



Science For A Better Life

Using a Clinical Data Review Tool in a SAS[®] based environment

**PhUSE 2013
Brussels**

13 – 16.Oct 2013 / Michael Hersch



Agenda

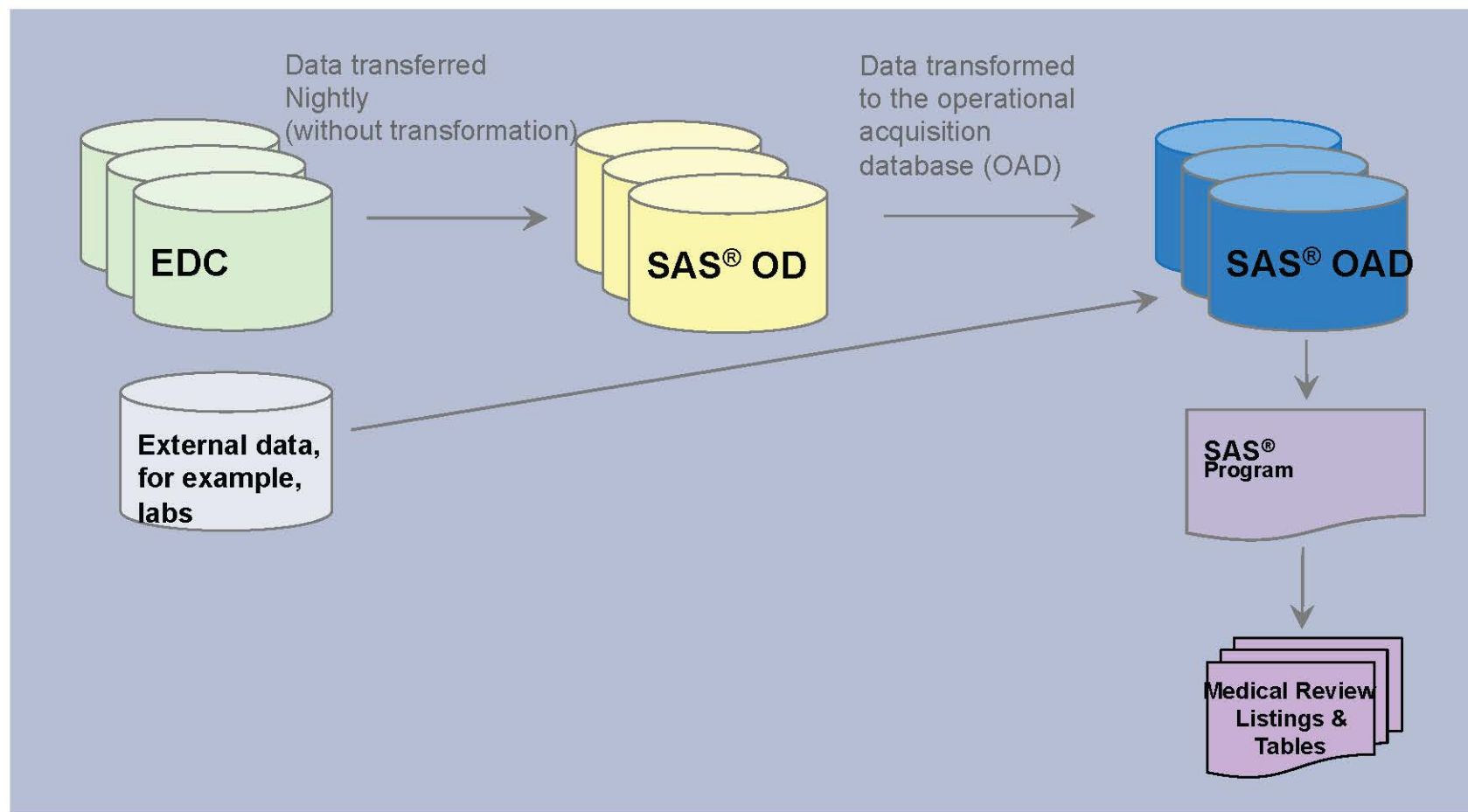
- Background
- Situation (in the past)
- Situation (today)
- Examples
- Conclusion



Background

- Patient Profiles are a compilation of individual subject data from the clinical database
- They are used in context of the Bayer Medical Review to check the completeness and consistency of the available subject data and to identify potential issues
- In the “Pre-CDRT Era” Patient Profiles were compiled by Bayer Global Data Management solely SAS® based
- Taking into consideration that the CDRT allows the registration of SAS® programs, it was investigated at Global Data Management that the combination of SAS® based Patient Profiles and the CDRT offers an additional benefit for the Medical Reviewers

Situation (in the past – without CDRT)





Situation (in the past – without CDRT)

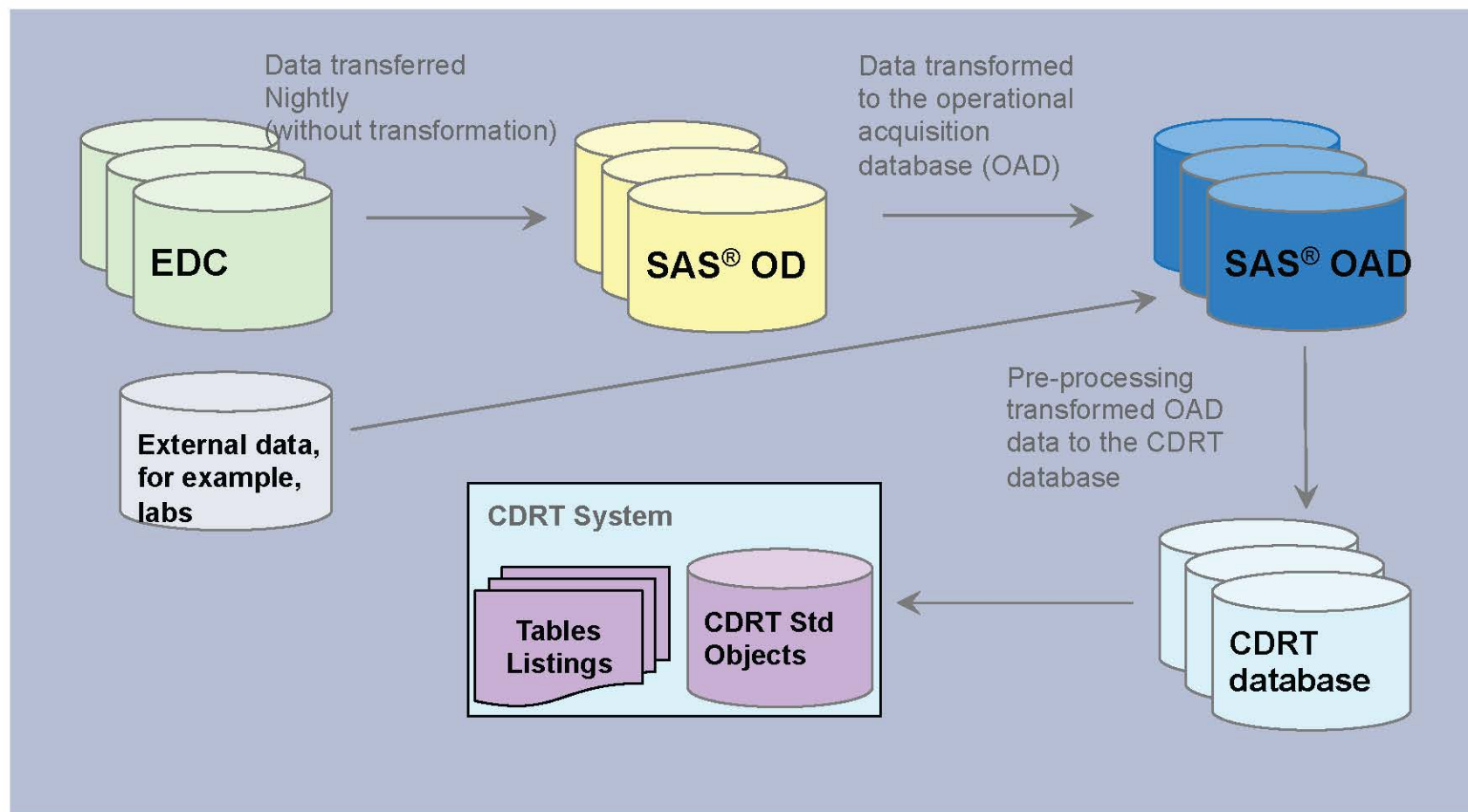
- PROS
 - SAS based PDF or RTF reports with all the possibilities SAS ODS offers
 - Possibility to fulfill nearly 100% of the user requirements our customers
 - Creation of batches to create reports for more than patient at once
 - Schedule of time consuming jobs to run them at night



Situation (in the past – without CDRT)

- **CONS**
 - Customization of every SAS program for each study to meet the user requirements
 - No possibility for the customer to create the reports on their own if needed
 - No interactivity to define personally the needed subject population
 - Standardization hardly possible

Situation (today, with CDRT only)





Situation (today, with CDRT only)

- PROS
 - Interactive Reports in the CDRT
 - The customers (Medical Experts) can execute the reports at any time
 - Release of standard objects (Reports) possible
 - Several populations (subsets) can be defined
 - Every object can be executed and calculated based on the selected subset



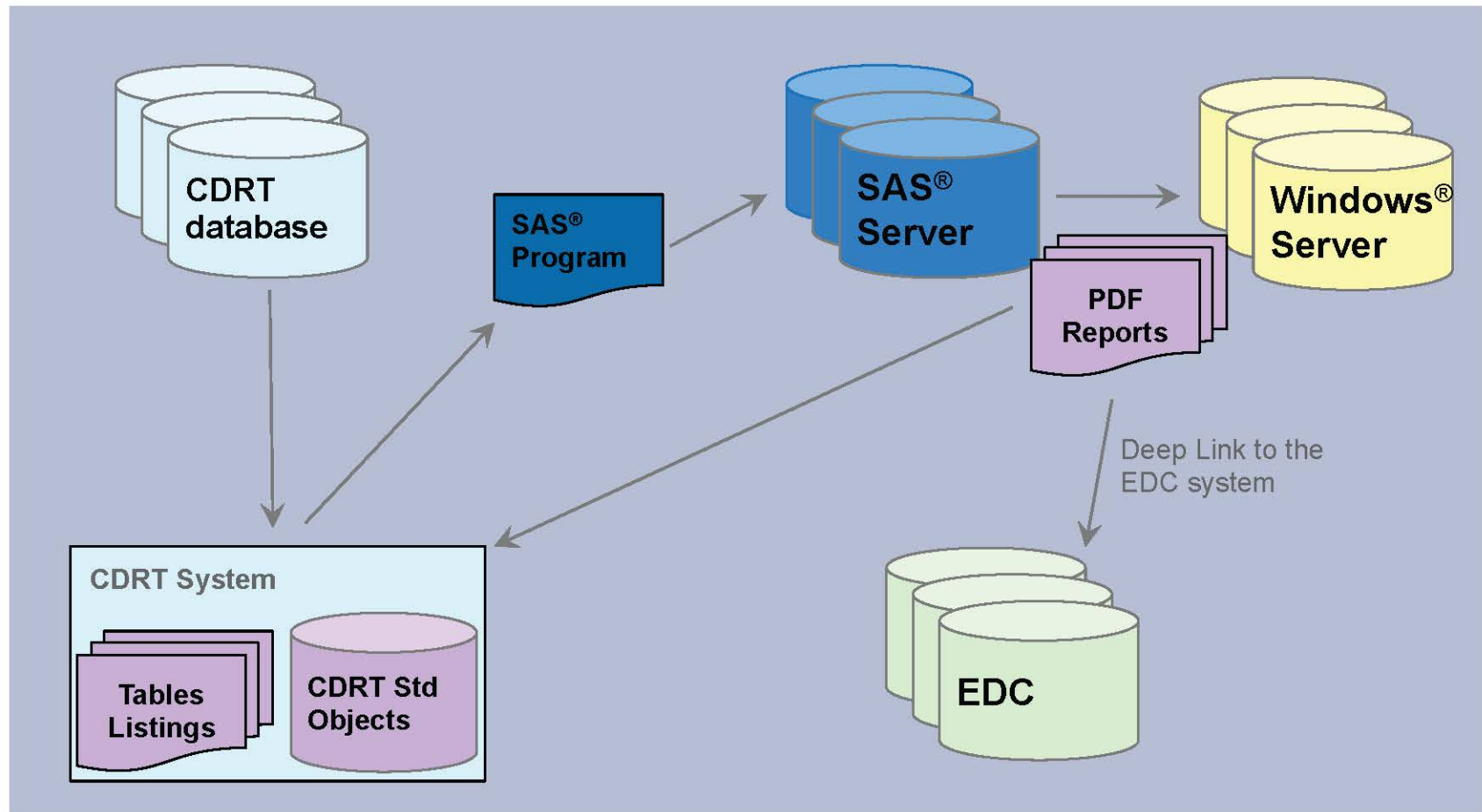
Situation (today, with CDRT only)

- PROS
 - Interactive Reports in the CDRT
 - The customers (Medical Experts) can execute the reports at any time
 - Release of standard objects (Reports) possible
 - Several populations (subsets) can be defined
 - Every object can be executed and calculated based on the selected subset

Situation (today, with CDRT only)

- CONS
 - New training needed because of a complete new system
 - Problem in the acceptance of such a new system
 - Problems in storing the reports for later usage or documentation
 - Patient wise Reports (Patient profiles) could not be created in an acceptable format for our customer

Situation (today, CDRT & embedded SAS Patient Profiles)



Advantages of embedded SAS® based Patient Profiles



- **Batch wise compilation of Patient Profiles is possible.** In combination with a Macro parameter the reviewer can decide if a single profile, profiles for a range of subjects or for all subjects of a study should be compiled
- By using the scheduling functionality of our CDRT an execution of large Patient Profile batches is feasible (e.g. at night)
- **Patient subsets (pre-specified in the CDRT can be applied to the SAS® based Patient Profiles.** This allows for example that Patient Profiles are compiled as a batch for subjects who required a CSR narrative (provided that a respective patient subset was set-up in the CDRT)
- The SAS® based **data highlighting functionality supports the Medical Reviewers** to focus on specific areas of interest (e.g. abnormal lab values)
- Automatic export of each Patient Profile to an CDRT independent network drive

Examples (CDRT Patient Profile)

Formatted Patient Profile [BPS_global:00000100020001]

Country: DEU Subject Number: 00000100020001 Last JR Update: 27MAY2013

Study drug

Demographics

Date of Birth	Age at Enrol.	Sex	Race	Ethnicity
1945-01-01	68 YEARS	M	WHITE	NOT HISPANIC OR LATINO

Demographics extended

Country	Trial Unit	Prot. vers.	Rand. No	Last Visit Date	NMI Flag
DEU	10002	3.00	100005	2011-06-01	

Disposition

Epoch	Epoch Completed?	Disposition Term	Date/Time	Primary IE criterion not met	Rel. AEs Line No	Code broken?	Extension Study?
SCREENING	Y	COMPLETED					
MAIN TREATMENT	Y	COMPLETED				N	Y

Protocol Milestone

Disposition Term	Date/Time	Rel S/E
INFORMED CONSENT OBTAINED	2011-02-01	-N -119
GENOMIC CONSENT OBTAINED	2011-02-01	-N -119
RANDOMIZED	2011-02-02T13:35	11 -118
INFORMED CONSENT OBTAINED FOR EXTENSION PHASE	2011-05-31	119 0
DATE OF LAST VISIT	2011-05-01	120 1

Medical History

MedDRA PT	Reported Term	Start Date/Time	Rel S/E	End Date/Time	Ongoing?	Line No
Cardiac failure	RECURRENT CARDIAC DECOMPENSATION				ONGOING	16
Hypertension	ARTERIAL HYPERTENSION				ONGOING	10
Gout	ATTACKS OF GOUT				ONGOING	17
Chronic obstructive pulmonary disease	CHRONIC OBSTRUCTIVE PULMONARY DISEASE				ONGOING	14
Type 2 diabetes mellitus	DIABETES MELLITUS TYP II				ONGOING	11
Obesity	OBESITY				ONGOING	16
Hyperlipidaemia	HYPERLIPIDEMIA				ONGOING	4
Congestive cardiomyopathy	DELTAED CARDIOMYOPATHY	2005-10-17	-3095 -3513	2009-11-26	ONGOING	1
Implantable defibrillator insertion	IMPLANTATION OF CARDIOVERTER-DEFIBRILLATOR	2005-03			ONGOING	7
Hypothyroidism	HYPOTHYROIDISM	2008			ONGOING	3
Renal failure chronic	CHRONICAL RENAL INSUFFICIENCY	2008			ONGOING	2
Atrial flutter	ATRIAL FLUTTER	2008-01			ONGOING	6
Bicuspid heart	MITRAL VALVE DYSPLASIA	2008-01-25	-1104 -1222	2008-01-25	ONGOING	8
Cardiac pacemaker insertion	IMPLANTATION OF CARDIAC RESYNCHRONIZATION DEVICE	2008-11-25	-433 -551		ONGOING	13
Diabetic neuropathy	DIABETIC POLYNEUROPATHY	2008-12			ONGOING	15
Hypokalaemia	HYPOKALAEMIA	2008-12			ONGOING	12
Hyperuricaemia	HYPERURICAEMIA	2008-12			ONGOING	12

- No advanced formatting
- No color coding
- Plain PDF format

Examples (CDRT + SAS Patient Profile)



12.03 Patient Profiles (SAS) - All Patients

Country: DEU
Treatment Group: Study drug
Subject Number: 00000100020001
Trial Unit: 10002
Study No: 00000
Last JR Update: 2012-12-07

Demographics

Subject Identifier	00000100020001
Rand. No.	100035
Date Of Birth	1945-01-01
Age At Enrol.	66 YEARS
Height (Cm)	166
Baseline Weight (Kg)	87
Sex	M
Race	WHITE
Ethnicity	NOT HISPANIC OR LAT
Nm Flag	
Informed Consent Obtained	2011-02-01
Genomic Consent Obtained	2011-02-01
Randomized	
Informed Consent Obtained For E	2011-02-02T13:35
Last Visit Date	
Prot. Vers.	

Disposition

Epoch

SCREENING

MAIN TREATMENT

Medical History

MedDRA PT

Cardiac failure

Chronic obstructive pulmonary disease

Gout

Hypertension

Hyperlipidemia

Obesity

Type 2 diabetes mellitus

12.03 Patient Profiles (SAS) - All Patients

Country: DEU
Treatment Group: Study drug
Subject Number: 00000100020001
Trial Unit: 10002
Study No: 00000
Last JR Update: 2012-12-07

Chemistry - Horizontal

Visit	Collection Date/Time	Rel S/E	Sodium	Potassium	Albumin	Urate	Urea	Creatinine	E-GFR
PRE STUDY VISIT	2011-02-01T10:45	1/-119	137 mmol/L	3.9 mmol/L	4.3 g/dL	5.4 mg/dL	57.7 mg/dL	1.6 mg/dL	46 mL/min/1.73m2
VISIT 1 (PROFILE VISIT)	2011-02-02T13:45	1/-118	138 mmol/L	3.9 mmol/L	4 g/dL	10.3 mg/dL	57.7 mg/dL	1.8 mg/dL	39 mL/min/1.73m2
VISIT 2 (DAY 14)	2011-02-15T08:30	14/-105	135 mmol/L	3.3 mmol/L	4.2 g/dL	10.3 mg/dL	57.7 mg/dL	1.5 mg/dL	51 mL/min/1.73m2
VISIT 3 (DAY 28)	2011-03-03T08:20	30/-89	128 mmol/L	3.3 mmol/L	4.4 g/dL	18.5 mg/dL	153.8 mg/dL	3.9 mg/dL	17 mL/min/1.73m2
VISIT 4 (DAY 56)	2011-03-29T08:00	56/-83	131 mmol/L	2.9 mmol/L	5 g/dL	16.3 mg/dL	149.5 mg/dL	2.2 mg/dL	32 mL/min/1.73m2
VISIT 5 (DAY 84)	2011-04-28T09:10	86/-33	142 mmol/L	3.5 mmol/L	4.6 g/dL	9.9 mg/dL	52.3 mg/dL	1.7 mg/dL	43 mL/min/1.73m2
VISIT 6 (DAY 112)	2011-05-30T10:10	118/-1	134 mmol/L	3.1 mmol/L	4.8 g/dL	17 mg/dL	126.1 mg/dL	2 mg/dL	35 mL/min/1.73m2

Chemistry part2

Visit	Collection Date/Time	Rel S/E	AST	ALT	GLDH	GGT	Bilirubin	Lipase	CK
PRE STUDY VISIT	2011-02-01T10:45	1/-119	14 U/L	11 U/L	1.6 U/L	166 U/L	1.8 mg/dL	25 U/L	79 U/L
VISIT 1 (PROFILE VISIT)	2011-02-02T13:45	1/-118	13 U/L	9 U/L	1.4 U/L	160 U/L	1.2 mg/dL	26 U/L	100 U/L
VISIT 2 (DAY 14)	2011-02-15T08:30	14/-105	12 U/L	8 U/L	1.3 U/L	165 U/L	1 mg/dL	24 U/L	82 U/L
VISIT 3 (DAY 28)	2011-03-03T08:20	30/-89	10 U/L	8 U/L	1.1 U/L	159 U/L	0.8 mg/dL	36 U/L	356 U/L
VISIT 4 (DAY 56)	2011-03-29T08:00	56/-83	14 U/L	12 U/L	1.1 U/L	229 U/L	1.3 mg/dL	52 U/L	89 U/L
VISIT 5 (DAY 84)	2011-04-28T09:10	86/-33	14 U/L	11 U/L	1.4 U/L	187 U/L	0.8 mg/dL	25 U/L	120 U/L
VISIT 6 (DAY 112)	2011-05-30T10:10	118/-1	14 U/L	11 U/L	1.1 U/L	177 U/L	1.3 mg/dL	42 U/L	85 U/L

Hematology - Horizontal

Visit	Collection Date/Time	Rel S/E	Hematocrit	Hemoglobin	Red Blood Cells	White Blood Cells	Platelets
PRE STUDY VISIT	2011-02-01T10:45	1/-119	35 %	10.6 g/dL	4.3 T/L	10.4 GIGAS/L	227 GIGAS/L
VISIT 1 (PROFILE VISIT)	2011-02-02T13:45	1/-118	34 %	10 g/dL	4.1 T/L	9.5 GIGAS/L	221 GIGAS/L
VISIT 2 (DAY 14)	2011-02-15T08:30	14/-105	34 %	10 g/dL	4.2 T/L	9.4 GIGAS/L	237 GIGAS/L
VISIT 3 (DAY 28)	2011-03-03T08:20	30/-89	35 %	9.5 g/dL	3.8 T/L	9.5 GIGAS/L	196 GIGAS/L

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Creatinine	E-GFR
1.6 mg/dL *H	46 mL/min/1.73m2
1.8 mg/dL *H	39 mL/min/1.73m2
1.5 mg/dL *H	51 mL/min/1.73m2

- Different color codes for alert ranges
- Different color for headlines and integrated deep links
- Better overall visual enhancements

Examples (Deep Link to EDC system)

SAS® Patient Profile

Adverse Events (OTHER) <Click here for RAVE page>

MedDRA PT/Rep. Term	Line No	Start Date/Time	REL S/E	TEAE?	End Date/Time	Rel. to SD?	Intensity	Seriousness	Action taken/Other Spec. Action	Outcome	Comment
Renal failure acute / ACUTE KIDNEY INSUFFICIENCY	3	2012-11-29T07:00	4/-40	Y	2012-11-30T07:00	N	MODERATE	N	DOSE NOT CHANGED; OTHER	RECOVERED/RESOLVED	OBSERVATION
Sick sinus syndrome / SICK-SINUS-SYNDROME (SSS)	1	2012-11-29T08:00	4/-40	Y	2012-11-29T15:51	N	SEVERE	Y: Requires or Prolongs Hospitalisation	DRUG INTERRUPTED; OTHER	RECOVERED/RESOLVED	PT. RECEIVED P. SEMAKER; SICK-SINUS-SYNDROME (SSS) DUE TO SSS AND SINUS ARREST AFTER CV AND BRADYCARDIA .PT RECEIVED IMPLANTATION OF DDD-SM)
Urinary tract infection enterococcal / URINARY TRACT INFECTION DUE TO ENTEROCOCCUS FAECIUM IN URIN	2	2012-11-29T08:00	4/-40	Y	2012-12-08T08:00	N	MODERATE	N	DOSE NOT CHANGED; Remedial Drug Therapy	RECOVERED/RESOLVED	



User Name:

Password:

[Activate New Account](#) [Forgot Password?](#)



Subject: 100010003
Page: Adverse Events - Visit Independent Forms?

EDC Page

The following events are not considered (SJAEs: stroke, TIA, non-CNS systemic embolism, MI)

Were there any Adverse Events?

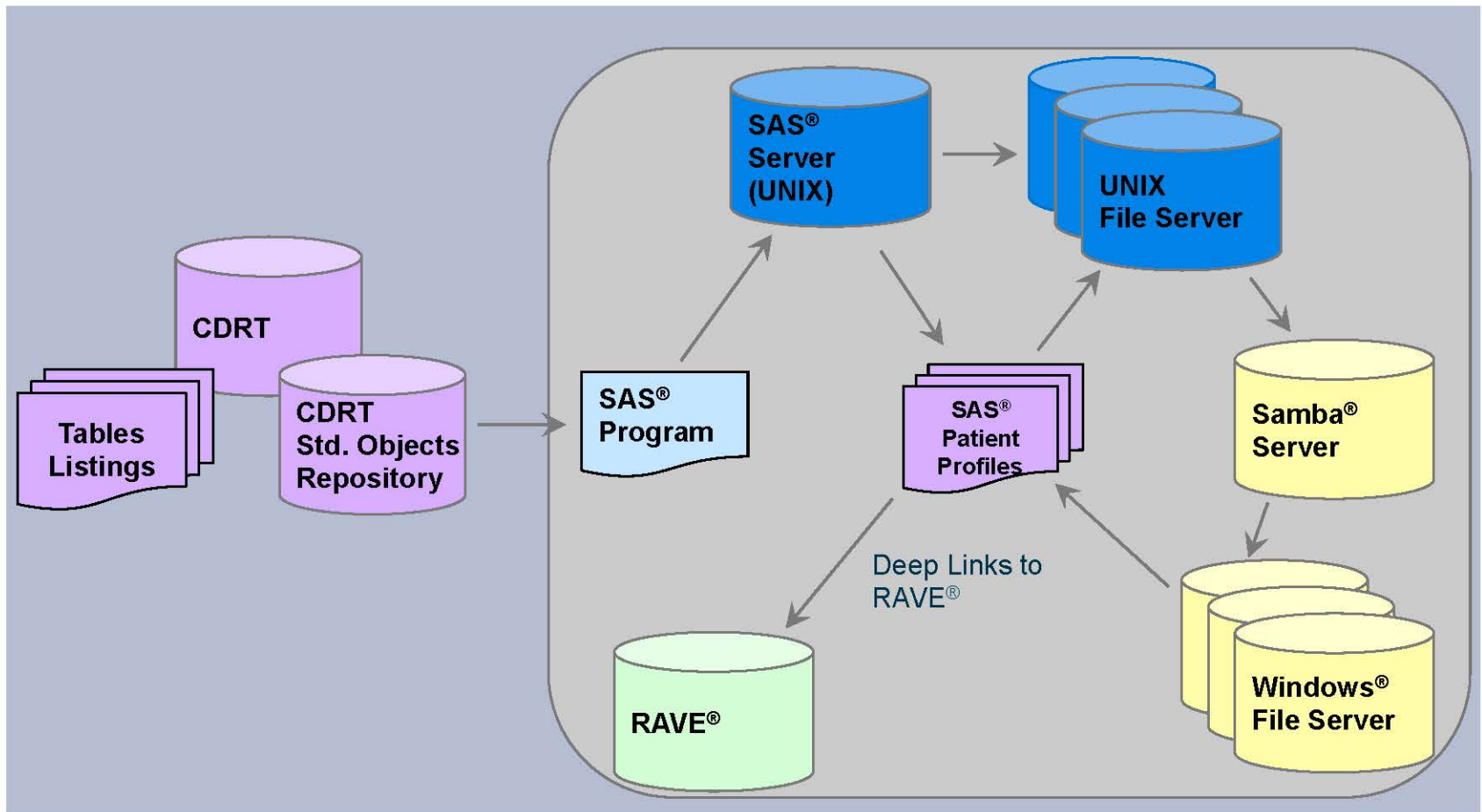
- ? According to the documentation on the 'Prior and Concomitant Medication' page, the subject had 'urinary tract infection and enterococcus faecium during stay in hospital'. Please check if these should be reported as additional adverse events. Thank you.
Opened To Clinical Site by DM (12 Dec 2012)
- done
- ? Provide the missing data or specify why the data is missing.
Opened To Clinical Site by System (15 Mar 2013)
- line 4 inactivated
- ? As there are adverse events reported, please select 'Yes' to the right. Thank you.
Opened To Clinical Site by DM (19 Mar 2013)
- updated

#	Adverse Event Category	AE Term?	Bleeding AE site	Antithrombotic agents used to treat the bleeding	Serious? Print the AE page from the page view, not the log line view.?	Reason: Death?	Life threatening?	Hospitalization	Anomaly: Birth Defect?	Sign. Disability?	Other serious or important medical event?	Sur sent reas
1	Other AE	Sick-Sinus-Syndrom (SSS)	-	-	Yes	☐	☐	☒	☐	☐	☐	1

Usage of "deep links" to the EDC system

The implementation of interactive deep links into embedded SAS® based subject profiles allows by "clicking" on the link, to switch automatically to the EDC page on which the respective information was entered

Examples (external storage of Patient Profiles)





Conclusion

- Combination of SAS® programmed Patient Profile and the CDRT offers many enhancements to the system
 - Allows user to execute Patient Profiles if required. This means the user is very flexible and not dependent on the Data Management Function.
 - Flexibility of the Reviewer by selecting Patient via a Patient Subset.
 - SAS® Patient Profiles registered in the CDRT will use the same data as used by other Medical Review activities in the CDRT
 - Although the Profiles are registered in the CDRT no export of Patient Profiles is necessary



Forward-Looking Statements

This presentation may contain forward-looking statements based on current assumptions and forecasts made by Bayer Group or subgroup management.

Various known and unknown risks, uncertainties and other factors could lead to material differences between the actual future results, financial situation, development or performance of the company and the estimates given here. These factors include those discussed in Bayer's public reports which are available on the Bayer website at www.bayer.com.

The company assumes no liability whatsoever to update these forward-looking statements or to conform them to future events or developments.



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Thank you!