RSNA/SNM/FDA

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Two Topic Imaging Workshop:

“Standards for Imaging Endpoints in Clinical Trials”

Ted Gastineau
President
ICON Medical Imaging

Management of Image Data Workflow
User Driven

- Pharma / Biotech
- Academia
- Regulatory: FDA, EMEA, Others

Diagnostics:
- Sens/Spec

Surrogate Marker / Endpoints:
- Criteria?
- Multi-Center Global

- Developers
- Consumers
- Data / Validation

- Exploratory Information
- Product Registration/Approval
Our Role = Data Integrity

- Deliver: Solutions and Service
- Reduce variability
- Reduce bias
- Comply with Good Clinical Practice

- Education: Who cares?
• 1990  First Commercial Imaging Core Labs
• 1996 Clinton-Kessler Initiative
• 1997  “Providing Clinical Evidence of Effectiveness for Human Drug and Biological Products.”
• 1997  “FDA Approval of New Cancer Treatment Uses for Marketed Drug and Biological Products.”
• 2004-2008 Critical Path
• 1997 – 2004 “Guidance For Industry: Developing Imaging Drug and Biological Products,
  Part 1: Conducting Clinical Safety Assessments,
  Part 2: Clinical Indications;
  Part 3: Design, Analysis and Interpretation of Clinical Studies”

• 2005-2007 “Guidance for Industry: Clinical Trial Endpoints for the Approval of Cancer Drugs and Biologics.”

• 2008 “DIA/PHARMA/FDA Charter Working Group”

• 2009 “Guidance for Industry: New Contrast Imaging Indication Considerations for Devices and Approved Drug and Biological Products.”
Image data flow: complete audit trail

SITE
- Imaging site archives digital data

Imaging Core Lab
- Imaging data logged
- Standard DICOM conversion
- Initial QA performed

Delivery to Sponsor / Agency
- Images Anonymized
- Encoded
- Image QC performed

Reconciliation
- eCRF validated
- Reader(s) Trained
- Reads completed

Measure time to QC
- Issues

Measure time, Queries, Image Quality, Compliance
- Issues

query
- Yes
- No
True Integration

Mapping Life Pixel by Pixel™

Clinical
• Site Selection
• Budgets
• Investigator Meetings
• Protocol Development
• CRF Development
• Site Initiation Visits

Imaging

Data Management

Medical

BD | Start Up | Maintenance | Analysis | Delivery
---|---------|-------------|----------|-------------
Clinical
Imaging
Data Management
Medical

• Integrated Communications
• RealTime Collect/QC
• Common Report
• Efficacy Data Transfers to DM/BS
• Standards tables and listings
Study Documents

- Imaging Manual
  - Instruction Manual for sites
    - Protocol Review
    - Image Acquisition
    - Archival / Shipping
    - Team Contact Listing

- Procedure Manual
  - Study Specific Document
    - IMI / Sponsor Responsibilities
    - Data Handling
    - QC / Query process
    - Quantification / Read Design

- Staffing Plan
  - IMI Team
  - Roles / Responsibilities

- Communication / Escalation Plan

- Database Set up
  - Data Plan
  - Study Timelines
  - Study Specific QC forms
  - Study Specific Query Process
Study Documents

- **Charter / Methodology**
  - Guideline for
    - Trial Objectives
    - How images will be acquired, transported, managed, blinded, and reviewed
    - Guidelines for execution of Review(s)
    - Matched with Protocol and Stat Plan

- **Systems Requirement Specification (SRS)**

- **Data Delivery Specification (DDS)**
  - Outlines data listing fields sponsor requires
  - Outlines delivery schedule / frequency
Start-up Activities

- Site feasibility support
- Imaging site technical evaluation surveys
  - Establish communication with imaging personnel
  - Determine “Standard of Care” imaging
  - Archival process at the site
  - Establish image data delivery requirements
  - Transmission
  - Referral centers
  - Collection of sample image data / phantoms
Site Training

- Review protocol requirements with assigned study coordinator/technologist/radiologist/physicist to determine:
  - Data flow
  - Personnel/equipment required
  - Archive capabilities & digital records retention policy
  - Do standard operations encompass imaging requirements or do methods need to change to accommodate study?
Image Data Submission Options

- **Digital image data:**
  - Electronic Networks – end-to-end digital solution – electronic DTF
  - Secure FTP
  - Web-Based – electronic DTF
  - DICOM Server push
  - DVD or CD via courier – paper DTF

- **Image data on film:**
  - Via courier – paper DTF

- **De-Identification:**
  - Remains a site dependent issue
  - “Private Tags” often contain data
  - Privacy (HIPPA etc) addressed through “portal” or at core lab
  - Need enough data to assure source verification
  - Study Specific SOP required
Study Maintenance

- On-going “real time” collection of imaging data
- Quality Control of image data
  - notification of QC results to sites (1-5 days)
  - Image Data Queries followed to resolution
- “RealTime” reads as needed: completed in 24-48hrs
  - Enrollment
  - Confirmation (Reduce Censoring)
  - Quality Control
- Study Reports
  - 24/7 access to images / Work-flow status
  - Weekly / Monthly Study & Site Status Reports (MCC group)
  - Study Specific Communication & Escalation Plan
Data Reconciliation

- **Clean transfers from clinical CRF**
  - Site/Subject identifiers
  - Scan Date
  - Modality
  - Anatomy

- **Queries generated based on discrepancies**
  - Mismatches (i.e., date, modality)
  - Missing data

- **Reconciled datasets moved to Reader’s queues**
Standardization: Industry/Entity

Mapping Life Pixel by Pixel™ Medical Imaging

Design  Implementation  Management  Analysis  Delivery

**Acquisition**
- Standardized
- Practical
- Sensitive

**Documents**
- Manuals
- Charters
- 80-20 Rule

- Site Evaluation
- Radiology Budgets
- Site Technical Support
- Performance Metrics

- Real Time Transmission
- Continual Review
- Common Format: DICOM
- De-identification
- QA/QC
- Create Audit Trail
- Common Reporting
- Performance Metrics

- Standardized
- Objective
- Reproducible
- Archived
- Audit Trail

- Databased
- Permanent
- Open