CDM System & Validation

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EPS International (China) Co.,Ltd

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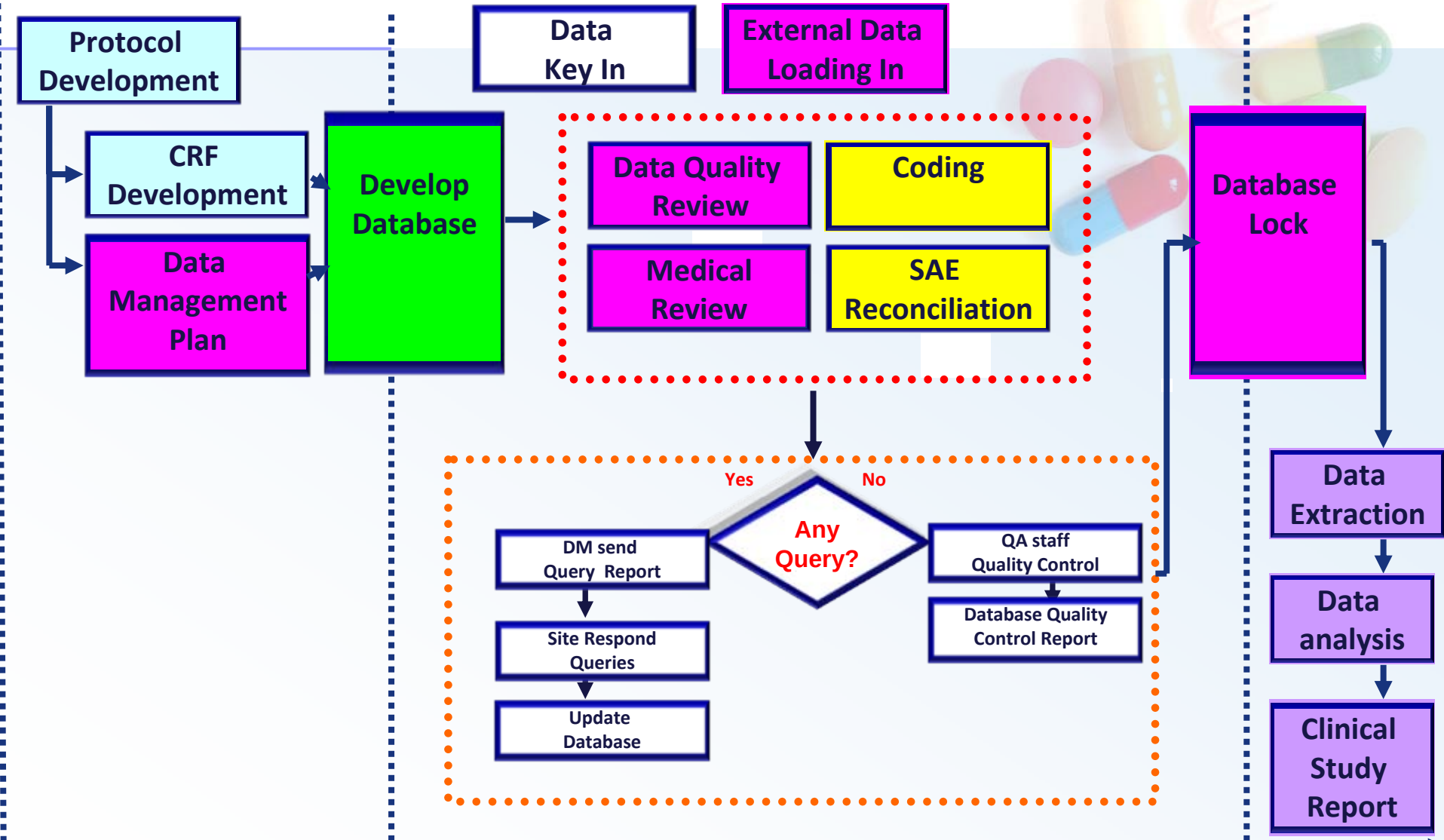
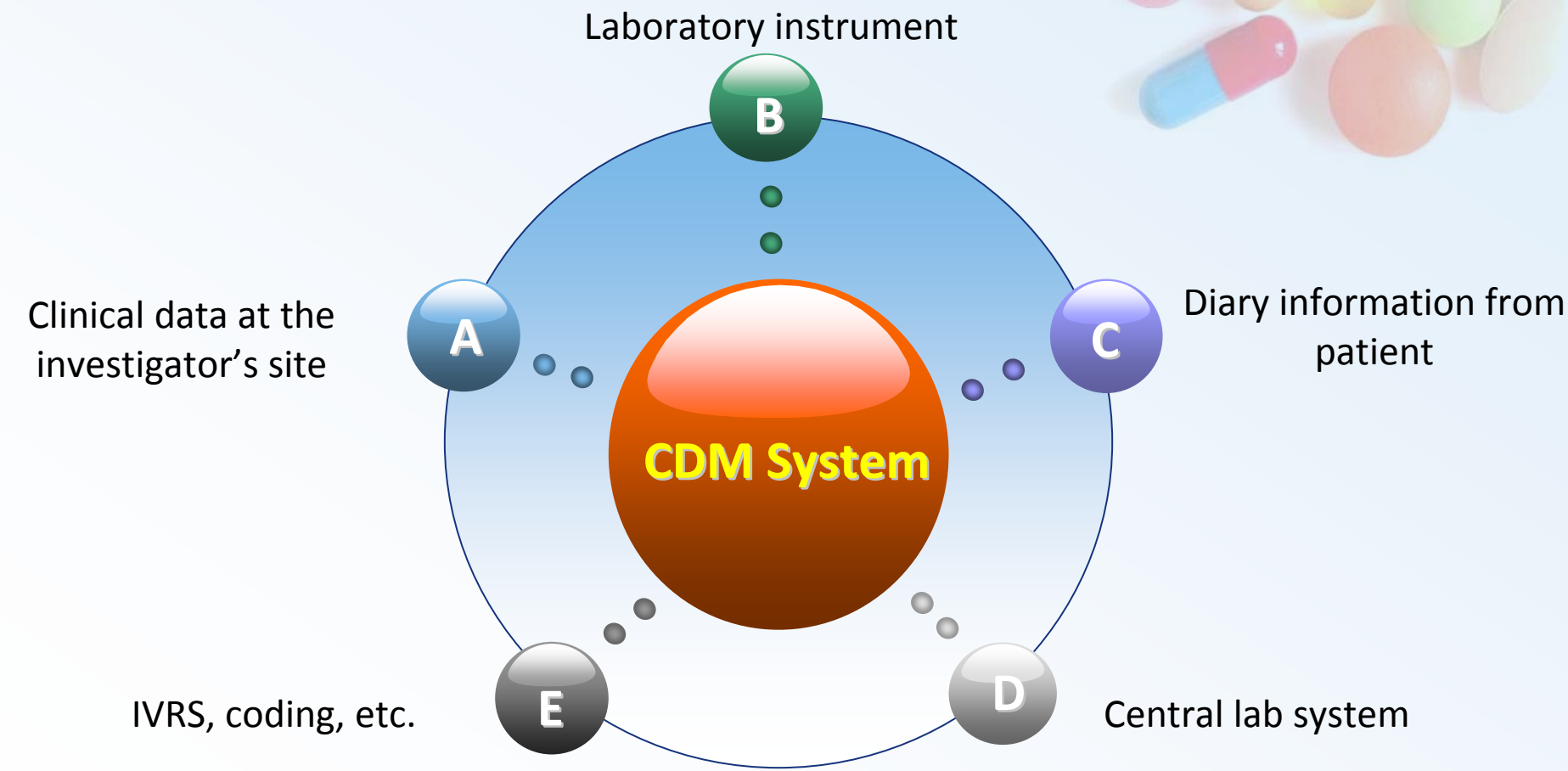
DM Flow


Protocol Development
CRF Development
Data Management Plan
Develop Database
Data Key In
External Data Loading In
Data Quality Review
Coding
Medical Review
SAE Reconciliation
Yes
No
Any Query?
DM send Query Report
Site Respond Queries
Update Database
QA staff Quality Control
Database Quality Control Report
Database Lock
Data Extraction
Data analysis
Clinical Study Report
Study Start Up
Conduct
Close out

Agenda

1. Clinical Data Management System
2. Database Validation
3. Change Control
4. Medidata RAVE Demo

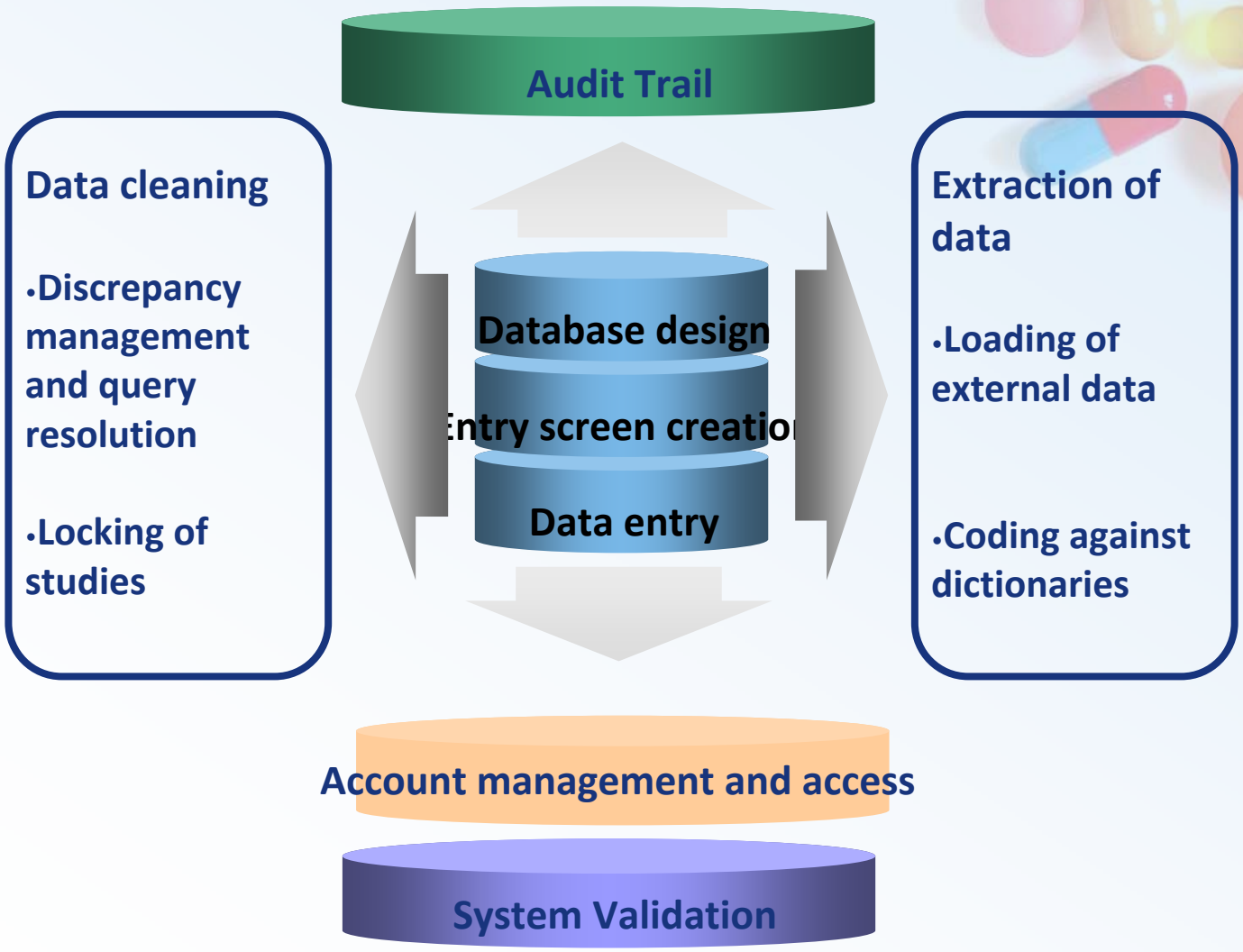
Clinical Data Management System



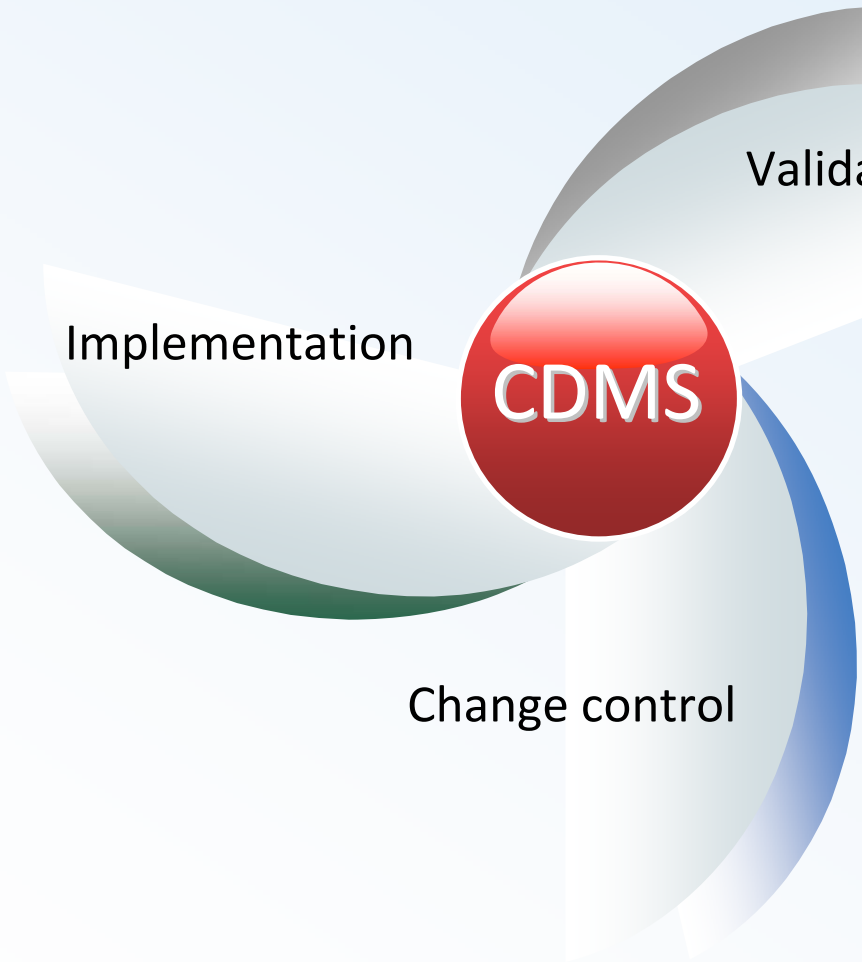
CDM System

- Medidata RAVE
- Oracle Clinical
- InForm™
- …
- SAS
- ~~Epidata~~

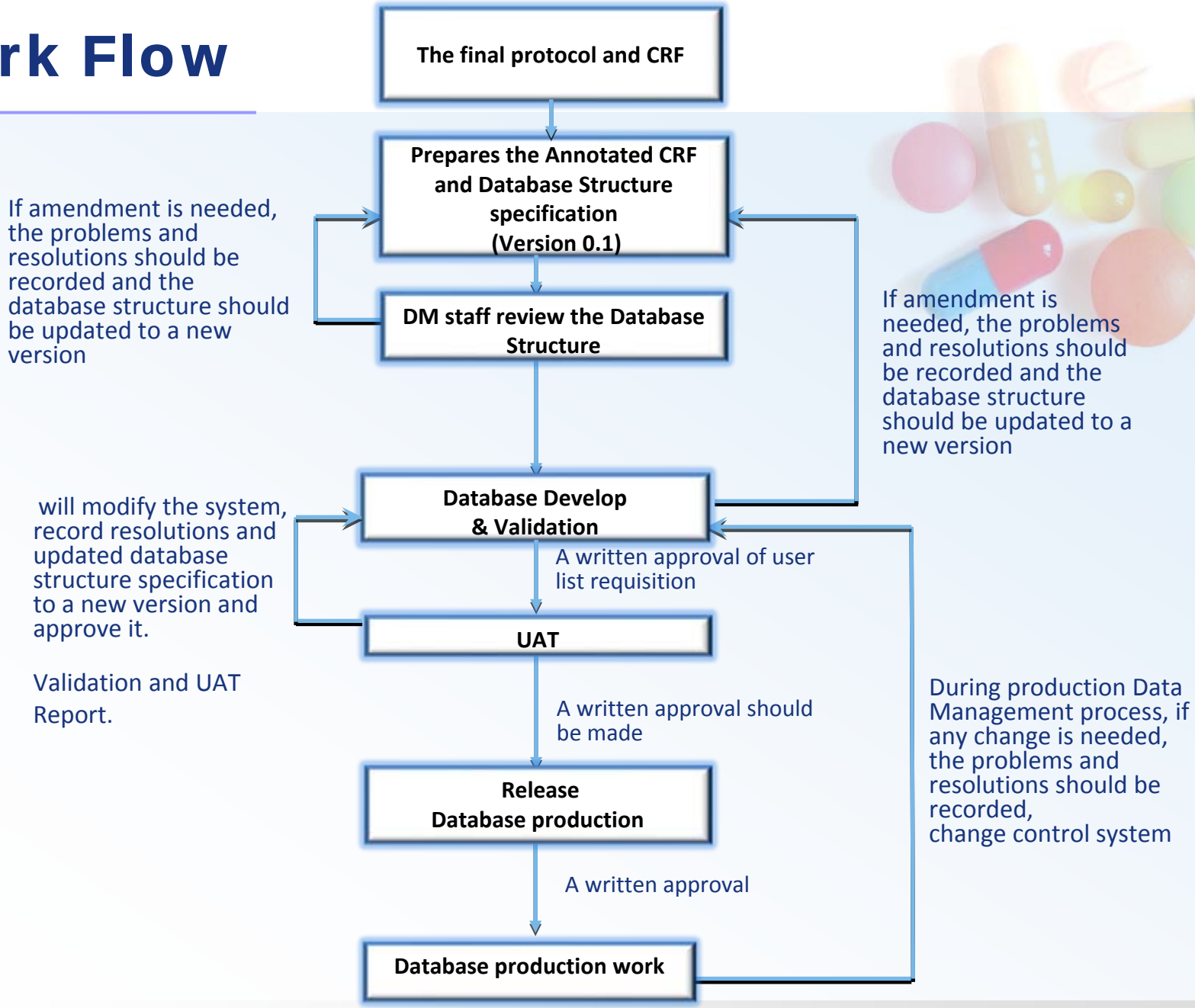
CDM System Feature (Minimum)



SOP for CDM System



Work Flow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will modify the system, record resolutions and updated database structure specification to a new version and approve it.
Validation and UAT Report.
A written approval of user list requisition
UAT
A written approval should be made
Release Database production
During production Data Management process, if any change is needed, the problems and resolutions should be recorded, change control system
A written approval
Database production work

Database Design Needs

- Store the data accurately
- Clarity, ease, and speed of data entry;
- Efficient creation of analysis data sets for biostatisticians;
- Formats of data transfer files;
- Database design theory;
- Database application software requirements;

Database Design Considerations

- High-impact fields
  - Hidden text fields
    - Text field
    - Numeric field
    - Text and numeric field
    - Numeric field and an associated field
    - Data entry guideline
  - Dates of all kinds
    - Knows dates related to the study (visit date, lab sample date)
    - Historical dated (previous surgery, prior treatment)
    - Dates closely related to the study but provided by the patient (concomitant medication, AE)
      - ✧ Incomplete dates
      - ✧ Varying date formats

Database Design Considerations (cont'd)

- High-impact fields
  - Text fields and annotations
    - Categorical (coded) values
    - Short comments
      - Abnormal, explain
      - Medical history term
      - Reason for discontinuation
    - Reported terms: AEs and medication
    - Long comments
      - As one large text field
      - As several numbered text fields
      - In a separate storage area
      - In CRF images only, with a cross reference in the data
    - Annotations on the page

Database Design Considerations (cont'd)

- High-impact fields
  - Header information
    - Patient-header
    - Page number
    - Page type or name (e.g., AE, DEMOG)
    - Document identifier
  - Single check boxes

    Check if any adverse events: [ ]
  - Calculated or derived values
  - Special integers
    - Patient identifier

Database Design Considerations (cont')

- Tall- skinny versus short-fat
- Using standards
- After deciding on a design
  - Annotated CRF
  - Design document
- Quality assurance for database design
  - Do and Review
- Standard operating procedures

Clinical Data Acquisition Standards Harmonization (CDASH)

&

Study Data Tabulation Model (SDTM)

Database specifications

- Name and label
- Dataset label, panel, or other logical group to which the data belongs
- Type (e.g., numeric, character, integer, decimal, date)
- Length (including number of characters before and after the decimal point, where applicable)
- Definitions for all coded values
- Indication of the origin of the data
- Algorithms for derived or calculated variables

Example

Agenda

1. Clinical Data Management System
2. **Database Validation**
3. Change Control
4. Medidata RAVE Demo

Database Validation

- Validation : “establishing documented evidence which provides a high degree of assurance that a specific process will consistently produce a product meeting its predetermined specifications and quality attributes.”

- The Food and Drug Administration (FDA) -- since 1996

- The FDA’s guidance on validation : “… confirmation by examination and provision of objective evidence that software specifications conform to user needs and intended uses, and that the particular requirements implemented through software can be consistently fulfilled.”

Database Validation (cont'd)

System Validation (off-the-shelf)

- Design Level's Validation
- Functional Level Testing

Study Level's Validation

- Validation of Development
- User Acceptance Testing

System (off-the-shelf) Validation

- Design level's validation
  - All tests are designed to conform to established requirements for completeness, accuracy, reliability, and consistent performance as intended.
  - Follows the Software Development Life Cycle (Software Quality Assurance)
  - Be available to the sponsor

System (off-the-shelf) Validation (cont'd)

- Functional level testing
  - In the target system to ensure that the system as implemented works correctly under acceptable system usage, based on a specification detailing the functionality.
  - Includes documenting the effect of any known limitations, problems, and defects on functions used for the sponsor's study

System (off-the-shelf) Validation (cont'd)

- Functional level testing
  - Testing of data entry screens to ensure that data are mapped to intended database structures
  - Validation of any generic integrity constraints or data-checking routines that execute during data entry (e.g., range, date, format, coding, field discrepancies)
  - Testing of data verification functions such as second-entry verification, file comparison, and batch verification
  - Batch data transfer to the clinical trial database from separate data entry systems (e.g., electronically transferred data or remote data entry systems)

Database Validation

System Validation (off-the-shelf)

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Study Level's Validation

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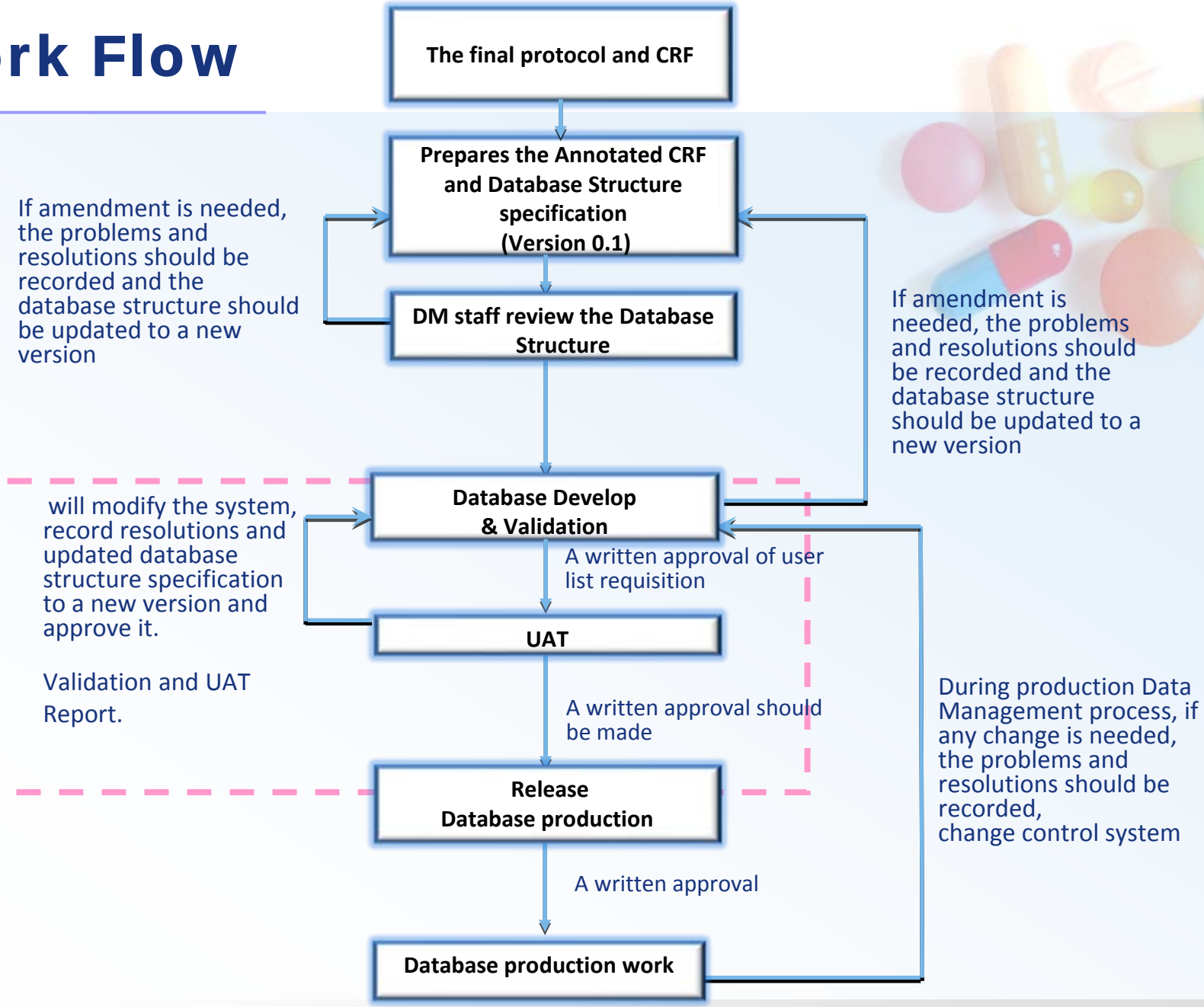
Work Flow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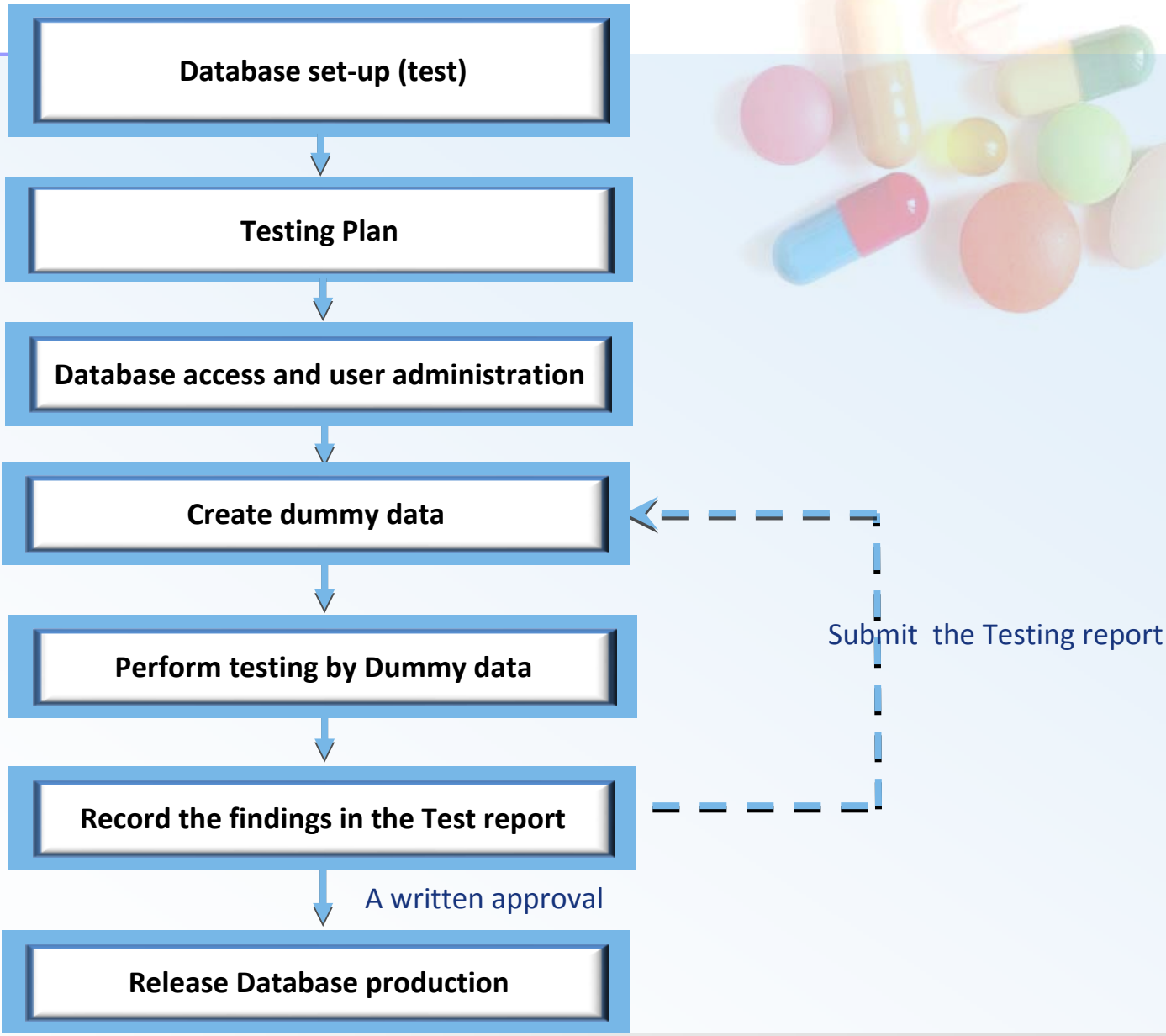
Work Flow-Validation



Testing Plan

- Methodology
- Scope
- Purpose
- Acceptance criterion
- Approvals
- That specifies the format for test data and problem reporting.

Study Level's Validation

- Study's data capture system testing
  - A data entry screen or captured via some other transfer process (e.g., electronic lab data transfers) map to the correct variables
  - Will all study data be accepted by the database?
  - All questions that need to be entered are set up
  - Easy to enter
  - Label text and header information correct
  - Question sequence and option sequence match CRF
  - Single/Multiple option setting correct
  - For repeated questions, repeat number matches the CRF

Study level's validation (cont'd)

- Study's data capture system testing
  - Are there unexpected blank records?
  - key records management issues
  - The data field definitions in terms of length and type
  - Are variable lengths sufficient to prevent truncating or rounding or or otherwise improperly being stored ?
  - Do character and numeric formats provide the necessary output
  - The audit trail for the trial (date, time, and user stamps in an audit trail that can be accessed as read-only for the life of the data.)
  - If the database is programmed to flag out-of-range data, are those flags being appropriately triggered during data entry or import?

Study level's validation (cont'd)

- Study's data capture system testing
  - Dummy data
    - 2-10 patients
    - Several: complete
    - Several: Withdraw
    - As similar as the real data
    - Not blank page
    - Dirty data
    - Additional page

Study level's validation (cont'd)

- Study-Specific Programming
  - Testing each logic condition in the programming, based on a test plan.
  - Algorithms for derived variables must be validated.
  - Study-specific programming are data loading or transfer programming and programming done to validate the data (e.g., edit checks, query rules, procedures).
  - Include programming that identifies data discrepancies such that queries are sent to clinical investigators or in-house data-editing conventions followed for items identified by the programming.

Study level's validation (cont'd)

- Study-Specific Programming
  - Every procedure (edit check) needs to be tested
  - kicks out for the appropriate patient, page with the correct output message
  - does not kick out for clean data.

Study level's validation (cont'd)

- Study-specific programming
  - Dummy data
    - 2 patients with clean data
    - 6 patients with dirty data
    - Missing data
    - Blank page
    - Every edit check
    - Withdraw
    - As similar as the real data
    - Additional page

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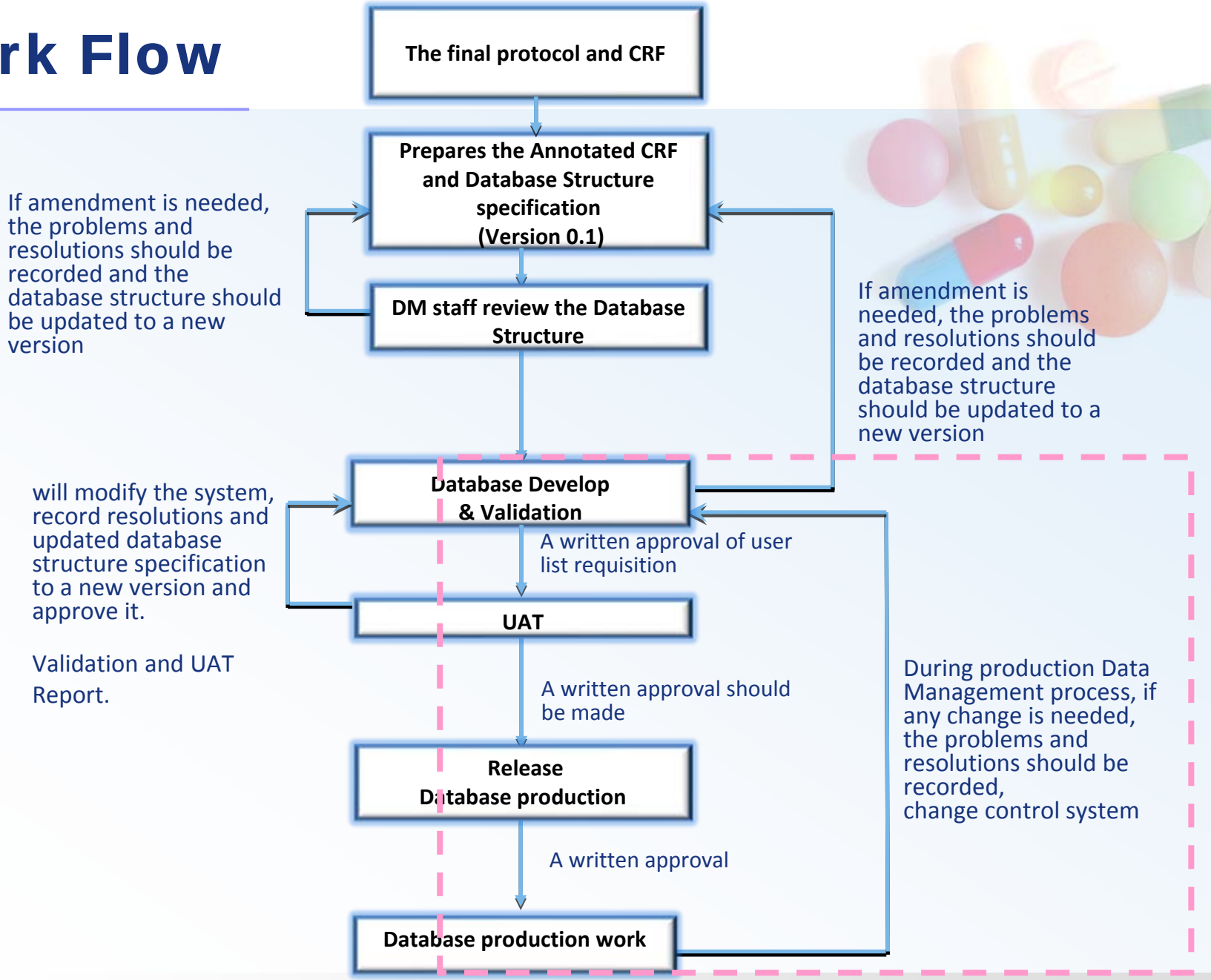
Work Flow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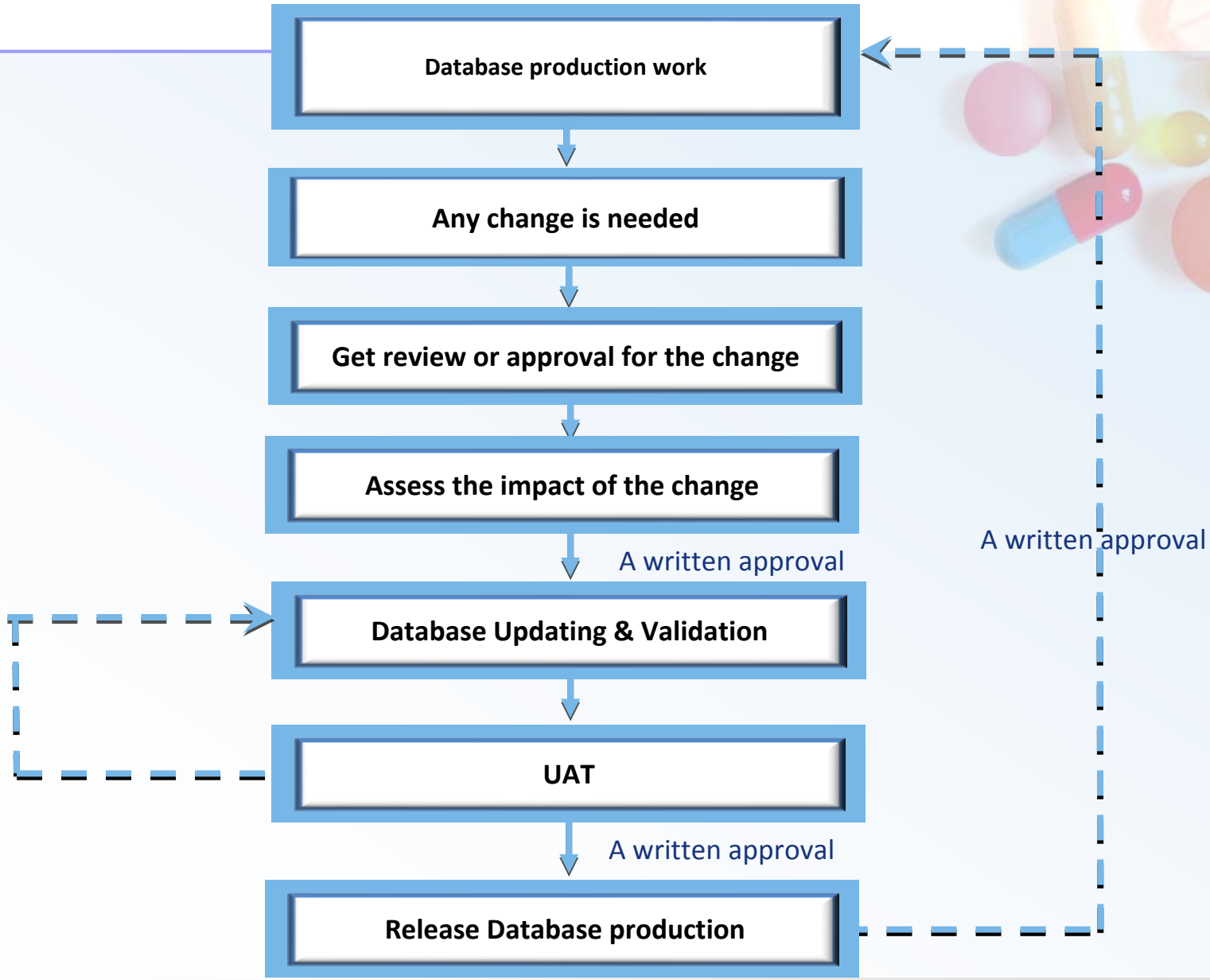
Database production work

Once the system is in production, any change should be tracked !

Work Flow-Change Control



What is a change?

What is a change?

Software systems

- Applications
- programs
- new versions of software
- bug fixes
- system or site configuration files or parameters

User applications

- Format
- Protocol amended
- study databases
- modifications or additions to the structures

Type of Change Control

- New fields;
- Changes to allowed codes for coded items;
- Modification or removal of a database field including changes in width;
- Changes to entry screens of all types;
- New, deleted, or otherwise modified programs for calculated items;
- New, deleted, or otherwise modified data cleaning rules or programs;

Not include In Change Control

- Adding, deleting, or modifying patient data according to standard practice and under audit trail
- Adding users and granting access
- Addition of new users or changes in permissions (as this is usually recorded elsewhere)
- Any changes made prior to a study being released to production
- New subjects created to support a new study

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The 2nd Clinical Data Management Training

Thank You !