Introduction

• The following slides cover all the content presented to train the PIER pathology residency program alpha test participants.

• Information provided here supports content found in Release 1 of the PIER Instructional Resource Guide and PIER Resource Toolkit found on:

  www.apcprods.org/PIER
Training Topics

• PIER Benefits
  – Program Directors and Residents
• How PIER was Developed
• PIER / Toolkit Overview
• Toolkit Demonstration
• Alpha Test Details
• Closing Comments
PIER Core Team

- Walter H. Henricks, MD, Cleveland Clinic
- Liron Pantanowitz, MD, UPMC
- Donald S. Karcher, MD, The George Washington University
- Priscilla Markwood, CAE, Executive Director, APC
- Ann Neumann, PhD, VP, CAP Learning
- Sue Plath, Education Manager, CAP Learning
About PIER
Program Directors & Residents

- **Benefits for PRODs**
  - Relevant performance outcomes (PIER Outcomes) map directly to ACGME Milestones
  - Up-to-date content is suitable for AP / CP curriculum
  - Scalable design based on program characteristics and needs
  - Simple straightforward PIER implementation tools, with on-going content updates

- **Benefits for Residents**
  - Receive flexible, high quality informatics training
  - Achieve essential pathology informatics skills
  - Ability to apply pathology informatics in order to collect/manage/share key medical information with colleagues and patients
Developed by Experts in Pathology Informatics

• Approach taken to develop PIER supports PROD needs for meeting ACGME milestones
  – Identified knowledge and skill outcome statements that all pathology residents should know upon completion of training
  – Mapped the outcome statements to ACGME Milestones
  – Organized outcome statements into four groups of informatics topics referred to as PIER Essentials
  – Identified resources and practice exercises applicable to informatics
Reflections from the Experts

We developed a curriculum that can be imbedded longitudinally in the course of resident training. The experts realized that informatics wasn’t a topic that could be crammed in a one month residency rotation, rather it should be embedded in everything that residents do throughout their residency.

PIER implementation tools were specifically designed to be simple and straightforward so that it could be used by all institutions regardless of whether they have informatics experts on site or not.

It is important to note that this curriculum is uniform across all programs, so as programs adopt this curriculum across the country, we can be assured that residents are being exposed to the knowledge and skill statements in a similar manner.

Donald S. Karcher, MD
Chair, Department of Pathology, The George Washington University
Reflections from the Experts

The PIER program offers a benefit to both the resident and program director as this product and its associated tools are directly mapped to the ACGME milestones (specifically SBP7). This content is suitable for all pathology curriculum types (AP, CP, and AP/CP).

For residents this is a flexible training tool for them to use. As you will see from the small details to the larger essentials overall, PIER is flexible in accommodating training time and informatics topics. It also allows residents to expand on things that they are interested in.

Lastly you need to be aware that the goal for PIER is to help residents apply the medical information with others in the laboratory and medical practice for the benefit of the patient; not to make the resident into an informatics expert.

Liron Pantanowitz, MD
Director of Cytopathology at UPMC Shadyside
Director of the Pathology Informatics Fellowship Program
Associate Director of the Pathology Informatics Division
Reflections from the Experts

PIER was developed for residents and aimed at what pathology residents should know. It was developed by a working group of about 15 informatics experts representing APC, API, and CAP over an extended period of time.

The experts identified specific knowledge and skill statements (PIER Outcomes) that a resident should have regarding informatics upon the completion of residency and mapped these statements directly to the ACGME milestones.

The program is organized into four groups of topics referred to as PIER Essentials. Included within each essentials group are resources and practical exercises that can be used throughout the resident’s training.

Walter H. Hendricks, MD
Director, Center for Pathology Informatics at Cleveland Clinic
PIER Resources
Where to Find PIER Resources

• PIER content is located on the Association of Pathology Chairs (APC) website at http://www.apcprods.org/PIER/

• This is the “go to” place for all information pertaining to PIER
  – PIER Instructional Resource Guide Release 1
  – PIER Toolkit Release 1
Overview

• **PIER Instructional Resource Guide**
  – *Explains Scope and Sequence*
    o Non-editable document
    o Identifies the “what” to teach (PIER content, organization, and toolkit descriptions)

• **PIER Resource Toolkit**
  – Provides tools for implementation
    o Downloadable, editable
    o Identifies the “how” to teach

• **Programs have unique needs and approaches**
  – Toolkit helps PRODS scale topics
  – Provides implementation options to meet program needs
  – Helps PRODS make good training decisions
PIER Scope and Sequence

PIER Essentials 1
- Informatics in Pathology Practice
- Information Systems Fundamentals
- Importance of Databases
- Introduction to Data Standards
- Data Availability & Security

Entry-Level Proficiency
ACGME Milestone Level 1
Instructional Hours: 4-6

PIER Essentials 2
- LIS Components & Functions
- Specialized LISs & Middleware
- Data & Communication Standards
- Digital Imaging
- Basics of the Health Care Information Ecosystem

Basic Proficiency
ACGME Milestone Level 2
Instructional Hours: 8-10

PIER Essentials 3
- Pathologist Role in LIS & EHR Projects
- LIS Installation & Configuration
- Information Systems & Laboratory Performance
- Data Security, Regulatory & Accreditation Requirements

Intermediate Proficiency
ACGME Milestone Level 3
Instructional Hours: 10-12

PIER Essentials 4
- LIS Management & Oversight
- Order and Results Management
- Laboratory Data for Quality Improvement & Research
- Laboratory Data & Enterprise Health Care Analytics

Advanced Proficiency
ACGME Milestone Level 4
Instructional Hours: 10-14
PIER Scope & Sequence (cont.)

• The working group developed a set of performance outcome statements identifying the pathology informatics knowledge and skills that a resident should have upon completion of their training.

• This set of 38 key outcomes provide the subject matter foundation of PIER.

• The outcomes were assigned proficiency levels; mapped to ACGME Informatics Milestone SBP7; analyzed and organized into a 4-part scope and sequence: PIER Essentials 1, 2, 3 and 4.
PIER Scope & Sequence (cont.)

• PIER exposes residents to information technology in pathology as they participate in residency activities related to management, quality assurance and control, regulatory and accreditation issues, as well as daily flow of information into and out of the laboratory and the proper utilization of that information.
PIER Scope & Sequence (cont.)

• Timing and pace is under the control of the program director. However, there is a learning sequence and the four Essentials build developmentally.

• Residency programs can manage the timing of the four Essentials to suit the scheduling availability of current residents as long as the recommended sequence is followed.
  
  o However, a resident cannot start for example, E3 or E4 if they do not have the prerequisite E1 and E2 knowledge and skills.
PIER Scope & Sequence (cont.)

- Each Essentials addresses specific aspects of pathology informatics ranging from the basics to more advanced topics.
- Each Essentials also identifies the proficiency level, ACGME milestone level, and the recommended range of instructional hours.
- Instructional hours are recommendations. The final number of actual hours will be determined by the program director’s delivery strategy decisions – therefore, the hours could be higher. In general, they should not be lower than the minimum number of hours, i.e., it would be difficult to achieve the outcomes in less than the minimum time allocation.
PIER Resource Toolkit

- The “toolkit” begins with the PIER Reference Library
- This library provides a list of expert recommended resources that map to the majority of PIER outcome statements
- Use to identify and assemble the resources needed to support the learning of all 4 Essentials
Toolkit Organization

• There are 3 key tools for each of the PIER Essentials:
  1. Essentials Map (planning & scheduling)
  2. Resource Options (learning)
  3. Outcomes Achievement Checklist (completion)
Essentials Map

Make selections to suit your specific needs

- **Top area**
  - Main topics
  - Rationale
  - Outcomes for Achievement
  - Topic content

- **Lower area**
  - Implementation strategies
  - Scheduling/progress tracker
Essentials 1 Map: Top Area

- Incorporates PIER’s Scope & Sequence (topic titles) explained previously
- Includes rationale, outcomes, content outline for each Essentials topic
- Lower section (not shown) helps with implementation, scheduling, tracking
Resource Options

• A companion tool to the Essentials Map
• Lists content sources to support self-study or to inform the development of didactic materials
• Identifies recommended PIER resources, practical exercises and other optional resources
• Provides a detailed scheduling and progress tracker
Resource Options

- The program director can use the map to preview the Essentials in entirety; plan out specific learning activities by topic using the Resource Option pages; and customize their approach by adding their preferred teaching resources, activities and materials to the map.

- The Essentials Map and Essentials Resource Options tools provide an organizer and process for residency programs to begin to develop their own self-study modules, lecture series and blended learning units.

Note: Fully developed, downloadable teaching materials are beyond the scope of PIER.
Outcomes Achievement Checklist

- Documents progress and accomplishments
- Resident can use the checklist to assess their achievements in preparation for the meeting with the evaluator
- Evaluator may be program director, faculty or other designated staff
- Best to complete in a face-to-face meeting
- Completion of an Essentials suggests completion of the corresponding ACGME informatics milestone level
- Final sign-off goes into the resident’s file
PIER Resource Toolkit
Step-by-Step
PIER Essentials Map Tool

Overall purpose of the Essentials Map

This tool is used for planning and scheduling the Informatics learning content. The map can be used for scheduling individual residents or groups of residents. The following slides will demonstrate the process steps for completing this tool.
### Step 1 – Review Essentials Topics

<table>
<thead>
<tr>
<th>Topic Title</th>
<th>Informatics in Pathology Practice</th>
<th>Information Systems Fundamentals</th>
<th>Importance of Databases</th>
<th>Introduction to Data Standards</th>
<th>Data Availability &amp; Security</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rationale</strong></td>
<td>The practice of pathology relies on the creation, management, and accurate and timely communication of clinical laboratory information. Computers are essential tools that pathologists use in the management of information for laboratory practice and patient care.</td>
<td>Databases provide core structure and tools that enable pathologists to manage and analyze large amounts of information. Standards enable sharing of data among different health care information systems (i.e., interoperability), which is necessary for patient care.</td>
<td>Pathologists are ultimately responsible for the access to and safety of pathology information.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PIER Outcomes</strong></td>
<td>Understand the relevance of informatics in pathology practice. Describe the difference between information technology (IT) and informatics and recognize how pathologists contribute to informatics initiatives. Explain the salient differences and similarities among pathology informatics, bioinformatics, public health informatics, health care information technology, and health knowledge informatics.</td>
<td>Use correct terminology to describe the major types and components of computer hardware, software, and computer networks. Convert to the fundamentals of databases (including data types, fields, records, database structure, and mechanisms for querying data), understand how data storage affects data retrieval options. Define the types and roles of standards used in pathology, at a basic level. Understand the elements of data availability as a key part of security.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Review** the topics included in each Essentials. For example, Essentials 1 has the following five topics:

1. Informatics in Pathology Practice
2. Information Systems Fundamentals
3. Importance of Databases
4. Introduction to Data Standards
5. Data Availability & Security

In addition, each topic provides:
- **Rationale** – provides the overlying purpose of each of the topics within an Essentials
- **PIER Outcomes** – indicates the desired outcome statements that are aligned with each topic
- **Content** – lists the basic information covered in each topic
### Step 2 – Determine Start Date

Indicate the date you want to begin each topic by clicking in the **Start Date** field and typing the date.

This date can be the same for all topics within an Essentials or the start dates may vary depending on the institutions existing curriculum and resident rotation schedules.

However, it is important that each topic within an Essentials be completed prior to moving on to the next Essentials.

<table>
<thead>
<tr>
<th>Topic Title</th>
<th>Informatics in Pathology Practice</th>
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</thead>
<tbody>
<tr>
<td>Rationale</td>
<td>The practice of pathology relies on the creation, management, and accurate and timely communication of clinical laboratory information.</td>
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</tr>
</tbody>
</table>
| Content                      | 1. Definition of informatics  
2. Relevance of informatics in pathology  
3. Different types of informatics  
4. The practice of informatics in pathology |
| Start Date                   | |
Step 3 – Identify Training Time

Use the Rotation field to indicate the rotation cycle in which the topic is to be taught by clicking on the drop down arrow and selecting the desired rotation.

As you can see from the list, there are a variety of rotations to select from.
Step 3 (Continued)

If you do not see the rotation listed, you can click in the **Additional Rotations Comments** text box and type in a specific rotation and/or add additional notes regarding the rotation schedule.
Step 4 – Identify Implementation Methods

Use the **Implementation Preference** fields to select one or more delivery methods for the topic content.

There are 4 pre-designated methods:

1. Program Lecture
2. PIER Resource Options
3. Outside Resources
4. Mentor/Preceptor
Step 4 (Continued)

Use the **Comments** text box to add notes about additional implementation options you want to consider, materials needed, or to document preceptor/mentor names with area of expertise and contact information.
Step 5 – Determine Alternate Training Options

Use the **Other Implementation Preference** text box to type in details related to your own existing training materials that you want to use for this topic (e.g., videos, online courses, in-house resources, etc.).
Step 6 – Evaluate Progress

Use the **Check Progress** date fields to schedule dates approximately one to two weeks out from the start date to follow up with your resident(s) and check on their progress or completion of topic areas and associated assignments.

This date field can be updated if you need to reschedule a second or third follow up for a resident or group of residents.
Step 7 – Set Completion Date

Use the Wrap-Up Date field to indicate the anticipated completion date for all assigned content pertaining to an Essentials topics.
PIER Resource Options Tool

Overall purpose of the PIER Resource Options Tool

This tool provides resource options for self study and practical exercises for each topic within an Essentials.

The top section of this tool restates the topic rationale, expected PIER outcomes, and the list of topics indicated in the Essentials Map.

Once completed the PIER Resource Option Tool can be printed and/or emailed to residents as their personalized learning tool.

The following slides will demonstrate the process steps for completing this tool.
Step 1 – Select PIER Resources

Select the resource options that you want to use in your program from the **Recommended PIER Resource Options** list.

These options were identified by informatics experts as important for a residents understanding of a topic and they support achievement of the outcome statements.

We recommend programs use all of these resources wherever possible.

### Recommended PIER Resource Options

<table>
<thead>
<tr>
<th>Topic 1: Informatics in Pathology Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rationale</strong></td>
</tr>
<tr>
<td><strong>PIER Outcomes</strong></td>
</tr>
</tbody>
</table>
| **Content** | 1. Definition of informatics  
2. Relevance of informatics in pathology  
3. Different types of informatics  
4. The practice of informatics in pathology |

#### Practical Exercises

- Informatics is embedded throughout the daily practice and laboratory activities. However, most residents do not realize just how much informatics they are using as part of their routine pathology training. By focusing on specific “moments” when informatics comes into daily use, we can help residents identify and recognize specific opportunities for enhancing their own informatics proficiency for patient care and laboratory operations.
- During rotations, have the resident identify and recognize specific “moments” when informatics comes into daily use. Moreover, compare and discuss informatics case studies or other sources of informatics education to further develop residents’ understanding of informatics in daily practice.

#### Recommended PIER Resource Options (Check options to be completed)

Some resource options are full book chapters or articles and may cover more content than indicated by the outcome statement.

Prior to selecting the option, we recommend that the program director review the materials and indicate if there is a specific section or pages that the resident should review.

Specific directions for reading selected portions of a resource can then be placed in the **Comments** text field.
Step 2 – Select Practical Exercises

Select the desired Practical Exercises that you want the resident(s) to complete. These practical exercises were specifically identified by experts in the informatics field and designed to work in most pathology residency settings.
Step 3 – Add Information

As stated previously in Step 1, use the Comments field to incorporate any specific reading materials, lecture content, outside programs, etc. that you feel would be beneficial for the resident(s).

This field can also be used to add comments regarding the content, additional needs, or future instructions for the resident.

The resident may want to use this comments field to add their own notes or questions for their mentor or program director.
Step 4 – Enter Completion Date

Enter the **Completion Date** by when you want the resident to finish the content assigned for this particular topic.

**Topic:** Informatics in Pathology Practice

<table>
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<th>Rationale</th>
<th>The practice of pathology relies on the creation, management, and accurate and timely communication of clinical information.</th>
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</tbody>
</table>

**Practical Exercises**

- Informatics is embedded throughout pathology practice and laboratory activities. However, most residents do not realize just how much informatics they are learning as part of their routine pathology training because this training is not specifically identified as informatics. During rotations, have the resident identify and recognize specific “moments” when informatics comes into play. Discuss informatics with more senior residents, staff pathologists, or informatics faculty to understand better the implications for patient care and laboratory operations.
- During rotations have the resident keep a log of informatics-related activities and questions that occur (e.g., do this for one week on each rotation).
- During a resident group meeting, provide an opportunity for residents to share their varied experiences, observations, and questions from their informatics log.

**Recommended PIER Resource Options**


**Optional Resources**

Step 5 – Assign Optional Resources

The Optional Resources are tools and resources that program directors can assign when a resident desires further knowledge on a particular topic or area of interest pertaining to an Essentials.

Optional Resources


PIER Outcomes Achievement Checklist Tool

Overall purpose of the Outcomes Achievement Checklist Tool

This tool provides a summation of the resident’s accomplishments for an Essentials.

As you can see, each topic’s outcome statement is presented with the option for you to check-off that the resident achieved this outcome.

The following slides will demonstrate the process steps for completing this tool.
Step 1 – Preparation

Upon completion of the assigned learning activities (eg, PIER resource options, outside training, mentoring, etc), the program director or designee will meet with the resident to review this checklist.

You may also have the resident complete this form to record their own assessment of their achievements.

This sets the stage for a good discussion about what was learned, how it was learned, and what is still outstanding for completion.

We recommend you explain this to the resident early on and then give them at least one week to complete it prior to a meeting.
Step 2 – Identify Achievements

Select the **Achieved** checkbox to indicate if the resident accomplished the **Outcome Statement** for each topic within an Essentials.
Step 3 – Add Comments

Use the **Comments** text field to indicate any specific notes, accomplishments, or need for additional study; along with recommendations for how they can achieve completion.
Step 4 – Print the Checklist

Prior to meeting with the resident, you may want to print a copy of the completed checklist for use during the discussion.
Step 5 – Sign & File the Checklist

Discuss the content of the Outcomes Achievement Checklist tool with the resident.

Add any additional comments that are necessary based on this discussion.

Obtain the necessary signatures and date of the discussion.

File the signed checklist in the resident’s folder as acknowledgement that they have completed the topics contained in an Essentials.

The information can be electronically saved by scanning the paper document with the signatures and saving the scanned document as a PDF.
Alpha Test
Alpha Test: Background

- PIER includes a change management strategy to support all groups needs.
- We need ongoing engagement from programs to gain and maintain momentum.
- The PIER alpha testing plan is a means to obtain crucial feedback and gain momentum for adoption.
- Adoption of PIER is critical if we want residents to be prepared and successful in the future.
Alpha Test: Goals

• Obtain feedback on PIER materials
• Obtain feedback on implementation challenges and success tips
• Gather tools and resources
• Gain momentum for adoption
Alpha Test: Programs

• Programs were identified by members of the PIER development team from more than 30 programs that expressed an interest during and following the 2014 APC annual meeting.

• Desired a broad range of participation with a good cross section of:
  • **Program sizes** – alpha test group includes large, medium and small size programs that range in the scope and quality of pathology informatics training for residents
  • **Geography** – include all regions of the US
  • **Sample of PIER Working Group member programs** – we wanted a sample of the working group members to have direct access and line of sight to their own institution’s participation and be able to assess PIER’s effectiveness in real time

• The alpha test programs will serve as a resource to other programs, as well as provide feedback for future development of PIER.
Alpha Test: Programs

- Baystate Medical Center
- Cleveland Clinic
- George Washington University
- Medical University of South Carolina
- University of Buffalo
- University of Kentucky
- University of New Mexico
- University of Miami
- University of Pittsburgh
- University of Southern California
- University of Toledo
- University of Washington
- University of Vermont
- Vanderbilt University
Alpha Test: Approach

• Obtain feedback from multiple perspectives and points in time (implementation planning to deployment:
  – Program Chairs, Program Directors, Faculty, Residents

• Accounts for needs of each stakeholder and provides a comprehensive understanding of PIER’s strengths and areas for improvement

• Feedback collected via online surveys
  – Chairs/PRODS may also be asked to participate in brief focus groups or interviews
Alpha Test: Approach (cont.)

• Data collection tools and feedback requested will be customized for each stakeholder group

• Stakeholders provide information about:
  – PIER resources (strengths and areas for improvement)
  – Impact on resident learning
  – Attitudes toward informatics training
  – Implementation challenges and success tips

• About 4 hours time commitment per individual

• Testing runs Nov 2014 to Oct 2015
• Feedback will be requested at 4 points in time
• Timeline shows precisely when feedback will be collected
• Baseline survey data used for comparison over time to evaluate impact of PIER
• PRODS provide feedback on implementation progress in 3 months
• Majority of feedback about PIER Resources gathered in May and October 2015
• All groups provide feedback in May and, except for Chairs, again in October
• Feedback obtained will be help indentify enhancements for PIER Release 2
Other Residency Programs
Other Residency Programs

• PIER is available to all residency programs during the Alpha Test
• Additional feedback will be collected from other PIER users, as well as non-users to:
  – Gauge adoption level outside of alpha test
  – Obtain feedback on PIER materials
  – Obtain feedback on barriers to adopting PIER
• Feedback collected from PRODS outside of Alpha Test group in Nov 2014 and Oct 2015
• May also survey residents in October 2015 but depends on number of other programs using PIER
Closing Comments
Our Hope: Widespread PIER Adoption and Implementation

• PIER seeks to ensure that all pathology residents acquire the informatics knowledge and skills needed for the modern practice of pathology

• We need your support for pathology residency programs to achieve this outcome together
Need Help?

• Direct all questions to Sue Plath, CAP Education Manager at splath@cap.org
Thank You for Supporting PIER