



HARVARD MEDICAL SCHOOL
TEACHING HOSPITAL



BRIGHAM AND
WOMEN'S HOSPITAL

Critical Care Clinical Pharmacy Practice in the USA: Focus on BWH, Boston, MA

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Disclosures

- I have no disclosures information on this top



Gracias por la invitación. es un honor hablar con usted hoy

SEDE

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INSCRIPCIONES

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Las plazas son limitadas. Plazo de preinscripción: 03/10/2014. Posteriormente se confirmará la relación definitiva de asistentes. Se priorizará la participación de un farmacéutico por hospital (preferentemente adjuntos con actividad y/o interés en áreas de pacientes críticos)

ENTIDADES PATROCINADORAS



SECRETARIA TÉCNICA - INFORMACIÓN

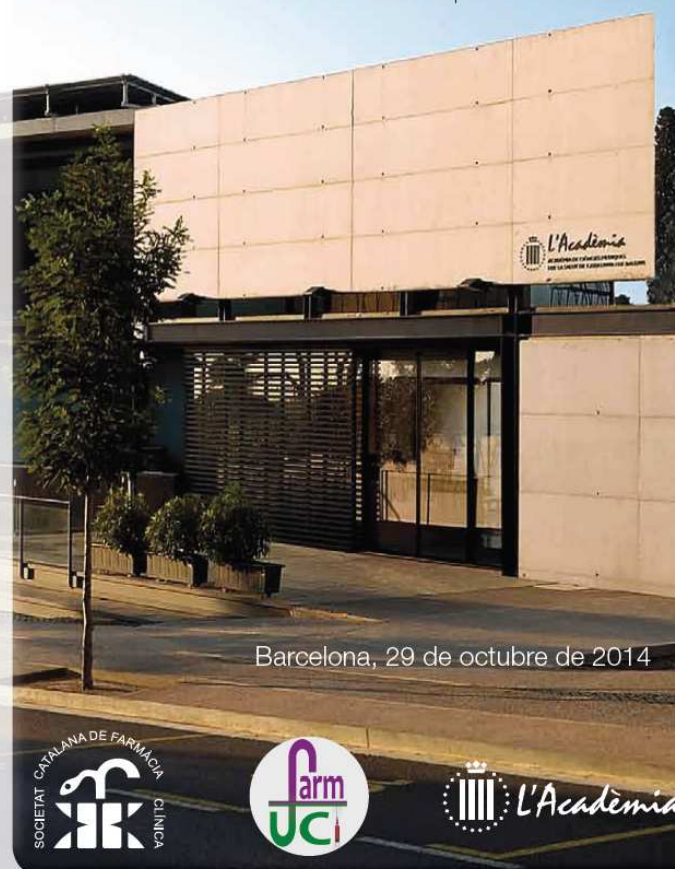
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I Jornada FarmUCI

El farmacéutico en la unidad de pacientes críticos



Barcelona, 29 de octubre de 2014



Do Clinical and Financial Impact of Pharmacy Services in the Intensive Care Unit: Pharmacist and Prescriber + the ICU

PRN OPINION PAPER

An Opinion Paper Outlining Recommendations for Training, Credentialing, and Documenting and Justifying Critical Care Pharmacy Services

William Dager, Pharm.D., Scott Bolesta, Pharm.D., Gretchen Brophy, Pharm.D., Kamila Dell, Pharm.D., Anthony Gerlach, Pharm.D., Judith Kristeller, Pharm.D., Scott Micek, Pharm.D., Mary Hess, Pharm.D., Michael Bentley, Pharm.D., Paul Juang, Pharm.D., Robert MacLaren, Pharm.D., Sandra Kane-Gill, Pharm.D., Krystal Haase, Pharm.D., Henry Mann, Pharm.D., Colby Miller, Pharm.D., Diane Pepe, Pharm.D., Robin Southwood, Pharm.D., Kyle Weant, Pharm.D., Jill Rebeck, Pharm.D., and Christopher Wood, Pharm.D.

In 2000, the Society of Critical Care Medicine (SCCM) and the American College of Clinical Pharmacy (ACCP) published a position paper that defined critical care pharmacy services as fundamental, desirable, and optimal. A task force was developed that included individuals who are members of the ACCP Critical Care Practice and Research Network, the SCCM clinical pharmacy and pharmacology section, and the American Society of Health-System Pharmacists to develop an opinion paper with three primary objectives: to provide recommendations for the level of preparation and training of pharmacists to practice in critical care, to develop recommendations for the credentialing of pharmacists providing critical care services, and to develop mechanisms for documenting and justifying intensive care unit (ICU) pharmacy services. Each objective was addressed to accommodate the levels of services defined as fundamental, desirable, or optimal,

Do as I say, not as I do.

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Overview

- Description of BWH and the pharmacy department
- Clinical services provided in the ICU
- Expectations of our ICU pharmacists
- Software support
- Importance of board certification

Description of BWH and the Pharmacy Department

- 800 bed Academic Medical Center
 - 102 adult ICU bed
 - MICU - 20
 - SICU - 10
 - Thoracic ICU - 10
 - Cardiac Surgery ICU- 22
 - Cardiac Medicine ICU- 10
 - Burn/Trauma ICU - 10
 - Neuroscience ICU - 20
 - About 70 Pharmacists
 - 15 with a focus on Critical Care
 - 8 pharmacist rounding in the ICU per day



BWH Clinical Pharmacy Metrics

- 43 Board Certified Pharmacists
- 24 hour, 7 day a week clinical coverage
- Rounding on over 18 teams house-wide daily
- Over 20,000 accepted clinical intervention annually
- Over 130 pharmacy students precepted annually
- Over 40 multidisciplinary teaching seminars annually
- Over 45 peer-reviewed manuscript published annually
- Over 50 national and regional presentations annually



The BWH Model

- ICU Pharmacy Practice vary in the USA
 - Focus on BWH Model
- Decentralized clinical pharmacists
- Integration of clinical and operational duties
 - Shared practice throughout the department
 - Duties include: computer order entry, rounds, presentations, student activities, collaboration with other healthcare professionals, oversight of delivery and omniceil problem resolution



Decentralization

- Monday through Friday: 7:00 AM- 3:30 PM
- Locations
 - ICU
 - Step/down
- Direct contact with other health care professionals
 - Nurses
 - Physicians
 - Respiratory Therapists
 - Physical Therapists
 - Nutritionists

Clinical Pharmacy Services Intensive Care Units (ICU)

- Neonatal ICU (1 pharmacists)
- Medical ICU (2 pharmacists)
- Surgical ICU (1 pharmacist)
- Burn/Trauma ICU (1 pharmacist)
- Cardiac Surgery ICU (1 pharmacist)
- Neurology ICU (1 pharmacist)
- Thoracic ICU (1 pharmacist)
- Coronary Care Unit (1 pharmacist)

Inpatient Roles and Responsibilities

- Daily Rounds
- Computer order entry approval process – continuous 24/7
- Documentation of interventions and adverse event reporting
- Clinical initiatives – some examples
 - Aminoglycoside Monitoring and other Therapeutic monitoring
 - Targeted discharge teaching
 - Clinical monitoring program
- Cost containment initiatives
 - Target drug initiatives/stewardship
 - IVIG, Dexmedetomidine, albumin, chlorthiazide, direct thrombin inhibitors
 - IV to PO
- Preceptorship of pharmacy students/residents
- Scholarship
 - Medication utilization evaluations (MUEs)
 - Presentation of research/reviews
 - publications



Expectations of Clinical Pharmacist Specialist

- **Clinical Specialist: Objective Requirements**

- P&T Newsletters (1) written/year
- Research Participation (1)
- Peer reviewed articles published/year (1)
- CEU programs presented/year (2)
- Prepare a journal club review, in-service, or case study for the 3pm pharmacist meeting
 - At least 6 per quarter or 24/year
- Precepting responsibly
 - Typically 8 month/year



Expectations of Clinical Pharmacist Specialist

- Clinical Specialist: Requirements
 - Leader within the department
 - Lead educational programs within department
 - Create new target drug initiatives
 - Go-to person
 - Leading throughout hospital
 - Interdisciplinary projects
 - Interdisciplinary committees

Clinical Pharmacist Practice



Topic intervened on by ICU pharmacist

- PAD
 - ICU sedation
- Glucose
- Hemodynamics
 - What pressor
 - Steroids
- Prophylaxis
 - Stress ulcer
 - VTE
 - Ventilator PNA
- Selection and Dosing of antimicrobials
- Therapeutic monitoring medication
- Drug-drug interaction

Clinical Pharmacy Consults: CPC's

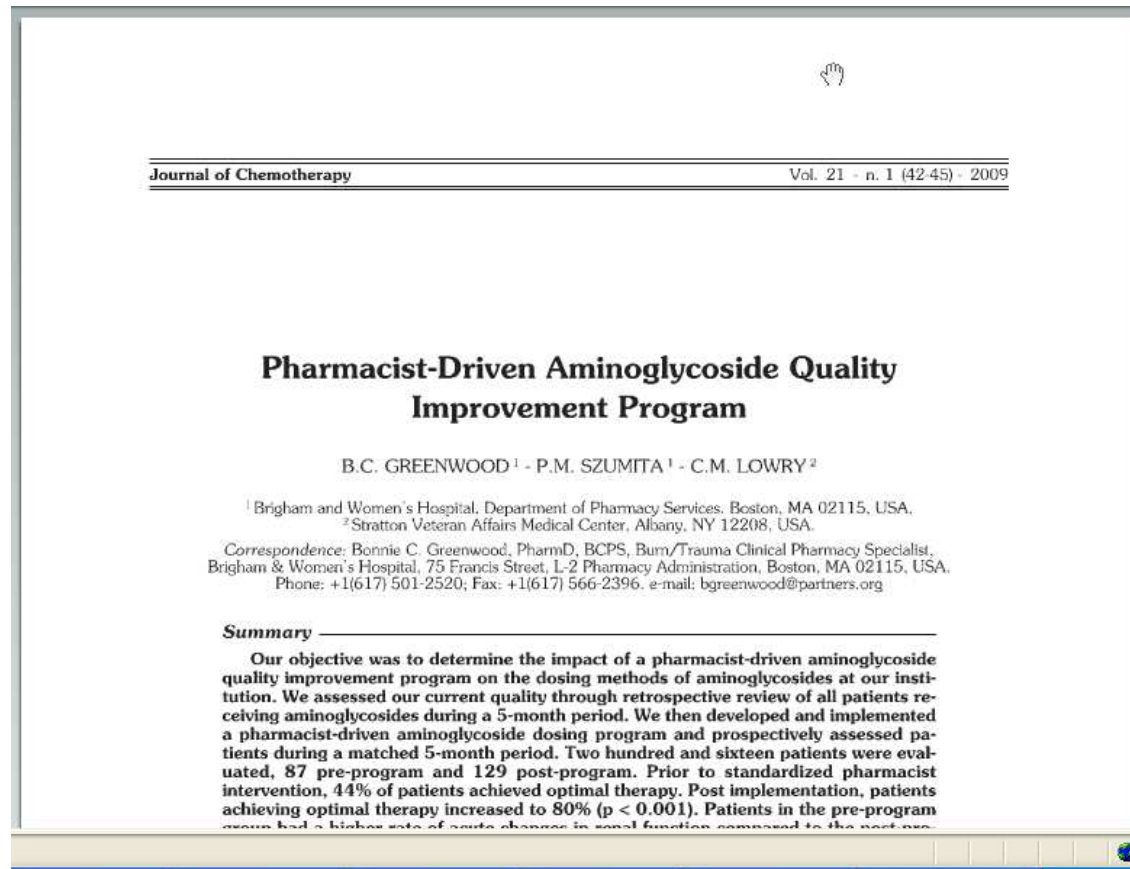
- Documentation of clinical interventions through Adult RX system
 - Monitoring
 - Alteration of drug regimens
 - Cost effectiveness
- Documented intervention last year
 - 20,000

Pharmacy Drug Initiatives:

Aminoglycoside Dosing

- Daily reporting of patients on aminoglycosides
- Pharmacist dosing recommendations
- Monitoring
 - Drug levels
 - Renal function
 - Efficacy and Safety variables

Result of Pharmacist Aminoglycoside Program



Greenwood B, Szumita PM, Lowry C. Pharmacist-driven
aminoglycoside quality improvement program. J Chemother.
2009 Feb 21 (1): 19-23



Resources are important

- Online Resource of Drug Information
- Pharmacy Drug Administration Guidelines
 - Drug Description
 - Indication and Dosage
 - Monitoring Parameters
- Intravenous Dilution Guidelines
- Drug Intravenous Push Guidelines
- Antimicrobial Agents Renal Dosing Guidelines

Clinical Guideline management of high cost drugs

Cost Containment Landscape

Financial Role of Clinical Pharmacist at BWH

- Cost consciousness, is necessary to contain budgets and meet fiscal goals
 - Total health care cost, include:
 - Length of stay, acuity of care, cost of adverse drug reactions, and acquisition cost of medication



Financial Role of Clinical Pharmacist at BWH

Prescribing guidelines may be necessary

- Prevent inappropriate use
- Promote use if appropriate
- Target Drug Initiatives
 - Clinical Interventions performed pharmacists
 - Example 2009 = Chlorothiazide IV ~ \$275.00 per dose
 - Change to PO save ~ \$100,000/year
 - » Not easy, clinical pharmacist responsibility to enforce



Pharmacy Drug Initiatives:

IV to PO Antimicrobial Conversion

- Daily antibiotic review for pharmacists
- Changes in patient status may qualify them for a change from IV medication to PO medication
- Significant cost savings for patients

Patient.Room

10B-371
10C-551
10D-711
11B-333
11C-511
11C-531
11C-591
12A-142
12D-761
14A-112
14A-151
14A-171
14B-311
14B-382
14C-591
15A-121
15A-142
15B-322
15B-351
15C-541
15C-541

B



Examples

- Dexmedetomidine Stewardship
- Inhaled epoprostenol (Veletri) – NO or Flolan
- IVIG IBW
- Stability of regular human insulin

Impact of ideal body weight dosing for all inpatient i.v. immune globulin indications

Intravenous immune globulin (IVIG) ABW. Grams averted was calculated as the theoretical IVIG dose minus the dose

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human insulin, stored under refrigeration, to the maximum beyond-use-date allowed by United States Pharmacopeia chapter 797.

Methods: At time "0" three admixtures of regular human insulin were prepared by withdrawing 1 mL of regular human insulin with a concentration of 100 units/mL and adding it to a sufficient

End point	iNO (n = 53)	iEPO (n = 52)	P
Duration of study	2.5 ± 0.7	2.2 ± 0.6	.66

Mean insulin concentration

Overall, this initiative resulted in a 20% theoretical reduction in the amount of IVIG dispensed in a 12-month period.

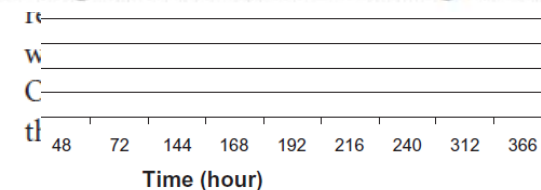


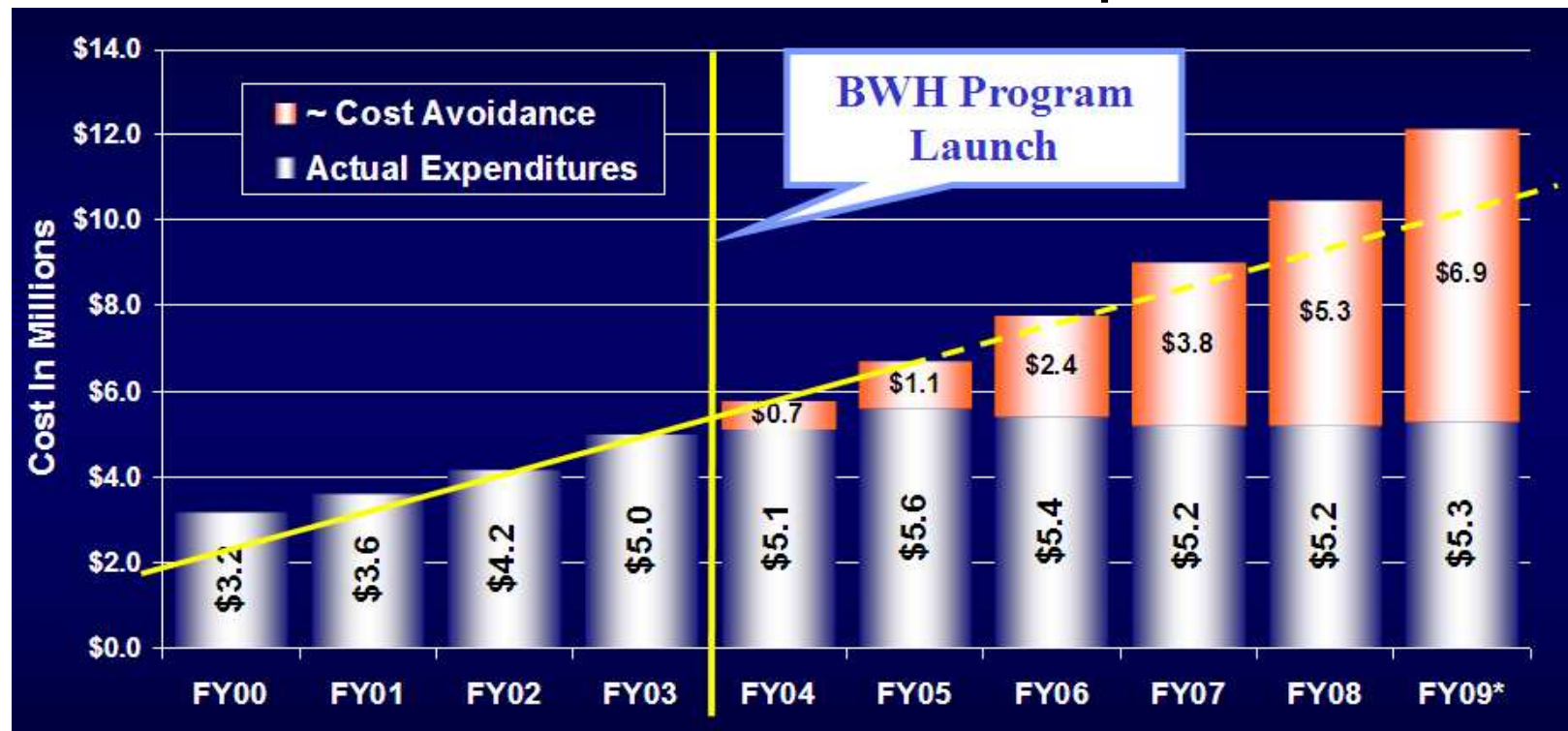
Figure 2 Mean concentration of insulin 100 units prepared in a total volume of 100 mL 0.9% sodium chloride stored at 2°C–8°C.

Notes: Data are expressed as mean ± standard deviation; *represents the 168-hour time point sample, which did not maintain the equilibrium concentration.

Figure 2. Dexmedetomidine use.

Antimicrobial Committee

Gross Antimicrobial Expenditures



Committee Participation

- ACPE Committee
- Acute Care Documentation Committee
- Adverse Drug Event Committee
- Aerosolized Medication Task Force
- Alcohol Withdrawal Syndrome Task Force
- Antimicrobial Subcommittee
- Alaris/Smart Pump Medication Library Team*
- ASHP Pharmacy Informatics and Technology Section Advisory Group
- ASHP Section of Clinical Specialists and Scientists: Programming Committee
- Chronic Pain Committee
- Combined Pharmacy Information System Steering
- Contrast Agent Safety Committee
- Council of Boston Teaching Hospitals Grand Rounds Steering Committee
- Critical Care Forum Advisory Board
- Deep Sedation Committee
- Delirium Task Force
- Diabetes Subcommittee
- Disaster Committee
- Drug Administration Guideline (DAG) Committee
- Drug-Drug Interaction Steering Committee
- Drug Safety Committee
- eMAR Business Owner Committee
- Emergency Department Care of Mechanical Ventilation
- Emergency Response Committee
- Event Engine Committee
- Executive Walk-rounds Group
- Falls Prevention Committee
- Forms Subcommittee (of the Medical Records Committee)
- GCRC Implementation Meetings



- Germ Warfare Committee (7CD)
 - High Performance Medicine 2 - Enhancing Patient Safety - Subgroup 2
-
- High Performance Medicine 2 - Medication Decision Support Steering Committee
 - Human Research Committee Institutional Review Board (IRB)
 - ICU Committee
 - Induced Hypothermia Task Force
 - Investigational Drug Services Information System Committee
 - IV Push Task Force
 - Joint Commission Ever Ready Committee
 - Joint Commission Steering Committee
 - Joint Commission Ambulatory Readiness Committee
 - LMR User Committee
 - Medical Assistant Medication Reconciliation Training Committee
 - Medication Incident Report Review Committee
 - Medication Knowledge Committee
 - Medication Order Intervention (MOI) Committee
 - Medication Reconciliation Committee
 - Metabolic Support Service Committee
 - Moderate Sedation Committee
 - Needle Safety Committee
 - Operating Room Safety Committee
 - Order Set Committee
 - Orthopedic Care Improvement Committee
 - Pain and Sedation Steering Committee
 - Partners Health Systems (PHS) Smart Infusion Pump Committee
 - Partners Pharmacy Executive Committee
 - Pharmacy Information System Business Owner Committee
 - Pharmacy Peer Review Committee
 - Pharmacy and Therapeutics Committee (BWH)
 - Pharmacy and Therapeutics Committee (Dana-Farber Cancer Institute)
 - Pharmacy and Therapeutics Committee (Faulkner Hospital)
 - Post-Operative Pain Committee
 - Peer Review Committee
 - Pneumonia Improvement Team
 - Pulmonary Medicine TB Clinic
 - Quality Outcomes Group Task Force
 - Restraint Committee
 - RiSC (Risk, Safety, Compliance) Group
 - SCIP: Surgical Quality Improvement Committee
 - Sedation Task Force
 - Sedation Agitation Pain in the ICU (SAPI) Committee
 - Thoracic Safety Committee
 - UHC Research and Education Committee
 - UHC Financial Performance
 - UHC Pharmacy Executive Committee
 - UHC Practice Advancement Committee
 - Vendor Task Force
 - Ventilator Bundle Compliance Committee
 - VHA Northeast Pharmacy Council



Daily Departmental Clinical Meeting

Monday - Friday

August, 2012						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	
29	30 3:00 PM Ticagrelor vs Prasugrel	31 3:00 PM Journal Watch	1 3:00 PM Jen - ED/HD updates	2 3:00 PM Pharmacy Safety Rounds- Chad	3 3:00 PM Celecoxib - no alert in system for sulfonamide allergy	4
5	6 3:00 PM The nobody signed up Keys special: RASS +5	7 3:00 PM Journal Watch	8 3:00 PM Glanzmann's Thrombasthenia- Gabby UCONN student	9 3:00 PM L and D Pharmacy Session #1A (Ashley)	10 3:00 PM L and D Pharmacy Session #1B (Veronica)	11
12	13 2:30 PM Monthly Staff Meeting	14 3:00 PM Journal Watch	15 3:00 PM NICU Order Verification Tips (Jamie)	16 3:00 PM L&D: OB Hemorrhage. Guest speaker Ginny Silva	17 3:00 PM Rachel M ISMP	18
19	20 3:00 PM James- Cardiac Surgery topic	21 3:00 PM Journal Watch	22 3:00 PM Last minute 3pm:Bloopers	23 3:00 PM Craig - Treatment of Delirium in Parkinsons	24 3:00 PM Moh-Neonatal Hypertension	25
26	27 3:00 PM	28 3:00 PM	29	30 3:00 PM	31 3:00 PM	1

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Tuesday 3PM Meeting: The Journal Watch

- Over 25 peer reviewed journals reviewed
- Weekly meeting with 4 to 5 presenters each week
- Each journal presented every 5 weeks
- Contents are summarized for clinically significant
 - Trials
 - Reviews
 - Editorials
 - Case Reports



BWH Pharmacy ADE Clinical Surveillance System

- Real-time alert monitoring application
 - Over 100 rules-based alerts (pharmacy, lab, micro)
 - Interventions documentation system
 - Patient Flags: electronic shift communication tool
 - Antimicrobial stewardship (drug-bug mismatch)
- Robust patient specific information and built-in clinical resources enhancing patient care and departmental communication

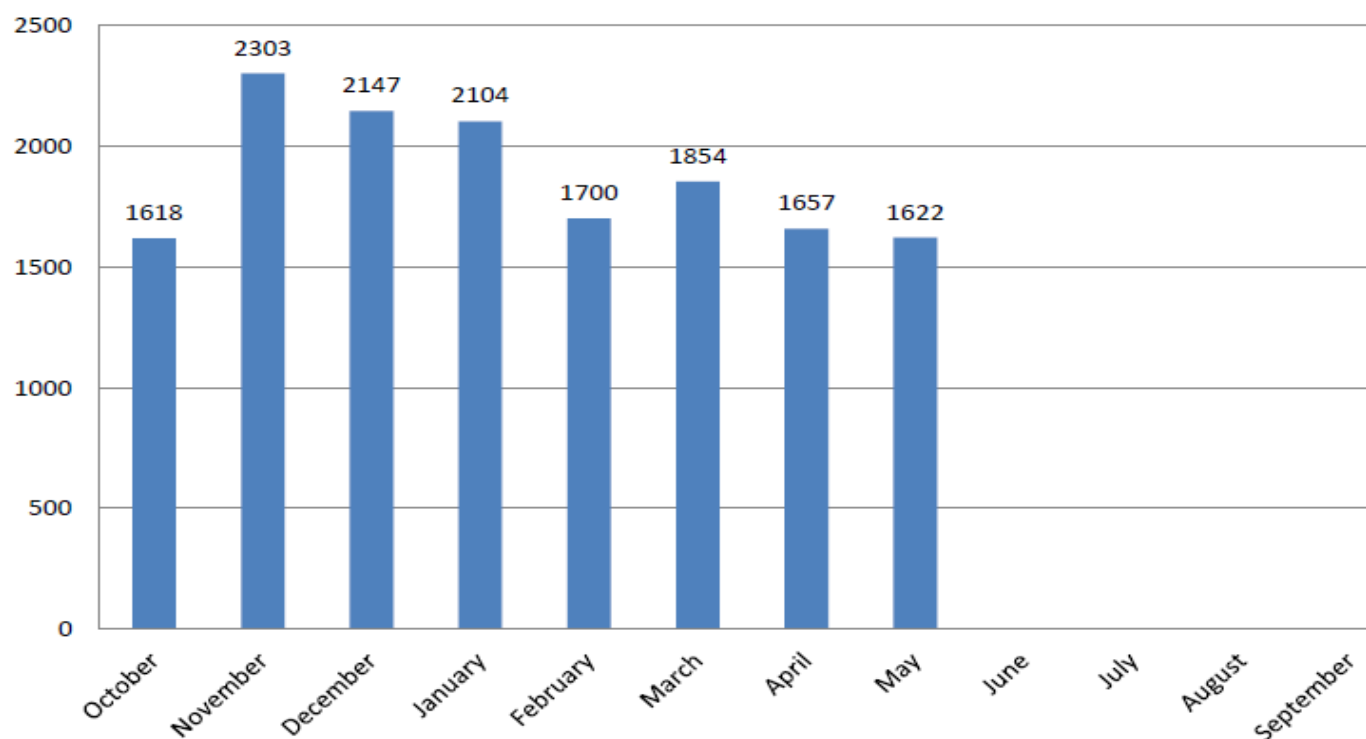


BWH Pharmacy Clinical Surveillance System

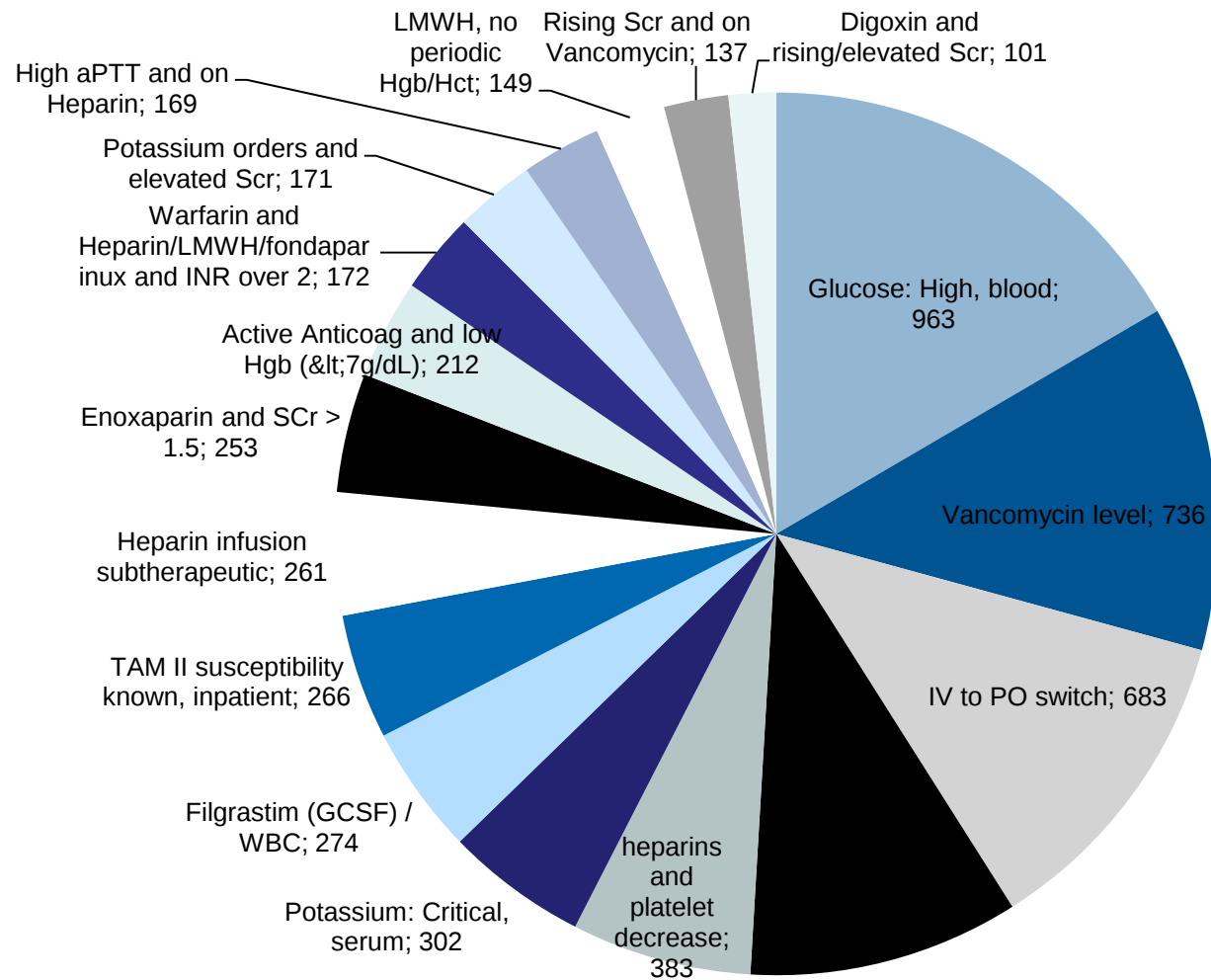
TheraDoc™

- FY13 ADE Monitor total interventions: 2,416
- FY14 YTD Interventions: **15,005**

Total Interventions per Month (2013/2014)



Top Interventions by Alert: 5 Months



Training/Board Certification

- BCPS
- BPS – Critical Care

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Conclusions

- ICU pharmacist can make impact
 - Clinical
 - financial
- Clinical practice differs globally; however the evolution of pharmacy practice is an on-going progression
- Training and certification are important, but not the end all

Muchas gracias por su atención y
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Edurne Fdez. de Gamarra
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