declines. In 2009, 62% of home births were attended by midwives (as opposed to other practitioners); the vast majority with favorable outcomes.

This developing body of evidence shows that women with low-risk pregnancies who had prepared and planned for a homebirth or given birth at a freestanding birth center, have as good or better birth outcomes than women who give birth at a hospital. Despite such data and support by maternal and public health organizations, including the American College of Nurse-Midwives (ACNM) and the American Public Health Association (APHA), the issue of planned home births remains controversial. Medical associations such as the American Congress of Obstetricians and Gynecologists (ACOG) and the American Academy of Pediatricians (AAP) remain skeptical about the value and safety of planned home births and care by skilled birth attendants, including midwives.[5] Wax and colleagues[17] recently published a meta-analysis of outcomes from planned home births compared to planned hospital births. These investigators concluded that the neonatal mortality rate was significantly greater in planned home births and they attributed this to less medical intervention. While an influential study, the investigators have been criticized for possible bias in their selection of studies for the analysis and for not differentiating between planned and unplanned home births, as planning is a critical predictive factor of a successful outcome.[18,19]

Other important organizations such as the American Academy of Family Physicians (AAFP) have yet to state an opinion on planned home births. The concerns expressed by physicians regarding the paramount safety of mother and baby and the legal constraints placed on them that hinder collaborative and supportive care certainly are important and are shared by those advocating safe home birth. As Declercq[20] wrote, "*The fact remains that the debate over home birth will not be resolved by any study, no matter how well designed. At its core, the home birth debate is ideological, centering on two diametrically opposed perspectives on birth held by groups that generally do not communicate with each other and unfortunately often hold each other in disdain. Perhaps the question we should be asking is not what is right or wrong about any study on this topic. Rather, why are increasing numbers of US women who are experienced in birth (80% with parity 2 or higher) choosing to reject hospital-centered systems of maternity care that so many well-meaning clinicians want to make better?*"(p. 6)

The purpose of this paper is to describe briefly the status of midwifery in Kansas, clarify the credentials of midwives, and highlight their positive role in the care of women with low-risk pregnancies who desire to give birth at home. In so doing, this paper may contribute to the discussions that need to continue between home- and hospital-based birth professionals, legislators, and insurers. The outcome of these discussions must be to establish a system that advances effective communication in the facilitation of spontaneous, unmedicated vaginal births for women with low-risk pregnancies in as natural a context as possible.

The Ebb and Flow of Midwifery

Throughout history, the process of

having a child, including pregnancy, labor, and birth, has been a family experience. Until the beginning of the last century, almost all births were attended by midwives and took place at home.[1,14] Frequently the entire, extended family was involved. Doctors were called only when there were complications which necessitated surgery.[21]

With medical advances, greater knowledge about hygiene, and standardized licensure and documented competencies for physicians, mothers in the United States were encouraged to give birth at a hospital.[5,22] New practices and routines included pain management and physician-assisted labor and delivery. Formula feeding was promoted to counteract possible disease and infection. However, instead of being recognized as a naturally occurring process, birth was viewed from a medical perspective, given the potential for illness or dysfunction in the mother and/or newborn that would require care from physicians. As the medical specialty of obstetrics became established, by the 1940s half of all deliveries occurred in hospitals and by 1969, the percentage of hospital births had increased to 99%.[9,14,21] As hospital births increased, family involvement declined. Family members were not present at the delivery and neonates were kept separate from their mothers in newborn nurseries.

With the post-World War II baby boom and increased medical efficiency, the time mothers and their well newborns spent at the hospital gradually decreased from two weeks to a few days.[9,11,22,23] From the 1950s to the 1970s, important factors encouraged many women to consider different options in the birthing process. These influential factors centered on the growing women's movement, the related increased interest in natural childbirth, and substantial research findings showing the negative effects of mother-infant separation following birth. Consequently, in the 1980s and 1990s, hospital-based labor and delivery facilities began to focus on providing more family-centered maternity care and to promote the relationships between childbearing women, their families, and care providers.

Women's increased understanding of the importance of giving birth in as natural a context as possible also was associated with a return to planned home births and midwifery services.[21] However, increasingly educated women then, and today, needed reassurance that the midwifery services they required were being provided by competent and experienced persons.

Midwives in Kansas: Qualifications, Licensing, and Certification

In Kansas, as in many other states, the profession of midwifery is comprised of both nurse-midwives and direct-entry midwives. In European countries, such as Germany and the United Kingdom, and in Asian-Pacific countries, such as Australia, nurse-midwives and direct-entry midwives have to meet the same qualifications.[24] In contrast, the regulatory system in the United States enables individual states to have a key role in determining scope of practice, licensure, and payment guidelines for the two types of midwifery practice. Thus, in the U.S., these practice guidelines can, and do, vary across the country.[21] Of interest, Kansas remains one of many states that do not yet have a Maternal Mortality Review Board.[25]

Nurse-midwives in Kansas. Nurse-midwives are registered nurses who have graduated from an accredited midwifery education program at an institution of higher learning and passed a national certification exam given by the American Midwifery Certification Board (AMCB). These certified nurse-midwives (CNMs) have hospital privileges, are able to prescribe medications, be reimbursed through medical insurance, and work in private practices with

obstetricians. In case of emergencies, they also have physician support. They are required to complete regular Continuing Education Units (CEUs) to maintain their certification status.

The programs from which these CNMs graduate are accredited by the American College of Nurse-Midwives (ACNM). The ACNM was established in 1969 and functions primarily to develop and promote the standards and practice of nurse-midwives. It has a Division of Accreditation, recognized by the US Department of Education, which accredits the certificate, baccalaureate, and graduate degree programs in nurse-midwifery. The organization strives to work collaboratively with the American Nurses Association (ANA) and ACOG concerning legislative issues that impact midwifery practice. Certified nurse-midwives are recognized and licensed to practice in all 50 states, the District of Columbia, and US territories. In Kansas, the practice of CNMs is regulated by the State Board of Nursing.[21,26]

At the present time, there are 43 accredited education programs in the United States that offer post-baccalaureate certificate and Master's degree programs in nurse-midwifery and midwifery, including several programs with long distance (on-line) learning education options. In Kansas, there is one accredited graduate program in nurse-midwifery at the University of Kansas in Kansas City.[26]

There are 63 licensed CNMs in Kansas. These CNMs practice in a variety of settings including hospitals, freestanding birth centers, homes, and military bases. They are able to prescribe medications, having obtained prescription writing privileges in 1989. There are 28 nurse-midwifery practices located throughout the state. In 2007 (the most recent year for available information), CNMs attended 1,902 births, approximately 4.5% of all births in Kansas for that year.[3]

Non-nurse midwives in Kansas. Midwives who are not nurses frequently are referred to as "direct-entry midwives (DEMs)," or "lay," or "traditional" midwives. They are not required to have a college degree or prior nursing experience to start a career in midwifery. Some of these midwives gain practical experience through completing general education and apprenticeship-training requirements, and pass written skills tests prior to receiving a certificate credential from the Midwives Alliance of North America (MANA) and its credentialing unit, the North American Registry of Midwives (NARM). The credential is "Certified Professional Midwife" (CPM). CPMs have legal status in Kansas but, as yet, there is (a) no designated regulatory agency, (b) no state law governing their relationship with physicians, nor (c) any requirement for their continuing education.[21,26]

Other non-nurse midwives enter an accredited midwifery education program directly without any previous nursing experience. Following their graduation from this accredited program and a passing score on the national certification exam, they receive the same certification as nurse-midwives. This certification reflects the fact that they have demonstrated the same competencies for midwifery practice that are expected of nurse-midwives. They are recognized as "certified midwives" (CMs) but not "certified nurse-midwives" (CNMs). They are licensed to practice in all 50 states, the District of Columbia, and US territories. In Kansas, their practice is regulated by the State Board of Nursing.[21,26]

These varying credentials and certification processes continue to exist for midwives in Kansas, and in other states, as the ACNM and MANA organizations work towards further agreement on the requirements for midwifery education and

practice.[21]

A caveat in Kansas. In Kansas, by law, women have the right to give birth anywhere they choose and to have any attendant they wish. Birth is recognized as a natural, not medical, event. Therefore, a birthing attendant is not required to hold a medical license.[27,28] While this law empowers women with low-risk pregnancies who wish to plan a home birth, these women need to make sure that they understand the qualifications, or lack of qualifications, of persons who promote themselves as experienced midwives. Davis-Floyd and Johnson[29] present the case of "renegade" midwives (p. 456) who view the credentialing process as antithetical to their independence and autonomy and yet who consider themselves well-qualified to practice as a result of their documented skill and experience. In examining the nuances of the arguments regarding credentialing and license to practice, Davis-Floyd and Johnson write that "*all midwives are, to some extent, renegades. Yet there is a spectrum of renegadeness, and those at the further end of it threaten the cultural acceptance of professional midwifery…. Every midwife must keep in mind that protecting the profession is ultimately in the best interests of mothers and babies, because it is the existence of midwifery that keeps the options of safe, non-interventive, and nurturant birth open to all who choose midwifery care.*"[29]

Reimbursement for Midwifery Practice in Kansas

In 2010, the US Congress noted that "*Midwives serve as faculty at many of the Nation's most prominent academic health centers; however, the time they spend training medical students, residents, and midwifery students is not reimbursed as it is for physicians. As a result, medical students, residents, and midwifery students often fail to benefit from the practice experience and physiologic birth experience of midwives.*"[16] (p. 10) In its subsequent 112th session, Congress introduced H.R. 2141: *Maximizing Optimal Maternity Services for the 21st Century*,[30] recognized as the "MOMS Act," accompanied by H.R. 1054: *Access to Certified Professional Midwives Act*,[31] in the House of Representatives. Both Acts support a systematic plan to promote evidence-based maternity practice and models of care, including appropriate reimbursement of services from certified midwives for planned home births. The establishment of interdisciplinary Centers for Excellence on Optimal Maternity Outcomes is planned and such Centers will include midwifery services. These Centers are essential for the coordinated, rather than fragmented, healthcare services needed by pregnant women, and midwifery services, when appropriate, need to be an integral aspect of this coordinated care.[9,32]

Currently in Kansas, third-party reimbursement for CNMs is not mandatory. If CNMs receive Medicaid reimbursement, they receive it at 75% of physician rates.[33] This inadequate rate of reimbursement will continue as long as state regulators view midwifery practice as a service that is specifically delegated by a physician.[21] Thus, a collaborative and supportive relationship between physicians and certified midwives is essential for the effective practice of midwifery and optimal care of women and infants. Physicians who work with CNMs are sued less often than physicians who do not work with CNMs and state attorneys general can play a key role in ensuring that restraint-of-trade practice does not become law.[21]

For Certified Professional Midwives in Kansas, their lack of regulation, or licensure, limits where they may practice, thus, third-party reimbursement. Most CPMs focus their service on home births, for which they receive direct payment.[17,33,34]

Conclusions

Birth is a natural part of life. When there are no medical complications, it needs to take place in as natural a context as possible to promote the bonding of mother and baby. Medical staff at hospital-based birthing centers strives to accomplish this but increasing numbers of women with low-risk pregnancies are choosing to plan for a birth at home. Although controversial, such planned home births frequently are attended by midwives, working in consultation with physicians.

Certified nurse-midwives, certified midwives, and certified professional midwives are able to practice in Kansas. CNMs and CMs are regulated by the Kansas Board of Nursing. The practice of CPMs is not regulated. All three types of midwives can assist at a planned home birth. Data show that appropriate use of the midwifery model for planned home births for women with low-risk pregnancies ranks well in terms of reduced labor interventions (although the duration of labor may be longer), increased maternal satisfaction, maternal and infant safety, and cost effectiveness for antenatal and intrapartum periods.[6,7,11,15] Conversely, results of a recent meta-analysis suggest a higher neonatal mortality rate with births at home.[17]

The ACNM envisions that, by 2020, certified midwives will attend 20% of births in the U.S.[26] The intent is that these midwives will be able to work collaboratively with physicians to shape women's healthcare systems, increase the diversity of effective healthcare providers, and ensure optimal outcomes for women and infants in both urban and rural areas.[4,9,29,35,36]

There is much work to be done to accomplish this vision. The national organizations that credential and certify midwives need to develop agreed-upon standards and such standards need to be adopted in Kansas. Well-designed studies with carefully controlled variables need to continue to support or revise midwifery practice for planned home births by women with low-risk pregnancies. When specific outcome measures document the effectiveness of midwifery practice, these practices need to be promoted and followed. Women with low-risk pregnancies who desire to experience a planned home birth need to be empowered to do so and these women need to be supported by a team of healthcare providers, including a qualified and skilled midwife, that is focused on effective communication and evidence-based practice.

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