
Educational Session Abstract

2013 Summer Meeting

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The Joint Commission Medication Management Update 2013

Mansur, J.

Joint Commission Resources, 1515 W. 22nd Street Suite 1300, Oak Brook, IL 60523, USA.

Email: jmansur@jcrinc.com

Adamski, P.

Compliance with medication related standards continues to be a top priority for hospitals who wish to build a foundation of medication safety as well as ensure compliance with Joint Commission and CMS requirements. This presentation will highlight key changes to the Joint Commission medication management standards for 2013 as well as some new standards enhancements being planned. Challenging standards will be discussed as well as practical ways to address these standards. New changes to CMS Conditions of Participation will be described which are being incorporated into Joint Commission deeming surveys.

Learning Objectives:

1. Describe 2 significant changes to the medication management standards and NPSG for 2013.
2. Identify key issues found on survey relating to the top 4 challenging medication management standards.
3. Cite at least 1 recommended strategy for compliance with each of the top 4 cited medication standards.

Self-Assessment Questions:

- 1.MM.03.01.01 is the most scored medication management standard because:
 - A.Surveyors find many examples where medications are not stored securely
 - B.Surveyors find examples of refrigerator logs with missing temperatures
 - C.There are many requirements that are part of MM.03.01.01
 - D.A and C
 - E.All of the above
- 2.Which of the following strategies should be followed to support compliance with medication preprinted orders:
 - A.They should be reviewed yearly
 - B.They should not be used in the hospital
 - C.They should be reviewed at a frequency defined by hospital policy
 - D.They should not include non-formulary medications
 - E.C and D
- 3.Compliance with MM.05.01.01 can be supported by which of the following actions:
 - A.Pharmacist review of a medication order prior to dispensing or administration

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- B. Controlling access to medications to limit use prior to pharmacist review of the medication order
- C. Review of medications removed from automated dispensing devices prior to pharmacist review through the override process
- D. Review of the medication order by an appropriately-trained individual when the pharmacy is closed
- E. All of the above

Answers: 1. (D); 2. (C); 3. (E)

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The ACO Pioneer Model 1 year later: what we've learned

Anderson, Jr., E.R.

489 Copeland St, Brockton, MA 02301, USA.

E-mail: anderson489@comcast.net

Setting the stage for a successful Accountable Care Organization (ACO) is critical. The Pioneer ACO's have largely been in the mode of building the appropriate infrastructure and educating providers to most appropriately care for ACO patients. The Pioneer ACO is the Medicare program in which 32 providers enrolled and were chosen. Several ACO have also assumed risk with commercial insurance companies through contracts to provide care to a population of patients. Many hospitals have elected to use ACO principles to care for their employees by assuming all risk for these patients/employees. Building the Information Technology infrastructure is paramount in order to manage the patients across the continuum of care. The quality measures for the Pioneer ACO are the same as in the Share Savings Program under Medicare. Pharmacists have a unique opportunity for to assume key roles on the patient care team in both the inpatient and ambulatory settings. Due to the bundled payment methodology and risk arrangements of ACO's, the rules have changed from the traditional fee for service model to total cost of care across the entire continuum of care. The astute pharmacist leader will learn how to structure our profession with provider organization's leadership as indispensable to the new value equation of ACO's. This session will provide the background and education regarding Accountable Care Organizations, Pioneer Accountable Care Organizations and Commercial risk contracts. Within this context the opportunities for pharmacists will be enumerated with the financial incentives to serve patients as the medication experts. Strategizing with the leadership of healthcare organizations will provide expanded opportunities for pharmacists in roles identified in the Pharmacy Practice Model Initiative and beyond.

Learning Objectives:

1. Describe the distinguishing characteristics between an Accountable Care Organization and a Pioneer ACO.
2. Describe the organizations that are involved in patients' "Transitions of Care."
3. Describe the opportunities for pharmacists within the context of an ACO or Pioneer ACO.

Self-Assessment Questions:

1. (True or False) The Pioneer ACOs began in 2012 and included 32 organizations.
2. Transitions in care facilities include the following:
 - A. Acute care hospitals
 - B. Long Term Acute Care hospitals
 - C. Home healthcare agencies
 - D. Health Insurance plans
 - E. All of the above

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3. Pharmacists' services to patients and ACOs may be expanded in the ACO model for all except:
- A. When pharmacists have provider status
 - B. To prevent readmissions to hospitals
 - C. To achieve patient clinical goals in ambulatory care
 - D. To complete Medication Reconciliation
 - E. To provide telehealth services to remote patients

Answers: 1. (T); 2. (E); 3. (A)

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Tumultuous times bring a myriad of models

Kirschenbaum, B.E.

Email: bkirschen@aol.com

Healthcare Reform will be tumultuous in 2013 with multiple payment initiatives like Accountable Care Organizations (ACOs), Value based purchasing or other models jockeying for position. Pharmacy's need for recognition and payment for clinical contributions and drugs requires core competency in strategic planning, budgets to increase revenue and decrease expense, managed care negotiations, Medicare/Medicaid payment systems and finding \$ to support PPMI. Selling new concepts to Finance teams and defending against outside influences striving to reduce expenses is challenging. Healthcare reform presents several opportunities for pharmacy but requires skill in developing strategy and an understanding of payment mechanisms. Pharmacy tends to lack a clear understanding of reimbursement processes, rules and politics. However, C-Suite discussions require pharmacy to understand ACO's, Managed Care Contracts, Healthcare Reform Implications, Alignment of incentives and Pharmacy's potential contributions. Selling pharmacy to the C-Suite both corporately and locally and Positioning Pharmacy for growth is essential. This presentation introduces concepts and continues discussions to assist articulating the goals and values of pharmacy and provides strategies for moving forward.

Learning Objectives:

1. Describe three reimbursement challenges and complexities in your practice setting.
2. Describe pharmacy leaders' roles in educating their health systems on PPMI's budgetary impact.
3. Be conversant on pharmacy's contribution to ACO, VBP and other emerging healthcare models.

Self-Assessment Questions:

1. Which of the following is true when trying to develop an adherence management strategy?
 - A. Identifying non-adherent patients is critical
 - B. Understanding and being able to utilize the key tools associated with managing medication adherence is part of the process
 - C. Learning how to use varying engagement approaches and their known impact on adherence is a skill pharmacy needs to acquire
 - D. All of the above
2. A Tweet: "What's pharmacy's drug spend 4 bundles&how RU getting it? Figured out how 2 get \$ for drug admin/package products? It's a model. Work on it" (True or False) This Tweet represents a model pharmacy could use to address the dilemma of getting paid for their portion of bundled payments.

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3. Which of these strategies are useful to prevent readmissions?
- A. Patient education with a Patient-friendly discharge plan
 - B. Medication reconciliation
 - C. Post-discharge intervention
 - D. All of the above

Answers: 1. (D); 2. (T); 3. (D)

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113th Congress: Priority Issues for Health System Pharmacists

Hill, J.M.

American Society of Health-System Pharmacists, 7272 Wisconsin Avenue, Bethesda, MD 20814, USA.

Email: jhill@ashp.org

Legislation enacted in 2012 had a title specifically designed to help alleviate drug shortages. Some of the provisions have been implemented and have had a positive effect, others are in process. Shortages remain a problem and a priority for ASHP. Since the meningitis outbreak in 2012, ASHP has been actively engaged with the Congress and FDA to address regulatory gaps in pharmaceutical compounding.

Learning Objectives:

1. Name at least three elements of Title X of FDASIA to address the drug shortage problem.
2. Describe the environment that allowed NECC to operate as a pharmacy when it behaved more like a manufacturer.
3. Describe how a third tier of registration may help to close the regulatory gap that exists with respect to compounding.

Self-Assessment Questions: (True or False)

1. Title X of FDASIA specifically dealt with ways to prevent and mitigate shortages.
2. The number of new drug shortages is higher than previous years.
3. NECC was licensed as a pharmacy but behaved more like a manufacturer.

Answers: 1. (T); 2. (F); 3. (T).

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Overview of policy issues

Meyer, B.M.

American Society of Health-System Pharmacists, 7272 Wisconsin Avenue, Bethesda, MD 20814, USA.

Email: bmeyer@ashp.org

Current public policy issues affecting health system pharmacy are described. The political environment is an important dynamic which determines the policy substance and outcome. The grassroots advocacy actions that individuals can apply are outlined.

Learning Objectives:

1. List the public policy issues affecting health system pharmacy that are under consideration at the federal and state level.
2. Describe the political environment in which these policy issues will be debated.
3. Name at least three grassroots actions individuals can take to advocate for policy changes.

Self-Assessment Questions: (True or False)

1. An approval pathway for biosimilars is being considered by Congress.
2. Federal legislation to mitigate drug shortages is under active consideration by Congress.
3. Legislator visits to health system pharmacies is a key advocacy tool.

Answers: 1. (F); 2. (F); 3. (T).

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Overview of regulatory issues

Topoleski, C.J.

American Society of Health-System Pharmacists, 7272 Wisconsin Avenue, Bethesda, MD 20814, USA.

Email: ctopoleski@ashp.org

Current regulatory issues affecting health system pharmacy are described. The FDA is currently implementing drug shortages legislation passed last year, create a pathway for the approval of biosimilar medications, while attempting to address the largest outbreak of fungal meningitis to date and potentially oversee a new class of manufacturers.

Learning Objectives:

1. Discuss implementation of drug shortages legislation passed in 2012.
2. Discuss current FDA challenges in oversight of compounding.
3. Update current state of affairs of biosimilar pathway.

Self-Assessment Questions: (True or False)

1. We should have a clearer plan of how the FDA plans to address drug shortages by the end of the summer.
2. The FDA is required to inspect and certify all registered entities to ensure they are fully cGMP compliant.
3. Once FDA approves biosimilars, we should expect to see a rapid conversion in the market to biosimilars with 80 to 90 percent savings off innovator products.

Answers: 1. (T); 2. (F); 3. (F)

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Effectively Orienting Residents to Your Program

Erstad, B.L.

University of Arizona College of Pharmacy, 1703 E. Mabel St, Tucson, AZ 85721, USA.

Email: erstad@pharmacy.arizona.edu

This talk will begin with a discussion of the importance of appropriate orientation of the resident to your program and to specific rotations. This will be followed by a discussion of techniques to facilitate information retention by the resident. The remainder of the talk will cover progression from mentor/mentee to more collaborative relationships.

Learning Objectives

1. Given descriptions of effective orientation to a residency program, attendees will refine their own orientation programs to enhance positive experiences for residents.
2. List at least two handouts that can be given to the resident at the beginning of the rotation that will facilitate the learning and evaluation processes.
3. Describe the usefulness of a taxonomical classification system of goals and objectives.

Self-Assessment Questions

1. Which of the following are essential differences between the function of a PGY1 and PGY2 resident:
 - A. PGY2 should be more of a team player
 - B. PGY2 should be more cynical of published literature
 - C. PGY1 are not expected to problem solve
 - D. None of the above are true
2. Which of the following handouts would be *least* important for the first day of a student's experiential rotation?
 - A. goals and objectives
 - B. expectations of preceptor
 - C. answers to pre-rotation quiz
 - D. list of scheduled activities
3. Which of the following evaluation tools is most likely to assess the various hierarchy of learning levels?
 - A. Bloom's taxonomy
 - B. Glasgow scale
 - C. Preceptor pain scale
 - D. Best ship scale

Answers: 1. (D); 2. (C); 3. (A).

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Creating residency projects that make a difference

Murphy, J. E.

The University of Arizona College of Pharmacy, 1295 N Martin Avenue, Tucson, AZ 85721, USA.

Email: murphy@pharmacy.arizona.edu

Conducting a project during residency training has long been a requirement in standards from the ASHP Commission on Credentialing. Unfortunately, a fairly small percentage of projects are presented beyond regional residency conferences or published. This session will focus on approaches that can enhance the quality of projects, increase potential for their external presentation and publication and, in turn, enhance their value to the resident, the residency site, and the profession.

Learning Objectives:

1. Describe common problems that lead to diminished value of residency projects.
2. Evaluate orientation and monitoring approaches used at attendees' institutions that could be revised to increase value of produced projects.
3. Describe at least two changes that would benefit the project outcomes at the attendees' institutions.

Self-Assessment Questions:

1. In the various studies described in this session of publication rates of projects presented at residency conferences, the highest publication rate noted was (rounded off):
 - A. 20%
 - B. 16%
 - C. 5%
 - D. 3 %
2. (True or False) The reason cited for lower acceptance rates of residency projects compared to other submissions to the American Journal of Health-System Pharmacy was that many were not novel enough.
3. (True or False) One of the main problems associated with preparation of residents and preceptors to conduct research-related projects is that there is a relative lack of instructional information available.

Answers: 1. (B); 2. (T); 3. (F)

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Transitioning from PGY-2 Resident to PGY-2 Preceptor

Phan, H.

University of Arizona Colleges of Pharmacy and Medicine, 1295 N. Martin Ave. Tucson, AZ 85721, USA.

Email: hphan@pharmacy.arizona.edu

Residency training is a common pathway for pharmacy graduates to gain additional training and experience in direct patient care. Provision of direct patient care for specialized patient populations such as pediatric patients, critically-ill patients, and those with specific conditions such as cancer, also necessitates additional advanced postgraduate residency training (e.g., PGY-2). Preceptors for these programs, especially those new to this role, often face challenges in establishing resident learning experiences (i.e., rotations), balancing various levels of trainees, meeting accreditation requirements, and continuously developing their various career facets including their own practices and rotations. Discussion and application of approaches to meeting challenges including creating and assessing resident learning experiences as a PGY-2 preceptor and meeting accreditation preceptor requirements are presented to provide clinicians an approach in developing effective resident experiences as part of a PGY-2 Residency Program.

Learning Objectives:

1. Identify helpful resources from PGY-2 or other post-graduate training toward development as a residency preceptor and/or program director.
2. Apply lessons learned from post-graduate training (good and bad) towards optimizing future resident learning experiences.
3. Develop assessment strategies to help preceptors and program directors continually improve their resident learning experiences (and program).

Self-Assessment Questions:

1. (True or False) All PGY-2 preceptors should teach starting at the coaching role for all PGY-2 residents as they should be advanced enough to begin at this stage.
2. Which of the following preceptor requirements is a common challenge for new preceptors?
 - A. Defining the lines in professionalism with regarding to interactions with residents
 - B. Demonstrated effectiveness in teaching
 - C. Formal recognition by peers as a model practitioner
 - D. Record of contributing to the total body of knowledge in pharmacy practice
3. (True or False) The term mentor and preceptor are always interchangeable with regards to the training of PGY-2 residents.

Answers: 1. (F); 2. (D); 3. (F)

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Coping with Change Management: Using LEAN and Mind mapping to Advance PPMI in Your Setting

Denure, D.

Email: deb@dbawi.com

The one thing that is consistent to a growing, thriving pharmacy practice is Change. The continued gap of “how too” and "choice" can be overwhelming. Use a LEAN strategy and MAP an approach to overcome PPMI challenges. Know Change or No Change will happen!

PPMI National Dashboard:

A set of goals and measures designed to provide a national, baseline measure of adoption of PPMI recommendations and allow measurement of progress over time. A total of 5 goals with 26 individual measures make up the scorecard. The scorecard will be updated annually with data from ASHP's National Survey of Pharmacy Practice in Hospital Settings. The national scorecard will be used primarily by ASHP/ASHP REF to report progress with PPMI. In time, state affiliates or large systems may wish to develop their own scorecard using the same goals and individual measures. (Note: All data reported are from the ASHP National Surveys.)

Learning Objectives:

1. Using the 5 goals of the PPMI National Dashboard, develop a LEAN approach to advance your departmental dashboard.
2. Identify three change barriers and map a communication plan.
3. Describe how to break down and organize a change strategy with four time management techniques.

Self-Assessment Questions: (True or False)

1. Mindsets are part of our “cognitive unconscious.”
2. A LEAN philosophy means a place for everything and everything in its place.

Answers: 1. (T); 2. (T)

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Developing mHealth Tools for Providers and Patients: There's an App for That

Young, M.T.

NAVMISSA, 300 Convent St, Suite 1100, San Antonio, TX 78205, USA.

Email: marc.young@med.navy.mil

This session will describe the current mHealth efforts for Navy Medicine with a pharmacy application for patients as one of the examples. The methods for developing and managing an mHealth application as well as the Agile methodology process will also be presented.

Learning Objectives:

1. Describe current mHealth efforts related to pharmacy.
2. Describe mHealth app development within the Navy's pharmacy operations.
3. List the project management principles that apply to mHealth app development.
4. Create an mHealth app roadmap for your organization.

Self-Assessment Questions:

1. Which of the following mHealth Apps has the Navy built?
 - A. Pharmacy
 - B. Asthma
 - C. Perinatal
 - D. Diabetes
2. mHealth applications support can support healthcare organizations meet meaningful use criteria.
3. The Agile process is being used to develop mobile apps for Navy Medicine.
4. Mobile applications on a patient's personal device developed by a healthcare entity would not be their IT strategy.

Answers: 1. (A); 2. (T); 3. (T); 4. (T)

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The Clinical Decision Support Consortium: A Five Year Review

Dixon, Brian E.

Indiana University-Purdue University Indianapolis, 410 W. 10th St., Suite 2000,
Indianapolis, IN, 46202

Email: bedixon@regenstrief.org

Clinical decision support (CDS) systems seek to improve decision-making in health care delivery. Adoption and use of CDS systems is sparse, although recent policies such as meaningful use and the affordable care act are encouraging more providers to implement CDS. The CDS Consortium (CDSC) is an effort sponsored by the Agency for Healthcare Research and Quality to assess, define, demonstrate, and evaluate best practices in CDS nationwide – and across multiple health systems. This presentation will define the CDSC, update the audience on its progress, and share the results from numerous CDS studies and demonstrations undertaken by the CDSC over the past five years.

Learning Objectives:

1. Define the Clinical Decision Support Consortium.
2. List and describe at least four challenges to adopting and using clinical decision support systems in clinical practice.
3. Explain the process by which clinical guidelines are translated into machine-executable logic used by electronic health record systems to alert clinicians.

Self-Assessment Questions:

1. (True or False) The CDSC is a new cable television network aimed at pharmacists.
2. Which of the following is NOT a barrier to the adoption and use of CDS?
 - A. Alert fatigue
 - B. Poor integration into clinical workflow
 - C. Clinician distrust of clinical guidelines
 - D. Insufficient number of CDS products available for purchase
3. Which of the following is a clinical guideline abstraction that could be integrated into a commercial EHR system?
 - A. Paper-based (or PDF) guideline.
 - B. Structured clinical knowledge.
 - C. Machine executable rules.
 - D. Computer source code.

Answers: 1. (F); 2. (D); 3. (C)

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Clinical Decision Support at the National Level: Current Status and Implications for Pharmacy—CDS Standards

Jenders, R.A.

Charles Drew University / UCLA, 1731 E 120th St, Los Angeles, CA 90059, USA.

Email: jenders@ucla.edu

There are a number of drivers promoting the use of clinical decision support (CDS) and challenges to overcome to realize its benefits. Key to the realization of the full benefits of CDS is health information technology standards, including those for representation of clinical data as well as those for knowledge representation. The presentation focuses on description and use of these standards, demonstrating how they fit in an overall CDS effort. Implications for pharmacists are elaborated.

Learning Objectives:

1. List specific challenges that can prevent implementation of CDS.
2. Describe the details of standards that are used to implement CDS.
3. Explain the role of standards development organizations in facilitating CDS.

Self-Assessment Questions:

1. (True or False) The HL7 Decision Support Services (DSS) standard provides a language for encoding procedural clinical knowledge.
2. What is the Arden Syntax?
 - A. A standard for representing queries to knowledge sources.
 - B. A standard for accessing knowledge bases.
 - C. A standard for representing procedural clinical knowledge.
 - D. The only standard facing the “curly braces” challenge.
3. What is the Virtual Medical Record (vMR)?
 - A. A terminology standard specifically tailored for laboratory data.
 - B. A standard data model for clinical decision support.
 - C. A standard for encoding event-condition-action rules.
 - D. A standard for representing the data queries and IF-THEN rules of clinical practice guidelines.

Answers: 1. (F); 2. (C); 3. (B)

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Clinical decision support (CDS): putting together the parts and pieces for effective medication use: software components of a clinical decision support system and governance of rule development

Jones, M.A.

University of Colorado Hospital, Epic Team, 7901 E Lowry Blvd., Ste 350, Denver, CO 80230, USA.

Email: michael.jones@uch.edu

The common software components of clinical decision support systems (CDSS) that can generate an alert will be described. An understanding of these basic concepts help informatics and non-informatics clinicians plan CDS rule implementation and future enhancements. Also discussed in this session is the role of CDS governance in rule development. Effective institutional CDS governance is essential to minimize alert fatigue and maximize the benefits of CDSS. University of Colorado Health CDS Governance Committee is described including guiding principles and general role in rule development and maintenance; and the important role of the CDS rule sponsor.

Learning Objectives:

1. Describe the common parts of an “alerting” clinical decision support system.
2. Describe the purpose and guiding principles of an institutional CDS Governance Committee.
3. Explain the purpose and responsibilities of the CDS rule sponsor.

Self-Assessment Questions: (True or False)

1. The common components of every clinical decision support systems capable of firing an alert include: toolkit for rule development, inference engine (aka rules engine) to run the rule, event monitor to trigger the rule, and notification system to alert end-user(s). The institution’s informatics specialists may or may not have access to all these components, but they are all there.
2. The CDS Governance Committee must be multidisciplinary as this is the nature of CDS issues, CDS quality issues, and CDS legal issues.
3. CDS rule ownership resides with the rule sponsor. The rule sponsor has a vested interest in solving the problem and has a good knowledge of end-user workflow or access to people who do.

Answers: 1. (T); 2. (T); 3. (T).

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111-2

Clinical Decision Support: Disassembled

Liu, W.

Vanderbilt University Medical Center, Suite 680, 3401 West End Ave., Nashville, TN 37203, USA.

Email: wing.liu@vanderbilt.edu

Effectively delivering clinical decision support (CDS) interventions requires a prerequisite understanding of its disassembled basic components. The stage 2 meaningful use requirement of using CDS to improve high priority clinical quality measures highlights the importance of proper CDS intervention selection, configuration, and maintenance. The building blocks and processes necessary for CDS to support and improve medication use will be discussed.

Learning Objectives:

1. Explain differences between back end and front end system capabilities for clinical decision support.
2. Demonstrate the process of selecting and configuring a clinical decision support intervention.
3. Develop best practices when measuring and maintaining the effectiveness of clinical decision support content.

Self-Assessment Questions: (True or False)

1. Clinical decision support systems (CDSS) should be designed to alter the clinician's workflow.
2. Displaying pertinent lab results at the point of ordering medications is an example of a "relevant information display" CDS type.
3. Analyzing baseline metrics before implementing a CDS intervention will help gauge its efficacy and outcome measures.

Answers: 1. (F); 2. (T); 3. (T).

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Clinical decision support: putting together the parts and pieces for effective medication use – role of RxNorm within medication interoperable exchange and clinical decision support

Robinson, G.A.

First Databank, Inc., 500 E 96th Street, Indianapolis, IN 46240, USA.

Email: grobinson@fdbhealth.com

The functional role of medication vocabularies within the context of electronic healthcare records and clinical information exchange are described. With Stage 2 meaningful use, supporting systems are required to use standardized vocabularies for purposes of information exchange and clinical quality measure reporting. Use of RxNorm as a vocabulary constraint within electronic prescribing, information exchange, medication reconciliation and clinical quality measure reporting will be discussed.

Learning Objectives:

1. Explain the functional differences between user interface and interoperable “standard” vocabularies.
2. Describe the types of interoperable exchanges and messaging transactions that require the use of RxNorm as a medication vocabulary constraint.
3. Explain how components of a medication formulation (e.g., ingredients, route, and brand name) may be used to associate “like” medications within medication reconciliation applications.

Self-Assessment Questions: (True or False)

1. The National Drug Code (NDC) has been named by Office of the National Coordinator as the medication vocabulary for use within HL7 Consolidated Clinical Document Architecture exchanges of medication allergy.
2. The RxNorm Semantic Clinical Drug “atorvastatin 20 MG Oral Tablet” is the appropriate interoperable concept for expressing the required “coded Product Name” for an EHR’s active medication of “LIPITOR 20 mg Tablets” within an HL7 Consolidated Clinical Document Architecture medication section.
3. The National Library of Medicine’s Value Set Authority Center is the official distribution source of code sets used for the electronic computation of clinical quality measures for Stage 2 meaningful use.

Answers: 1. (F); 2. (T); 3. (T).

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Ten human factors concepts every pharmacist should know for information technology

Russ, A.L.

Department of Veterans Affairs, Roudebush VA Medical Center 11-H, Health Services Research and Development, Center on Implementing Evidence-Based Practice, Indianapolis, IN 46202, USA.

Email: alissa.russ@va.gov

There are a variety of concepts from human factors science that can be applied to health information technology. The goals of human factors, applied to the work of pharmacists, include improving systems and technologies to enhance pharmacist performance, efficiency, and satisfaction, and also to enhance patient safety. This session will provide and overview of some key human factors concepts and offer insights on the benefits and risks of automation; underlying causes of workarounds; and usability evaluation methods that can be applied to improve information technologies. In addition, five basic strategies to reduce safety risks will be presented, along with the relative strengths of these approaches. Human factors principles are important for many pharmacy applications and can be applied to advance healthcare quality and patient safety.

Learning Objectives:

1. Describe key concepts from human factors science and how they apply to informatics.
2. Discuss when training is likely to be effective and ineffective for addressing IT challenges at your institution.
3. Describe human factors methods used to evaluate and improve IT throughout the development life-cycle.

Self-Assessment Questions:

1. According to human factors science, workarounds to information technology
 - A. indicate a need to correct provider behavior
 - B. should be eliminated if they involve the use of paper
 - C. can be either helpful or harmful to patient safety
2. Based on human factors science...
 - A. training is a strong defense against patient safety risks related to information technology
 - B. training is often an effective strategy to reduce information technology errors that are occur across multiple people
 - C. training on information technologies is very important for new employees and when new technologies are introduced
3. Usability can be defined as:
 - A. the extent to which technology is user-friendly and intuitive

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- B. measuring the quality of a user's experience while the user interacts with technology
- C. how well end-users like using the technology

Answers: 1. (C); 2. (C); 3. (B)

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112-2

Incorporating human factors concepts during implementation and optimization of information technology

Xiao, Y.

Baylor Health Care System, 8080 North Central Expressway, Dallas, TX 75093, USA.

Email: yan.xiao@baylorhealth.edu

Although human factors engineering is well-adopted in safety-critical sectors, such as military and transportation, it is relative novel in health care. Strategies are needed to incorporate human factors concepts during implementation and optimization of information technology, such as basic awareness education among pharmacy informatics experts and information technology champions, and scalable processes to conduct human factors analysis and evaluation. Case-based learning during root-cause analysis and design sessions may be an efficient learning approach. Selective addition of user studies, testing and failure model and effect analysis on key steps, such as pharmacy label printing and compounding may be feasible.

Learning Objective:

1. Describe at least two strategies in education and process changes to increase organizational competencies in human factors.

Self-Assessment Questions: (True or False)

1. Human factors concepts are important but nearly impossible to use in information technology implementation and optimization.
2. Learning human factors can be incorporated into analytical meetings and design sessions.
3. There are practical ways to reduce potential errors associated with human memory and detailed reading through design and process changes.

Answers: 1. (F); 2. (T); 3. (T).

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Combating medication safety with analytics

Siska, M.H.

Mayo Clinic Rochester, 201 W. Center Street, Rochester, MN 55902, USA.

Email: siska.mark@mayo.edu

As healthcare costs continue to rise and the demand for quality and safety remains high, employing analytics is the most effective strategy an organization can employ to keep costs down, improve quality and safety initiatives and remain competitive. This presentation will describe the needed infrastructure to effectively combat medication safety using clinical analytics. It will examine the key elements for developing a medication business information model and the required skills to effectively sustain an informatics culture and program.

Learning Objectives:

1. Identify the top three information technology related priorities identified in the 2013 HIMSS leadership survey.
2. Identify the key traits and or skills required for developing an analytics culture.
3. Describe the key elements for building a medication business information model.

Self-Assessment Questions: (True or False)

1. The most important IT related priority identified in the 2013 HIMSS leadership survey involved the achievement of meaningful use.
2. A key characteristic or trait required for developing an analytics culture is leadership.
3. Data governance and data stewardship are key components for developing a business information model.

Answers: 1. (T); 2. (F); 3. (T)

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Strategies for Improving Medication Safety: A National Perspective from ISMP

Rich, D.S.

Institute for Safe Medication Practices, 200 Lakeside Dr., Suite 100, Horsham, PA 19044, USA.

Email: drich@ismp.org

Cohen, M.

Although hospitals have focused on, and improved, medication safety in the past 10 years, there is still significant harm from medications occurring in hospital patients today. Some medication safety issues are reoccurring, while others have appeared more significant in the past year. As a federally-certified patient safety organization (PSO), ISMP receives confidential reports of medication errors and issues nationally from its own reporting program, FDA, MedMARx, and other sources. This presentation will discuss the top 10 medication safety issues based on patient harm and frequency, as determined by ISMP from submitted medication error reports it received, and on-site medication safety assessments conducted by ISMP in hospitals over the past year. Effective strategies will be presented for improving medication safety for these top issues. In addition, there will be a discussion of how hospitals can improve their internal medication error reporting programs to be more effective in reducing patient harm from medications.

Learning Objectives:

1. List the top three medication safety issues reported to ISMP in the past year with one successful practice to mitigate the error potential for each.
2. Describe the top three reasons why hospital-based error reporting programs are not effective in reducing errors.
3. Develop a strategy to improve the effectiveness and value of medication error reporting in your hospital or health system.
4. Cite at least one website with guidelines that can improve medication safety.

Self-Assessment Questions: (True or False)

1. The medication class of drugs with the most reported harmful medication errors (over twice that of the second class of drugs) is opioids.
2. The most effective strategy for reducing look-alike, sound-alike errors is related to labeling of medication storage areas.
3. One of the highest reported categories of medication process errors comes from computer order entry errors.
4. As long as the pharmacy dispenses oral solutions in oral syringes, the potential for a serious medication error is eliminated.
5. ISMP is now recommending eliminating the use of insulin pens in hospitalized patients.

Answers: 1. (T); 2. (F); 3. (T); 4. (F) 5. (T)

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Practical applications of MedWatch updates: introduction and varenicline

Haber, S. L.

Midwestern University College of Pharmacy-Glendale, 19555 N. 59th Ave., Glendale, AZ 85308, USA.

Email: shaber@midwestern.edu

Drug Safety Communications are a part of the Food and Drug Administration's MedWatch Safety Program and used to provide actionable information to patients and healthcare professionals on new safety information. In June of 2011, a Drug Safety Communication on varenicline was issued, which indicated that it may increase the risk of adverse cardiovascular events in patients with cardiovascular disease based on the results of one randomized controlled trial. Since then, three meta-analyses and one observational study have been reported. A majority of the studies support that varenicline may be associated with a small, but statistically insignificant, increased risk of adverse cardiovascular events. Varenicline should only be considered for patients with cardiovascular disease if other smoking cessation regimens are not options and the benefits are believed to outweigh the risks.

Learning Objectives:

1. Identify four key sections of Drug Safety Communications.
2. Describe the primary literature on the risk of adverse cardiovascular events with varenicline.
3. Select an appropriate option for smoking cessation for a patient with cardiovascular disease.

Self-Assessment Questions: (True or False)

1. Drug Safety Communications provide some actionable information specifically for patients.
2. Varenicline was associated with a statistically significant increased risk of adverse cardiovascular events in one study.
3. Varenicline can be recommended for patients with cardiovascular disease without concerns about its safety.

Answers: 1. (T); 2. (T); 3. (F).

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Practical applications of MedWatch updates: ondansetron and azithromycin

Leonard, M.C.

Cleveland Clinic Department of Pharmacy, 9500 Euclid Ave (Hb-101), Cleveland, OH 44195, USA.

Email: leonarm@ccf.org

Drug Safety Communications are a part of the Food and Drug Administration's (FDA) MedWatch Safety Program and used to provide actionable information to patients and healthcare professionals on new safety information. In September 2011, a Drug Safety Communication for ondansetron was issued, which indicated an ongoing safety review of potential increased risk of QT prolongation and torsade de pointes (TdP) based on two published studies. In 2012, two additional Drug Safety Communications for ondansetron were released resulting in the removal of ondansetron 32 mg injection from the US market. In May 2012, there was an FDA alert on azithromycin, which indicated a risk of cardiovascular death based on a published cohort study. In March 2013, a Drug Safety Communication for azithromycin was issued stating health care professionals should consider the risk of TdP before prescribing azithromycin. Ondansetron and azithromycin are frequently prescribed for management of nausea/vomiting and infections, respectively. Although data show ondansetron statistically prolongs the QT interval compared to placebo, the QT prolongation observed in these studies may not be clinically significant in all patients. Likewise, azithromycin data demonstrate a statistical increase in the risk of cardiovascular death when compared to select antibiotics, but this may not be applicable in all patients receiving azithromycin therapy. For both ondansetron and azithromycin, the risk depends on patient specific factors for developing QT prolongation and TdP. These risk factors include congenital long QT syndrome (LQTS), bradycardia, electrolyte imbalances, impaired renal or hepatic function, and pharmacokinetic or pharmacodynamic drug interactions. Before initiating therapy, the risks versus benefits of ondansetron and azithromycin must be considered in all patients.

Learning Objectives:

1. List patient risk factors associated with QT prolongation.
2. Describe the primary literature on the risk of QT prolongation with ondansetron.
3. Describe the primary literature on the risk of cardiovascular death with azithromycin.

Self-Assessment Questions: (True or False)

1. An electrolyte imbalance (e.g., hypokalemia, hypocalcemia) is a risk factor for torsade de pointes.
2. Ondansetron has been associated with a statistically significant increased risk of QT prolongation.
3. In a patient with known risk factors for QT prolongation, moxifloxacin is a safer antimicrobial agent compared to azithromycin.

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Answers: 1. (T); 2. (T); 3. (F).

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Practical applications of MedWatch updates: zolpidem and discussion

Phillips, J. A.

Midwestern University College of Pharmacy-Chicago, 555 31st Street, Downers Grove, IL 60515, USA.

Email: jphillips@midwestern.edu

Drug Safety Communications are a part of the Food and Drug Administration's MedWatch Safety Program and used to provide actionable information to patients and healthcare professionals on new safety information. In January of 2013, a Drug Safety Communication for zolpidem was issued, which required manufacturers to lower the recommended dose of the immediate release product from 10 mg to 5 mg and the dose of the extended-release product from 12.5 mg to 6.25 mg in women. This recommendation was based on findings from pharmacokinetic and driving simulation studies, which revealed increased zolpidem blood levels in women the morning after ingestion as well as a subsequent increased risk of impaired driving. This presentation will also summarize the results from a systematic review that evaluated the impact of FDA communications on drug utilization, health care services, and health outcomes as well as summarize the Sentinel Initiative and Mini-Sentinel Pilot program.

Learning Objectives:

1. Identify patient populations who might be at risk for impaired driving with higher doses of zolpidem.
2. Describe published data analyzing the impact of FDA risk communications on clinical practice.
3. Describe the purpose of the FDA's Mini-Sentinel Pilot program.

Self-Assessment Questions: (True or False)

1. Women are at an increased risk for driving impairment with 10 mg of zolpidem compared to 5 mg of zolpidem.
2. FDA risk communications advising for increased monitoring generally have a large and sustained impact on clinical practice.
3. The FDA's Mini-Sentinel Pilot program is an active surveillance system that can be used by the FDA to make regulatory actions or decisions.

Answers: 1. (T); 2. (F); 3. (T).

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Concerns for cognition

Rudolph, J.L.

VA Boston Healthcare System, 150 South Huntington Ave, Boston, MA 02130, USA.

Email: james.rudolph@va.gov

Medication management, a key to independent function in older patients, can be diminished in older adults with cognitive impairment. Cognitive impairment is closely associated with increasing age, occurring in 5% of people in their 70's, 24% of those in their 80s, and >35% of those in their 90s. Because individuals with cognitive deficits are at risk for non-adherence and medication safety issues, the PILL Service was developed at the VA Boston Healthcare System. In this session, a geriatrician will provide an overview of the major cognitive domains and spectrum of deficits associated with cognitive impairment that may impact medication use. Basic cognitive assessments will also be reviewed.

Learning Objectives:

1. Identify the major cognitive domains and deficits associated with cognitive impairment.
2. Describe how cognitive impairment can impact function and medication safety among older adults.
3. Compare two cognitive screening tools that could be utilized by members of the healthcare team in various settings.

Self-Assessment Questions:

1. Dementia is defined as impairment in ≥ 2 cognitive domains. Which of the following is not one of those domains?
 - A. Executive function
 - B. Memory
 - C. Language
 - D. Attention
2. (True or False) Medication management is an Instrumental Activity of Daily Living (IADL), key to independent function of older adults.
3. (True or False) The Clock-in-the-Box is a quick cognitive test that assesses working memory, attention and organization.

Answers: 1. (D); 2. (T); 3. (T)

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Dangers of discharge and drugs

Kostas, T.R.

VA Boston Healthcare System, 150 South Huntington Ave, Boston, MA 02130, USA.

Email: tia.kostas@va.gov

Older adults consume more medications than any other cohort. Due to physical effects of aging coupled with potential cognitive difficulties, as well as polypharmacy, they are most susceptible to medication-related problems and adverse events. These risks are most salient when patients are transitioning home from the hospital. Recognition of this vulnerability was key to the implementation of the PILL Service for post-discharge patients. In order to ensure medication safety, pharmacists must first recognize potentially inappropriate medications and suboptimal regimens in their elderly patients. In this session, a geriatrician will outline the dangers of medications and transitions of care for older adults.

Learning Objectives:

1. Identify medication regimen factors that may present adherence challenges for older adults.
2. Recognize drugs that are potentially inappropriate for elderly patients, and drugs that may negatively impact cognition.
3. Explain the risks associated with care transitions for older adults and their caregivers.

Self-Assessment Questions:

1. (True or False) Using a dosing range (such as acetaminophen 325mg-650mg every 4 hours as needed) can improve adherence since it minimizes the amount of medications patients need to take.
2. According to the Anticholinergic Risk Scale, all of the following drugs have anticholinergic activity except:
 - A. Amitriptyline
 - B. Gabapentin
 - C. Hydroxyzine
 - D. Loratadine
3. Approximately ___% of all hospital-related medication errors and 20% of all ADEs have been attributed to poor communication at transitions and interfaces of care.
 - A. 10%
 - B. 25%
 - C. 50%
 - D. 75%

Answers: 1. (F); 2. (B); 3(C)

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Strategies for safety

Paquin, A.M.

VA Boston Healthcare System, 150 South Huntington Ave, Boston, MA 02130, USA.

Email: allison.paquin@va.gov

Hospital discharge, drugs, and medication discrepancies are dangerous for older adults. More concerning is the cumulative threat in the setting of cognitive impairment, as highlighted in the first two sessions. The VA Boston PILL Service was designed as a medication safety net for these vulnerable patients. In this session, a pharmacist from the VA Boston will describe their quality improvement program along the continuum of early planning stages, development and implementation, and pilot outcomes. We will share successes and lessons learned to facilitate similar initiatives at interested pharmacists' practice sites.

Learning Objectives:

1. Describe the VA Boston PILL Service intervention and the pharmacist's role in this program.
2. Identify key components of the PILL Service that could be used in the development of other medication safety interventions at other institutions.
3. Recall the outcome measures and results of the PILL Service quality improvement program at the VA Boston Healthcare System.

Self-Assessment Questions:

1. In the scope of the PILL Service, the pharmacist is responsible for:
 - A. Geriatric medication reviews
 - B. Medication reconciliation by telephone
 - C. Collaborating with geriatricians and other providers on treatment plans
 - D. All of the above
2. (True or False) Although the PILL Service targets patients with cognitive impairment after hospital discharge, the program principles (e.g. proactive medication review, patient-centered medication reconciliation) could be applied to other high-risk patient groups.
3. Based on results from the VA Boston quality improvement program, pharmacist follow-up by telephone after hospital discharge was associated with:
 - A. Reduced acute care utilization
 - B. Increased patient quality of life
 - C. Reduced adverse drug events
 - D. Reduced complexity of medication regimen

Answers: 1. (D); 2. (T); 3. (A)

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Case: Pills and PILL

Paquin, A.M.

Rudolph, J.L.

Kostas, T.R.

VA Boston Healthcare System, 150 South Huntington Ave, Boston, MA 02130, USA.

Email: allison.paquin@va.gov

In this section, learners will participate in an interactive patient case that incorporates concepts from the first 3 presentations. This case will address the topics of cognitive impairment, medication safety in geriatrics, and transitions of care. The pharmacist's role in enhancing medication safety among older adults will be emphasized.

Learning Objectives:

1. Apply concepts presented in this session to enhance medication safety and reconciliation for high-risk patients at your practice site.

Self-Assessment Questions:

1. Which of the following outcomes is commonly used to calculate program effectiveness and cost savings for care transitions programs?
 - A. Pharmacist workload / time
 - B. Acute care visits
 - C. Patient satisfaction survey
 - D. Number of medication interventions
2. Which of the following is/are possible side effects of anticholinergic drugs?
 - A. Constipation and urinary retention
 - B. Falls
 - C. Memory loss
 - D. All of the above
3. Which of the following is true regarding older patients such as Mr. S, and why they may be more sensitive to medications?
 - A. Creatinine declines 1% per year after age 50
 - B. Increased muscle-to-fat ratio
 - C. Decreased permeability of blood-brain barrier
 - D. Lower plasma albumin levels

Answers: 1. (B); 2. (D); 3. (D)

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Patient-Centered Event Investigations

Bartel, S.B.

Dana-Farber Cancer Institute, 450 Brookline Ave Rm. YC-537, Boston, MA 02225, USA.

Email: Sylvia_bartel@dfci.harvard.edu

The involvement of patients and families in pharmacy department initiatives, workgroups and medication event investigation is described. Dana-Farber Cancer Institute has involved patients and families in partnership to strengthen communication and collaboration among patients, families, caregivers and staff over the past 15 years. This has enhanced various programs, services and policies. Patients and families have also participated in medication event investigation and system improvement initiatives. The involvement of patients and families has improved clinic operations, and workflows including the medication use process.

Learning Objectives:

1. Describe the incorporation of patients and families into pharmacy department initiatives.
2. Provide examples of patients and families contributions as a member of various pharmacy workgroups/committees.
3. Evaluate three medication events describing the incorporation of patients and families.

Self-Assessment Questions: (True or False)

1. Patients and families participate in workgroups involving operations, outpatient pharmacy and medication safety.
2. Patients and families do not receive information about medication errors.
3. Patients and families participate in the development of patient education materials.

Answers: 1. (T); 2. (F); 3. (T).

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The hidden hazards of acetaminophen

Adams, B.J.

St. Luke's Episcopal Hospital, 6720 Bertner Avenue, Houston, TX 77030, USA.

Email: badams@sleh.com

Acetaminophen is one of the most widely used analgesic-antipyretics in the world, present in hundreds of medicines used to treat pain, allergies, colds, and flu. Taken in recommended doses of no more than 4000 mg daily, acetaminophen is considered to be a safe medication. However, in specific patient populations, the recommended maximum dose is even smaller, due to potential liver toxicity. Database reports maintained by the American Association of Poison Control Centers and reported to the FDA in 2001 demonstrated that the number of fatalities associated with acetaminophen exposures increased by nearly 100 percent between 1995 and 1999. Since that time the FDA has repeatedly attempted to alert consumers and the healthcare community about this preventable problem. Challenges in monitoring acetaminophen consumption in the hospital setting include its inclusion in multiple different combination products and in variable amounts; multiple indications for which this agent is used in single ingredient form or in combinations; and the time required by caregivers to calculate the dose administered over a 24 hour period. This presentation will discuss an effective method of determining actual acetaminophen intake in the hospital setting through the use of the electronic health record, and its impact on usage in a tertiary teaching hospital.

Learning Objectives:

1. List three factors that contribute to the challenge of monitoring acetaminophen use in the inpatient setting.
2. Describe various methods that have been used to avoid excessive administration of acetaminophen in the hospital.
3. Compare the effectiveness of electronic notifications of acetaminophen limits to manual monitoring methods.

Self-Assessment Questions: (True or False)

1. Acetaminophen toxicity is the leading cause of acute liver failure in the U.S.
2. Use of pre-printed orders was effective in controlling the amount of acetaminophen given daily.
3. Electronic alerts were shown to be effective in significantly reducing the number of times acetaminophen doses exceeded recommended limits.

Answers: 1. (T); 2. (F); 3. (T)

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It's Growing: Who are You Going to Call? Developing an antimicrobial surveillance program in your facility

Jen, C.A.

Banner Boswell Medical Center, Department of Pharmacy Services, 10401 W.

Thunderbird Blvd., Sun City, AZ 85351, USA.

Email: christi.jen@bannerhealth.com

In 2011, the U.S. Department of Health and Human Services survey on about 230,000 patients revealed that about 3% of the patients used the emergency department (ED) as their usual place of care. In another survey in 2010, about 3% of 130,000 ED visits were related to infectious diseases. Most of these were secondary to urinary tract and skin and soft tissue infections. As of February 2013, the number of new and existing sexually transmitted infections increased as well. Therefore, emergency departments are tasked with ensuring that patients are being appropriately treated. While the use of the antibiogram specific to the ED has helped in empiric treatment of such infections, it becomes imperative that the final results and susceptibilities are being reviewed to ensure appropriate therapy on a daily basis. This presentation explores the role of the pharmacists and their expertise in antimicrobial therapy in developing and sustaining an antimicrobial surveillance program in their respective EDs.

Learning Objective:

1. Identify opportunities related to culture surveillance in the ED.

Self-Assessment Questions:

1. When performing antimicrobial surveillance, it is important to consider the following factors prior to making recommendations regarding drug therapy:
 - A. Allergies
 - B. Pregnancy status
 - C. Renal function
 - D. Hepatic function
 - E. All of the above
2. When calling a patient back for follow-up of a sexually transmitted infection, it is important to ensure that the following are completed:
 - A. Check and ensure that anti-infectives were given in the ED
 - B. If not given in the ED, call in a prescription for the patient and partner(s) if allowed by state law and facility policy
 - C. Notify infection control department and/or state department of public health
 - D. All of the above

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Does Your Institution Need an Emergency Department Specific Antibigram?

Laroco, L.L.

WakeMed Health and Hospitals – Raleigh Campus, Department of Pharmacy Services,
3000 New Bern Avenue, Raleigh, NC 27610, USA.

Email: llaroco@wakemed.org

This presentation will review the general concept on the clinical benefits seen from the utilization of an antibiogram when choosing empiric antibiotic therapy, the concept of unit specific antibiograms, and lastly, explore the need for an emergency department (ED) specific antibiogram. The ED serves a diverse patient population that includes the treatment of both hospital and community acquired type infections. The goal of this presentation is to demonstrate that hospital wide antibiograms may not accurately reflect the susceptibility rates of pathogens found in an ED population; therefore, lacking utility for the ED prescriber. The development of an ED antibiogram may display these differences and serve as an additional resource that can further improve empiric antibiotic therapy selections for this patient population.

Learning Objective:

1. Discuss the purpose of an antibiogram in an ED setting.

Self-Assessment Questions:

1. (True or False) The primary function of an antibiogram is to aid clinicians in making evidence-based decisions when choosing the most appropriate agents for empiric therapy using local antimicrobial susceptibility data.
2. (True or False) Unit specific antibiograms can reflect differences in susceptibility rate results when compared to a hospital wide antibiogram.
3. When considering the development of an ED specific antibiogram, which of the following hospital personnel's participation is essential?
 - A. Laboratory
 - B. ED prescribing staff
 - C. Pharmacy
 - D. All of the above

Answers: 1. (T); 2. (T); 3. (D)

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Urinary tract infection (UTI) Resistance and antibiotic prescribing

Ortmann, M.J.

The Johns Hopkins Hospital, Department of Pharmacy, Carnegie 180, 1800 Orleans Street, Baltimore, MD 21287, USA.

Email: mortman3@jhmi.edu

This presentation will review the concepts of current trends in antibiotic resistance and their impact on prescribing practices for the management of urinary tract infections (UTI) in the Emergency Department setting. Over the last two decades antimicrobial resistance to urinary pathogens has increased dramatically leaving few viable options for treatment of uncomplicated cystitis and pyelonephritis. The goal of this presentation is to review the concepts of appropriately identifying UTIs that require treatment and to discuss how to apply the Infectious disease Society of America guidelines for UTI treatment in daily practice given our limitations with antimicrobial resistance.

Learning Objectives:

1. Explain current resistance patterns with a focus on urinary pathogens.
2. Apply the current Infectious disease Society of America (IDSA) recommendations to outpatient UTI management.

Self-Assessment Questions:

1. Which of the following statements most appropriately characterizes current urinary pathogen concerns?
 - A. U.S. surveillance testing in the last decade has demonstrated an overall increase in antibiotic resistance
 - B. Flouroquinolone resistance remains low despite increases in prescribing patterns
 - C. Resistance rates for urinary pathogens are the same throughout the U.S.
 - D. None of the above answers make sense!
2. (True or False) A urinalysis with cloudy or foul-smelling urine should always be treated with antibiotics for presumed infection.
3. (True or False) A patient with suspected uncomplicated pyelonephritis requires a urine culture prior to antibiotic treatment.

Answers: 1. (A); 2. (F); 3. (T)

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Update in Infectious Diseases: Treatment of *Clostridium difficile* Infection (CDI)

Slain, D.

West Virginia University, 1124 Health Sciences North, Morgantown, WV 26506, USA.

Email: dslain@hsc.wvu.edu

Clostridium difficile infection (CDI) is responsible for significant morbidity, mortality, and increases in health care expenditures. New hypervirulent strains of *c. difficile* have contributed to increasing these occurrences. Clinicians struggle with selecting optimal therapy for CDI especially in severe and complicated cases. The optimal use of metronidazole versus vancomycin for CDI treatment has been debated for years. Unfortunately, CDI recurrence has been a frequent occurrence. Now newer therapies like fidaxomicin, rifaximin, and fecal bacteriotherapy may provide effective alternative to the more traditional regimens.

Learning Objectives:

1. Develop a treatment plan for the first episode of *Clostridium difficile* infection (CDI).
2. Differentiate situations favoring the empiric use of vancomycin over metronidazole.
3. Compare and contrast treatment recommendations for CDI recurrence.
4. Analyze the findings of the fidaxomicin approval studies.

Self-Assessment Questions: (True or False)

1. Alcohol-based hand cleaner is preferred over soap and water hand washing in the care of *C. difficile*-infected patients.
2. Fidaxomicin displayed superiority over oral vancomycin in clinical cure rate in Phase III trials.
3. The use of proton pump inhibitors has been identified as an independent risk factor for CDI.

Answers: 1. (F); 2. (F); 3. (T)

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Optimizing insulin therapy and cardiovascular care in type 2 diabetes patients

Ip, E.J.

Touro University California College of Pharmacy, 1310 Club Drive, Vallejo, CA 94592, USA. Kaiser Permanente Mountain View Clinics, 555 Castro Street, Mountain View, CA 94041, USA.

Email: eric.ip@tu.edu

Diabetes mellitus is a multifactorial condition which requires optimization of glycemic control as well as cardiovascular care. Pharmacists have become increasingly involved in medical management of diabetes patients. In fact, via collaborative practice agreements more and more pharmacists around the nation are able to prescribe/adjust medications and order appropriate laboratory work with autonomy. The purposes of this presentation are to highlight key aspects of the 2013 American Diabetes Association Standards of Medical Care, to provide guidance on managing insulin therapy, and to help clinicians optimize cardiovascular care in adult diabetes patients.

Learning Objectives:

1. Describe how to interpret and utilize the 2013 American Diabetes Association (ADA) Standards of Medical Care.
2. Describe how to interpret and utilize the 2012 ADA/EASD Management of Hyperglycemia in Type 2 Diabetes Position Statement.
3. Assess and adjust various types of insulin regimens in case-based scenarios.
4. Evaluate diabetic patient cases and develop optimal treatment recommendations.

Self-Assessment Questions: (True or False)

1. Insulin is more effective than a DPP-4 inhibitor in lowering the A1C in diabetes patients.
2. NPH has a faster onset and shorter duration of action than aspart.
3. According to the 2013 American Diabetes Association Standards of Medical Care, the new blood pressure goal for non-pregnant adult diabetes patients is <140/80 mmHg.

Answers: 1. (T); 2. (F); 3. (T)

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Drug Dosing in the Obese Critically Ill Patient

Barletta J.F.

Midwestern University, College of Pharmacy – Glendale, 19555 N 59th Avenue,
Glendale, AZ 85308, USA.

Email: jbarle@midwestern.edu

Drug dosing in obesity can be extremely challenging given the altered pharmacokinetic profiles encountered and the limited data available in this population. There are several principles that the pharmacist must consider when formulating a dosage for an obese patient. These include the pharmacokinetic profile of the medication, the risk for adverse effects, the clinical scenario and whether therapeutic drug monitoring is available. While these principles should be applied for all medications, they are particularly apparent when dosing anticoagulants and antibiotics. Along with these principles, pharmacists must also evaluate the pharmacodynamic properties of the medication and determine if the medication can even be considered once the pharmacokinetic alterations are appreciated. Therapeutic drug monitoring can be extremely useful and should be employed in these scenarios. This presentation will describe the literature pertaining to anticoagulants and antibiotics in obesity using a case-based approach and provide guidance when literature may not be available for a particular agent.

Learning Objectives:

1. Develop a dosing strategy for an anticoagulant medication in a patient with morbid obesity.
2. Develop a dosing strategy for an antimicrobial agent in a patient with morbid obesity.
3. Describe the principles that should be considered when developing a dosing strategy for a medication when primary literature is not available.

Self-Assessment Questions:

1. Which of the following statements is TRUE?
 - A. There are many large randomized controlled trials describing unfractionated heparin dosing in morbidly obese patients.
 - B. Dose adjustments are NOT necessary for low-molecular weight heparins used for prophylaxis in morbidly obese patients.
 - C. Anti-factor Xa monitoring can be considered when therapeutic dosing is utilized for low molecular weight heparins.
 - D. There are many large randomized controlled trials describing low-molecular weight heparin dosing in patients who weigh more than 190 kg.
2. Which of the following statements is TRUE?
 - A. Morbid obesity can lead to shorter times above the MIC and lower area's under the inhibitory curve.

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- B. It is not necessary to evaluate individual susceptibility breakpoints in morbidly obese patients, as long as the organism is susceptible.
 - C. Optimal pharmacodynamic goals are easy to achieve when dosing levofloxacin in a morbidly obese patient.
 - D. There is no difference in either Vd or Cl with beta-lactam agents in morbid obesity.
3. Which of the following principles should be considered when developing a dosing regimen for a patient who is morbidly obese?
- A. The severity of illness
 - B. The adverse effect profile of the medication
 - C. If therapeutic drug monitoring can be performed
 - D. All of the above

Answers: 1. (C); 2. (A); 3. (D)

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Medication Dosing in Obese and Overweight Patients

Erstad, B.L.

University of Arizona College of Pharmacy, 1295 N. Martin Ave., Tucson, AZ 85721, USA

Email: erstad@pharmacy.arizona.edu

This presentation uses embedded multiple choice questions as an active learning strategy for discussing general considerations of drug dosing in the obese patient. The talk will begin with a discussion of the physiological changes associated with obesity and why the choice of an appropriate size descriptor such as weight is so important. The presentation will include a discussion of the limitations of available size descriptors, particularly with respect to body composition changes. The next section of the presentation will discuss considerations for choosing a size descriptor for loading and maintenance doses of medications. The presentation will conclude with the important concept of dose proportionality for deciding the appropriate weight to use with weight-based dosing regimens.

Learning Objectives:

1. Discuss the limitations of using adjusted body weight calculations for drug dosing in obese patients.
2. Describe a process for determining the initial dosing regimen for an adult obese patient when limited dosing information is not available in the usual product information brochures.

Self Assessment Questions:

1. The majority of studies involving drug dosing in obese critically ill patients focused on providing recommendations for:
 - A. The initiation of drug dosing based on volume of distribution and clearance
 - B. Maintenance drug dosing based on volume of distribution and clearance
 - C. The initiation of drug dosing based on lipid partition coefficients
 - D. Long-term drug dosing in patients undergoing bariatric surgery
2. Body mass index (BMI) is increasingly being used to determine if subjects are overweight or obese. Which of the following statements regarding BMI for the dosing of medications?
 - A. Most pharmacokinetic studies investigating drug dosing in obese patients have adjusted doses based on BMI
 - B. BMI is calculated by dividing the patient's height (in inches or cm) by the patients weight (in pounds or kg)
 - C. A patient with a BMI greater than 25 should have his/her doses based on ideal body weight if the drug is highly lipid soluble

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- D. Dosing of medications is most difficult in patients with BMIs greater than 40 since there are few studies in this population
3. A physician asks your assistance in dosing an obese, adult female patient on a new cephalosporin antibiotic that has not been studied in obese subjects. Which of the following equations is theoretically appealing since it takes into account gender, height, and weight as size descriptors?
- A. Ideal body weight
 - B. Lean body weight
 - C. Body mass index
 - D. Body surface area

Answers: 1. (A); 2. (D); 3. (B)

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125-3

Drug Dosing in Obese and Overweight Pediatric Patients

Phan, H.

University of Arizona Colleges of Pharmacy and Medicine, 1295 N. Martin Ave.,
Tucson, AZ 85721, USA.

Email: hphan@pharmacy.arizona.edu

Children are vulnerable to medication error due to factors such as complexity of dosing by weight or body surface area, severe illness, and possible organ function changes. With the addition of physiological changes due to overweight and obesity as a factor potentially further altering pharmacokinetics, the risk of dosing error increases due to the lack of data to guide clinicians. Questions exist regarding the lack of pediatric-specific data describing pharmacokinetic changes, choice of dosing weight, and maximum dosage limits in obese and overweight children. Much of the current recommendations regarding dosing weights in obese and overweight children and adolescents are based on extrapolated, adult obesity data. The current available statements regarding maximum dosing in pediatric patients provides limited guidance to clinicians today facing the rising epidemic of pediatric obesity. Discussion and application of current data on medications used in inpatient and outpatient settings, specific to obese and overweight children and adolescents, are presented to provide clinicians an approach in determining initial dosing regimens in this specialized patient population.

Learning Objectives:

1. Describe the potential pharmacokinetic changes in obese and overweight children and adolescents, including changes in body composition.
2. Explain current data regarding dosing of antimicrobials, anticoagulants, and analgesics in obese and overweight pediatric patients.
3. Identify challenges regarding resuscitation medication dosing in obese and overweight pediatric patients using current approaches.
4. Discuss possible approaches to increasing medication safety for obese and overweight children.

Self-Assessment Questions:

1. (True or False) Drug distribution in pediatric obese patients is well-described and similar to adult obesity data.
2. Which of the following weights should be used to dose cefepime in an 8-year-old, obese child?
 - A. Adjusted body weight
 - B. Ideal body weight
 - C. Total or actual body weight, maximum limit at adult dose

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3. (True or False) Obese and overweight children need additional doses (i.e., more than 2 injections) of epinephrine for treatment of anaphylaxis due to excess body weight.

Answers: 1. (F); 2. (C); 3. (F)

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126-1

Analgesia and Sedation in the Intensive Care Unit

Barletta J.F.

Midwestern University, College of Pharmacy – Glendale, 19555 N 59th Avenue,
Glendale, AZ 85308, USA.

Email: jbarle@midwestern.edu

The provision of analgesia and sedation in the critically ill patient is a cornerstone of ICU care and significantly associated with clinical outcomes. Recently, evidence-based guidelines were published that provide a roadmap for developing integrated, patient-centered protocols for preventing and treating pain and agitation. These guidelines provide both strong and weak recommendations based on the level of evidence available and group consensus. Regarding analgesia, the current guidelines describe the incidence emphasizing the importance of monitoring and assessment. Global strategies for treatment of pain, including drug class and method of administration, are provided. Regarding sedation, strategies for monitoring and depth of sedation sought are described. Therapeutic agents are compared and contrasted using clinical endpoints such as duration of mechanical ventilation and ICU length of stay. This presentation will describe some of the highlights of these guidelines and summarize major changes from previous recommendations.

Learning Objectives:

1. Describe methods to recognize and assess the level of pain in patients who are unable to self-report.
2. Develop an evidence-based treatment strategy for an ICU patient with pain.
3. Compare and contrast the available pharmacologic agents used for the provision of sedation.

Self-Assessment Questions:

1. Which of the following is TRUE?
 - A. Assessment of vital signs can be used to determine the need for pain medications.
 - B. Pain is uncommon in medical ICU patients without trauma who are receiving mechanical ventilation.
 - C. Preemptive analgesia should be administered in ICU patients prior to an invasive and potentially painful procedure.
 - D. The Behavioral Pain Scale is superior to the Critical Care Pain Observation Tool for the assessment of pain.
2. Which of the following is TRUE?
 - A. Gabapentin or carbamazepine in addition to IV opioids should be considered for neuropathic pain.
 - B. Fentanyl is superior to morphine for the treatment of pain and is the agent of first choice.

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- C. Morphine can safely be used in patients with renal failure who are receiving dialysis.
 - D. Hydromorphone and morphine are equipotent and interchangeable for the treatment of pain.
3. Which of the following statements is TRUE?
- A. Propofol is associated with a shorter length of ICU stay compared to dexmedetomidine.
 - B. The combination of metabolic acidosis, hypertriglyceridemia, hypotension and arrhythmias is a troublesome adverse effect associated with dexmedetomidine.
 - C. Objective measures of brain function should be used in all patients to assess level of sedation.
 - D. Non-benzodiazepine strategies for sedation are preferred over those that include benzodiazepines.

Answers: 1. (C); 2. (A); 3. (D)

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126-2

Application of New Sedation/Analgesia Guidelines

Erstad, B.L.

University of Arizona College of Pharmacy, 1295 N. Martin Ave., Tucson, AZ 85721,
USA

Email: erstad@pharmacy.arizona.edu

This presentation uses a clinical scenario with embedded multiple choice questions as an active learning strategy for discussing general considerations of implementing new guidelines into local clinical practice. The talk will begin with an overview of the concept of evidence-based medicine and the typical hierarchy of evidence used to evaluate published literature and expert opinion. The next section of the presentation will discuss the process of clinical guideline development in order to understand the potential pitfalls in guideline adoption at the local level. The remainder of the presentation will focus on more specific issues related to adaptation of national guidelines into clinical practice.

Learning Objectives:

1. Develop a plan for integrating evidence-based guidelines into clinical practice and evaluate their impact on clinical outcomes.

Self-Assessment Questions:

1. Which of the following is the highest level of evidence based on the usual hierarchal approach to evidence evaluation?
 - A. Randomized controlled trial
 - B. Meta-analysis
 - C. Systematic review
 - D. Prospective cohort study
2. Which of the following is most likely to help ensure the successful adoption and use of well-formulated local clinical practice guidelines or protocols?
 - A. Use the recommendations exactly as they appear in published national guidelines
 - B. Only involve local opinion leaders in the process if they have expertise in the area
 - C. Only involve recommendations that have a 1A level of evidence ranking
 - D. Ensure that the guidelines or protocols have appropriate updating
3. According to the Institute of Medicine, which of the following statements **should** be true regarding the development of clinical practice guidelines?
 - A. Always involve an external review process
 - B. Always involve meta-analyses of literature
 - C. Use the same system for grading evidence
 - D. Involve only physicians who practice in area

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Answers: 1. (C); 2. (D); 3. (A)

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126-3

Sedation and analgesia in the ED

Patanwala, A.E.

University of Arizona College of Pharmacy, 1295 N Martin, P.O. Box 210202, Tucson, AZ 85721, USA.

Email: patanwala@pharmacy.arizona.edu

The appropriate provision of analgesia and sedation is an important component of care in the management of critically ill patients in the ED. However, there are no guidelines for the dosing and selection of analgesics for the treatment of pain in this setting. Nor are there guidelines for the use of sedatives in patients transitioning from the ED to the ICU. There is great variability in patient response to analgesics often leading to pain that is inappropriately managed. In addition, there are logistical barriers to care that need to be overcome with regard to the use of these high- risk medications. In this session, the audience will be provided with important evidence and practical information on which to base the selection and dosing of opioids and sedatives to optimize care in this setting.

Learning Objectives:

1. Discuss appropriate strategies for pain assessment in the emergency department.
2. Explain the selection and dosing of opioids for pain in the emergency department.
3. Describe how paralytic selection for intubation can influence use of sedation and analgesia during the transition from ED to ICU.

Self-Assessment Questions: (True or False)

1. The peak analgesic effect of intravenous morphine occurs in less than one minute.
2. Obese patients should receive doses of morphine proportional to their weight.
3. Sedative and analgesic use after intubation can be influenced by the type of paralytic used to facilitate intubation.

Answers: 1. (F); 2. (F); 3. (T).

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127-1

New Hypertension and Cholesterol Guidelines: Stay Tuned

Saseen, J.J.

University of Colorado Anschutz Medical Campus, Skaggs School of Pharmacy and Pharmaceutical Sciences, 12850 E. Montview Blvd., Aurora, CO 80045, USA.

Email: joseph.saseen@ucdenver.edu

The National Heart Lung and Blood Institute (NHLBI) should be releasing new hypertension and dyslipidemia guidelines, the JNC 8 and ATP 4, in 2013. Other consensus recommendations from the American Diabetes Association, American Heart Association and National Lipid Association have been released and provide newer recommendations for both hypertension and dyslipidemia. With new consensus-based guidelines and recommendations come new challenges. This session will review the overall recommendations from these new guidelines and consensus documents, and will focus on ways that pharmacists can implement these evidence-based recommendations.

Learning Objectives:

1. Apply the new guideline and consensus document recommendations to the clinical care of patients with hypertension and dyslipidemia.
2. Describe clinical controversies related to the optimal use of antihypertensive and dyslipidemia pharmacotherapy.
3. Analyze the key components and the proven clinical benefits of hypertension and dyslipidemia pharmacist-managed clinical services.
4. Identify changes that you can make in your practice that will help to achieve the overall intent of the new evidence-based recommendations.

Self-Assessment Questions:

1. The 2013 American Diabetes Association Standards currently recommends which of the following systolic BP goals for patients with diabetes?
 - A. < 120 mm Hg
 - B. < 130 mm Hg
 - C. < 140 mm Hg
 - D. As low as can be achieved without side effects or syncope
2. (True or False) In patients with hypertension, hydrochlorothiazide 25 mg daily is more potent in lowering blood pressure than chlorthalidone 25 mg daily.
3. Which of the following was a benefit of antihypertensive drug therapy based on finding from the HYVET trial?
 - A. Decreased rate myocardial infarction
 - B. Increased risk of stroke
 - C. Decreased risk of death
 - D. Increased risk of dementia

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4. Based on available evidence, which of the following combinations has been shown to provide the best reductions in CV events when used in the treatment of hypertension?
 - A. Amlodipine with benazepril
 - B. Hydrochlorothiazide with benazepril
 - C. Hydrochlorothiazide with triamterene
 - D. Telmisartan with ramipril

5. Which of the following is the recommended LDL cholesterol goal for patients with a history of atherosclerotic vascular disease as a reasonable goal by the American Heart Association?
 - A. <160 mg/dL
 - B. <130 mg/dL
 - C. <100 mg/dL
 - D. <70 mg/dL

6. (True or False) Evidence suggests that nearly all patients with type 2 diabetes that are above the age of 40 years should be treated with a statin-based lipid-lowering therapy, regardless of their baseline lipid values.

7. (True or False) Clinical trials have demonstrated that adding fenofibrate to a statin-based regimen in patients with diabetes reduces risk of cardiovascular events.

8. Which of the following lipid lowering combination therapies has definitively been shown in clinical trials reduce the risk of cardiovascular events in patients with a history of coronary heart disease?
 - A. Statin with niacin
 - B. Statin with fibrate
 - C. Statin with ezetimibe
 - D. None of the above

9. In clinical trials evaluating the benefits of pharmacist-provided direct patient care, which of the following outcome measures has been decreased?
 - A. Blood pressure goal attainment rates
 - B. LDL-cholesterol goal attainment rates
 - C. Mean blood pressure values
 - D. Quality of life

10. (True or False) Clinical intervention programs that have incorporated pharmacists into the management of secondary prevention patients with dyslipidemia have been associated with a lower rate of death.

Answers: 1. (C); 2. (F); 3. (C); 4. (A); 5. (D); 6. (T); 7. (F); 8. (D); 9. (C); 10. (T)

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Surviving Resuscitation: Drug Therapy and the Pharmacist's Role – Cardiac Arrest

Barletta J.F.

Midwestern University, College of Pharmacy – Glendale, 19555 N 59th Avenue,
Glendale, AZ 85308, USA.

Email: jbarle@midwestern.edu

Cardiac arrest is the cessation of cardiac mechanical activity as confirmed by the absence of signs of circulation. In adult patients, cardiac arrest usually results from the development of an arrhythmia and historically, ventricular fibrillation has been the most common rhythm. Recent data however have revealed a declining incidence of ventricular arrhythmia with non-shockable rhythms becoming more common. Patients who suffer cardiac arrest must undergo early cardiopulmonary resuscitation with defibrillation for shockable rhythms. Recent evidence-based guidelines emphasize the importance of high-quality CPR with minimal interruptions in chest compressions. This concept is consistent with an approach known as cardiocerebral resuscitation. Cardiocerebral resuscitation includes the provision of continuous chest compressions with a focus on maintaining adequate coronary perfusion pressures. Nevertheless the pressures generated by chest compressions do not reach threshold values that are associated with the return of spontaneous circulation. Thus, vasopressor therapy is required. Clinical trials with vasopressors however have produced mixed results and recent data have linked epinephrine administration to sub-optimal outcomes. This presentation will review the results of these trials and describe the current and future role of drug therapy for the treatment of cardiac arrest.

Learning Objectives:

1. Describe the pathophysiologic sequelae encountered following a cardiac arrest.
2. Describe the outcomes achieved with epinephrine therapy as noted in clinical trials
3. Describe the role of vasopressin following a cardiac arrest

Self-Assessment Questions:

1. Which of the following statements is TRUE?
 - A. Ventricular fibrillation is the most common initial rhythm in patients with cardiac arrest.
 - B. Chest compressions alone provide coronary perfusion pressures that are associated with the return of spontaneous circulation.
 - C. CPR should be provided with an emphasis on minimal interruptions in chest compressions.
 - D. Lay providers should first check a pulse before beginning CPR.
2. Which of the following statements is TRUE?
 - A. The beneficial effects of epinephrine in cardiac arrest are due to its beta agonist properties.

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- B. Higher epinephrine doses should be administered if standard doses are ineffective.
 - C. Epinephrine is associated with improved survival over placebo in clinical trials.
 - D. Epinephrine is administered to increase coronary perfusion pressures.
3. Which of the following statements is TRUE?
- A. Vasopressin does not cause tachycardia and increased myocardial oxygen demand in the post-resuscitative phase.
 - B. Vasopressin exhibits its effects through stimulation of alpha receptors.
 - C. Vasopressin is associated with increased survival to hospital discharge in patients with ventricular fibrillation.
 - D. Vasopressin should be repeated every 3 to 5 minutes.

Answers: 1. (C); 2. (D); 3. (A)

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128-2

Surviving Resuscitation: Drug Therapy and the Pharmacists Role – Traumatic Resuscitation

Patanwala, A.E.

University of Arizona College of Pharmacy, 1295 N Martin, P.O. Box 210202, Tucson, AZ 85721, USA.

Email: patanwala@pharmacy.arizona.edu

Guidelines for Advanced Trauma Life Support primarily focus on patient assessment and diagnostics, with little emphasis on drug therapy. Consequently, pharmacists involved in the care of trauma resuscitations have little guidance as to the type of activities they may perform and the drug therapy issues that are most important. In this session, the audience will be provided with information regarding how a pharmacist can be an effective member of the trauma resuscitation team. In addition, the evidence to support pertinent drug therapy issues in the care of these patients will be discussed. This includes the selection and dosing of analgesics, sedatives, paralytics, fluids, antimicrobials, hemostatic agents, and osmotic agents.

Learning Objectives:

1. Discuss appropriate strategies for opioid selection in trauma patients.
2. Explain the selection and dosing of medications used for rapid sequence intubation in trauma patients.
3. Describe the use of antimicrobial prophylaxis for traumatic injury.

Self-Assessment Questions: (True or False)

1. Intravenous fentanyl has a quicker onset of analgesia than morphine.
2. Succinylcholine and rocuronium both lead to similar intubation success rates.
3. Patients with grade 1 open fractures should receive cefazolin in combination with an aminoglycoside for infection prophylaxis.

Answers: 1. (T); 2. (T); 3. (F).

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130-1

Investing in You: Effective Team-Leading in Ambulatory Settings

Haines, S.L.

Palm Beach Atlantic University, Gregory School of Pharmacy, 901 S. Flagler Drive,
PO BOX 24708, West Palm Beach, FL 33416, USA.

Email: seena_haines@pba.edu

Van Amburgh, J.A.

Expectations for health-system pharmacists to lead the effort in improving patient outcomes are high, especially as the profession advances with new practice models. This session is part of a five-part series that will build your ambulatory care leadership skills and competencies.

Managing relationships is at the foundation of delivering care in ambulatory care settings. In this session, you will examine leadership styles and inventories, self-reflective techniques to raise personal awareness, and explore strategies to demonstrate appreciation in the workplace.

Learning Objectives:

1. Compare and contrast work-related leadership inventories to lead by your strengths.
2. Apply knowledge to improve self-awareness and work-related relationships through a heuristic exercise.
3. Explore strategies to demonstrate employee appreciation in the workplace.

Self-Assessment Questions:

1. (True or False) According to Don Clifton's and the Gallup Organization research, individuals should focus as much time on developing their strengths as well as learning strategies to improve their weaknesses.
2. Dr. Burke is personable and easy going and believes individuals sometimes have to experience things for themselves. She is always willing to show individuals ways to improve their performance, but does not micro-manage the situations. Which of the following best describes Dr. Burke's leadership style?
 - A. Challenge the process
 - B. Encourage the heart
 - C. Inspire a shared vision
 - D. Model the way
3. The two key ideas behind the Johari Window are building trust by personal disclosure with others AND:
 - A. Give you confidence that others will be more accepting of your limitations.

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- B. Improve your ability to enlarge the hidden area for improved communication.
 - C. Provide feedback from others that will help you come to terms with personal issues.
 - D. Serve as a representation of your “mental character”.
4. Which of the 5 languages of appreciation in the workplace focuses on using words to communicate a positive message?
- A. Acts of service
 - B. Quality time
 - C. Tangible gifts
 - D. Words of affirmation

Answers: 1. (F); 2. (D); 3. (C); 4. (D)

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131-1

Leading Change in Your Ambulatory Practice

Van Amburgh, J.A.

Northeastern University, Bouve College of Health Sciences, School of Pharmacy, 360
Huntington Avenue R218, Boston, MA 02115, USA.

Email: j.vanamburgh@neu.edu

Haines, S.L.

Expectations for health-system pharmacists to lead the effort in improving patient outcomes are high, especially as the profession advances with new practice models. This session is part of a five-part series that will build your ambulatory care leadership skills and competencies.

This session covers essential skills for managing change and optimizing relationships in the ambulatory practice setting. Essential skills for managing change, teamwork, and project management will be applied to case scenarios. Participants will walk away with decision-making tools to aid in individual and group collaboration.

Learning Objectives:

1. Identify how you recognize, respond and adapt to change.
2. Apply an 8-step process of leading change.
3. Apply collaborative problem-solving principles to ambulatory practice scenarios.
4. Explore ways to utilize different organizational frames to leadership development.

Self-Assessment Questions:

1. (True or False) Leadership is about coping with the complexity of the organization as well as coping with change.
2. Which of the following steps addresses an organization's contentment with the status quo?
 - A. Creating a sense of urgency
 - B. Creating the guiding coalition
 - C. Developing a change vision
 - D. Empowering broad-based action
3. Which De Bono value medal helps a team discuss the environmental influences, sustainability, and impact on the organization?
 - A. Brass
 - B. Gold
 - C. Steel
 - D. Wood
4. Which De Bono thinking hat color is responsible for providing positivity and benefits of implementing a change to improve organizational health?

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- A. Blue
- B. Red
- C. White
- D. Yellow

Answers: 1. (F); 2. (A); 3. (D); 4. (D)

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132-1

Managing Conflict: Up, Down, And All Around

Haines, S.L.

Palm Beach Atlantic University, Gregory School of Pharmacy, 901 S. Flagler Drive, PO BOX 24708, West Palm Beach, FL 33416, USA.

Email: seena_haines@pba.edu

Brown, T.R.

Expectations for health-system pharmacists to lead the effort in improving patient outcomes are high, especially as the profession advances with new practice models. This session is part of a five-part series that will build your ambulatory care leadership skills and competencies.

This session covers discussions on conflict management and maintaining the health of the organization through interpersonal relationship building in the ambulatory practice setting. Essential skills for managing conflict to avoid low morale, low productivity, and strained communications within a practice setting are key to being an effective leader. Participants will walk away with techniques on how manage disputes and reduce the cost of conflict. In addition, they will participate in a self-analysis to determine how they approach conflict and work on ways to improve how they handle interpersonal relationships using a solution-driven approach.

Learning Objectives:

1. Recognize common causes, which can lead to conflict in the workplace.
2. Utilize a tool to identify your conflict management style.
3. Apply knowledge and skills that can assist participants during a conflict situation in the workplace.

Self-Assessment Questions:

1. (True or False) Emotions, culture, and personality are common causes of conflict in the workplace.
2. Which of the 5 styles of responding to conflict focuses on your own agenda and relationships with colleagues?
 - A. Avoiding
 - B. Cooperating
 - C. Directing
 - D. Harmonizing
3. There are ___ key practices of servant leadership
 - A. Three
 - B. Five
 - C. Seven
 - D. Nine

Answers: 1. (T); 2. (B); 3. (C)

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133-1

Peer Review and Precepting in Ambulatory Care

Haines, S.T.

University of Maryland School of Pharmacy, 20 North Pine Street, 4th Floor, Baltimore, MD 21201, USA.

Email: shaines@rx.umaryland.edu

Haines, S.L.

Van Amburgh, J.A.

Expectations for health-system pharmacists to lead the effort in improving patient outcomes are high, especially as the profession advances with new practice models. This session is part of a five-part series that will build your ambulatory care leadership skills and competencies.

This session will focus on developing peers and preceptors by exploring different ways to engage learners using learning style inventories, active learning strategies, and innovative assessment techniques. Participants will be provided information about online tools to maximize the preceptor-learner relationship. In addition, participants will explore best practices in conducting peer review. Peer review is a well-established quality-management strategy frequently employed by healthcare organizations to examine the quality of care provided to patients. A well-managed peer review program can be an effective tool that engages front-line pharmacists in continuous quality improvement, generates data regarding individual and practice-wide performance, and encourages self-reflection. During this session we will explore best practices in conducting peer review and ponder key questions about program design and implementation.

Learning Objectives:

1. Explore different learning styles using inventory tools and ways to integrate them in the workplace.
2. Integrate a variety of active learning and assessment techniques in the practice to enhance learning.
3. Examine effective quality improvement and peer review processes to integrate into the workplace.

Self-Assessment Questions: (True or False)

1. A student's preferred method of learning is multi-modal (visual and aural learning styles) and therefore you should teach through storytelling and using pictures and graphs only.
2. Formative feedback should be provided at the midpoint to the learner with an action plan for each area of improvement.

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3. To “protect” the peer review process means that all patient care documents and peer review data collection sheets are stored in a secure location (e.g. a password protected folder on a shared hard drive or a locked cabinet).

Answers: 1. (F); 2. (T); 3 (F)

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134-1

The Next Step: Strategies to Advance Ambulatory Care Practice

Brown, T.R.

Center for Medicine at Akron Medical Center, 400 Wabash Ave, Akron, OH 44307, USA.

Email:

Riddle, S.

Epplen, K.

Expectations for health-system pharmacists to lead the effort in improving patient outcomes are high, especially as the profession advances with new practice models. This session is part of a five-part series that will build your ambulatory care leadership skills and competencies.

Creating a business plan can be daunting for many in clinical practice; however, this type of planning is essential as the profession transitions to a new model. The intent of this session is to illustrate how to take the PPMI Summit recommendations and create a 3D strategic plan that uses a business model that has been translated into a Practice Advancement Model approach. Tools will be provided that assist a team or department to track progress around strategically prioritized goals and help drive implementation of improvements. This program and workshop will demonstrate the application of the Practice Advancement Model with examples involving execution of an ASHP Section's strategic plan and application/utilization within an ambulatory practice setting.

Learning Objectives:

1. Describe the key drivers for development of ambulatory pharmacy services.
2. Design ambulatory pharmacy services to meet key accountability goals and organizational needs.
3. Utilize business planning to identify and justify service expansion opportunities across the continuum of healthcare delivery.
4. Explore steps pharmacists can use to achieve quality benchmarks as part of an interdisciplinary healthcare team.

Assessment Questions:

1. (True or False) There are at least 6 PPMI recommendations relating to Ambulatory Care.
2. Which of the following is the first step in creating a Practice Advancement plan?
 - A. Prioritizing the deliverables
 - B. Determining current status
 - C. Conducting a gap analysis
 - D. Identify areas of need
3. (True or False) The Practice Advancement plan should always align with the mission of your health system.

Answers: 1. (T); 2. (D) 3. (T)

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136-1

What has the compounding tragedy taught us?

Kienle, P.C.

Cardinal Health Pharmacy Solutions, 106 Elmwood Drive, Laflin, PA 18702, USA.

Email: patricia.kienle@cardinalhealth.com

Kastango, E.S.

Recent issues concerning reliability and safety of sterile compounding practices have heightened the need to ensure that all facilities that compound are compliant with USP <797> Pharmaceutical Compounding – Sterile Preparations. During this session, participants will have the opportunity to develop a priority list specific to their site, based on a review of the standard; identification of common gaps in practice; and practical steps to take based on evaluation of facilities, personnel, monitoring, and work practices. Items extracted from FDA inspections of sterile compounding facilities will be used to demonstrate areas that require attention.

Learning Objectives:

1. Develop plans to modify your clean rooms and segregated compounding areas and personnel testing programs per USP <797> requirements and list the resources available that should be used to support planning and service decisions.
2. Differentiate viable and non-viable monitoring.
3. Evaluate gaps in certification and quality reports that need to be investigated.
4. Interpret the state and federal licensure challenges and how they apply to your setting.
5. Review the findings of the FDA 483s issued to prominent outsource providers and how to use those findings in developing an audit program for outsource vendors.

Self-Assessment Questions: (True or False)

1. USP <797> is a minimum standard.
2. Surface samples comply with the requirement for electronic viable monitoring.
3. Preparation testing is required if beyond-use dates are exceeded.

Answers: 1. (T); 2. (F); 3. (T)

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137-1

Prescription Medication Harm and Death: An Epidemic. What is Being Done?

Link, M.

Aspire Resource, Cleveland, OH, USA.

Email: marie@AspireResource.com

Jones, C.M.

Quang, L.S.

Fudin, J.

No matter what the cause, prescription drugs are causing more harm and death than they should. This fact is most certainly a problem. Learn more than just the facts. Evaluate the ways healthcare providers (physicians, prescribers, nurses, pharmacists) and individuals can take part in contributing to solutions: increased awareness, limiting access, steps to take to increase transparency and educating others.

This will be a Federal, State and Local level overview. Drs. Link and Jones will present a federal perspective; Dr. Quang will present state, Attorney General's Office and US Poison Center perspective. Dr. Fudin will present local level and opioid safety and will engage the audience in discussions of real patient cases where “standard” opioid conversions went awry due to dangerously understated drug interactions.

Learning Objectives:

1. Describe the measures that both the private sector and government offices are taking to reverse the alarming trend of harm and death related to prescription drug use in the United States.
2. Evaluate various perspectives and potential causes underlying this trend with prescription drugs.
3. Utilize and evaluate available resources applied to a practice scenario.

Self-Assessment Questions: (True or False)

1. According to the Centers for Disease Control and Prevention statistics, there were more unintentional deaths from opioid analgesics than cocaine and heroin combined.
2. A medication prescribed for a legitimate medical purpose should not pose risk of unintended harm and death.
3. Certain FDA REMS programs require an informed consent or a prescriber–patient agreement be signed prior to issuing a prescription.

Answers: 1. (T); 2. (F); 3. (T)

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138-1

Improving transparency of our medication errors by telling stories

Monroe, P.S.

The University of Texas MD Anderson Cancer Center, 1515 Holcombe Blvd, Houston, TX, 77030, USA.

Email: psmonroe@mdanderson.org

Purpose: In 2011, our institution participated in "The 2011 Institute of Safe Medication Practices (ISMP) Medication Safety Self-Assessment® for Hospitals, and one area we scored low was transparency with our medication errors throughout the organization. In order to increase transparency of our medication errors, a video series called "The Event Report" was established to communicate certain medication errors across the institution to raise awareness of these errors and prevent similar errors from occurring in the future.

Methods: A multi-disciplinary team meets monthly to identify certain medication errors for video consideration from our medication event database that originate at the prescribing/ordering level of the medication management process and follow the "Swiss cheese" model until they reach the patient or result in a "near miss" before administration, along with corrective actions that are implemented by the area where the error originated. A process has been developed to approve the errors for video consideration, produce the videos, and distribute the video throughout the facility for viewing. We track the viewing of the videos, provide a survey to the users on the usefulness of the videos, and track similar events to those highlighted in the video. It is planned to show one of these videos during the Management Case Study presentation.

Results: "The Event Report" video series started in October of 2012, and we have shown a video monthly. From October 1, 2012 through December 15, 2012, three of the videos have been accessed 645 times by hospital leadership. Our survey numbers as of December 20, 2012 show favorable responses by the users of 84.2%, 91.9%, 91.6% to accessing the videos, sharing medication event information through the videos, and overall satisfaction of the videos, respectively. We have had one reported medication error that is similar to an error highlighted in the video series, since we started this program.

Conclusion: "The Event Report" video series that highlights our medication errors has increased our transparency of medication errors throughout the institution. Our limited data to date has shown a positive impact on our safety culture in the institution. We continue to improve this process as we collect feedback from the users.

Learning Objectives:

1. Describe methods used to increase transparency of medication errors within an organization.
2. Identify roadblocks/challenges that can be encountered in an organization trying to increase transparency of medication errors.
3. Identify methods to measure safety culture in an organization.

Self-Assessment Questions: (True or False)

1. The ISMP Medication Safety Self-Assessment survey cannot be used to measure safety culture in an organization.

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2. When communicating a medication error throughout an organization, it is important to only choose those events that were caused by a dispensing error.
3. When communicating a medication error throughout an organization, it is important not to place blame on one person or discipline and to focus on the processes associated with the error.

Answers: 1. (F); 2. (F); 3. (T)

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Huddle Up! Safety Huddles for the Hospital and Pharmacy Department

Lile, J.

St. Mary's of Michigan, 800 South Washington, Saginaw, MI 48601, USA.

Email: james.lile@stmarysofmichigan.org

Purpose: Patient, visitor, and employee safety are key concerns and a focus of daily practice. This case describes one hospital's answer to the question: What are YOU doing about safety?

Methods: In January of 2011, daily safety huddles were initiated. These huddles are held Monday through Friday from 8am to 8:30am. Representatives from nursing, pharmacy, administration, rehabilitation services, radiology, security, engineering, environmental service, patient transport, supply and distribution, laboratory, risk management, dietary, and others gathered together to openly and honestly discuss safety events and near misses. Small groups and ad hoc teams are developed as needed to dig deeper into specific issues to develop processes, policies, and practices to identify, resolve, and prevent future safety events. The Pharmacy Department began weekly safety huddles in 2012.

Results: All leaders and front-line staff are invited to Safety Huddle. All employees are encouraged to attend and participate as their schedules allow. In 2011, twenty-six serious safety events occurred. In 2012, six serious safety events occurred. Communication between departments has improved. Communication in the Pharmacy Department has improved however medication error rates are stable.

Conclusion: Safety Huddles evolve with time. Safety Huddles have a positive impact on inter- and intra-department communication. Safety Huddles have a positive impact on patient, visitor, and employee safety.

Learning Objectives:

1. Describe the composition of a Safety Huddle team.
2. Describe ad hoc groups formed from Safety Huddle.
3. Describe the potential benefits of Safety Huddle.

Self-Assessment Questions: (True or False)

1. Safety Huddles should include front-line staff and leadership.
2. Daily Safety Huddles may improve communication and reduce serious safety events.
3. Safety Huddles MUST be interdisciplinary.

Answers: 1. (T); 2. (T); 3. (T)

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Taking the Time: Using a Time-Motion Study to Evaluate the Value of an Automation Interface

Wolfe, A.S.

UNC Hospitals and Clinics, 101 Manning Dr, Campus Box 7600, Chapel Hill, NC 27514, USA.

Email: awolfe@unch.unc.edu

Reichard, J.S.; Hatfield, C.J.

Purpose: An 803 bed academic medical center installed two medication carousels (MCs) to provide organized and accessible medication storage within a limited footprint. The carousels streamlined medication stocking, selection and inventory management. However, the lack of an interface for patient specific batched items and first doses to the MCs resulted in significant manual work for pharmacy technicians and potential delays in patient care. An interface between the MCs and the pharmacy information system (PIS) was not originally developed due to the anticipation of a new PIS within a year and perception that it would not be cost effective. In this case study, a generalizable action plan using time motion studies to evaluate the impact of an interface between the MCs and a PIS will be presented.

Methods: Following the MCs implementation and workflow redesign, the central inpatient pharmacy operations team became aware of decreased work efficiency and employee morale, and increased medication variances attributable to the lack of an interface between the MCs and PIS. To address these concerns, the operations team created an action plan to evaluate the pharmacy technician work flow before and after interface implementation using time-motion studies. This management case study will provide detailed information on building methodology to evaluate outcomes including insights on conducting time-motion studies on pharmacy operation workflow.

Results: Patient specific batches were pulled from the MCs by pharmacy technicians. Lacking an interface, pharmacy technicians were required to enter the patient-specific medications, first doses, and missing doses as manual picks into the MC inventory management software system, match a pharmacy medication management system label to a MC label, and manually enter the priority level for items (e.g., missing dose, manual pick, STAT). A return on investment (ROI) was built around pharmacy technician work-hour savings with the presence of an interface between the MCs and PIS. Time motion studies demonstrated pharmacy technicians were spending 12 work-hours per day performing patient specific batches. Post-implementation of the interface removed manual entry, manual matching, and automatically prioritized the entries, all significant contributors of pharmacy technician work-hours per day. After the interface, the daily pharmacy technician work-hour investment into patient-specific batches decreased to 7.5 hours. Additionally, the volume of patient specific labels increased from 600 to 1200 per day due to discontinuing loading medications that were not in stock in automated dispensing cabinets (ADCs) twice daily. With increased volume, the MC/PIS interface resulted in a savings of 4.5 pharmacy technician work-hours per day. The MC Vendor assigned the value of the interface as a one-time cost of \$25,000. Using an hourly rate of a pharmacy technician at \$15.00, an ROI was calculated at 370 days which will be reached prior to the conversion to a new PIS.

Conclusion: The interface resulted in cost-effective improvements pharmacy operations and a perceived added value in medication turnaround times, prioritization of emergent orders, technician job satisfaction and reduction in medication variances.

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Learning Objectives:

1. Describe how new pharmacy automation technology can lead to active and latent medication errors.
2. Identify and develop metrics to evaluate the value of pharmacy automation.
3. Describe how to evaluate workflow around pharmacy automation using time-motion studies and return on investment calculations.

Self-Assessment Questions: (True or False)

1. Adoption of an interface resulted in streamlined workflow options for all tasks.
2. When conducting an ROI, internal personnel hours invested should be included.
3. The implementation of an interface results in the elimination of latent errors.

Answers: 1. (F); 2. (T); 3. (F)

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139-2

Meaningful Use – Utilizing Clinical Decision Support to Enhance Clinical Quality Measures: Venous Thromboembolism Prophylaxis

Anderson, B.J.

HealthEast Care System, 1700 University Ave, St. Paul, MN 55104, USA.

Email: bjanderson2@healtheast.org

Smestad, N.

Purpose: During the build of our CPOE system the realization that many order sets had different variations of Venous Thromboembolism Prophylaxis was made. This case describes the process the informatics team used, working with several interdisciplinary groups, to achieve standardization of electronic ordering of Venous Thromboembolism (VTE) Prophylaxis. The case includes discussion of the Clinical Decision Support tools used to support the standardization process.)

Methods: Order sets to be standardized were identified by isolating orders commonly associated with VTE Prophylaxis such as sequential compression devices, subcutaneous heparin, and enoxaparin. An interdisciplinary team consisting of order set builders, pharmacy, and provider leadership constructed a standardized VTE order set to be utilized for surgical patients. The initial attempt showed some improvement but not the desired level of compliance. Meetings continued which resulted in the development and implementation of a new order set containing enhanced Clinical Decision Support that would serve both medical and surgical patients.

Results: The addition of Clinical Decision Support methods such as integrated linking and automatic warnings, helped to improve compliance results and consistency with VTE Prophylaxis ordering for patients. The integrated linking technique assured providers were presented with the standardized treatment options and the automatic warnings were generated by the form when required information was not provided. Initially negative feedback was received from some provider groups, but further education helped to explain the process.

Conclusion: A single VTE Prophylaxis electronic order set serving both medical and surgical patients has shown a positive increase in the measures associated to the correct ordering of VTE prophylaxis. An additional benefit of the order set is the improved documentation of reasons for patients being excluded from either mechanical or pharmacological prophylaxis.

Learning Objectives:

1. Give examples of different types of Clinical Decision Support.
2. Explain integrated linking functionality.
3. Describe how standardization of process can improve compliance.

Self-Assessment Questions: (True or False)

1. Active integrated linking allows the provider to choose which subsequent order sets open.
2. Integration of clinical guidelines enhance the providers ability to correctly order VTE Prophylaxis.
3. Pop-up warning can be utilized to ensure all information is documented on an electronic order set.

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Answers: 1. (F); 2. (T); 3. (F)

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140-1

Comparison of a hybrid medication distribution system to simulated decentralized distribution models

Gray, J.P.

Cedars-Sinai Medical Center, 8700 Beverly Blvd, LL South Tower, Room A903, Los Angeles, CA 90094, USA. Email: johnpgray@uwalumni.com

Ludwig, B.

Purpose: The assessment of the nurse, pharmacist, and pharmacy technician workload associated with the hybrid medication distribution system at a 561-bed academic medical center is described. Possible decentralized medication distribution models are simulated to assess workload.

Methods: Direct observations of pharmacist, pharmacy technician, and nurse workload associated with the hybrid medication distribution system and with a decentralized medication distribution system at a comparator hospital were performed to generate time standards for medication preparation and dispensing tasks. Workload statistics for medication preparation and dispensing tasks were obtained via direct observation, the electronic medical record, and the interfaced pharmacy computer system. Commercially-available simulation software was utilized to build and run simulation scenarios to determine the impact of varying medication distribution systems on the pharmacy (pharmacist and pharmacy technician) and nursing workload. Utilizing the workload statistics and time standards (gathered as above) at the two institutions, four simulation scenarios were developed. Each scenario represented a potential medication distribution system.

Results: Assessment of the four simulated scenarios revealed that as the percentage of doses that are dispensed from ADCs increases, pharmacy technician labor decreased while nursing labor increased. Correspondingly, the cost of the human resource time involved in the process increased by \$229,691 per annum because nurses are a more costly resource than pharmacy technicians.

Conclusion: As the percentage of doses dispensed from ADCs increases, the pharmacy labor to support the medication dispensing system decreases while the nursing time required to obtain and prepare doses for administration increases. From an overall health-system perspective, this represents an unfavorable shift in skill mix and corresponding human resource costs.

Learning Objectives:

1. Describe the advantages and disadvantages of various medication distribution models.
2. Identify the characteristics of tasks that are most-appropriately studied using direct observation.
3. Identify the characteristics of workflow redesign projects for which computer simulation would be most beneficial.

Self-Assessment Questions: (True or False)

1. One advantage of a decentralized automated dispensing system is the automation of controlled substance inventory reconciliation processes.
2. Tasks that are short in duration, occur infrequently, and have clearly defined start and stop times are most-appropriately studied using direct observation.

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3. One situation in which simulation is of particular value is comparing multiple alternative systems for determining resource or scheduling requirements (e.g. alternative pharmacy staffing models).

Answers: 1. (T); 2. (F); 3. (T)

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An interdisciplinary approach to reducing missing dose requests

Birney, P.J.

The Methodist Hospital, 6565 Fannin St, DB1-09, Houston, TX 77030, USA.

Email: pjbirney@tmhs.org

Varkey, A.C.

Purpose: Missing dose requests are a significant workflow burden for the Pharmacy Department, and are a potential source of medication administration errors and other patient safety concerns. Roughly 0.7% of the 10 million doses distributed from the study institution's pharmacy department per year are in response to a missing dose request. Due to the cart-fill distribution model utilized in this hospital, a disproportionate amount of missing dose requests occurs following patient transfer. The pharmacy management team worked with leaders from Nursing and Central Transport to identify a simple, effective process to reduce the number of missing dose requests following a patient transfer.

Methods: A retrospective chart review was performed on a monthly basis to track the number and proportion of missing dose requests. Additional data was collected to analyze the number of missing dose requests within six hours following a patient transfer. The management team identified that targeting successful transfer of medications with the patient would be the most simple and cost-effective measure to reduce missing dose requests following transfer, without negatively impacting workflow on the unit. Further, the negative implications of missing doses on nursing workflow and patient safety would ensure buy-in across disciplines. A proposal was submitted to, and approved by, hospital executives requesting permission for Central Transport employees to take custody of non-controlled medications during transfer. Early communication with managers from Nursing and Central Transport ensured that all key role-players were informed and in agreement with the process change. A flow-diagram was developed and posted on Nursing units as a reminder to send medications with the patient, and as a tool to identify which medications are appropriate to send. Nursing directors and Transport managers were relied upon to communicate the expectations to staff members.

Results: Leaders from Pharmacy, Nursing, and Central Transport departments were actively engaged to enact a process change to reduce missing dose requests in the hospital. Roles for the various departments' employees were vetted through managers and staff members to elicit buy-in, and clearly described in the flow diagram. The process was well-communicated to all role players to ensure compliance, and results revealed that the change had a positive impact without affecting the previous patient transfer workflow.

Conclusion: A multidisciplinary approach to operational issues with widespread effects can encourage collaboration among professions and result in efficient process improvements. Participation in the planning phase of the project will ensure that the various departments are committed to the process change.

Learning Objectives:

1. Describe a process improvement that decreases missing dose requests without significantly impacting other workflow.

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2. Describe how incorporating multiple disciplines into planning a process change can help to achieve an outcome.
3. Describe how a process change can be communicated across multiple departments in the hospital to improve compliance.

Self-Assessment Questions: (True or False)

1. Planning a new or changed process should be completely focused on achieving the targeted outcome, without spending significant resources analyzing impact on existing processes.
2. Including all stakeholders into the planning phase of a process change will ensure all needs are sufficiently addressed.
3. Communication should begin early and be clear in order to guarantee managers and staff employees implement the process change appropriately.

Answers: 1. (F); 2. (T); 3. (T)

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Are You Confident About the Quality of Your Sterile Compounding Quality Assurance Plan?

Palmer, K.

Cedars-Sinai Medical Center, 8700 Beverly Blvd, South Tower, Room A-903, Los Angeles, CA 90048, USA.

Email: katherine.palmer@cshs.org

Vinson, B.; Shane. R.

Purpose: Sterile compounding has undergone intense scrutiny in recent months due to compounding events that have resulted in patient harm. Hospital pharmacy departments can increase confidence in their compounding practices by proactively reevaluating and redesigning their quality assurance plan. This case describes the elements and benefits of a comprehensive quality assurance plan and creation of an in-house dashboard to ensure the highest level of quality and safety in sterile compounding.

Methods: To ensure ongoing quality assurance monitoring for sterile compounding, our quality assurance plan was updated and a dashboard was created. The different areas addressed in the plan include environmental control, personnel performance, quantitative analysis, environmental cleaning, medication storage, recalls, and process validation. The dashboard enables monitoring of metrics and goals. An example of environmental control elements monitored include air particle testing and bioburden. Periodic observation of staff for ongoing aseptic technique compliance is measured. Samples are sent for quantitative analysis.

Results: Elements of the plan are monitored at defined intervals (ex. bi-annually, quarterly, monthly) and are tracked on the dashboard. We use the dashboard to track our performance, identify opportunities for improvement, and share results with our staff.

Conclusion: Given the national focus on sterile compounding, having a robust quality assurance plan serves as a framework for evaluating our sterile compounding program.

Learning Objectives:

1. Describe the benefits of developing a quality assurance plan for sterile compounding.
2. List key areas that may be addressed in a quality assurance plan.
3. Determine how the quality assurance plan may be applied at your practice site.

Self-Assessment Questions: (True or False)

1. Periodic observation of technician aseptic technique does not meet any goals of a quality assurance plan.
2. Potency testing results of samples may improve confidence in established compounding practices.
3. A dashboard format of the quality assurance plan enables tracking of performance.

Answers: 1. (F); 2. (T); 3. (T)

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Determining a method of pharmacist-patient interaction to improve HCAHPS scores

Stuckey, N.T.

Email Address: nastuc@ccf.org

Cleveland Clinic - Fairview Hospital, 18101 Lorain Rd, Cleveland, OH 44111, USA.

Purpose: Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) is now a vital metric associated with inpatient reimbursement. HCAHPS are comprised of several domains; one being Medication Communication. The pharmacy department has been given the task of improving the scores of the Medication Communication domain. The goal of this improvement project was to determine which method of patient-pharmacist interaction has any or the largest impact on HCAHPS scores.

Methods: As part of our institution's practice model initiative, 9 pharmacists were decentralized and assigned to 4 different nursing units. Those 4 nursing units were then divided into 2 test arms. In one nursing-unit group, the new medication arm, the pharmacists provided medication education to only the patients with new medication orders. The pharmacists in the new medication arm provided the patients with a single-page handout that included the medication name, indication and most frequent side effects. In the other nursing-unit group, the rounding arm, the pharmacists attempted to visit every patient in that nursing unit everyday. During those visits, the pharmacist would ask the following open-ended questions to the patients: "What questions do you have about your medications; what questions do you have about the side effects of your medication?" During a 3 month period of time the following data was collected: HCAHPS results, number of patient encounters, time of direct-patient contact, and the name of the medications in the new medication arm that were most frequently discussed with patients.

Results: In the new medication arm, the medication communication domain score was 65.7%. The pharmacists had 624 patient encounters for a total of 4330 minutes of direct-patient contact. The top five medications that were discussed with patients in the new medication arm were warfarin, potassium chloride, docusate, ondansetron, and furosemide. In the rounding arm, the medication communication domain score was 60.2%. The pharmacists had 1852 patient encounters for a total of 9262 minutes of direct-patient contact.

Conclusions: Medication communication scores were higher in the new medication arm compared to the rounding arm (65.7% vs. 60.2%). The new medication arm during the study period achieved a 70th percentile rank, while the rounding arm achieved only a 31st percentile rank. The results are unexpected given that the rounding arm had almost 3 times the number of patient encounters compared to the new medication arm. The higher medication communication results found in the new medication arm were driven solely by one nursing unit. When the other nursing units' medication communication scores were compared with historical values, there was little change in those scores during the study period. This implies that there are factors outside of the pharmacist-patient encounters that are having a greater effect on the HCAHPS scores. Pharmacists do impact patient care, but the HCAHPS survey is a poor tool to measure that impact.

Learning Objectives:

1. Review the questions found on the HCAHPS survey.

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2. Examine the relationship between pharmacist-patient encounters and HCAHPS scores.
3. Discuss factors that may affect the medication communication domain scores.

Self-Assessment Questions: (True or False)

1. Pharmacists are explicitly mentioned in the HCAHPS surveys.
2. Medication communication domain score are directly related to the number of direct patient encounters by pharmacists.
3. Patient handouts alone will improve medication communication scores.

Answers: 1. (F); 2. (F); 3. (F)

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An Organizational Approach to Defining and Implementing a Care Transition Pharmacist Role

Fera, T.

Pittsburgh Regional Health Initiative, 650 Smithfield St, Pittsburgh, PA 15222, USA.

Email: ferat26@hotmail.com

Anderson, C.; Kanel, K.T.

Purpose: A Primary Care Resource Center (PCRC) is a novel concept to address gaps in care transitions. Staffed by nurse care managers, the PCRC was established to serve as a hospital-based care coordination hub for patients with complex chronic diseases, with the goal to reduce unnecessary readmissions, and avoid consequent financial penalties. Medication management was identified as being critical to improving the quality of care for these patients, and minimizing unnecessary utilization of high-cost acute care services. This case study describes the process to create a care transition pharmacist (CTP) role in the PCRC.

Methods: A CTP role in the PCRC was developed with input from key stakeholders, including primary care physicians, hospital administration and a multidisciplinary team charged with reducing readmissions for patients with chronic obstructive pulmonary disease and heart failure. The CTP position description was developed, and the pharmacist recruited from the existing pharmacy staff. The pharmacist intervention was complementary to the nurse care manager intervention for the identified patients. The CTP reviewed medications with hospitalized patients, and contacted patients via telephone within 72 hours of discharge. The pharmacist reinforced the plan of care, reviewed medications with the patient, and ensured any identified care gaps were addressed. Pharmacist activity and interventions were tracked in the hospital's electronic health record and outpatient registry. In the first six months of the program, challenges, such as timely identification of patients and documentation of care were also addressed.

Results: The impact of the CTP was evaluated using outcome measures jointly determined by the team and hospital administration. In the first 6 months of the service (May-October, 2012), the pharmacist attempted to call 175 patients post-discharge and was able to reach 118 (67.43%) for phone follow-up. The patients who were contacted by the pharmacist were approximately 50% less likely to have an acute care visit within 30 days of discharge, a statistically significant difference (Risk ratio 0.52, 95% CI 0.311, 0.8256). A final report was created to describe the value of the CTP and presented to the stakeholder group. Furthermore, these results will be used in discussions with payers to evaluate the potential for reimbursement of these services.

Conclusion: By aligning key stakeholder objectives and organization quality improvement goals, a new care transition pharmacist position was successfully implemented in a Primary Care Resource Center.

Learning Objectives:

1. Describe readmission penalties and the potential financial impact on hospitals.
2. Describe the role of a care transition pharmacist to reduce acute care hospital service utilization.
3. Describe common interventions made by a care transition pharmacist.

Self-Assessment Questions: (True or False)

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1. All hospital admissions generate revenue for hospitals.
2. Patients who were contacted by a care transition pharmacist were 50% less likely to use acute care hospital services.
3. The most common post-discharge intervention by the transition care pharmacist was reinforcement of the patients' care plan.

Answers: 1. (F); 2. (T); 3. (T)

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Understanding 340B Contract Pharmacy Administrators

Guthman, J.B.

Froedtert Health, 9200 W Wisconsin Ave, Milwaukee, WI 53226, USA.

Email: justinguthman@live.com

Purpose: To identify the value and design of 340B contract pharmacy administrators in facilitating a partnership between a covered entity and a contract pharmacy

Methods: On September 5th, 2010, the United States Department of Health and Human Administration - Health Resources and Service Administration (HRSA) published new guidelines stating covered entities would no longer be limited to the number of contract pharmacies. These guidelines opened a new avenue for covered entities to improve patients' access to their outpatient prescription medications.

Secondary to a low internal prescription capture rate, Froedtert Hospital viewed these new guidelines as an opportunity to improve access and provide additional pharmacy services to its patients. Therefore, Froedtert Hospital, a 550-bed academic-disproportionate-share hospital and a member of University Health Consortium (UHC), located in Milwaukee, Wisconsin, partnered with a large retail pharmacy chain to administer 340B contract pharmacy.

While the current contract pharmacy partnership proved to be a viable method of extending pharmaceutical services into the community, there were a large percentage of eligible prescriptions that were not being captured by a single contract pharmacy partner. In order to maximize the 340B program, Froedtert Hospital determined the need to develop a partnership with a 340B contract pharmacy administrator.

Results: Froedtert Hospital evaluated several 340B contract pharmacy administrators and developed a detailed comparison grid and ROI. In the process of developing these tools, Froedtert Hospital was able to identify the variety of novel fee structures proposed by the 340B contract pharmacy administrators. These fee structures included use of lesser of logic, transactional fees, replenished fees, and implementation fees.

Conclusion: To expand the 340B benefit for Froedtert Hospital, a partnership was developed with a 340B contract pharmacy administrator. Selection of this partner was made carefully evaluating the fee structure and benefits provided by the administrator.

Learning Objectives:

1. Describe the benefits of partnering with contract pharmacies.
2. Identify the advantages and disadvantages with partnerships with 340B contract pharmacy administrators.
3. Explain the different fee structures used by 340B contract pharmacy administrators.

Self-Assessment Questions: (True or False)

1. Covered entities are limited to 10 contract pharmacy agreements.

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2. The "lesser of logic" helps ensure that the covered entity does not accrue costs greater than the revenue captured for an eligible prescription.
3. All 340B contract pharmacy administrators use the same method for determining cost to covered entities.

Answers: 1. (F); 2. (T); 3. (F)

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PPMI Evaluation Drives Practice Optimization

Eshleman, O.

Harris Health System, 9240 Kirby, Ste 600, Houston, TX 77054, USA.

Email: Ogechi.Eshleman@harrishealth.org

Purpose: Prior to our Pharmacy Practice Model Initiative (PPMI) assessment, nearly all of our clinical activities were being performed and tracked via manual process. Similarly, our approaches towards roles of student, technician, and technology was inconsistent. Our organization embarked on a self-assessment using ASHP's PPMI to enhance clinical services and optimize pharmacy practice. Our evaluation provided momentum for the development of patient lists for clinical monitoring, end user education and accountability, new opportunities for students and technicians, and prioritization and vision for future operational, technological and clinical initiatives. This case shall describe the methodical approach employed by our organization to perform the evaluation and hold ourselves accountable for results.

Methods: A Clinical/Operational (ClinOps) Committee was formed, consisting of inpatient operations managers, clinical manager, directors of pharmacy and informatics manager. The ClinOps Committee completed the PPMI survey, reviewed the action plan and assigned topics to Team Leads. The Team Leads were responsible for setting goals and presenting deliverables at our departmental meeting. The ClinOps Committee met weekly to discuss goals and deliverables and to find solutions to challenges or obstacles that arose.

Results: After six months, the Team Leads were able to present deliverables at the departmental meeting. Deliverables of note included: 1) optimization and/or implementation of 5 clinical programs, supported by a systematic approach to patient monitoring and discharge counseling as well as a reliable means of holding staff accountable for performance 2) implementation of technician-check-technician (TCT) program; 3) optimization of student involvement in clinical and operational activities; and 4) creation of a formal assessment of technological needs. Team Leads continue to sustain progress made in these goals and also identify new goals and deliverables as needed.

Conclusion: Using the PPMI assessment as a framework, our department was able to optimize resources and elevate the practice of pharmacy in our institution.

Learning Objectives:

1. Describe an organized approach in using ASHP's PPMI.
2. Explain the need for commitment of time and resources towards practice elevation.
3. Explain the need for alignment of organizational priorities with development of pharmacy operational, technological and clinical initiatives.

Self-Assessment Questions: (True or False)

1. Commitment (of time and resources) of management to the optimization of clinical and operational practice is not integral to success.
2. Accountability for pharmacy management needs to be established prior to engaging front-line staff.

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3. One of the most difficult tasks to master in creating new programs is sustaining performance.

Answers: 1. (F); 2. (T); 3. (T)

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More Than Just a Check

Spangler, J.D.

Novant Health, 3333 Silas Creek Pkwy, Winston-Salem, NC 27103, USA.

Email: jspangler@novanthealth.org

Koneru, R.; Montanya, K.

Purpose: With the implementation of a tech-check-tech program, several challenges and opportunities were encountered associated with staff engagement, perceptions of fairness, and workflow continuity. This case will describe the approaches and tools used to successfully and seamlessly implement a tech-check-tech program.

Methods: The tech-check-tech program was integrated as a component for advancing within a pharmacy technician career ladder. This provided a framework whereby technicians can see their pathway for advancement within the department and understand the value additional education has in their advancement. Communication to staff was necessary to explain legal and regulatory limitations and the define new role of validating technicians within the department. Workflow redesign was necessary to integrate new tech-check-tech systems into existing workflows to minimize lags and optimize efficiency.

Results: Implementation of the tech-check-tech program has allowed the redeployment of 1.4 pharmacist FTE towards elevating clinical practice, improved staff engagement among the pharmacy technicians, and created a new informal leadership role within the pharmacy technician ranks.

Conclusion: Implementation of a tech-check-tech program has advanced the level of practice of both technicians and pharmacists.

Learning Objectives:

1. Describe the processes necessary to implement a tech-check-tech program.
2. Explore downstream impacts of the tech-check-tech program and approaches to optimizing impact.
3. Review legal/regulatory status of tech-check-tech programs and the lobbying efforts we engaged in.

Self-Assessment Questions: (True or False)

1. Pharmacy technicians can safely perform select non-clinical pharmacist functions.
2. Tech-check-tech programs are clean and simple to implement.
3. Tech-check-tech programs represent an exciting opportunity to improve staff engagement and develop new leaders.

Answers: 1. (T); 2. (F); 3. (T)

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Antibiotic Sensitivity Reactions: Clinical Implications and Management

Pogue, J.M.

Sinai-Grace Hospital, 6071 W Outer Dr, Detroit, MI 48235, USA.

Email: jpogue@dmc.org

Antibiotic hypersensitivity reactions can be associated with life threatening consequences related both to the type of allergic reaction, such as anaphylaxis, as well as the hesitance of practitioners to use first-line, structurally related antimicrobials in patients with reported allergies. Cross-reactivity between penicillins and cephalosporins is not as high as initially believed with more recent analyses showing a strong correlation between similarities in side chains and cross-reactivity. While aztreonam cross-reactivity with penicillins appears to be negligible, carbapenem cross-reactivity rates with penicillins vary greatly in the literature and caution should be used in administering to penicillin allergic patients. Sulfonamide non-antimicrobials appear safe to administer in patients with allergies to sulfonamide antimicrobials due to a lack of similarity in side chains. Desensitization offers a method to safely administer an antibiotic to patients with an immediate type hypersensitivity reaction to that agent through an induction of tolerance.

Learning Objectives:

1. Differentiate between various types of “rashes” associated with antibiotic use and understand the implication on therapy.
2. Discuss the likelihood of cross-reactivity with other structurally similar agents for patients with penicillin or “sulfa” allergies.
3. Describe when desensitization is appropriate, and apply it to a patient case.

Self-Assessment Questions: (True or False)

1. Type of allergy is not an important factor when deciding whether or not to challenge an allergic patient with a structurally similar drug.
2. Cross-reactivity appears minimal between penicillins and aztreonam, but one should be cognizant of the similarities aztreonam has with ceftazidime.
3. Desensitization is appropriate for patients with a history of Stevens Johnson Syndrome to an agent.

Answers: 1. (F) 2. (T) 3. (F)