Drug Information PRN Focus Session—Drug Information Education in the Pharmacy Curriculum

Activity No. 0217-0000-11-075-L04-P (Knowledge-Based Activity)

Monday, October 17
1:30 p.m.–3:30 p.m.
Convention Center: Rooms 317 & 318

Moderator: Michael Gabay, Pharm.D., BCPS
Clinical Associate Professor, Director, Drug Information Group and Prior Authorization Services,
University of Illinois at Chicago College of Pharmacy, Chicago, Illinois

Agenda

1:30 p.m.  Drug Information Education: Current Status
Michael Gabay, Pharm.D., BCPS

2:30 p.m.  Drug Information Education: Survey of Educators
Jennifer Phillips, Pharm.D., BCPS
Assistant Professor, Midwestern University Chicago College of Pharmacy, Downers Grove, Illinois

3:15 p.m.  Effective Drug Information Education: What Works and What Doesn’t—Panel Discussion
Michael Gabay, Pharm.D., BCPS
Jennifer Phillips, Pharm.D., BCPS

Faculty Conflict of Interest Disclosures

Michael Gabay: no conflicts to disclose.
Jennifer Phillips: no conflicts to disclose.

Learning Objectives

1. Describe current ACPE standards for drug information/literature evaluation.
2. Review ACCP Drug Information PRN opinion paper on drug information: from education to practice.
3. Describe current approaches to effectively teach drug information/literature evaluation.
4. Explain the development process for the survey of educators.
5. Discuss results from the survey regarding drug information/literature evaluation education at colleges of pharmacy.
6. Discuss implications of the results and steps forward to improve drug information/literature evaluation education.

Self-Assessment Questions

Self-assessment questions are available online at www.accp.com/am
Drug Information Education – Current Status
Michael Gabay Pharm.D., J.D., BCPS
Clinical Associate Professor – University of Illinois at Chicago
October 17, 2011
Conflicts of Interest

- No conflicts of interest related to this presentation.
Learning objectives

- Describe current ACPE standards for drug information/literature evaluation.
- Review available literature on drug information education in colleges of pharmacy.
- Review the ACCP Drug Information PRN opinion paper on drug information: from education to practice.
ACPE standards

- Most recent guidelines Version 2.0 – effective February 2011
- Colleges must ensure that graduates are competent to:
  - Provide patient-centered and population-based care
  - Manage human, physical, medical, informational, and technological resources
  - Manage medication use systems
  - Promote availability of health and disease prevention services and health policy

In order to achieve the above, graduates must be able to:

- Communicate and collaborate with patients, care givers, and other healthcare providers, etc.
- Retrieve, analyze, and interpret the literature to provide drug information and counseling
- Evaluate quality of evidence to appropriately apply study results to practice decisions
- Demonstrate expertise in informatics
- Carry out duties in accordance with guidelines
- Maintain professional competence

ACPE standards

**Foundational areas:**
- Basic biomedical sciences
- Pharmaceutical sciences
- Social/behavioral/administrative sciences
- Clinical sciences

**Drug Information**
- Fundamentals of drug information practice
- Application of DI skills for delivery of pharmaceutical care
- Technology of DI retrieval for quality assurance
- Ability to judge reliability of various information sources

Clinical sciences

- Literature evaluation and research design
  - Fundamentals of design and methodology
  - Principles of primary literature evaluation
  - Implications of the primary literature
  - Principles of design and analysis in practicing evidence-based pharmacy
  - Levels of clinical evidence
  - Regulatory and ethical principles of research

- Other areas: medication safety; informatics
Pre-APPE performance domains and abilities

- Drug information analysis and literature research
  - Example performance competencies
    - Collect accurate, comprehensive DI from appropriate sources
    - Recognize types of information in various sources
    - Analyze and apply information to patient- or population-specific needs
    - Describe content in commonly used resources
    - Use effective written, verbal, and nonverbal communication skills to respond to DI questions
Required APPEs:
- Community
- Hospital or health-system
- Ambulatory care
- Inpatient/acute care general medicine

Drug information – elective APPE

IPPE – drug information skills
Literature review

- Kirschenbaum and Rosenberg 1984
- 72 colleges
- 93% response rate
- Almost all provided some degree of DI education
- 50% formal DI clerkship (baccalaureate)
- 100% DI clerkship requirement (PharmD)

Literature review

- Davis and Krucke 1994
- 75 colleges of pharmacy
- Response rate: 75%
- 84% offered drug information course
  - 0.5 to 4 credit hours
- 91% offered DI clerkship
  - 40 to 320 hours

Entry-level PharmD DI course objectives

- History/philosophy of DI services
- Biomedical publication process
- Systematic handling of requests
- Primary, secondary, tertiary literature
- Databases
- Verbal/written communication techniques
- Drug literature evaluation
- Adverse drug reactions – detection, evaluation, reporting

Entry-level PharmD DI course objectives

- Drug policy management, formulary development*
- Drug approval process
- Personal library development – keeping current
- Ethical/legal issues
- Quality assurance

Entry-level PharmD clerkship objectives

- Drug information retrieval from literature/computerized databases
- ADR reporting
- Respond to requests from public/health professionals
- Written communication
- Drug policy management
- Application of literature evaluation skills
- DI quality assurance activities
- Develop personal library

Literature review

- Mullins et al 1995
- 74 colleges of pharmacy
- Response rate: 89.2%
- 59.1% - course director completed survey
- 85% offered stand-alone DI course
  - 1 to 4 credit hours

“Strongly emphasized” course topics

<table>
<thead>
<tr>
<th>Course Topic</th>
<th>Percent</th>
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<tbody>
<tr>
<td>Clinical importance of study design</td>
<td>72.5%</td>
</tr>
<tr>
<td>Efficient search strategies</td>
<td>61.5%</td>
</tr>
<tr>
<td>Types and functions of information resources</td>
<td>50.9%</td>
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<tr>
<td>Oral and written communication skills</td>
<td>47.1%</td>
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<tr>
<td>Statistical methods</td>
<td>44.2%</td>
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</table>

“Not included” course topics

- Drug utilization evaluation – 30.8%
- Career opportunities – 30.2%
- Library orientation – 28.3%

Literature review

- Cole and Berensen 2005
- 88 colleges of pharmacy
- Surveys conducted via phone
- 15 min interview with standard script
- Response rate: 90%
- 89% of first professional degree programs required at least 1 DI course
- 36% required 2 DI courses

Literature review

- **Major topics covered:**
  - Systematic approach
  - DI resources
  - Organization of biomedical literature
  - Computerized searching skills
  - MICROMEDEX
  - Adverse drug reactions
  - Critical literature evaluation
  - Ethics
  - Biostatistics

Literature review

- 20% of first professional degree programs required DI practice experience
- 70% offered as an elective
- 10% did not offer a DI experience
- Mean length required: 4 weeks (2.5 to 6 weeks)
- Mean length elective: 5 weeks (4 to 8 weeks)
- Reasons for not offering: lack of sites and qualified faculty

Drug information – advanced practice experience

<table>
<thead>
<tr>
<th>Major efforts of practice experience</th>
<th>Percentage of first professional pharmacy degree programs</th>
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<tbody>
<tr>
<td>Improve knowledge of references</td>
<td>100%</td>
</tr>
<tr>
<td>Improve computerized searching skills</td>
<td>99%</td>
</tr>
<tr>
<td>Staff DI center and respond to requests</td>
<td>97%</td>
</tr>
<tr>
<td>Participate in journal club</td>
<td>90%</td>
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<tr>
<td>Evaluate adverse drug reactions</td>
<td>79%</td>
</tr>
<tr>
<td>Write formulary monographs</td>
<td>75%</td>
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If no practice experience offered or required, how are DI skills evaluated?

- DI portfolio kept and evaluated by DI faculty member – 5%
- DI portfolio kept and evaluated by non-DI faculty – 19%
- DI skills are assumed and not specifically taught or evaluated – 70%
- Unsure – 6%

Literature review

- Wang et al 2006
- 86 colleges of pharmacy
- Web-based survey
- Response rate: 73%
- Respondents: DI course coordinators (44%)

Literature review

How is didactic drug information taught?

Team taught course – 63%
Primary course instructor full-time faculty member – 90%
75% of primary instructors – some level of postgraduate training
54% of above completed specialized DI training

Literature review

- 35% had DI course in second year
- 19% in third year
- 11 schools offered DI didactic work integrated into 2 professional years
- 50% had a laboratory or recitation component

Literature review

- **Laboratory or recitation activities**
  - Advanced literature searching/analysis
  - Managing adverse drug reactions
  - Answering DI requests
  - Journal club
  - Medication use evaluation
  - Monograph preparation
  - Research projects

Integrated courses

- 30% overall offered an integrated approach
- Laboratory or recitation component often included
- Top activities in integrated sessions:
  - Advanced literature searching and evaluation
  - Answering drug information requests

Literature review

- Experiential education
  - 23% required
  - 62% elective
  - 15% did not offer
    - Assumed to be covered in other APPEs or other experiences
    - Lack of training sites
    - Lack of faculty resources

Literature review

Most common activities in experiential
- Answering drug information requests
- Advanced literature searching and analysis
- Journal club
- Monograph preparation

Primary experiential preceptor
- 67% completed residency or fellowship
- 41% specialized DI training

2009 – ACCP DI PRN opinion paper

- “Drug information: from education to practice”
- 2 distinct sections
  - Education and training
  - Practice areas

Purpose

- Describe role of DI and that of the DI specialist in the training of students and advanced trainees
- Describe role of focused training for specialization
- Describe role of DI specialist in practice areas, identify challenges, and provide recommendations

Minimum core DI concepts

- Applying medical information to specific patients
- Counter-detailing and appropriate interactions with industry
- Literature search strategies
- Critical evaluation of marketing and promotional materials/advertisements
- Describing the drug regulation process
- Distinguishing statistical vs. clinical significance
- Discerning/communicating appropriate information to patients
- Evaluating drug use policies and procedures
- Identifying, evaluating, and utilizing key print sources

Minimum core DI concepts

- Identifying, managing, reporting, and preventing adverse drug events
- Incorporating principles and practices of evidence-based medicine into pharmaceutical care
- Locating and critically evaluating medical information on the Internet
- Preparing, presenting, and participating in journal clubs
- Providing verbal and written responses to DI requests
- Summarizing basic biostatistics and research design
- Understanding creation/management of a drug formulary
- Using electronic databases/other references in effective manner

**APPE recommended activities**

- Accessing/evaluating/applying information to promote optimal health care
- Conducting drug use review
- Developing/analyzing clinical drug guidelines
- Identifying/reporting medication errors and adverse drug reactions
- Managing drug use system and applying systems approach to drug safety
- Managing use of investigational drug products
- Participating in discussions/assignments concerning health policy matters that may affect pharmacy

■ APPE recommended activities

- Participating in discussions/assignments regarding compliance
- Participating in discussions/assignments regarding drug approval process and role of key organizations in public safety and standards
- Participating in the formulary process
- Participating in quality improvement
- Participating in protocol development
- Performing outcomes analysis to support formulary recommendations and therapeutic guideline development
- Using publications in decision-making process
- Working with technology used in practice

DI PRN opinion paper

- DI skills should be applied/required in all APPEs

Recommendation:

- All colleges of pharmacy offer specific DI APPEs precepted by appropriately trained DI specialists

Drug information educators

- Noticeable trend is lack of qualified educators
- Recommendation:
  - All colleges of pharmacy devote minimum of 1 FTE for drug information specialists
  - Colleges should also provide sufficient resources to faculty and preceptors
  - Drug information educators should have substantial postgraduate training

Summary

- ACPE recent updated guidelines
- Some updates affect the area of drug information
- Over the years, variety of published literature on drug information education
- 2009 DI PRN opinion paper offered recommendations DI education and training
Summary

- Where do we go from here?
  - Dr. Phillips – survey
  - Hope to build upon DI PRN opinion paper
Questions?
DI PRN Survey:
Instructional Methodology

Jen Phillips, Pharm.D., BCPS
Assistant Professor, Pharmacy Practice
Midwestern University Chicago College of Pharmacy
October 17, 2011
Learning Objectives

- Explain the development process for the survey of educators.
- Discuss results from the survey regarding drug information/literature evaluation education at colleges of pharmacy.
- Discuss implications of the results and steps forward to improve education on drug information/literature evaluation.
Goals of Study

- Assess the extent to which opinions expressed in the 2009 DI PRN paper have been incorporated by pharmacy schools in the U.S.
- Characterize qualifications of faculty members involved in drug information education
- Identify types of methodology used to deliver drug information education
- Identify recent changes in drug information education
Recruitment

- After IRB approval, a description letter and survey link was sent to:
  - Deans of Pharmacy
  - AACP Directory
  - ACCP DI PRN

- Survey recipient was asked to forward to the appropriate individual at their institution

- Completion of survey implied consent to participate in the survey
Survey Development Process

- Initial discussion at 2010 ACCP DI PRN Business Meeting
- Several phone meetings with survey team
  - Find and discuss relevant background information
  - Determine question(s) of interest
  - Determine feasibility of the project
  - Develop survey instrument
- Survey instrument refined & piloted by survey team
- IRB application submitted and approved
- Survey distributed (3 week response time)
- Data analysis
Information collected in this survey was organized into 4 sections:

- Demographics
- Methodology of instruction
- Content of curriculum
- Recent changes (content or methodology)
Response Rate

- Survey distributed to Deans of Pharmacy (n=128) and ACCP DI PRN
- 72 completed surveys
  - 4 excluded (duplicates from same institution)
  - 2 excluded (experiential preceptors)
  - 1 excluded (student on a DI rotation)
- Response rate: 64 (50%)
Demographics

Survey Responders

Assistant, Associate, or Full Professor: 70%
Course Director: 59%
Instructor: 36%
Other: 11%
Assistant/Associate Dean: 6%
Chair / Vice Chair: 6%
Demographics

- 4-year PharmD program: 46 (72%)
- 6-year PharmD program: 15 (23%)
- Non-traditional PharmD program: 2 (3%)
- Other: 5 (8%)
  - 7-year PharmD program (n=1)
  - 3-year accelerated program (n=3)
  - 1 combination MS, PhD program (n=1)
Demographics

- Age of pharmacy program
  - Mean: 53 years (range 1-152 years)

- Class size
  - 2010 class
    - Mean 119 (range: 51-250)
  - 2011 class
    - Mean 124 (range: 52-287)
Demographics

Geographical Region

- Northeast: 2%
- Midwest: 25%
- South: 38%
- West: 13%
- Other: 2%

American College of Clinical Pharmacy

Northeast
Midwest
South
West
Other
Demographics

Pre-requisite Classes for Admission

<table>
<thead>
<tr>
<th>Course</th>
<th>Yes</th>
<th>No</th>
<th>I don't know</th>
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<tbody>
<tr>
<td>Statistics</td>
<td>53%</td>
<td>39%</td>
<td>5%</td>
</tr>
<tr>
<td>Computer Literacy</td>
<td>13%</td>
<td>69%</td>
<td>16%</td>
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Yes
No
I don't know
Demographics

- **Length of Term (n=62)**
  - Semester system: 54 (87%)
  - Quarter system: 5 (8%)
  - Other: 3 (5%)
    - One had both quarter and semester and two utilized a block schedule

- **Laptops (n=62)**
  - Required: 33 (53%)
  - Not required: 26 (42%)
  - Unknown: 3 (5%)
<table>
<thead>
<tr>
<th></th>
<th>1 FTE or more</th>
<th>Mean</th>
<th>Range</th>
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<tbody>
<tr>
<td>Overall</td>
<td>61% (39/62)</td>
<td>1.8</td>
<td>0.5-8.1</td>
</tr>
<tr>
<td>Class size ≥100</td>
<td>68% (21/31)</td>
<td>2.29</td>
<td>1-8.1</td>
</tr>
<tr>
<td>Class size &lt; 100</td>
<td>47% (10/21)</td>
<td>1.45</td>
<td>0.5-3</td>
</tr>
<tr>
<td>New schools</td>
<td>78% (7/9)</td>
<td>1.14</td>
<td>1-2</td>
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Methodology
Drug Information in the Curriculum (n=61)

- DI alone: 39%
- DI + Lit Eval + Stats: 31%
- DI + Lit Eval: 11%
- Throughout Program: 8%
- Other Course: 6%
- Other: 5%
Literature Evaluation in the Curriculum (n=37)

- Lit Eval alone: 51%
- Lit Eval + Biostats: 27%
- Another Course: 11%
- Throughout Program: 5%
- Other: 5%
Biostatistics in the Curriculum (n=34)

- Stats alone: 56%
- Another course: 32%
- Other: 6%
- Throughout program: 3%
- Not taught: 3%
Stand-alone Courses

- Drug Information (n=26)
  - Most (62%) offered one class
  - Mean credit hours: 2.7 (range: 1-6)
  - Most (73%) offered in the 1st professional year

- Literature Evaluation (n=20)
  - Most (70%) offered one class
  - Mean credit hours: 2.6 (range: 1-6)
  - Most offered in the 2nd (48%) or 3rd (33%) professional years
Stand-alone Courses

- Biostatistics (n=19)
  - Most (95%) offered one class
  - Mean credit hours: 2.4 (range: 1-3)
  - Most offered in 1\textsuperscript{st} (44%) or 2\textsuperscript{nd} (44%) professional years
Combination Courses

- DI + Lit Eval (n=5)
  - All offered one class
  - Mean credit hours: 2.8 (range: 2-3)
  - Most (60%) offered in the 2nd professional year

- DI + Lit Eval + Biostats (n=19)
  - Most (68%) offered one class
  - Mean credit hours: 3.6 (range: 2-6)
  - Most offered in 1st (37%) or 2nd (42%) professional years
Combination Courses

- Lit Eval & Biostats (n=8)
  - Most (75%) offered one class
  - Mean credit hours: 2.9 (range: 2-4)
  - Most (75%) offered in the 3rd professional year
Instructional Methodology

- Time devoted to didactic lectures
  - 44% used this format for 26-50% of course hours
  - 25% used this format for 51-75% of course hours
  - 19% used this format for >75% of course hours

- Time devoted to small-group activities
  - 49% used this format for 26-50% of course hours
  - 39% used this format for <25% of hours
Instructional Methodology

- Internet-based activity
  - 44 (76%) used this format
    - 53% used this format for <25% of course hours
    - 17% used this format for 26-50% of course hours
  - Content covered:
    - Internet resources, Pubmed, plagiarism, research ethics, biostats support, guidelines, on-line journal club
Instructional Methodology

- 56 (93%) of institutions used small-group activities in their course
  - Literature Evaluation/Journal Club: 48 (86%)
  - DI References: 42 (75%)
  - Other: 15 (27%)
    - Guidelines, Pubmed, Endnote, plagiarism, peer review, team-based learning, consults, level of evidence, verbal responses to DI questions
Instructional Methodology

- Didactic Instructors
  - Mean: 4 (range: 1-15)
  - No apparent relationship between the number of instructors and the class size

- Small-group facilitators
  - Mean: 3.8 (range: 1-20)
  - No apparent relationship between the number of facilitators and class size
Instructional Methodology

- 100% had at least one mandatory assignment
  - Mean: 8.7 (range: 1-35)
  - Top assignments:
    - DI references (individual): 45 (74%)
    - Pubmed search (individual): 44 (72%)
    - Journal club (group): 42 (69%)
    - DI paper/consult (individual): 39 (64%)
    - DI references (group): 28 (46%)
Instructional Methodology

- Technology used:
  - On-line course management: 95%
  - Audience response systems: 61%
  - Youtube: 13%
  - On-line blogs: 9%
  - Twitter: 4%
  - Wikis: 4%
  - Facebook: 0%
  - Others: Captivate, discussion boards, APhA counseling videos
Faculty Qualifications

![Bar chart showing faculty qualifications in different fields.](chart.png)

- **PharmD**
- **PhD**
- **PGY-1**
- **DI Residency**
- ** Specialty Residency**
- **Other**
Course Director Qualifications
Small-group Learning

- DI faculty: 73%
- Pharm Pract Faculty: 61%
- PGY-1: 32%
- Students: 23%
- Non-Pharm Pract Faculty: 18%
- PGY-2 DI: 14%
- Other: 13%
- PGY-2 (other): 4%
Activities performed by faculty:

- Facilitation: 50 (89%)
- Workshop writing/development: 17 (30%)
- Workshop grading: 35 (63%)
- Other: 6 (11%)

- Journal club evaluation, computer-based activities, self-study DI questions, designing in-class activities
Content
A total of 19 criteria described as “essential” in the DI PRN Opinion paper were evaluated.

- 10/19 (52.6%) were covered in the curriculum by all colleges of pharmacy.
- 14/19 (73.6%) were covered by all by one college of pharmacy.
- 5/19 (26%) were identified as “not taught” by a number of colleges of pharmacy.
Content of Curriculum

- Areas taught by 100% of respondents
  - Literature searching
  - Literature evaluation
  - Statistical vs. clinical significance
  - Using print resources effectively
  - Medication safety (ADRS, med errors, quality improvement)
  - Journal clubs
Content of Curriculum

- Areas taught by 100% of respondents (cont.)
  - Verbal & written responses to DI questions
  - Summarizing basic biostatistics
  - Discerning & communicating essential health information for patient education
Content of Curriculum

- Top areas identified as “not taught” in the curriculum:
  - Counter-detailing industry (n=22)
  - Evaluating marketing materials (n=14)
  - Pharmacy informatics (n=10)
  - Drug use policies/procedures (n=6)
  - Formulary management (n=6)
Content of Curriculum

Top areas taught in another course:
- Drug approval process (n=43)
- Medication safety (n=39)
- Communicating information for patient education (n=36)
- Drug use policies/procedures (n=33)
- Formulary management (n=31)
Recent Changes
Recent Changes to Content

- More focus on EBM: 66%
- Less emphasis on print resources: 46%
- More focus on informatics: 24%
- More focus on med safety: 22%
- Other: 20%
- No changes: 14%
- More focus on policy/regulatory issues: 8%
Recent Changes to Content

Other responses included:

- Increased focus on the internet & on-line resources
- Medication Usage Evaluations
- Increased focus on writing
- Increased focus on more “real world” topics
- Increased focus on statistics
- Increased focus on non-inferiority studies
Recent Changes to Methodology

- More active learning: 76%
- More workshops: 42%
- Incorporating technology: 25%
- Other: 15%
- No changes: 14%
Recent Changes to Methodology

- Other responses included:
  - Increasing the number of credit hours
  - Making class more “learner-centered”
  - Creating a DI lab
  - Making information more pertinent to practicing pharmacists
Top Areas Students Struggle With

- Top 3 topics students struggle with:
  - Critically evaluating medical literature (n=44)
  - Summarizing basic biostatistics and research design (n=27)
  - Creating effective and efficient literature search strategies (n=25)
Strategies to Help Students

- More practice opportunities for students (n=32)
  - More active learning opportunities
  - More assignments
  - More small-group learning
  - OSCEs

- Reinforcing drug information skills throughout the curriculum (n=4)
Strategies to Help Students

- Changing Curriculum (n=4)
  - Allocating more time for these topics (n=2)
  - Changing the order of the curriculum (n=1)
  - Combining courses (n=1)
- Making examples more patient-specific (n=2)
- Creating interactive tutorials/modules (n=2)
- Allocating more human resources to help students (n=1)
Conclusions

Original goals of study:
- Assess the extent to which DI PRN recommendations have been incorporated
- Progress is being made with regard to content covered
  - 53% of core DI concepts were covered by all colleges responding to survey
  - 74% of core DI concepts were covered by almost all colleges responding to survey
- Still room for improvement
  - 26% of core DI concepts were not taught by a number of colleges of pharmacy
Conclusions

- Characterize qualifications of faculty members
  - Most faculty teaching DI (96%) and literature evaluation (90%) have a PharmD degree
    - Most (64% and 56%, respectively) have completed a DI residency
  - 58% of faculty teaching biostatistics have a PharmD degree
    - 39% have completed a DI residency
- Most (63%) had at least 1 FTE for DI
  - 78% of new schools had at least 1 FTE
Conclusions

- Identify types of methodology used to deliver drug information education
  - A variety of different formats are used to deliver drug information education
    - 100% had mandatory assignments
    - 93% used small-group activities
    - 76% used internet-based activities
Conclusions

- Identify recent changes in drug information education
  - Content:
    - More focus on EBM, informatics, med safety
    - Less emphasis on print resources
  - Methodology:
    - More active learning, workshops, technology
Lessons Learned

- Summer months may not be the best time for surveying
- Identifying a contact person from each institution may be more optimal
- Having responder choose their institution helped eliminate duplicate responses
Thank you to my co-investigators!

- Cathy Ficzere, PharmD, BCPS (Belmont University School of Pharmacy)
- Michael Gabay, PharmD, JD, BCPS (University of Illinois at Chicago College of Pharmacy)
- Kristina Ward, BS, PharmD, BCPS (University of Rhode Island College of Pharmacy)
Questions