INTRODUCING CLINIC AUTOMATION IN A PHASE I UNIT WITH END-TO-END E-SOURCE DATA PROCESSING

Wim Verreth
PhUSE Conference 2014
12-15 Oct 2014
OUTLINE

- What is Clinical Automation?
- Why we implemented a clinic automation system?
- Scope of the clinic automation system
- Implementation overview
- Key Benefits
- Benefits for Data Management
- Experiences from monitors & clients
- Encountered challenges
- Take home messages
A centralized software tool implemented within a clinical unit to:

- support the recruitment of volunteers
- directly capture study data electronically (eSource)
- streamline the clinical process

Allows sharing online, real-time, high quality data with clients
WHY IMPLEMENT AN AUTOMATED SYSTEM?

CLIENT NEEDS

- Clients indicated the need for an EDC system
  - Main drivers for our clients are:
    - Time and Cost-saving
      - Paperless e-crf
      - Quick set-up and recruitment
      - Single data entry instead of double data entry
      - Simplified and remote monitoring
      - Reduction of queries
    - Remote access to online, real-time, high quality data
    - Traceability
      - From eSource to electronic regulatory submission
    - Quality
WHY IMPLEMENT AN AUTOMATED SYSTEM?

ENCOURAGED BY REGULATORY AUTHORITIES

References:
- Oversight of Clinical Investigations – A Risk-Based Approach to Monitoring - U.S. Department of Health and Human Services - Food and Drug Administration
  - FDA Webinar – Jan 29, 2014
- The final FDA guidance of Aug 2013
- The future integration of Electronic Health Records (EHR) and the finalization of the ICH E2B(R3) standards will provide an end-to-end solution for one overall integrated approach on patient safety monitoring.
- Reflection paper on expectations for electronic source data and data transcribed to electronic data collection tools in clinical trials – European Medicines Agency
- Oversight of Clinical Investigations – A Risk-Based Approach to Monitoring - U.S. Department of Health and Human Services - Food and Drug Administration
- Computerized Systems Used in Clinical Investigations - U.S. Department of Health and Human Services - Food and Drug Administration
- CDISC e-source standard requirements-CDISC (Clinical Data Interchange Standards Consortium) Version 1.0 20 November 2006
Final Guidance on Electronic Source Data in Clinical Investigations
Promoting eSource Data Capture

[assists] “in ensuring the reliability, quality, integrity, and traceability of electronic source data.”

“...promotes capturing source data in electronic form...”

WHY IMPLEMENT AN AUTOMATED SYSTEM?

OPTIMIZE THE CLINICAL PHARMACOLOGY UNIT’S PROCESSES

- Running multiple trials at a single location and staffed by a common group makes a Phase I unit a natural setting for automated solutions
  - Supports subject management / selection / appointments => faster recruitment
  - Automates the workflow through an electronic trial design schedule driving key operations at the clinical floor (what /where/whom/when)
  - Collects real-time source data electronically
  - Controls the sample management process
  - Enables sharing of online, real-time subject clinical data to review and process
  - Supports query management
  - Supports study and resource planning
SCOPE OF THE CLINIC AUTOMATION

Subject Recruitment
- Full volunteer database
- Recruitment call wizard
- Ad campaign tracking
- Adhoc lookup
- Appointment scheduling
- Screening data capture

Direct Data Capture
- Rapid study protocol setup
- Point-of-Subject
- Electronic source
- Data cleaned as captured
- Supports industry standards
- Interface to instruments

Sample Management
- Rapid configuration of study protocols
- Sample processing automation
- Configurable edit checks
- Pharmacokinetic (PK) sample scheduling

Data Management
- View real-time clinical data
- Querying capabilities
- Share views with sponsors and investigators
- Data Review/Approval/Release management

Reporting
- Ad-hoc reporting tool
- CDISC ODM export format
- Export clinical data
- Numerous standard reports
IMPLEMENTATION OVERVIEW

Jan 2010 - March 2011
URS & vendor selection

Jan 2012
Start Clinical Floor Pilots

Jun-Dec 2012
System familiarization and training

Jan-Mar 2013
Start first Production Studies

Dec 2013
12 production studies
6 dbase locks
1 study audit

Sept 2014
38 production studies
2 planned
25 dbase locks
1 study audit

1. User requirements
2. Vendor presentations
3. System evaluation life situation
4. Vendor selection
5. Setup IT infrastructure
6. End-user training
7. Conference Room Pilots
8. Clinical Floor Pilots
9. Go live
### STUDIES PERFORMED WITH LABPAS IN ANTWERP

<table>
<thead>
<tr>
<th></th>
<th>Locked</th>
<th>Ongoing</th>
<th>Planned</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full scope projects</td>
<td>12</td>
<td>10</td>
<td>2</td>
<td>24</td>
</tr>
<tr>
<td>With partial data transfer</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>As source only</td>
<td>9</td>
<td>2</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>25</td>
<td>13</td>
<td>2</td>
<td>40</td>
</tr>
</tbody>
</table>

23 different clients
LEVERAGING THE CLINICAL PROCESS

FLEXIBILITY

CONFIGURABILITY

QUALITY

COST CONTROL

SUBJECT RECRUITMENT

PROTOCOL SETUP

STUDY EXECUTION

DATA CAPTURE

SAMPLE MANAGEMENT

DATA MANAGEMENT

REPORTING
WHAT ARE THE KEY BENEFITS? 1/4

- **Quicker recruitment**
  - An easy-to-use scripted data collection wizard and appointment scheduling tools
  - An efficient configurable inclusion & exclusion rules process (demographics & medical history)
  - Integrated trigger for payment subjects

- **Rapid protocol setup**
  - Days instead of weeks compare with eCRF set-up time in an EDC system
  - Libraries with adaptable elements (test panels and tests)

- **Screening / Study execution**
  - Follows operational workflow of nurses/lab technicians
  - Provides “what, where, whom and when” info they require to run the trial
  - Wireless solution to increase the mobility of the nurses
WHAT ARE THE KEY BENEFITS? 2/4

- Direct data capture strongly reduces the need for paper
  - Direct data capture from devices (no human intervention)
  - Device interfaces with HL7 as promoted by FDA
  - Barcode driven (subject, dose, collection, instruments) which increase data quality
  - Edit-checks and alerts reduce data entry errors
  - Transcription eliminated

- Automated sample management
  - Barcode-driven sample management captures data and controls samples process
  - Automated lab data integration (hospital lab for safety samples)
Optimized data management
- eSource system as eCRF platform
  - Eliminating (e)CRF design
  - Data visualization & verification, review and approval with metrics
  - Query management
- Flexible data transfer options
  - Different data transfer options available
    - CDISC SDTM datasets
    - CDISC Operational Data Model (ODM) extract
    - Custom sponsor data format
  - Online access to subjects data (sponsor access)
- Real-time subject data monitoring allows faster query resolution

Comprehensive Reporting
DATA FLOW

1. Immediate storage of LabPas data in database

2. Conversion of LabPas data to SDTM format every night and/or ad-hoc

3. Transfer of SDTM SAS datasets before and at Database Lock

4. Refresh output checks and listings every night and/or ad-hoc

5. Create queries & follow-up on queries

Data available for sponsor
The setup of LabPas studies will be standardized per sponsor:
- Library screens used in LabPas
- Standard CRF template
- Standard CRF annotation
- Standard conversion rules
- Standard DVP including rules

This will lead to a more efficient process, which will save time and money.
Data cleaning can start earlier

- Cleaning can start as soon as clinical data is captured in LabPas
- LabPas data immediately available for DM for import into clinical database
  - No data extracts needed
- No additional monitoring time needed
  - Monitoring queries can be raised in parallel with cleaning
- Limited source verification
  - Monitoring can be done remotely
- Database lock will be earlier

Turnaround of the queries is shorter

- All queries created in the DQ module of LabPas are directly seen in the CT application of LabPas
- Through online process the query response time is reduced
BENEFITS FOR DATA MANAGEMENT

- Number of queries decreased – improved quality of source data
  - System queries run first in the LabPas application flagging all possible anomalous data
    - E.g. values out of ranges without investigator evaluation, missing comments when a test is not done,…
  - Elimination of data entry or transcription errors to a minimum
  - Less missing data
    - System requires a comment when a result is not captured
  - Lab results automatically loaded into the LabPas system
    - No additional data transfers needed

- AE and CM terms standardized, based on MedDRA and WhoDrug
  - Facilitate coding
**TIME**

- Standard forms and work-flows enable setting up of studies faster
- Automated labeling of vessels
- Saving time to respond to queries through online process
- LabPas architecture using one database structure to store data for all studies allows reports or data management sponsor templates from one study to be used for other studies improving synergies

**COST & QUALITY**

- Automation of manual processes reduces errors in data capture and improve adherence to protocol; automated process are both on the clinic floor and during PK sample processing
- Real time reporting enables quick corrective action, where necessary
- Automation of results capture, data entry etc. will reduce paper and stationary required
- Significantly fewer errors and queries through real time checking and more controlled process
- Receiving the data in already edit-checked electronic form

**AUDIT & COMPLIANCE**

- Enables tracking adherence to protocol
- Audit control records fully captured in the central database
- Maintains protocol versions
- ~20 standard reports in LabPas that can be leveraged out of the box
- Easy to make customer reports as well
- Role specific dashboard
**IMPROVING COST CONTROL & QUALITY**

**TIME**
- Standard forms and work-flows in LabPas enable setting up of studies faster
- Automated labeling of vessels
- Saving time to respond to queries through online process
- LabPas architecture using one database structure to store data for all studies allows reports or data management sponsor templates for other studies

**COST & QUALITY**
- Automation of manual processes reduces errors in data capture and improve adherence to protocol; automated process are both on the clinic floor and during PK sample processing
- Automation of results capture, data entry etc. reduces paper and stationary required
- Real time reporting enables quick corrective action, where necessary
- Significantly fewer errors and queries through real time checking and more controlled process
- Receiving the data in already edit-checked electronic form

**AUDIT & COMPLIANCE**
- Enables tracking adherence to protocol
- Audit control records fully captured in the central database
- Maintains protocol versions
- ~20 standard reports in LabPas that can be leveraged out of the box
- Easy to make customer reports as well
- Role specific dashboard
**IMPROVING AUDIT & COMPLIANCE**

**TIME**
- Standard forms and work-flows in LabPas enable setting up of studies faster
- Automated labeling of vessels etc. reducing time needed for this activity
- Saving time to respond to queries through online process
- LabPas architecture using one database structure to store data for all studies allows reports or data management sponsor templates for other studies

**COST & QUALITY**
- Automation of manual processes will reduce errors in data capture and improve adherence to protocol; automated process are both on the clinic floor and during PK sample processing
- Automation of results capture, data entry etc. will reduce paper and stationary required
- Real time reporting enables quick corrective action, where necessary
- Significantly fewer errors and queries through real time checking and more controlled process
- Receiving the data in already edit-checked electronic form

**AUDIT & COMPLIANCE**
- Enables tracking adherence to protocol
- Audit control records fully captured in the central database
- Maintains protocol versions
- ~20 standard reports in LabPas that can be leveraged out of the box
- Easy to make customer reports as well
- Role specific dashboard
EXPERIENCES FROM MONITORS AND CLIENTS

- The availability of tabular excel reports is successful
  - Daily refresh of reports on sFTP server
  - Standard reports available but can be customized per client
  - 1 client reduced monitoring time with 45% after learning curve of 2 weeks.

- A lot of checks can be done at home/in the office (so travel hours reduction and flexible work planning)

- Source data is always available. If confirmation is needed about something, you don’t need to go to the site to double check

- There are alerts if values are out of range => increased quality

- There are excel files to filter data, which makes it possible to check the data as wanted. F.i. per assessment instead of per subject.

- No mistakes/time wasted due to unclear handwriting

- High quality SDTM datasets available throughout the trial
CHALLENGES ENCOUNTERED

- Internal learning curves may be longer than expected
- Implementation needs to be supported by SOPs/WIs
- Learning curves within sponsor companies as well
  - Implementation of a clinic automation system influences the structures and processes of sponsors
  - Sponsors worry about the steep learning curves to switch to the clinic automation system despite the advantages
- Some technical limitations encountered => new release by Oracle
TAKE HOME MESSAGES

- Choice to implement was driven by
  - Our clients first
  - Authorities such as the FDA & EMEA are promoting EDC
  - Need to streamline the clinical process
- eSource allows remote (risk-based) monitoring
- Multiple benefits at Data Management level
- Increased quality and traceability
- Big, Medium & Small pharma do like the system and our approach

⇒ CLIENTS & SGS ARE IN A WIN-WIN POSITION
THANK YOU FOR YOUR ATTENTION

WHERE EXPERIENCE MEETS SPEED

CONTACT US

CLINICAL RESEARCH

www.sgs.com/CRO

Wim Verreth
Life Science Services
Head Project Management Biometrics
Project Director Biometrics & Medical Affairs

SGS Belgium NV
Generaal De Wittelaan 19A b5
2800 Mechelen – Belgium
Phone: +32 (0)15 29 93 34
Mobile: +32 (0)475 92 20 60
Fax: +32 (0)15 27 32 50
E-mail: wim.verreth@sgs.com
www.sgs.com/CRO